MAPS

Location

Zoning

Future Land Use

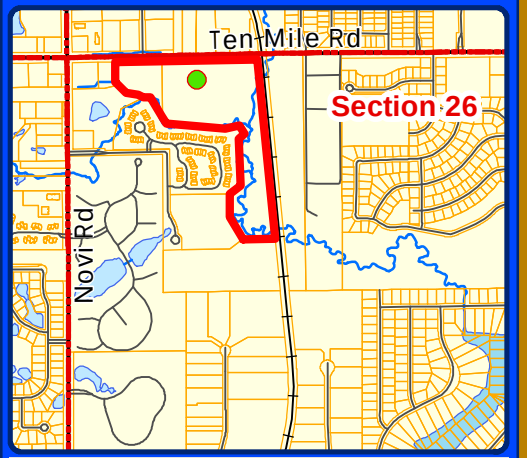
Natural Features

Floodplain

NOVI TEN PRO

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: Lindsay Bell
Date: 7/19/24
Project: NOVI TEN PRO
Version #: 1

Feet
0 90 180 360 540

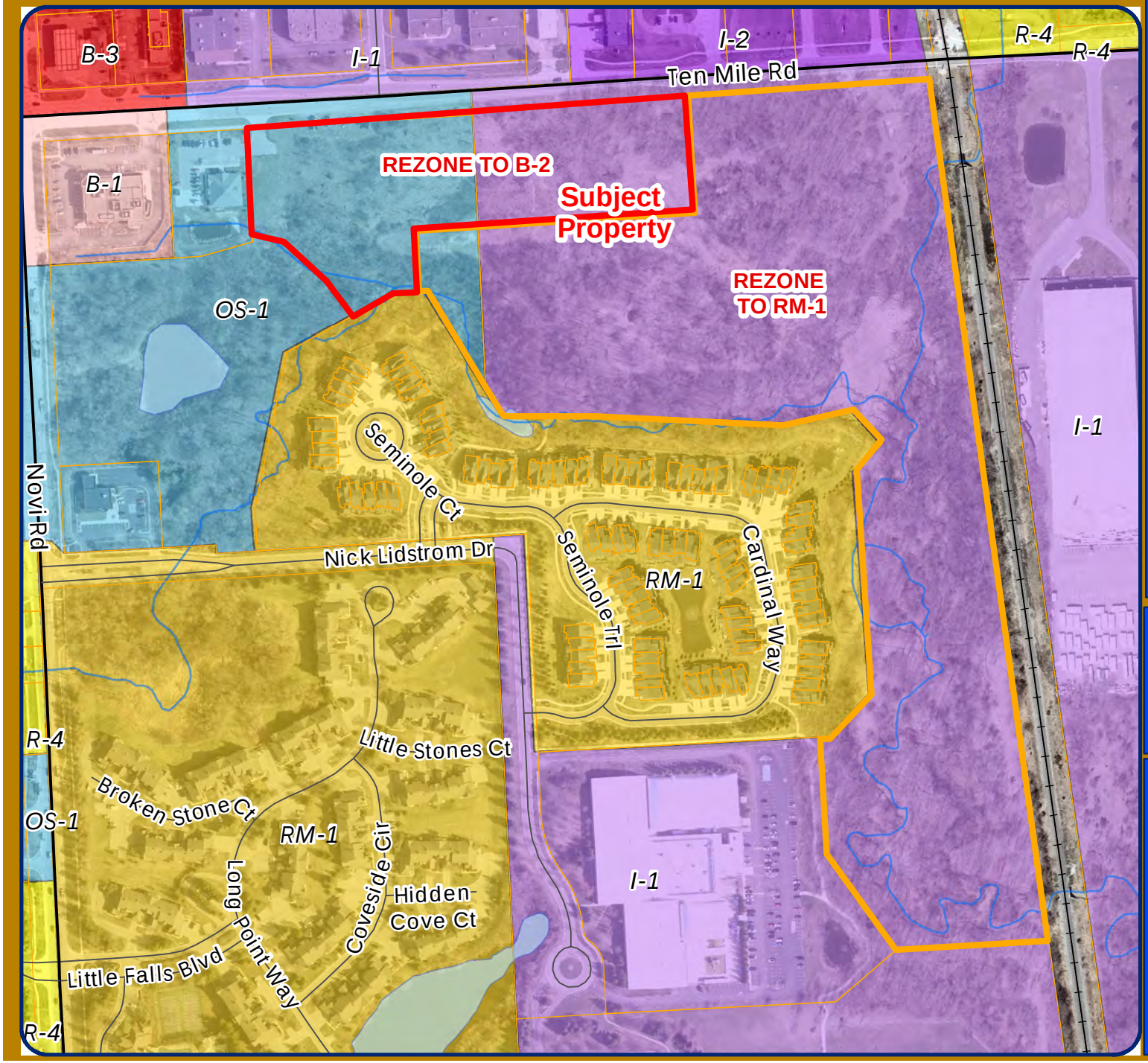
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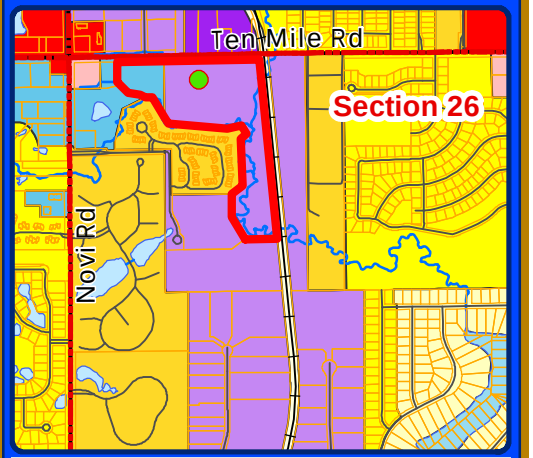
MAP INTERPRETATION NOTICE

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NOVI TEN PRO

ZONING





Legend

- R-4: One-Family Residential District
- RM-1: Low-Density Multiple Family
- B-1: Local Business District
- B-3: General Business District
- I-1: Light Industrial District
- I-2: General Industrial District
- OS-1: Office Service District
- 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: Lindsay Bell
Date: 7/19/24
Project: NOVI TEN PRO
Version #: 1

Feet
0 70 140 280 420

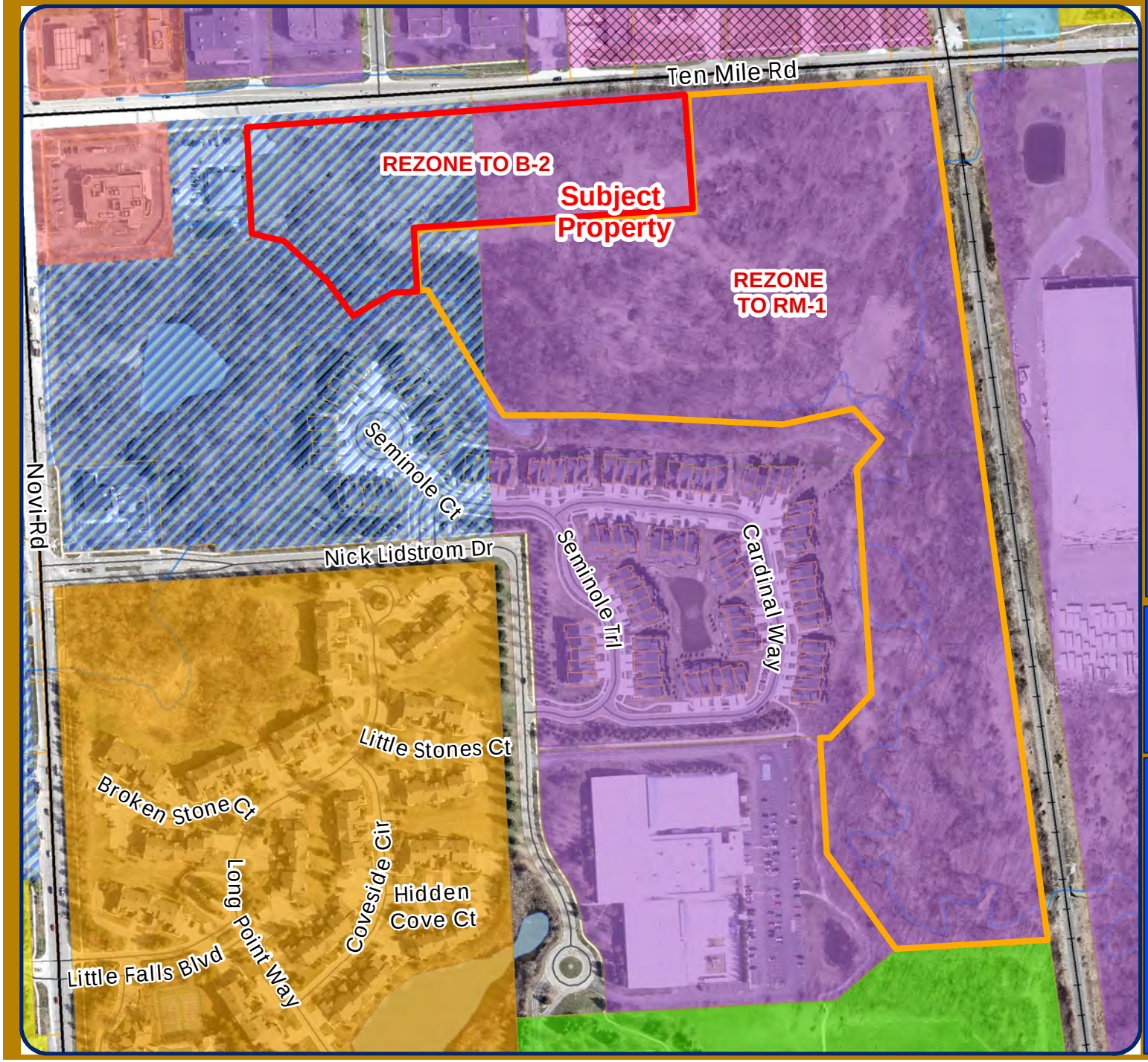
1 inch = 333 feet

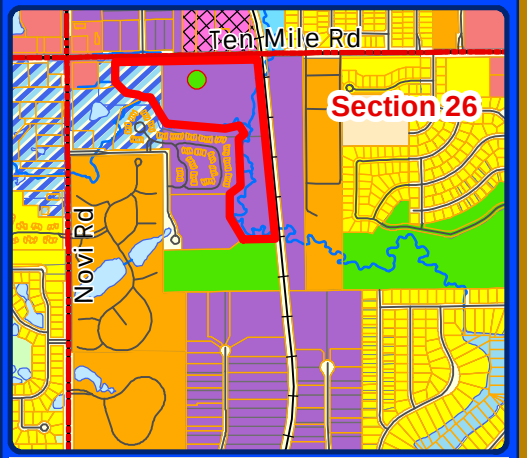
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NOVI TEN PRO

FUTURE LAND USE





Legend

- Single Family
- Multiple-Family Residential
- Community Office
- Industrial, Research, Development and Technology
- Heavy Industrial
- Local Commercial
- Public
- Public Park
- 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: Lindsay Bell
Date: 7/19/24
Project: NOVI TEN PRO
Version #: 1

Feet
0 70 140 280 420

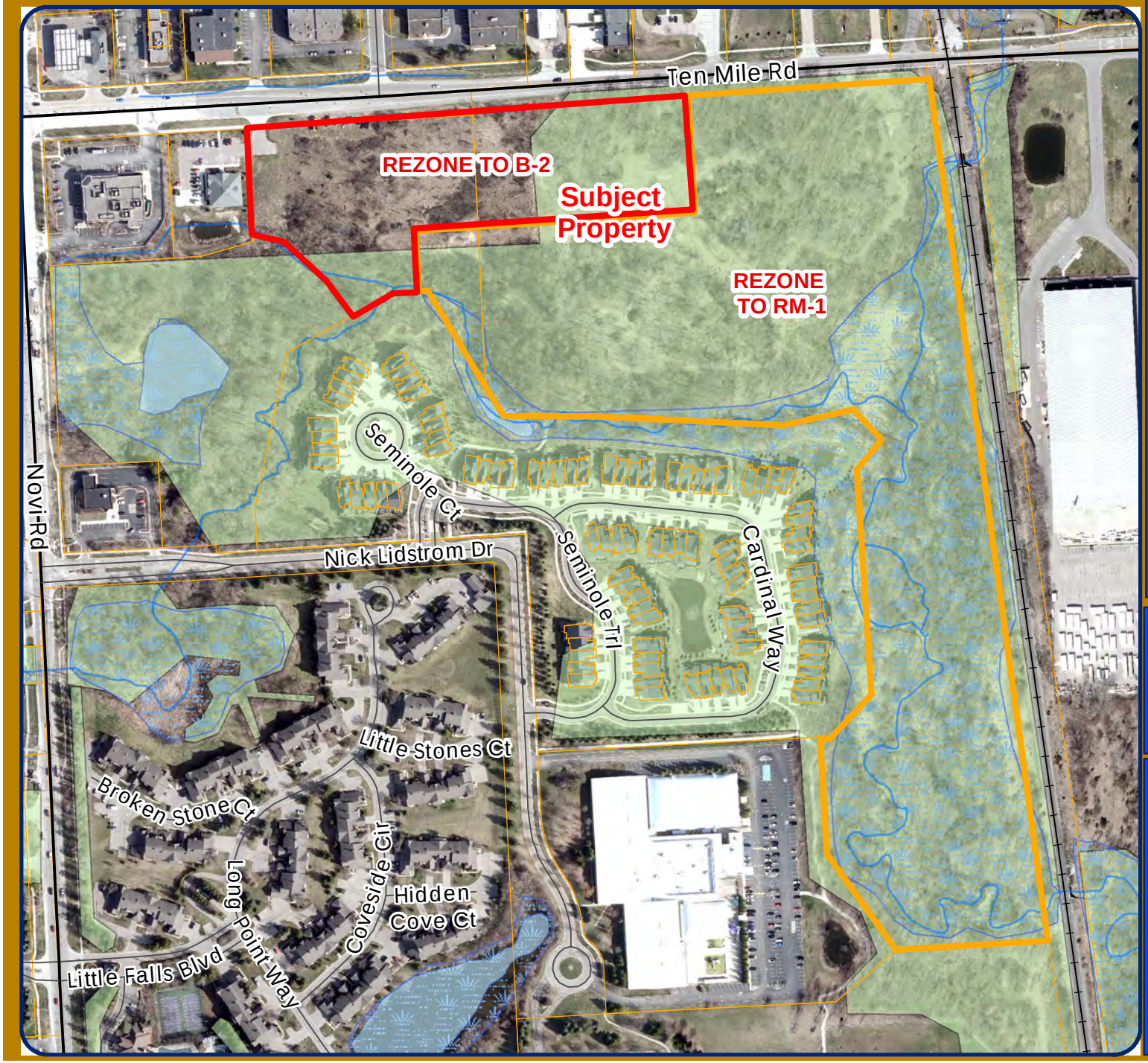
1 inch = 333 feet

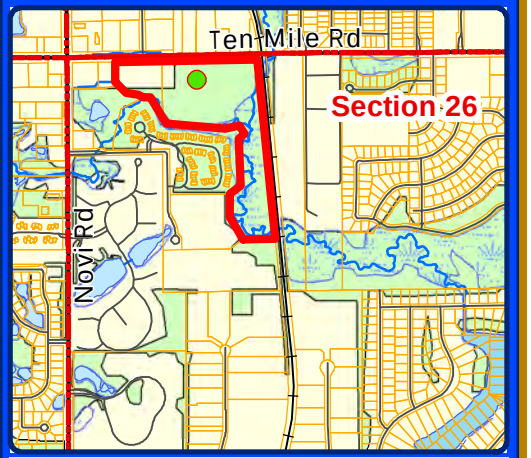
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NOVI TEN PRO

NATURAL FEATURES





Legend

- Wetlands
- Woodlands
- 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: Lindsay Bell
Date: 7/19/24
Project: NOVI TEN PRO
Version #: 1

Feet
0 70 140 280 420

1 inch = 333 feet

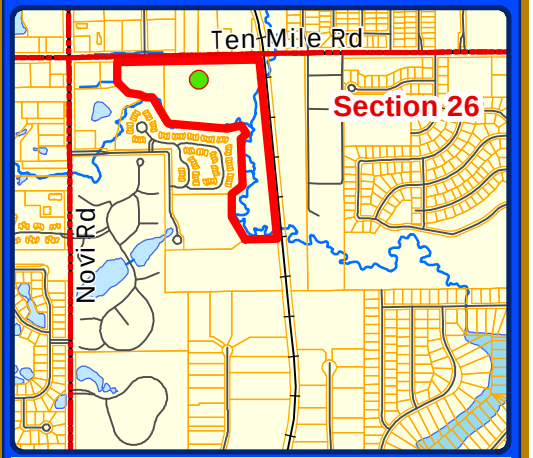
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NOVI TEN PRO

FLOODPLAIN AREAS





Legend

FEMA Flood Zone

Flood Zone

AE - Base floodplain

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: Lindsay Bell
Date: 7/19/24
Project: NOVI TEN PRO
Version #: 1

Feet
0 70 140 280 420

1 inch = 333 feet

MAP INTERPRETATION NOTICE

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FORMAL PRO CONCEPT PLAN
June 17, 2024

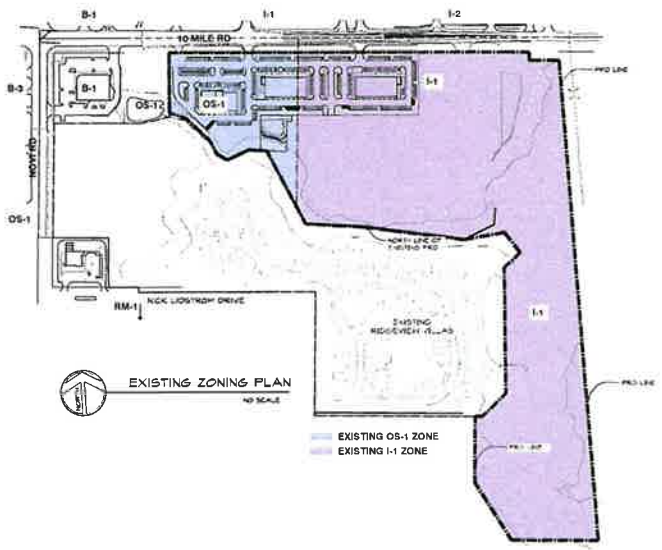
NOVI TEN ASSOCIATES

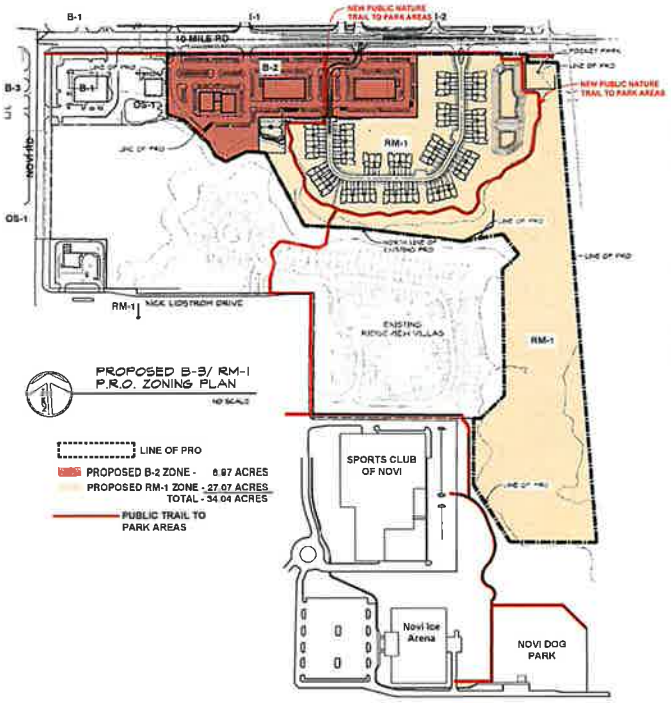
PROPOSED RE-ZONING & PRO PLAN

NOVI, MICHIGAN

WALKABLE RESIDENTIAL & COMMUNITY COMMERCIAL DEVELOPMENT

NOVI PROJECT JZ23-09





PROPOSED PARCEL B3 LEGAL DESCRIPTION (PART OF PARCELS 22-26-101-028 & 22-26-101-044)

A PARCEL OF LAND LOCATED IN AND BEING PART OF THE NORTHWEST 1/4 OF SECTION 26, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN AND BEING MORE PARTICULARLY DESCRIBED AS

COMMENCING AT THE NORTHWEST CORNER OF SECTION 26, T1N, R8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN; THENCE N86°27'27"E 1330.39 FEET, ALONG THE NORTH SECTION LINE AND THE CENTERLINE OF 10 MILE ROAD (120 FEET WIDE); THENCE S03°32'33"E 60.01 FEET TO THE POINT OF BEGINNING; THENCE N86°27'27"E 1003.81 FEET; THENCE S07°12'31"E 260.00 FEET; THENCE S86°27'27"W 520.00 FEET; THENCE S86°59'03"W 149.46 FEET; THENCE S01°32'25"E 144.88 FEET; THENCE N90°00'00"W 98.89 FEET; THENCE S60°31'08"W 98.39 FEET; THENCE N84°10'08"W 47.96 FEET; THENCE N32°30'06"W 64.67 FEET; THENCE N58°04'25"W 133.83 FEET; THENCE N75°25'58"W 71.24 FEET; THENCE N03°32'33"W 283.46 FEET, TO THE POINT OF BEGINNING, CONTAINING 6.97 ACREAS OF LAND (303,626 SFT); MORE OR LESS AND BEING SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY.

PROPOSED PARCEL PRO LEGAL DESCRIPTION (PART OF PARCELS 22-26-101-028 & 22-26-101-044)

A PARCEL OF LAND LOCATED IN AND BEING PART OF THE NORTHWEST 1/4 OF SECTION 26, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN AND BEING MORE PARTICULARLY DESCRIBED AS:

COMMENCING AT THE NORTHWEST CORNER OF SECTION 26, T1N, R8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN; THENCE N86°27'27"E 1330.39 FEET, ALONG THE NORTH SECTION LINE AND THE CENTERLINE OF 10 MILE ROAD (120 FEET WIDE); THENCE S03°32'33"E 60.01 FEET TO THE POINT OF BEGINNING; THENCE N86°27'27"E 1003.81 FEET; THENCE S07°56'33"E 1012.15 FEET; THENCE S86°56'27"W 355.53 FEET; THENCE N35°58'56"W 279.43 FEET; THENCE N03°03'33"W 269.20 FEET; THENCE N86°56'27"E 30.00 FEET; THENCE N43°47'02"E 133.85 FEET; THENCE N04°10'47"W 518.60 FEET, THENCE N49°34'07"E 91.51 FEET; THENCE N41°34'10"W 305.00 FEET; THENCE S76°46'33"W 187.10 FEET; THENCE N86°27'27"W 420.86 FEET; THENCE S03°32'33"W 233.83 FEET; THENCE N31°29'21"W 339.33 FEET; THENCE N90°00'00"W 75.00 FEET; THENCE S00°51'08"W 96.39 FEET; THENCE N84°10'08"W 47.96 FEET; THENCE N32°30'06"W 64.67 FEET; THENCE N58°04'25"W 133.83 FEET; THENCE N75°25'58"W 71.24 FEET; THENCE N03°32'33"W 283.46 FEET, TO THE POINT OF BEGINNING, CONTAINING 34.04 ACREAS OF LAND (1,482,894 SFT); MORE OR LESS AND BEING SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY

PROPOSED PARCEL RM1 LEGAL DESCRIPTION (PART OF PARCELS 22-26-101-028 & 22-26-101-044)

A PARCEL OF LAND LOCATED IN AND BEING PART OF THE NORTHWEST 1/4 OF SECTION 26, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN AND BEING MORE PARTICULARLY DESCRIBED AS:

COMMENCING AT THE NORTHWEST CORNER OF SECTION 26, T1N, R8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN; THENCE N86°27'27"E 1554.20 FEET, ALONG THE NORTH SECTION LINE AND THE CENTERLINE OF 10 MILE ROAD (120 FEET WIDE); THENCE S03°32'33"E 60.01 FEET TO THE POINT OF BEGINNING; THENCE N86°27'27"E 573.65 FEET, THENCE S07°56'33"E 2012.19 FEET; THENCE S86°56'27"W 355.53 FEET; THENCE N35°58'56"W 279.43 FEET; THENCE N03°03'33"W 244.20 FEET; THENCE N86°56'27"E 30.00 FEET; THENCE N43°47'02"E 133.85 FEET; THENCE N04°10'47"W 519.60 FEET; THENCE N49°34'07"E 91.51 FEET; THENCE N41°34'10"W 305.00 FEET; THENCE S76°46'33"W 187.10 FEET; THENCE N86°27'27"W 420.86 FEET; THENCE S03°32'33"W 233.83 FEET; THENCE N31°29'21"W 339.33 FEET; THENCE N90°00'00"W 75.00 FEET; THENCE N84°10'08"W 47.96 FEET; THENCE N32°30'06"W 64.67 FEET; THENCE N58°04'25"W 133.83 FEET; THENCE N75°25'58"W 71.24 FEET; THENCE N03°32'33"W 283.46 FEET, TO THE POINT OF BEGINNING, CONTAINING 27.07 ACREAS OF LAND (1,179,267 SFT); MORE OR LESS AND BEING SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY

CLIENT:
NOVI TEN ASSOCIATES
1 WEST SQUARE LAKE RD.
BLOOMFIELD HILLS, MICHIGAN 48302
PH (248) 334-4800

THE TOWNS AT NOVI STATION
HIGHGAN DIVISION OFFICE
26200 TOWN CENTER DR., SUITE 200
NOVI, MICHIGAN 48375
PH (248) 904-1308

ARCHITECT: (EXCLUDING RESIDENTIAL)
SIEGAL/ TUOMAALA ASSOCIATES
ARCHITECTS AND PLANNERS, INC.
29200 NORTHWESTERN HIGHWAY
SOUTHFIELD, MICHIGAN 48034
PH (248) 352-0099

CIVIL ENGINEER
SEIBER, KEAST LEHNER
CONSULTING ENGINEERS
24205 COUNTRY CLUB DRIVE
SUITE C8
FARMINGTON HILLS, MICHIGAN 48331
PH (248) 308-3331

DRAWING LIST

TITLE SHEET
P-0 EXISTING AND PROPOSED ZONING

ARCHITECTURAL
P-1 REGIONAL PLAN
P-2 SITE PLAN WITH EXISTING ZONING
P-3 PRO PLAN
P-4 WALKABLE COMMUNITY PLAN
P-5 B-2 COMMUNITY BUSINESS ZONING SITE PLAN
P-6 B-2 BUILDING FLOOR PLANS
P-7 RETAIL RESTAURANT BUILDINGS A & B ELEVATIONS
P-8 RETAIL/RESTAURANT BUILDING C ELEVATIONS
P-9 RETAIL BUILDING PHOTOMETRIC LAYOUT
P-10 RETAIL BUILDING PHOTOMETRIC SPECIFICATIONS

LANDSCAPE (B-2)
PL-1 TREE REMOVAL AND PROTECTION PLAN
PL-2 TREE SURVEY
PL-3 USE AREA PLAN
PL-4 B2 LANDSCAPE PLAN (CONCEPTUAL)

CIVIL ENGINEERING
1 COVER SHEET
2. BOUNDARY SURVEY
3. TOPOGRAPHIC SURVEY
4 - 5. SOIL BORING LOGS
6A. PRO-1OF4
6B. PRO-B-2
7. EXISTING AND PROPOSED ZONING
8. STORM WATER MANAGEMENT PLAN
9. OPEN SPACE PLAN
10 TRUCK ROUTING PLAN
11. PHOTOMETRIC LIGHTING PLAN
NO. NOTES AND DETAILS

LANDSCAPE (RM-1)
RL-1 CONCEPTUAL LANDSCAPE PLAN
RL-2 GREENBELT AND ENTRY
RL-3 WOODLAND PLAN
RL-4 LANDSCAPE DETAILS
RL-5 TREE LIST

TOLL RM-1 ARCHITECTURAL PLANS (BY TOLL)
I-10 BUILDING FLOOR PLAN & ELEVATION
II SCHEDULE REGULATING FACADE MATERIALS

SIEGAL/TUOMAALA ASSOCIATES ARCHITECTS & PLANNERS INC.
29200 northwestern hwy
suite 160
southfield, mi 48034
p • 248 • 352 • 0099
f • 248 • 352 • 0098
www.sta-architects.com



SITE LOCATION MAP
NO SCALE

project name:
NOVI TEN PRO

project location:
NOVI, MICHIGAN

date/revision:
- Oct 04, 2023 - Issue PRO
- Jan. 02, 2024 - Revised PRO
- June 17, 2024 - PRO Eligibility

sheet title:
EXISTING AND PROPOSED ZONING

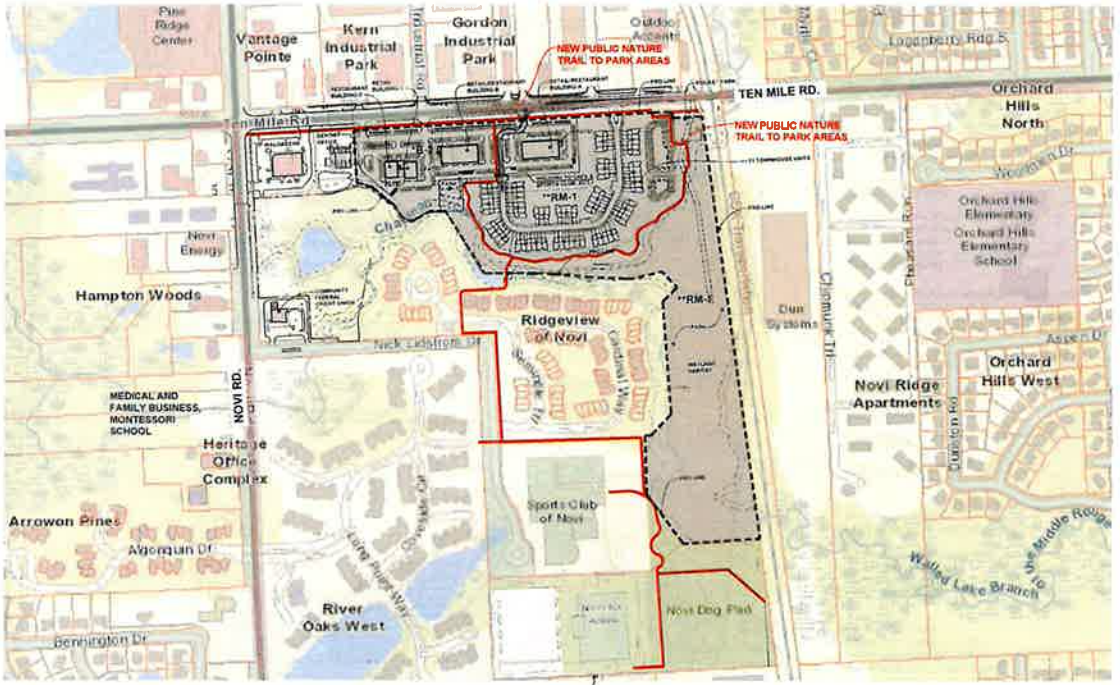
project number:
1537E

sheet number:
P.0

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300 YARDS TO 1/2 MILE NORTH
- LOCAL RETAIL
- RESTAURANT / TAKE-OUT
- AUTOMOTIVE
- ANIMAL EMERGENCY CENTER
- WORSHIP
- USPS OFFICE

1/2 TO 1 MILE WEST
- NOVI CIVIC CENTER
- NOVI PUBLIC SAFETY
- NOVI PUBLIC LIBRARY
- PARKS & SPORTS ARENA
- NOVI HIGH SCHOOL
- WORSHIP



TENNIS SPORTS CLUB AND ARENA FACILITIES, CHILD CARE, DANCE / YOGA, BANQUET ROOMS FOR BIRTHDAY'S, ETC.

PRO LINE

PUBLIC TRAIL TO PARK AREAS

PRO REGIONAL PLAN

NO SCALE

THIS PLAN INDICATES THE PROPOSED RESIDENTIAL AND COMMERCIAL DEVELOPMENT, THAT WILL TIE IN THE EXISTING RESIDENTIAL COMMUNITIES TO THE SOUTH VIA A VIEWING / WALKING PATH THRU THE NATURE ARES, AND TO THE EXISTING RECREATIONAL FACILITIES ALSO TO THE SOUTH, AND CONTINUES NORTHWARD TO SUCH AS THE SIDEWALK CAFE AND OTHER COMMUNITY COMMERCIAL. SEE SHEET P-3 FOR ADDITIONAL INFORMATION.

*B-2 GENERAL BUSINESS DISTRICT:
APPROX 8.97 ACRES

**RM-1 RESIDENTIAL:
APPROX 27.07 ACRES

STA

SIEGAL/TUOMAALA ASSOCIATES ARCHITECTS & PLANNERS INC.

29200 northwestern hwy
suite 180
southfield, mi 48034

p • 248 • 352 • 0099
f • 248 • 352 • 0088
www.sta-architects.com

project name:
NOVI TEN PRO

project location:
NOVI, MICHIGAN

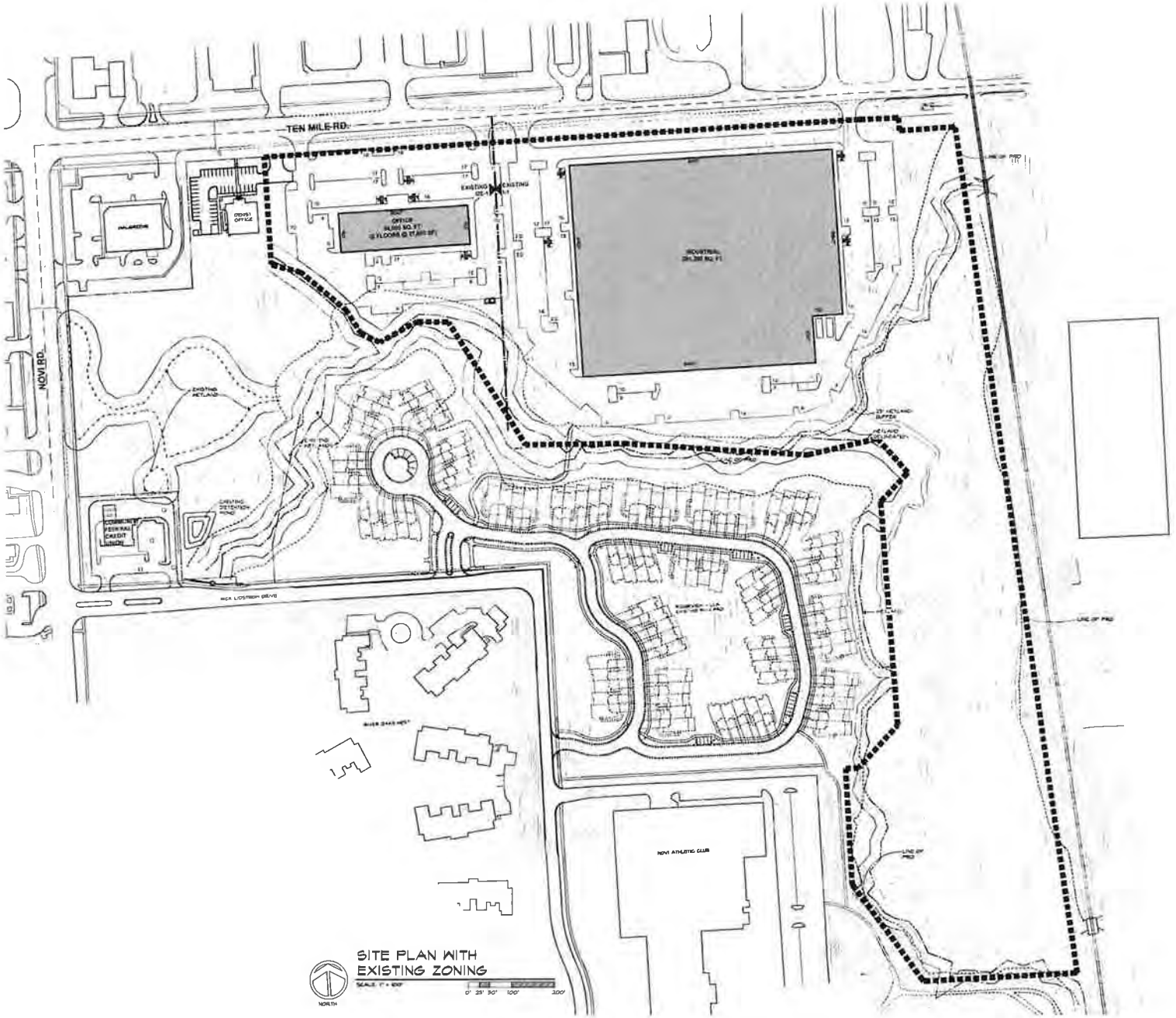
date/revision:
- Oct.04, 2023 - Issue PRO
- Jan. 02, 2024 - Revised PRO
- June 17, 2024 - PRO Eligibility

sheet title:
PRO REGIONAL PLAN

project number:
1537E

sheet number:
P-1

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SITE PLAN WITH EXISTING ZONING

SCALE: 1" = 200'

SIEGAL/TUOMAALA ASSOCIATES ARCHITECTS & PLANNERS INC

29200 northwestern hwy
suite 160
southfield, mi 48034

p • 248 • 352 • 0099
f • 248 • 352 • 0066
www.sta-architects.com

project name:
NOVI TEN PRO

project location:
NOVI, MICHIGAN
SECTION 26

date/revision:
- Oct.04, 2023 - Issue PRO
- Jan 03, 2024 - Revised PRO
- June 17, 2024 - PRO Eligibility

sheet title:
Site Plan With Existing Zoning

project number:
1537E

sheet number:
P.2

copyright 02.2022



PRO CONCEPT PLAN

NORTH

GENERAL NOTES:

1. THE SCREENING BETWEEN RESIDENTIAL AND COMMERCIAL PROPERTY IS PROVIDED ON THE RESIDENTIAL SIDE OF THE PROPERTY BORDER, NOT THE COMMERCIAL SIDE. SAME EFFECTIVE RESULT

REFERENCED PLAN NOTES:

1. 20 FT WIDE TEMPORARY EMERGENCY ACCESS ROAD TO MEET COUNTY ROAD STANDARDS HERE OR OTHERWISE LOCATED TO 10 MILE ROAD.
2. PICNIC AREA FOR CARRY OUT, SAFE FOODS ETC.
3. BENCHES AND PICNIC TABLES IN PARK AT WEST END
4. PROP. 8' HIGH MASONRY WALL OR OTHER CITY APPROVED BUFFER.
5. BREAKAWAY GATE PER CITY OF NOVI STANDARDS
6. NO WALL OR BERM BETWEEN RESIDENTIAL AND COMMERCIAL ZONES AT PARK.

LINE OF PRO

P = 15.67 ACRES PARK/NATURE AREA (CONSERVATION EASEMENT)

PUBLIC TRAIL TO PARK AREAS (SEE SHEET P.4 FOR COMPLETE TRAIL SYSTEM

36.04 ACRES TOTAL PRO

*B-2 GENERAL BUSINESS DISTRICT ZONING
8.97 ACRES: RETAIL BUILDINGS A, B, & C AND SUPERMARKET

**RM-1 LOW RISE MULTIPLE FAMILY DISTRICT
27.07 ACRES: 71 TOWNHOUSE UNITS & PARK/NATURE AREA

SEE CIVIL ENGINEERING, LANDSCAPE & PHOTOMETRIC DRAWINGS FOR ADDITIONAL INFORMATION

SIEGAL/TUOMAALA ASSOCIATES ARCHITECTS & PLANNERS INC
29200 northwestern hwy
suite 100
southfield mi 48034
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f • 248 • 352 • 0088

project name:
NOVI TEN PRO

project location:
NOVI, MICHIGAN
SECTION 26

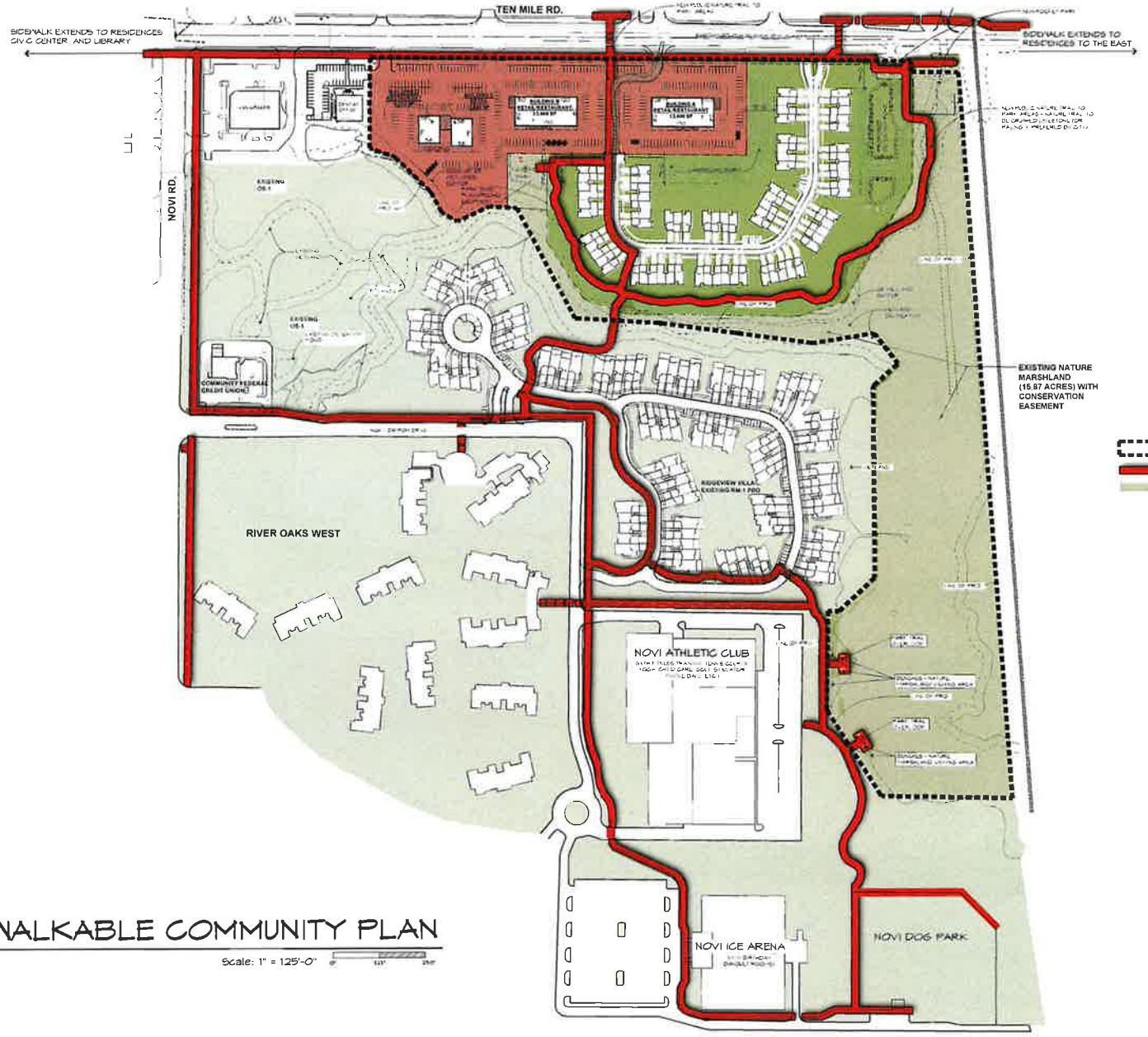
date/revision:
- Oct 04, 2023 - Issue PRO
- Jan 02 2024 - Revised PRO
- June 17 2024 - PRO Eligibility

sheet title:
PRO PLAN

project number:
1537E

sheet number:
P.3

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WALKABLE COMMUNITY PLAN

Scale: 1" = 125'-0"

SIEGAL/TUOMAALA ASSOCIATES ARCHITECTS & PLANNERS INC.

29200 northwestern hwy
suite 160
southfield, mi 48034

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f • 248 • 352 • 0088
www.sta-architects.com

project name:
NOVI TEN PRO

project location:
NOVI, MICHIGAN
SECTION 26

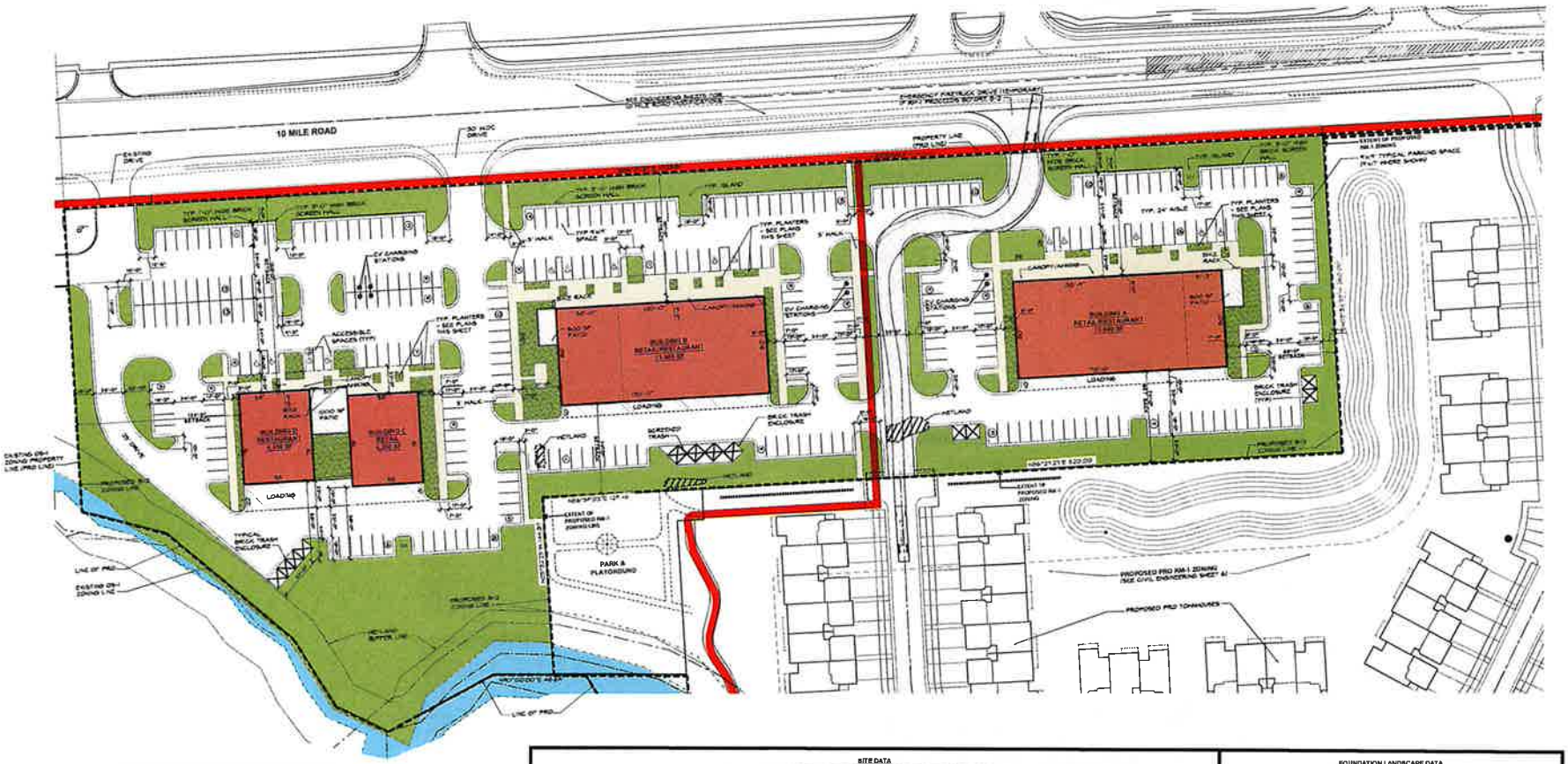
date/revision:
- Oct 04, 2023 - Issue PRO
- Jan. 02, 2024 - Revised PRO
- June 17, 2024 - PRO Eligibility

sheet title:
WALKABLE COMMUNITY PLAN

project number:
1537E

sheet number:
P.4

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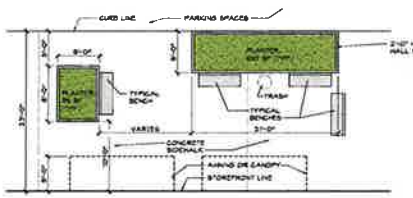
B2 COMMUNITY BUSINESS ZONING SITE PLAN

NOTES:

FOUNDATION LANDSCAPING

ZONING LINE (IN PRO)

WETLAND AREA



TYPICAL SIDEWALK PLANTERS AT STOREFRONTS

SITE DATA

ZONING: B-2 COMMUNITY BUSINESS DISTRICT (USES RESTRICTED PER PRO)

SITE: 8.87 ACRES

BUILDING AREA:

RETAIL/RESTAURANT BUILDING A -	13,640 SF
RETAIL/RESTAURANT BUILDING B -	13,620 SF
RETAIL BUILDING C:	4,350 SF
RESTAURANT BUILDING D:	4,350 SF
	35,960 SF TOTAL

PARKING:

REQUIRED		
BUILDING A - ASSUMED RESTAURANTS	4,000 SF @ 70 SF/SPACE =	36 SPACES
PATIO DINING:	500 SF @ 70 SF/SPACE =	7 SPACES
ASSUMED RETAIL:	11,100 SF @ 200 SF/SPACE =	56 SPACES
		99 SPACES REQUIRED
BUILDING B - ASSUMED RESTAURANTS:	2,500 SF @ 70 SF/SPACE =	37 SPACES
PATIO DINING:	500 SF @ 70 SF/SPACE =	7 SPACES
ASSUMED RETAIL:	9,600 SF @ 200 SF/SPACE =	48 SPACES
		113 SPACES REQUIRED
BUILDING C - RETAIL	4,350 SF @ 200 SF/SPACE =	22 SPACES REQUIRED
BUILDING D - RESTAURANT:	4,350 SF @ 70 SF/SPACE =	62 SPACES
PATIO DINING:	1,000 SF @ 70 SF/SPACE =	14 SPACES
		76 SPACES REQUIRED
TOTAL SPACES REQUIRED =		309 SPACES
TOTAL SPACES PROVIDED =		329 SPACES

LOADING:

BUILDING A:	170' x 10' = 1,700 SF REQUIRED	170' x 10' = 1,700 SF PROVIDED
BUILDING B:	170' x 10' = 1,700 SF REQUIRED	170' x 10' = 1,700 SF PROVIDED
BUILDING C:	58' x 10' = 580 SF REQUIRED	58' x 15' = 870 SF PROVIDED
BUILDING D:	58' x 10' = 580 SF REQUIRED	58' x 22' = 1,276 SF PROVIDED

BUILDING HEIGHT:
30 FT BUILDING HEIGHT/2 STORIES MAX PERMITTED

BUILDINGS A,B,C & D = 23'-0" HT (MAX.)

BUILDING SETBACKS:

MIN. REQUIRED FRONT SETBACK = 40 FT.	MIN. PROVIDED FRONT SETBACK = 101 FT.
MIN. REQUIRED REAR SETBACK = 30 FT.	MIN. PROVIDED REAR SETBACK = 74 FT.
MIN. REQUIRED SIDE SETBACK = 30 FT	MIN. PROVIDED SIDE SETBACK = 86 FT.

PARKING SETBACKS:

MIN. REQUIRED FRONT SETBACK = 20 FT.	MIN. PROVIDED FRONT SETBACK = 20 FT
MIN. REQUIRED REAR SETBACK = 10 FT.	MIN. PROVIDED REAR SETBACK = 20 FT.
MIN. REQUIRED SIDE SETBACK = 10 FT.	MIN. PROVIDED SIDE SETBACK = 10 FT.

PARKING SPACE SIZE: 9 FT. x 19 FT. (TYPICAL) +17 FT. AT INTERIOR 7 FT. SIDEWALKS
MINIMUM DRIVE AISLE: 24 FT.
PARKING ISLAND SIZE: 13 FT. WIDE (CLEAR) x 15.5 FT. DEEP MIN. - CLEAR (200 SF PLANTING)

1. EV CHARGING STATIONS WHERE SHOWN
2. LANDSCAPE - SEE LANDSCAPE PLAN SHEET PL-3
3. CIVIL ENGINEERING - SEE CIVIL ENGINEERING DRAWINGS
4. SITE LIGHTING - SEE SITE LIGHTING PHOTOMETRIC DRAWINGS
5. ALL ROOF MOUNTED MECHANICAL EQUIPMENT TO BE SCREENED
6. LIGHT POLES SHALL NOT EXCEED 21'-0" AND BE SHIELDED (SEE SITE LIGHTING PHOTOMETRIC DRAWINGS)

FOUNDATION LANDSCAPE DATA

BUILDING A:
PERIMETER = 170' x 2 + 80' x 2 = 500LF
DEDUCT = 8 DOORS x 3' = 24'
LOADING WALL = 170'
PATIO = 30'
REQUIRED: 276' x 8' = 2,200 SF
PROVIDED: 680 SF (WEST) + 1,040 SF (EAST) + 420 SF (NORTH PLANTERS)* = 2,320 SF

BUILDING B:
PERIMETER = 170' x 2 + 80' x 2 = 500LF
DEDUCT = 8 DOORS x 3' = 24'
LOADING WALL = 170'
PATIO = 30'
REQUIRED: 276' x 8' = 2,200 SF
PROVIDED: 2,500 SF (WEST) + 600 SF (EAST) + 440 SF (NORTH PLANTERS)* = 4,009 SF

BUILDING C:
PERIMETER = 58' x 2 + 75'+ 2' = 285LF
DEDUCT = 3 DOORS x 3' = 9'
LOADING WALL = 58'
REQUIRED: 189' x 8' = 1,512 SF
PROVIDED: 1,125 SF (WEST) + 525 SF (EAST) + 560 SF (NORTH PLANTERS)* = 2,210 SF

BUILDING D:
PERIMETER = 58' x 2 + 75' x 2 = 266LF
DEDUCT = 3 DOORS x 3' = 9'
LOADING WALL = 58'
PATIO = 35'
REQUIRED: 164' x 8' = 1,525 SF
PROVIDED: 400 SF (WEST) + 525 SF (EAST) + 600 SF (NORTH PLANTERS)* = 1,525 SF

*DEVIATION REQUESTED FOR PLANTERS AS FOUNDATION LANDSCAPE

PARKING LOT ISLANDS

4,776 SF REQUIRED (SEE B2 LANDSCAPE CALCULATIONS)
15,230 SF PROVIDED

SIEGAL/TUOMAALA ASSOCIATES ARCHITECTS & PLANNERS INC.
29200 northwestern hwy
suite 150
southfield, mi 48034
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f • 248 • 352 • 0282
www.sta-architects.com

project name:
NOVI TEN PRO

project location:
NOVI, MICHIGAN
SECTION 26

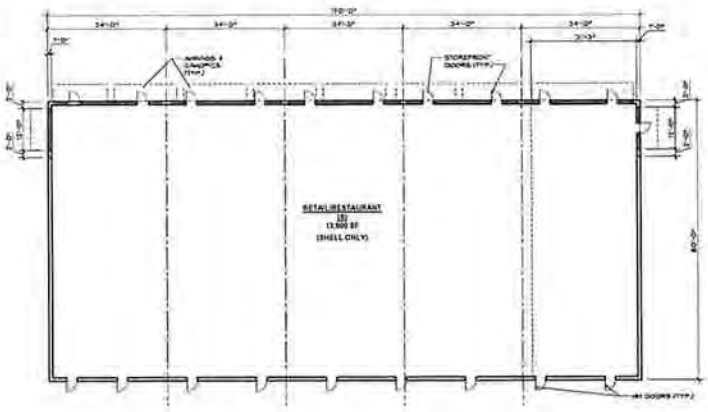
date/revision:
- Oct.04, 2023 - Issue PRO
- Jan. 02, 2024 - Revised PRO
- June 17, 2024 - PRO Eligibility

sheet title:
B-2 COMMUNITY BUSINESS ZONING SITE PLAN

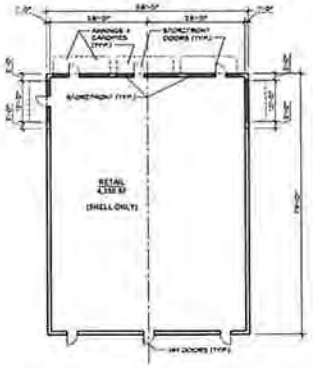
project number:
1537E

sheet number:
P.5

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BUILDINGS A & B (SHELL)
FLOOR PLAN



BUILDING C (SHELL) - (BUILDING D OPP. HAND)
FLOOR PLAN

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suite 100
southfield mi 48034

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project name:
NOVI TEN PRO

project location:
NOVI, MICHIGAN
SECTION 26

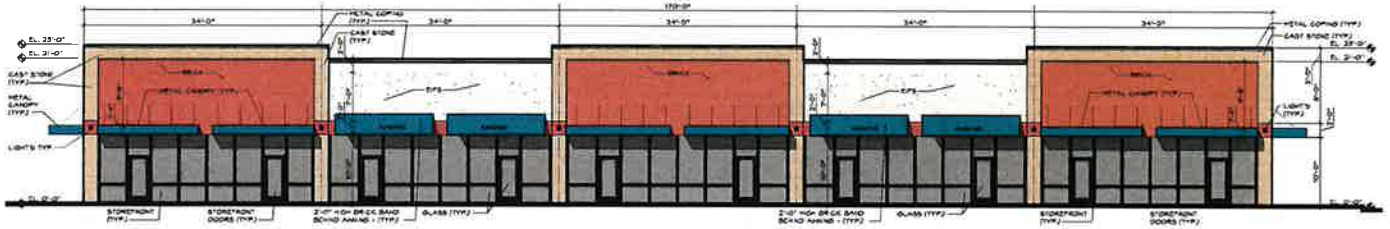
date/revision:
- Oct.04, 2023 - Issue PRO
- Jan. 02, 2024 - Revised PRO
- June 17, 2024 - PRO Eligibility

sheet title:
B-2 BUILDING
FLOOR PLANS

project number:
1537E

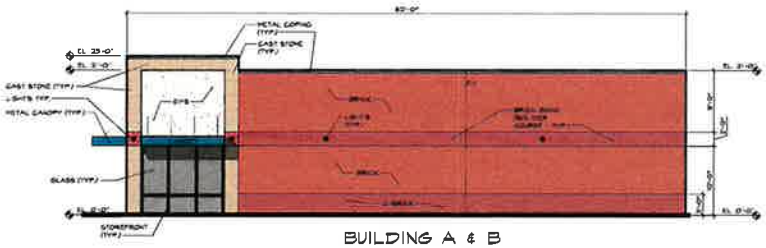
sheet number:
P.6

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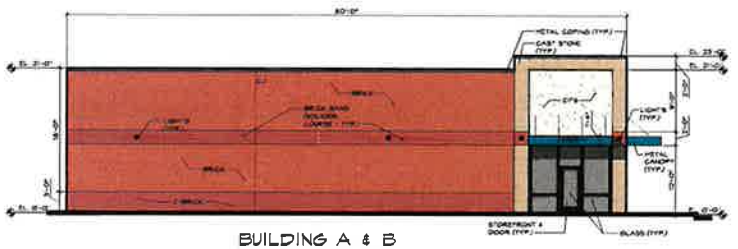
BUILDING A & B
NORTH ELEVATION

Scale: 1/8" = 1'-0"



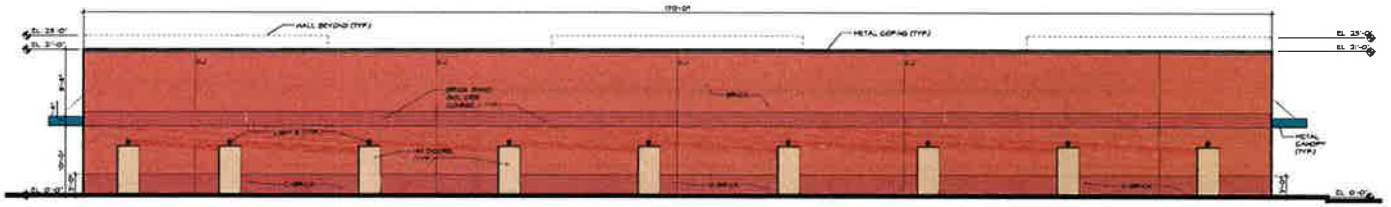
BUILDING A & B
WEST ELEVATION

Scale: 1/8" = 1'-0"



BUILDING A & B
EAST ELEVATION

Scale: 1/8" = 1'-0"



BUILDING A & B
SOUTH ELEVATION

Scale: 1/8" = 1'-0"

RETAIL/RESTAURANT BUILDINGS A & B - FACADE MATERIAL CHART

NORTH

MATERIAL	AREA (SF)	% TOTAL	ORDINANCE
BRICK	1504	52.0%	30% MIN
C-BRICK	-	-	25% MAX
EIFS	516	25.0%	25% MAX
CAST STONE	480	16.3%	25% MAX
METAL PANEL	180	6.1%	30% MAX (CANOPY + FASCIA)
TOTAL	2500	100 %	
VISION GLASS	+1286		
	3714 SF		

WEST

MATERIAL	AREA (SF)	% TOTAL	ORDINANCE
BRICK	1150	72.2%	30% MIN
C-BRICK	192	12.1%	25% MAX
EIFS	106	6.6%	25% MAX
CAST STONE	116	7.3%	25% MAX
METAL PANEL	28.0	1.8%	30% MAX (CANOPY + FASCIA)
TOTAL	1943	100 %	
VISION GLASS	+120		
	1112 SF		

RETAIL/RESTAURANT BUILDINGS A & B - FACADE MATERIAL CHART

SOUTH

MATERIAL	AREA (SF)	% TOTAL	ORDINANCE
BRICK	2932	82.3%	30% MIN
C-BRICK	424	12.0%	25% MAX
EIFS	-	-	25% MAX
CAST STONE	-	-	25% MAX
METAL PANEL (DOORS)	184	5.3%	30% MAX
TOTAL	3510 SF	100 %	

EAST

MATERIAL	AREA (SF)	% TOTAL	ORDINANCE
BRICK	1150	72.2%	30% MIN
C-BRICK	192	12.1%	25% MAX
EIFS	106	6.6%	25% MAX
CAST STONE	116	7.3%	25% MAX
METAL PANEL	28.4	1.8%	30% MAX (CANOPY + FASCIA)
TOTAL	1593	100 %	
VISION GLASS	+120		
	1112 SF		

WALL MATERIAL BEHIND AWNING IS INDICATED

NOTES:
1. ALL ROOF MOUNTED MECHANICAL EQUIPMENT TO BE SCREENED
2. SEE SHEETS P.10 & P.11 FOR WALL LIGHT PHOTOMETRICS

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southfield mi 48034

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project name:
NOVI TEN PRO

project location:
NOVI, MICHIGAN
SECTION 26

date/revision:
- Oct 04, 2023 - Issue PRO
- Jan. 02, 2024 - Revised PRO
- June 17, 2024 - PRO Eligibility

sheet title:
RETAIL/
RESTAURANT
BUILDINGS
A & B
ELEVATIONS

project number:
1537E

sheet number:
P.7

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RETAIL C - FACADE MATERIAL CHART (BUILDING D OPP. HAND)

NORTH

MATERIAL	AREA (SF)	% TOTAL	ORDINANCE
BRICK	373	44.0%	30% MIN
C-BRICK	-	-	25% MAX
EIFS	-	-	25% MAX
CAST STONE	365	43.1%	25% MAX
METAL PANEL	24	2.8%	50% MAX (CANOPY + FASCIA)
TOTAL VISION GLASS	963 sf + 302 1265 SF	100 %	

WEST

MATERIAL	AREA (SF)	% TOTAL	ORDINANCE
BRICK	1061	73.4%	30% MIN
C-BRICK	177	12.2%	25% MAX
EIFS	84	5.8%	25% MAX
CAST STONE	105	7.4%	25% MAX
METAL PANEL	28	1.9%	50% MAX
TOTAL VISION GLASS	1455 + 120 1575 SF	100 %	

RETAIL C - FACADE MATERIAL CHART (CONTINUED)

SOUTH

MATERIAL	AREA (SF)	% TOTAL	ORDINANCE
BRICK	865	71.0%	30% MIN
C-BRICK	290	23.8%	25% MAX
EIFS	-	-	25% MAX
CAST STONE	-	-	25% MAX
METAL PANEL (DOORS)	63	5.2%	50% MAX
TOTAL	1218 SF	100 %	

EAST

MATERIAL	AREA (SF)	% TOTAL	ORDINANCE
BRICK	1061	72.9%	30% MIN
C-BRICK	177	12.2%	25% MAX
EIFS	84	5.8%	25% MAX
CAST STONE	105	7.4%	25% MAX
METAL PANEL	28	1.9%	50% MAX
TOTAL VISION GLASS	1455 + 120 1575 SF	100 %	

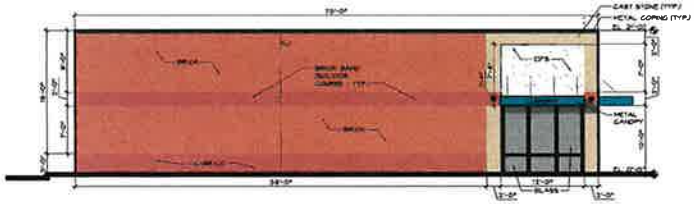
WALL MATERIAL BEHIND AWNING IS INDICATED



NOTE: BRICK BEHIND AWNING

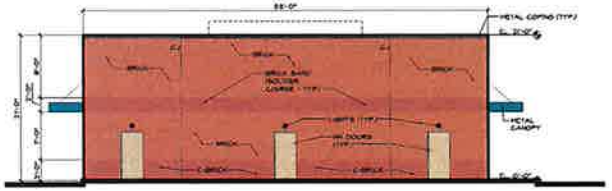
BUILDING C
NORTH ELEVATION

Scale: 1/8" = 1'-0"



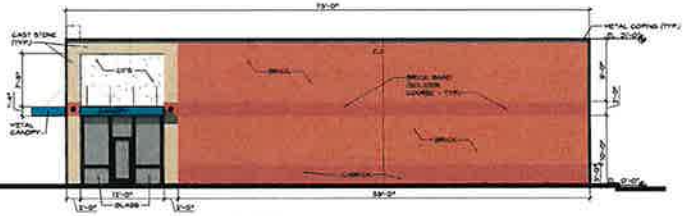
BUILDING C
EAST ELEVATION

Scale: 1/8" = 1'-0"



BUILDING C
SOUTH ELEVATION

Scale: 1/8" = 1'-0"



BUILDING C
WEST ELEVATION

Scale: 1/8" = 1'-0"

NOTES:
1. ALL ROOF MOUNTED MECHANICAL EQUIPMENT TO BE SCREENED
2. SEE SHEETS P.10 & P.11 FOR WALL LIGHT PHOTOMETRICS

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suite 100
southfield, mi 48034

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project name:
NOVI TEN PRO

project location:
NOVI, MICHIGAN
SECTION 26

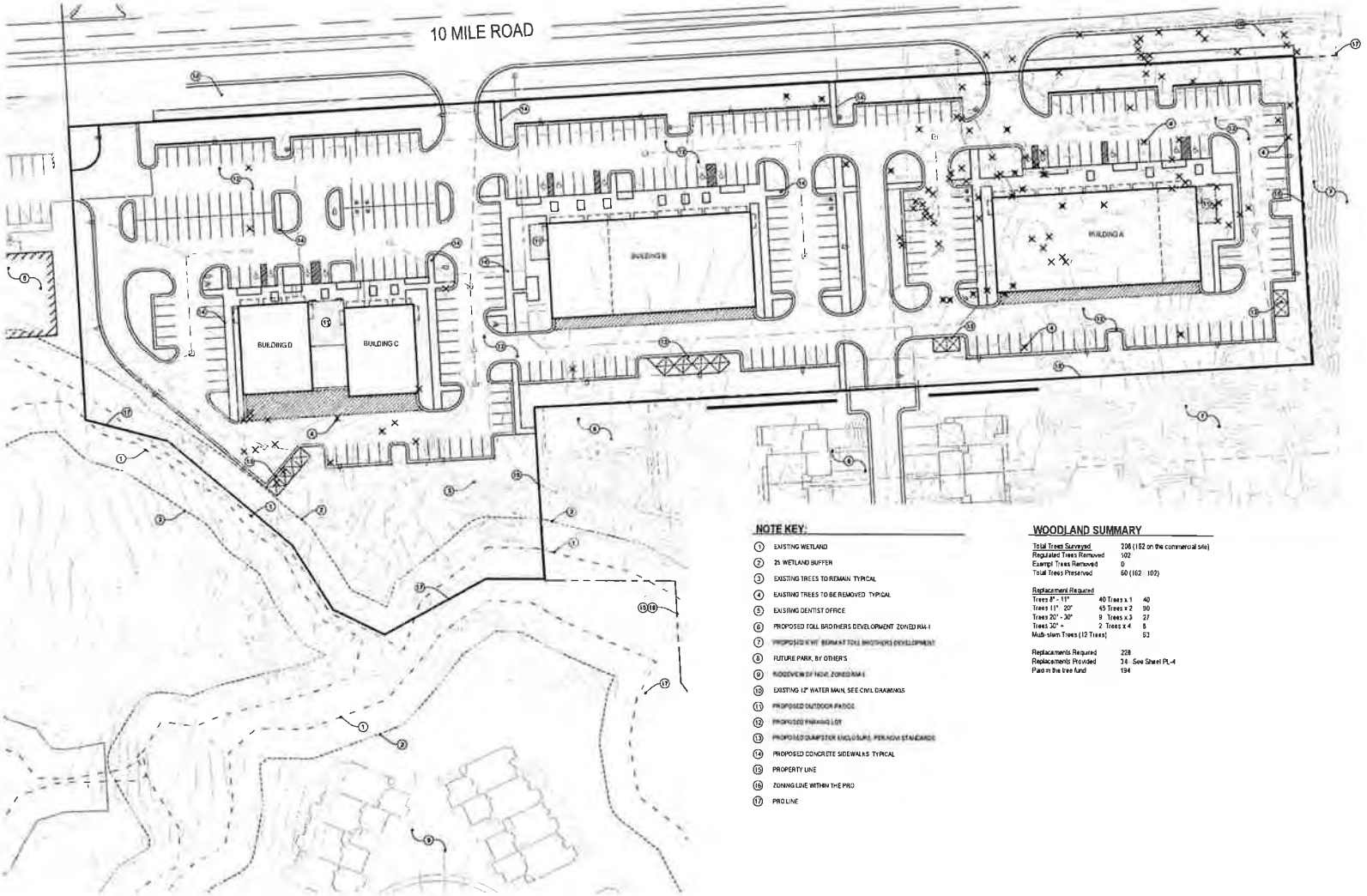
date/revision:
- Oct.04, 2023 - Issue PRO
- Jan. 02, 2024 - Revised PRO
- June 17, 2024 - PRO Eligibility

sheet title:
RETAIL BUILDING C & RESTAURANT BUILDING D ELEVATIONS

project number:
1537E

sheet number:
P.8

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NOTE KEY:

1. EXISTING WETLAND
2. 25 WETLAND BUFFER
3. EXISTING TREES TO REMAIN TYPICAL
4. EXISTING TREES TO BE REMOVED TYPICAL
5. EXISTING DENTIST OFFICE
6. PROPOSED TOLL BROTHERS DEVELOPMENT ZONED RM-1
7. PROPOSED KWF BERM AT TOLL BROTHERS DEVELOPMENT
8. FUTURE PARK, BY OTHERS
9. RIDGEVIEW OF NOVI, ZONED RM-1
10. EXISTING 12" WATER MAIN, SEE CIVIL DRAWINGS
11. PROPOSED OUTDOOR PATIOS
12. PROPOSED PARKING LOT
13. PROPOSED DUMPSTER ENCLOSURE, PER NOVI STANDARDS
14. PROPOSED CONCRETE SIDEWALKS TYPICAL
15. PROPERTY LINE
16. ZONING LINE WITHIN THE PRO
17. PRO LINE

WOODLAND SUMMARY

Total Trees Surveyed	206 (162 on the commercial site)	
Regulated Trees Removed	102	
Exempt Trees Removed	0	
Total Trees Preserved	60 (162 - 102)	
Replacement Required		
Trees 8" - 11"	40 Trees x 1	40
Trees 11" - 20"	45 Trees x 2	90
Trees 20" - 30"	9 Trees x 3	27
Trees 30" +	2 Trees x 4	8
Multi-stem Trees (12 Trees)		53
Replacements Required		228
Replacements Provided		34 See Sheet PL-4
Paid in the tree fund		194

TREE SURVEY PROVIDED BY:
ALLEN DESIGN
557 Carpenter
Northville, MI 48167
248 467 4668
Dated: 03.28.2023
Job No. 21-027

NOT FOR CONSTRUCTION

SCALE 1" = 40'-0"

NORTH

VMA Vert Verde Landscape Architecture
734.249.3526 Plymouth, MI
james@vertverde.com

Issued for

06.23.2023	PRO Submittal
12.22.2023	Revised PRO Submittal
06.17.2024	PRO Eligibility

Project:

NOVI TEN PRO

10 Mile Road
Novi, Michigan

Project Sponsor:

Weiss Construction Co.
41001 Grand River Ave.
Novi, MI 48375

Sheet Name:

Tree Removal and Protection Plan

Seal:

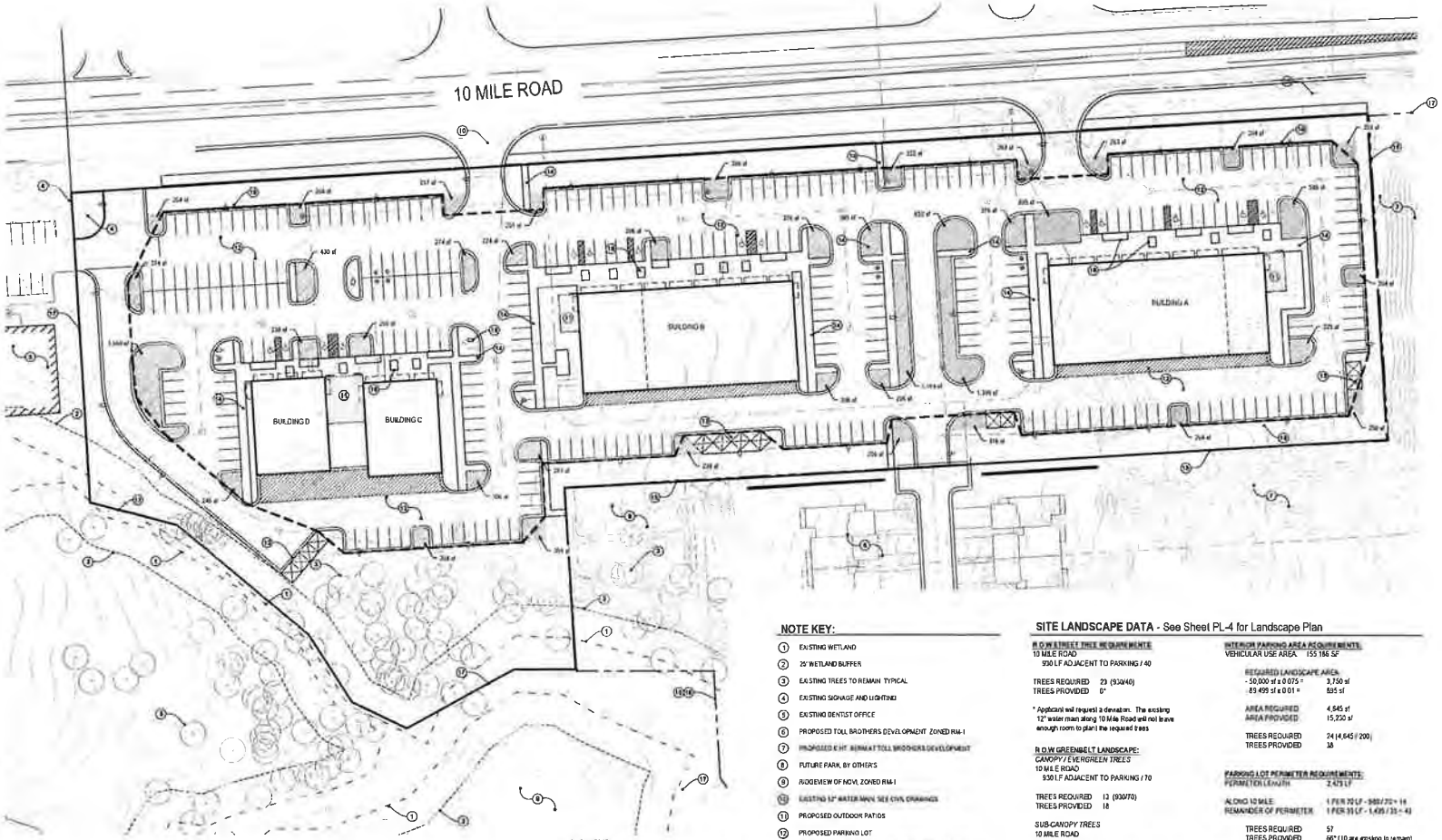
STATE OF MICHIGAN JAMES GRAY LANDSCAPE ARCHITECT No. 1301 REGISTERED LANDSCAPE ARCHITECT

Drawn	JG
Checked	JG
Date	06.2023
Scale	1" = 40'-0"

Project Number: 23.035

Sheet Number: PL-1

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NOTE KEY:

1. EXISTING WETLAND
2. 25' WETLAND BUFFER
3. EXISTING TREES TO REMAIN TYPICAL
4. EXISTING SIGNAGE AND LIGHTING
5. EXISTING DENTIST OFFICE
6. PROPOSED TOLL BROTHERS DEVELOPMENT ZONED RM-1
7. PROPOSED ENT. BERM AT TOLL BROTHERS DEVELOPMENT
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14. PROPOSED CONCRETE SIDEWALKS, TYPICAL
15. PROPERTY LINE
16. ZONING LINE WITHIN THE PRO
17. PRO LINE
18. PROPOSED PLANTER, SEE ARCHITECTURE
19. PROPOSED LIGHT POLES, SEE PHOTOMETRIC PLANS

LEGEND:

- VEHICULAR USE AREA
- INTERIOR PARKING LOT ISLAND
- PARKING LOT PERIMETER LINE

SITE LANDSCAPE DATA - See Sheet PL-4 for Landscape Plan

R.O.W STREET TREE REQUIREMENTS:
10 MILE ROAD
930 LF ADJACENT TO PARKING / 40

TREES REQUIRED 23 (930/40)
TREES PROVIDED 0*

* Applicant will request a deviation. The existing 12" water main along 10 Mile Road will not leave enough room to plant the required trees

R.O.W GREENBELT LANDSCAPE:
CANOPY / EVERGREEN TREES
10 MILE ROAD
930 LF ADJACENT TO PARKING / 70

TREES REQUIRED 13 (930/70)
TREES PROVIDED 18

SUB-CANOPY TREES
10 MILE ROAD
930 LF ADJACENT TO PARKING / 40

SUB-CANOPY TREES REQUIRED 23 (930/40)
SUB-CANOPY TREES PROVIDED 25

SHRUBS
10 MILE ROAD
930 LF ADJACENT TO PARKING / 40 X 3

SHRUBS REQUIRED 70 (930/40*3)
SHRUBS PROVIDED 93

INTERIOR PARKING AREA REQUIREMENTS:
VEHICULAR USE AREA 155,186 SF

REQUIRED LANDSCAPE AREA
- 50,000 sf x 0.075 = 3,750 sf
- 89,495 sf x 0.01 = 895 sf

AREA REQUIRED 4,645 sf
AREA PROVIDED 15,230 sf

TREES REQUIRED 24 (4,645 / 200)
TREES PROVIDED 38

PARKING LOT PERIMETER REQUIREMENTS:
PERIMETER LENGTH 2,425 LF

ALONG 10 MILE: 1 PER 70 LF - 930 / 70 = 14
REMAINDER OF PERIMETER 1 PER 35 LF - 1,495 / 35 = 43

TREES REQUIRED 57
TREES PROVIDED 60* (10 are existing to remain)
*All greenbelt trees are within 15' of the parking lot and are being double counted as parking lot perimeter trees

ACCESS DRIVE TREES
TOTAL ACCESS DRIVE LENGTH 480 LF

TREES REQUIRED 16 (480 / 30)
TREES PROVIDED 21

BUILDING FOUNDATION LANDSCAPE REQUIREMENTS:
SEE SHEET P 5 FOR FOUNDATION CALCULATIONS

NOT FOR CONSTRUCTION

SCALE: 1" = 40'-0"

NORTH

VMA | Verti Verde landscape architecture

Issued For:

06 23 2023	PRO Submittal
12 22 2023	Revised PRO Submittal
06 17 2024	PRO Eligibility

Project:

NOVI TEN PRO

10 Mile Road
Novi, Michigan

Project Sponsor:

Weiss Construction Co.
41001 Grand River Ave.
Novi, MI 48375

Sheet Name

Use Area PLan

Seal

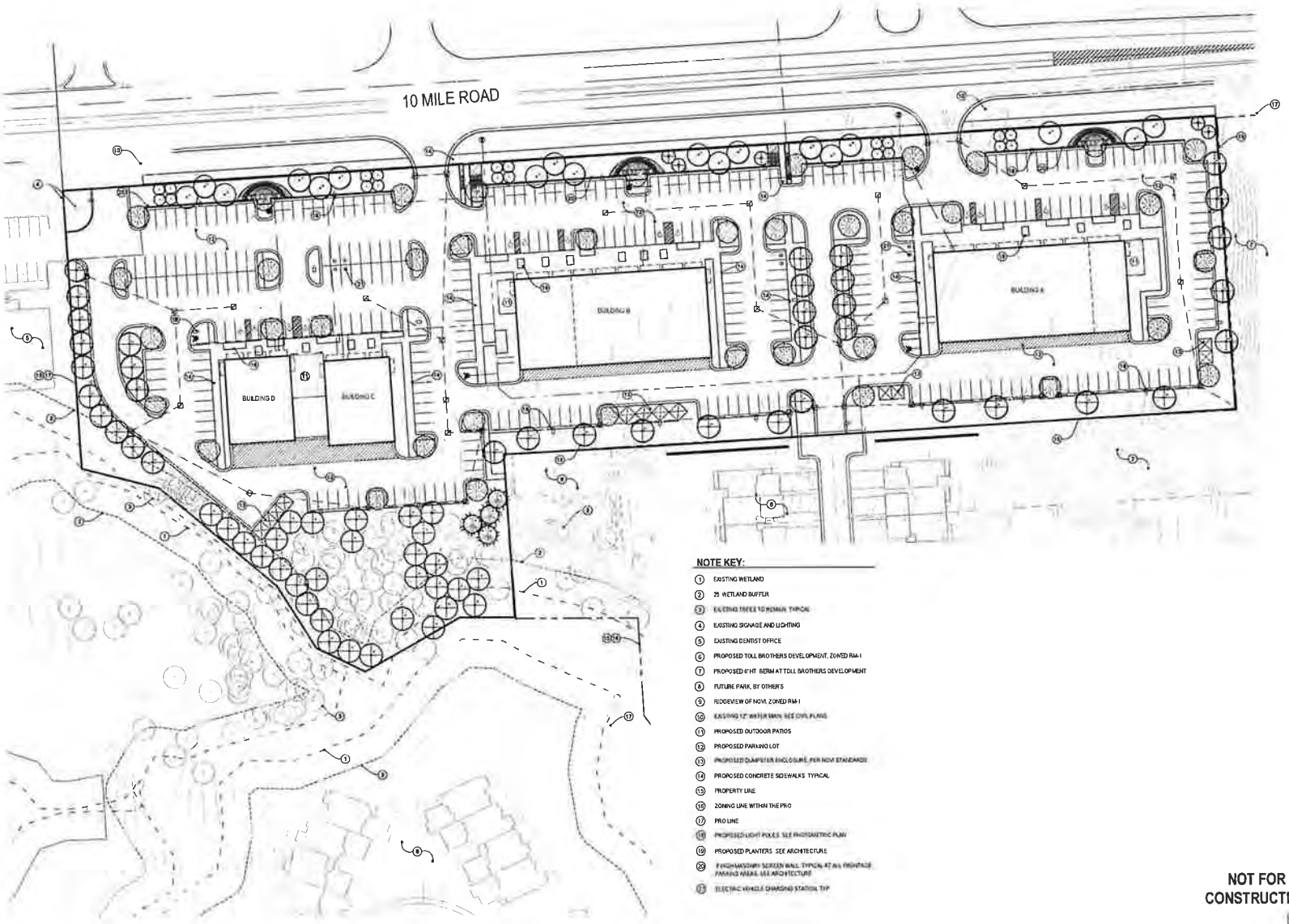
STATE OF MICHIGAN · JAMES GRAY · LANDSCAPE ARCHITECT · No. 1306 · LANDSCAPE ARCHITECTURE

Drawn:	JG
Checked:	JG
Date:	06 2023
Scale:	1" = 40'-0"

Project Number: 23.035

Sheet Number: PL-3

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NOTE KEY:

1. EXISTING WETLAND
2. 25 WETLAND BUFFER
3. EXISTING TREES TO REMAIN, TYPICAL
4. EXISTING SIGNAGE AND LIGHTING
5. EXISTING DENTIST OFFICE
6. PROPOSED TOLL BROTHERS DEVELOPMENT, ZONED RM-1
7. PROPOSED 6'HT. BERM AT TOLL BROTHERS DEVELOPMENT
8. FUTURE PARK, BY OTHERS
9. RIDGEVIEW OF NOVI, ZONED RM-1
10. EXISTING 12" WATER MAIN, SEE CIVIL PLANS
11. PROPOSED OUTDOOR PATIOS
12. PROPOSED PARKING LOT
13. PROPOSED DUMPSTER ENCLOSURE, PER NOVI STANDARDS
14. PROPOSED CONCRETE SIDEWALKS, TYPICAL
15. PROPERTY LINE
16. ZONING LINE WITHIN THE PRO
17. PRO LINE
18. PROPOSED LIGHT POLES, SEE PHOTOMETRIC PLAN
19. PROPOSED PLANTERS, SEE ARCHITECTURE
20. 6' HIGH MASONRY SCREEN WALL, TYPICAL AT ALL FRONTAGE PARKING AREAS, SEE ARCHITECTURE
21. ELECTRIC VEHICLE CHARGING STATION, TYP.

NOT FOR CONSTRUCTION

SCALE: 1" = 40'-0"

NORTH

VVLA Verde landscape architecture
734.249.3366 Plymouth, MI
jamie@verdvarde.com

Issued for:

06 23 2023	PRO Submittal
12 22 2023	Revised PRO Submittal
06 17 2024	PRO Eligibility

Project:

NOVI TEN PRO

10 Mile Road
Novi, Michigan

Project Sponsor:

Weiss Construction Co.
41001 Grand River Ave.
Novi, MI 48375

Sheet Name:

B2 Zoning Landscape Plan (Conceptual)

Seal:

STATE OF MICHIGAN JAMES GRAY LANDSCAPE ARCHITECT REGISTERED LANDSCAPE ARCHITECT

Drawn	JG
Checked	JG
Date	06 2023
Scale	1" = 40'-0"

Project Number: 23 035

Sheet Number: PL-4

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REZONING AND PLANNED REZONING OVERLAY ("PRO") PLAN

NOVI TEN TOWN HOMES AND RETAIL

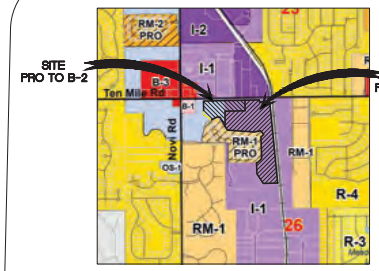
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST,
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

PREPARED FOR:

NOVI TEN ASSOCIATES, LLC

7 W. SQAURE LAKE ROAD
BLOOMFIELD HILLS, MICHIGAN 48302
248.909.1308

ZONING MAP

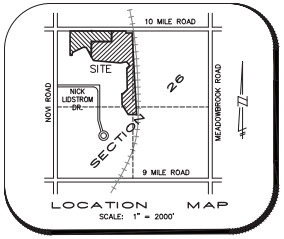


PROP. ZONING: PRO TO RM-1
PRO TO B-2

Zoning Districts

R-A: Residential Acreage	GE: Gateway East
R-1: One-Family Residential	FS: Freeway Service
R-2: One-Family Residential	I-1: Light Industrial
R-3: One-Family Residential	I-2: General Industrial
R-4: One-Family Residential	NCC: Non-Center Commercial
RT: Two-Family Residential	OS-1: Office Service
RM-1: Low-Density Multiple-Family	OSC: Office Service Commercial
RM-2: High-Density Multiple-Family	OST: Office Service Technology
MH: Mobile Home	EXO: OST District with EXO Overlay
B-1: Local Business	RC: Regional Center
B-2: Community Business	P-1: Vehicular Parking
B-3: General Business	PSV: Pavilion Shore Village
C: Conference	TC: Town Center
EXPO: Expo	TC-1: Town Center-1





SOILS MAP



SOIL CLASSIFICATIONS

(PER "SOILS SURVEY OF OAKLAND COUNTY MICHIGAN", UNITED STATES DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE IN COOPERATION WITH MICHIGAN AGRICULTURAL EXPERIMENT STATION, ISSUED MARCH 1982)

10B – MARLETTE SANDY LOAM, 1 TO 6 PERCENT SLOPES
10C – MARLETTE SANDY LOAM, 6 TO 12 PERCENT SLOPES
43 – SLOAN–MARLETTE ASSOCIATION

FIRE DEPARTMENT NOTES

1. All fire hydrants & water mains shall be installed & in service prior to above foundation building construction.
2. All roads shall be paved and capable of supporting 35 tons prior to construction above foundation.
3. Building addresses shall be posted facing the street. Addresses shall be a minimum of three inches in height on a contrasting background.
4. Provide 4–6" diameter concrete filled steel posts 48" above finish grade at each hydrant as required.
5. Fire lanes shall be posted with "Fire Lane – No Parking" signs in accordance with Ordinance #85.99.02.

NOTES

1. ALL WORK SHALL CONFORM TO THE CITY OF NOVI'S CURRENT STANDARDS AND SPECIFICATIONS.
2. ALL PAVEMENT MARKINGS, TRAFFIC CONTROL SIGNS, AND PARKING SIGNS SHALL COMPLY WITH THE DESIGN AND PLACEMENT REQUIREMENTS OF THE 2011 MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

SCALE
150 0 75 150 300 600
(IN FEET)
Scale: 1 inch = 150 ft.

SHEET INDEX

ENGINEERING PLANS:
1. COVER SHEET
2. BOUNDARY SURVEY
3. TOPOGRAPHIC SURVEY
4.–5. SOIL BORING LOGS
6A. PRO–RM1
6B. PRO–B–2
7. EXISTING AND PROPOSED ZONING
8. STORM WATER MANAGEMENT PLAN
9. OPEN SPACE PLAN
10. TRUCK ROUTING PLAN
11. PHOTOMETRIC LIGHTING PLAN
ND. NOTES AND DETAILS

LANDSCAPE PLANS: (TOLL MULTI–FAMILY)
RL–1 CONCEPTUAL LANDSCAPE PLAN
RL–2 GREENBELT AND ENTRY
RL–3 WOODLAND PLAN
RL–4 LANDSAPE DETAILS
RL–5 TREE LIST

ARCHITECTURAL PLANS: (TOLL MULTI–FAMILY)
1–10 BUILDING FLOOR PLAN & ELEVATION
11. SCHEDULE REGULATING FACADE MATERIALS

SEE P SHEETS FOR ADDITIONAL SITE & RETAIL INFORMAITON

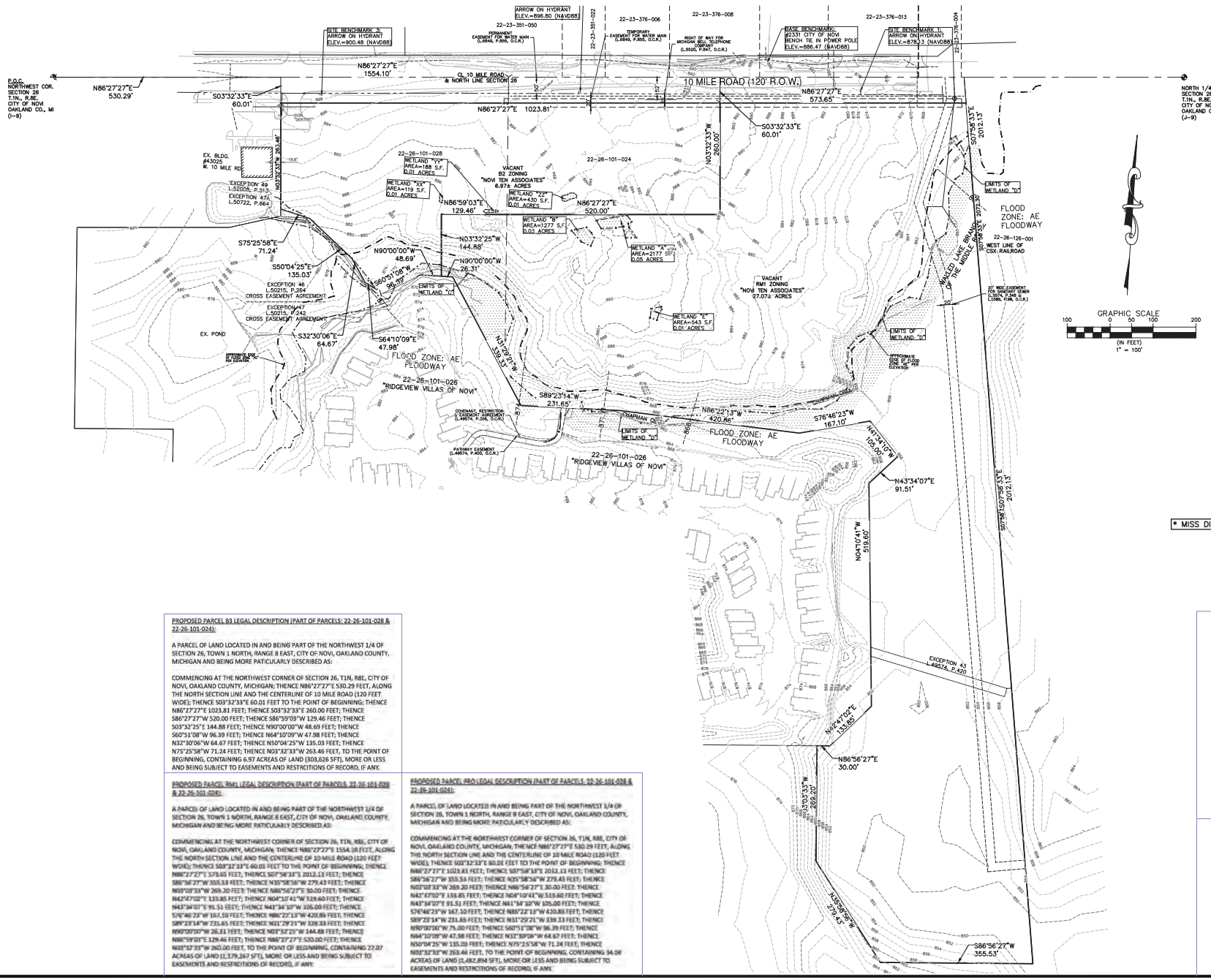
LANDSCAPE PLANS PROVIDED BY:
ALLEN DESIGN
557 CARPENTER
NORTHVILLE, MICHIGAN 48167
PHONE: 248.467.4668

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

CITY PROJECT NUMBER
JZ23-0009

REVISIONS			ENGINEER'S SEAL
NO.	ITEM	DATE	
1.	ADD COMMERCIAL PER CLIENT	05-19-22	
2.	ISSUED	02-28-23	
3.	REVISE PRO	01-02-24	
4.	PRO ELIGIBILITY	06/17/24	

DATE: 05-29-23 | DESIGNED BY: A.A. | JOB NUMBER: 21-006
CHECKED BY: J.E. | DRAWING FILE: 21006-CS.dwg



* MISS DIG NOT CONTACTED FOR SURVEY *

UTILITY DISCLAIMER NOTE:
ALL WATER MAIN, SEWER LINES AND UNDERGROUND UTILITY LINES HAVE BEEN FIELD LOCATED WHERE VISIBLE. WHEN AVAILABLE, UNDERGROUND LOCATIONS HAVE BEEN TAKEN FROM RECORD DOCUMENTS, AND NO GUARANTEE CAN BE MADE TO THE EXACTNESS OF THESE LOCATIONS.

PROPOSED PARCEL B3 LEGAL DESCRIPTION (PART OF PARCELS: 22-26-101-028 & 22-26-101-024):

A PARCEL OF LAND LOCATED IN AND BEING PART OF THE NORTHWEST 1/4 OF SECTION 26, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN AND BEING MORE PATICULARLY DESCRIBED AS:

COMMENCING AT THE NORTHWEST CORNER OF SECTION 26, T1N, R8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN; THENCE N86°27'27"E 530.29 FEET, ALONG THE NORTH SECTION LINE AND THE CENTERLINE OF 10 MILE ROAD (120 FEET WIDE); THENCE S03°32'33"E 60.01 FEET TO THE POINT OF BEGINNING; THENCE N86°27'27"E 1023.81 FEET; THENCE S03°32'33"E 260.00 FEET; THENCE S86°27'27"W 520.00 FEET; THENCE S86°59'03"W 129.46 FEET; THENCE S03°32'25"E 144.88 FEET; THENCE N90°00'00"W 48.69 FEET; THENCE S60°51'08"W 96.39 FEET; THENCE N64°10'09"W 47.98 FEET; THENCE N32°30'06"W 64.67 FEET; THENCE N50°04'25"W 135.03 FEET; THENCE N75°25'58"W 71.24 FEET; THENCE N03°32'33"W 263.46 FEET, TO THE POINT OF BEGINNING, CONTAINING 6.97 ACREAS OF LAND (303,626 SFT), MORE OR LESS AND BEING SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY.

PROPOSED PARCEL RM1 LEGAL DESCRIPTION (PART OF PARCELS: 22-26-101-028 & 22-26-101-024):

A PARCEL OF LAND LOCATED IN AND BEING PART OF THE NORTHWEST 1/4 OF SECTION 26, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN AND BEING MORE PATICULARLY DESCRIBED AS:

COMMENCING AT THE NORTHWEST CORNER OF SECTION 26, T1N, R8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN; THENCE N86°27'27"E 1554.10 FEET, ALONG THE NORTH SECTION LINE AND THE CENTERLINE OF 10 MILE ROAD (120 FEET WIDE); THENCE S03°32'33"E 60.01 FEET TO THE POINT OF BEGINNING; THENCE N86°27'27"E 573.65 FEET; THENCE S07°58'33"E 2012.13 FEET; THENCE S86°56'27"W 355.53 FEET; THENCE N35°58'56"W 279.43 FEET; THENCE N03°03'33"W 269.20 FEET; THENCE N86°56'27"E 30.00 FEET; THENCE N42°47'02"E 133.85 FEET; THENCE N04°10'41"W 519.60 FEET; THENCE N43°34'07"E 91.51 FEET; THENCE N41°34'10"W 105.00 FEET; THENCE S76°46'23"W 167.10 FEET; THENCE N86°22'13"W 420.86 FEET; THENCE S89°23'14"W 231.65 FEET; THENCE N31°29'21"W 339.33 FEET; THENCE N90°00'00"W 75.00 FEET; THENCE S60°51'08"W 96.39 FEET; THENCE N64°10'09"W 47.98 FEET; THENCE N32°30'06"W 64.67 FEET; THENCE N50°04'25"W 135.03 FEET; THENCE N75°25'58"W 71.24 FEET, THENCE N03°32'33"W 263.46 FEET, TO THE POINT OF BEGINNING, CONTAINING 27.07 ACREAS OF LAND (1,179,267 SFT), MORE OR LESS AND BEING SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY.

PROPOSED PARCEL RM2 LEGAL DESCRIPTION (PART OF PARCELS: 22-26-101-028 & 22-26-101-024):

A PARCEL OF LAND LOCATED IN AND BEING PART OF THE NORTHWEST 1/4 OF SECTION 26, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN AND BEING MORE PATICULARLY DESCRIBED AS:

COMMENCING AT THE NORTHWEST CORNER OF SECTION 26, T1N, R8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN; THENCE N86°27'27"E 530.29 FEET, ALONG THE NORTH SECTION LINE AND THE CENTERLINE OF 10 MILE ROAD (120 FEET WIDE); THENCE S03°32'33"E 60.01 FEET TO THE POINT OF BEGINNING; THENCE N86°27'27"E 1023.81 FEET; THENCE S07°58'33"E 2012.13 FEET; THENCE S86°56'27"W 355.53 FEET; THENCE N35°58'56"W 279.43 FEET; THENCE N03°03'33"W 269.20 FEET; THENCE N86°56'27"E 30.00 FEET; THENCE N42°47'02"E 133.85 FEET; THENCE N04°10'41"W 519.60 FEET; THENCE N43°34'07"E 91.51 FEET; THENCE N41°34'10"W 105.00 FEET; THENCE S76°46'23"W 167.10 FEET, THENCE N86°22'13"W 420.86 FEET, THENCE S89°23'14"W 231.65 FEET; THENCE N31°29'21"W 339.33 FEET; THENCE N90°00'00"W 75.00 FEET; THENCE S60°51'08"W 96.39 FEET; THENCE N64°10'09"W 47.98 FEET; THENCE N32°30'06"W 64.67 FEET; THENCE N50°04'25"W 135.03 FEET; THENCE N75°25'58"W 71.24 FEET, THENCE N03°32'33"W 263.46 FEET, TO THE POINT OF BEGINNING, CONTAINING 34.04 ACREAS OF LAND (1,482,894 SFT), MORE OR LESS AND BEING SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY.

BENCHMARKS:
BASE BENCHMARK:
@2331 CITY OF NOVI
BENCH TIE SET IN SOUTH FACE OF POWER POLE LOCATED EAST OF DRIVE #42850 AND 8 FEET NORTH OF BACK OF CURB
ELEVATION=886.47 (NAVD88)

SITE BENCHMARK 1:
ARROW ON HYDRANT
LOCATED SOUTH SIDE OF 10 MILE ROAD DIRECTLY NORTH OF SUBJECT PROPERTY
ELEVATION=878.13 (NAVD88)

SITE BENCHMARK 2:
ARROW ON HYDRANT
LOCATED SOUTH SIDE OF 10 MILE ROAD
ELEVATION=896.80

SITE BENCHMARK 3:
ARROW ON HYDRANT
LOCATED SOUTH SIDE OF 10 MILE ROAD
ELEVATION=900.48

FLOOD ZONE:
THE PROPERTY FALLS WITHIN FLOOD ZONE X AND ZONE AE, SPECIAL FLOOD HAZARD AND REGULATORY FLOODWAY (BASE FLOOD ELEVATIONS AS NOTED ON PLAN, RANGES FROM 875 TO 865)
MAP No. 26125C0628F & 26125C0629F
DATED: 9/29/2006

LEGEND

	SECTION CORNER
	OVERHEAD UTILITY LINES
	EXISTING FENCE
S	EXISTING SANITARY MANHOLE
	EXISTING STORM SQ. CATCH BASIN
	EXISTING STORM ROUND CATCH BASIN
	EXISTING STORM MANHOLE
	EXISTING GAS MARKER
	EXISTING FIRE HYDRANT
	UTILITY POLE
	PUBLIC INFORMATION SIGN
F.I.	FOUND IRON
F.MON.	FOUND MONUMENT
S.I.	SET IRON
P.O.C.	POINT OF COMMENCEMENT
P.O.B.	POINT OF BEGINNING

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING
Professional Engineers
Professional Surveyors
Professional Planners
Professional Landscape Architects
Professional Traffic Engineers
Professional Environmental Engineers
Professional Construction Managers
Professional Facility Managers
Professional Project Managers
Professional Program Managers
Professional Consultants
Professional Contractors
Professional Subcontractors
Professional Suppliers
Professional Manufacturers
Professional Distributors
Professional Retailers
Professional Wholesalers
Professional Service Providers
Professional Technology Providers
Professional Software Providers
Professional Hardware Providers
Professional Network Providers
Professional Cloud Providers
Professional Data Providers
Professional Analytics Providers
Professional Artificial Intelligence Providers
Professional Machine Learning Providers
Professional Robotics Providers
Professional Automation Providers
Professional Internet of Things Providers
Professional Blockchain Providers
Professional Cryptocurrency Providers
Professional Virtual Reality Providers
Professional Augmented Reality Providers
Professional Mixed Reality Providers
Professional Gaming Providers
Professional Entertainment Providers
Professional Media Providers
Professional Publishing Providers
Professional Education Providers
Professional Training Providers
Professional Certification Providers
Professional Accreditation Providers
Professional Licensing Providers
Professional Regulatory Providers
Professional Compliance Providers
Professional Risk Management Providers
Professional Insurance Providers
Professional Financial Providers
Professional Banking Providers
Professional Investment Providers
Professional Accounting Providers
Professional Tax Providers
Professional Legal Providers
Professional Consulting Providers
Professional Advisory Providers
Professional Strategy Providers
Professional Marketing Providers
Professional Sales Providers
Professional Customer Service Providers
Professional Support Providers
Professional Maintenance Providers
Professional Repair Providers
Professional Upgrade Providers
Professional Replacement Providers
Professional Disposal Providers
Professional Recycling Providers
Professional Sustainability Providers
Professional Environmental Providers
Professional Social Responsibility Providers
Professional Ethics Providers
Professional Governance Providers
Professional Leadership Providers
Professional Management Providers
Professional Operations Providers
Professional Administration Providers
Professional Human Resources Providers
Professional Recruitment Providers
Professional Onboarding Providers
Professional Training Providers
Professional Development Providers
Professional Performance Providers
Professional Compensation Providers
Professional Benefits Providers
Professional Retirement Providers
Professional Termination Providers
Professional Offboarding Providers
Professional Succession Providers
Professional Planning Providers
Professional Organizing Providers
Professional Staffing Providers
Professional Scheduling Providers
Professional Coordinating Providers
Professional Controlling Providers
Professional Reporting Providers
Professional Auditing Providers
Professional Evaluating Providers
Professional Improving Providers
Professional Innovating Providers
Professional Creating Providers
Professional Designing Providers
Professional Developing Providers
Professional Testing Providers
Professional Deploying Providers
Professional Operating Providers
Professional Monitoring Providers
Professional Troubleshooting Providers
Professional Debugging Providers
Professional Optimizing Providers
Professional Scaling Providers
Professional Securing Providers
Professional Protecting Providers
Professional Backing Up Providers
Professional Restoring Providers
Professional Archiving Providers
Professional Deleting Providers
Professional Migrating Providers
Professional Integrating Providers
Professional Connecting Providers
Professional Communicating Providers
Professional Collaborating Providers
Professional Sharing Providers
Professional Publishing Providers
Professional Subscribing Providers
Professional Billing Providers
Professional Invoicing Providers
Professional Paying Providers
Professional Receiving Providers
Professional Refunding Providers
Professional Auditing Providers
Professional Reporting Providers
Professional Analyzing Providers
Professional Forecasting Providers
Professional Budgeting Providers
Professional Planning Providers
Professional Controlling Providers
Professional Improving Providers
Professional Innovating Providers
Professional Creating Providers
Professional Designing Providers
Professional Developing Providers
Professional Testing Providers
Professional Deploying Providers
Professional Operating Providers
Professional Monitoring Providers
Professional Troubleshooting Providers
Professional Debugging Providers
Professional Optimizing Providers
Professional Scaling Providers
Professional Securing Providers
Professional Protecting Providers
Professional Backing Up Providers
Professional Restoring Providers
Professional Archiving Providers
Professional Deleting Providers
Professional Migrating Providers
Professional Integrating Providers
Professional Connecting Providers
Professional Communicating Providers
Professional Collaborating Providers
Professional Sharing Providers
Professional Publishing Providers
Professional Subscribing Providers
Professional Billing Providers
Professional Invoicing Providers
Professional Paying Providers
Professional Receiving Providers
Professional Refunding Providers
Professional Auditing Providers
Professional Reporting Providers
Professional Analyzing Providers
Professional Forecasting Providers
Professional Budgeting Providers

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NO.	DESCRIPTION	DATE
1.	ADD COMMERCIAL PER CLIENT	05-19-23
2.	ISSUED	02-28-23
3.	REVISE PRO	5-02-24
4.	PRO ELIGIBILITY	06/17/24

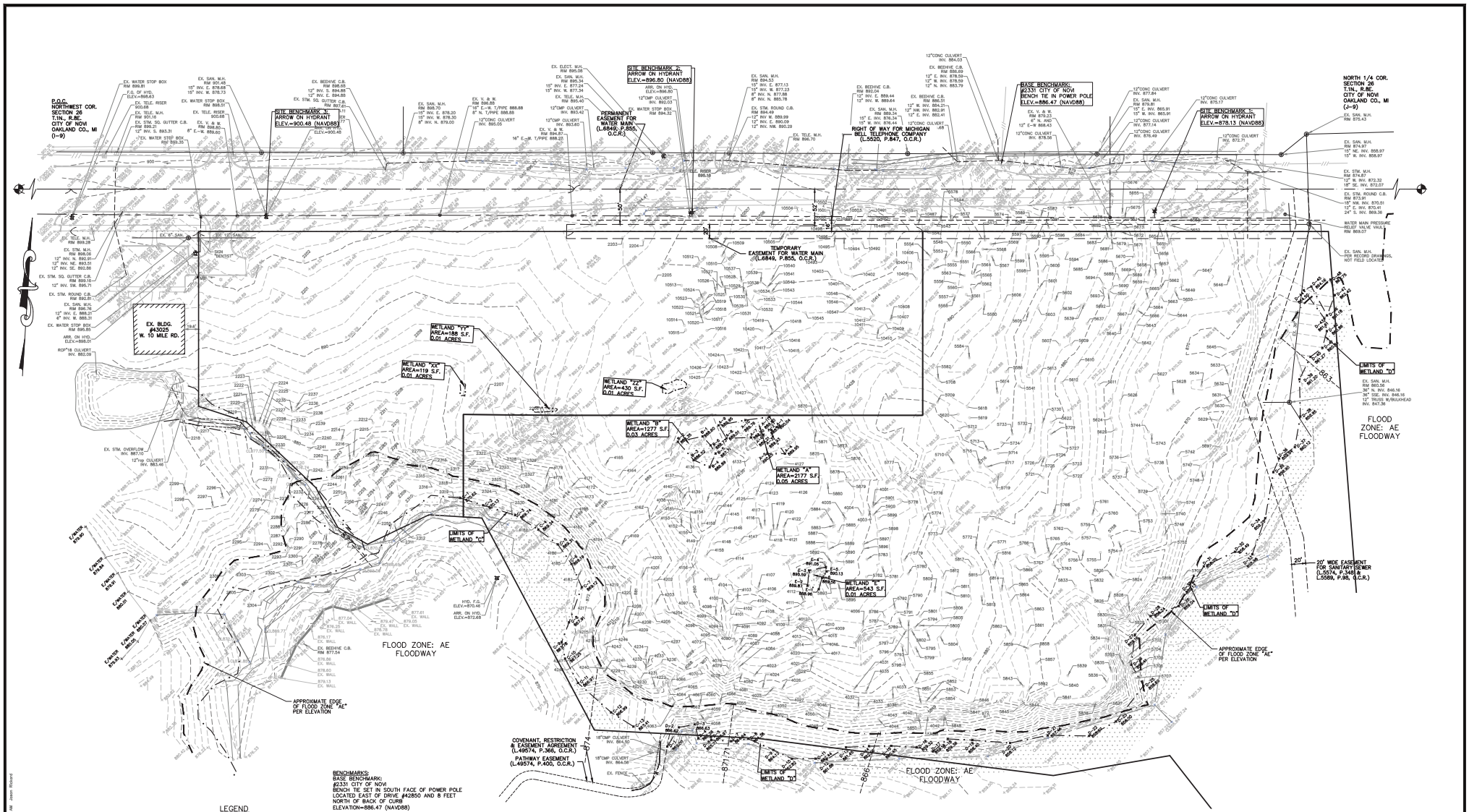
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3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
OR 811 OR GO TO MISSDIG811.COM
TO BE NOTIFIED OF UTILITIES IN YOUR AREA

DRAWN BY: N.G.
DATE: 02-28-23
CHECKED BY: J.R.
JOB No.: 21-006

CLIENT:
NOVI TEN ASSOCIATES, LLC
7 W. SQUARE LAKE ROAD
BLOOMFIELD HILLS
MICHIGAN 48302
248.909.1308

PROJECT NAME:
NOVI TEN TOWN HOMES
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN
SHEET TITLE:
BOUNDARY SURVEY

SHEET
2



BENCHMARKS:
BASE BENCHMARK:
#2331 CITY OF NOVI
BENCH TIE SET IN SOUTH FACE OF POWER POLE LOCATED EAST OF DRIVE #42850 AND 8 FEET NORTH OF BACK OF CURB
ELEVATION=886.47 (NAVD88)

SITE BENCHMARK 1:
ARROW ON HYDRANT
LOCATED SOUTH SIDE OF 10 MILE ROAD DIRECTLY NORTH OF SUBJECT PROPERTY
ELEVATION=878.13 (NAVD88)

SITE BENCHMARK 2:
ARROW ON HYDRANT
LOCATED SOUTH SIDE OF 10 MILE ROAD
ELEVATION=896.80

SITE BENCHMARK 3:
ARROW ON HYDRANT
LOCATED SOUTH SIDE OF 10 MILE ROAD
ELEVATION=900.48

FLOOD ZONE:
THE PROPERTY FALLS WITHIN FLOOD ZONE X AND ZONE AE, SPECIAL FLOOD HAZARD AND REGULATORY FLOODWAY (BASE FLOOD ELEVATIONS AS NOTED ON PLAN, RANGES FROM 875 TO 883)
MAP No. 26125C0628F & 26125C0629F
DATED: 9/29/2006

LEGEND

- SECTION CORNER
- OVERHEAD UTILITY LINES
- EXISTING FENCE
- EXISTING SANITARY MANHOLE
- EXISTING STORM SQ. CATCH BASIN
- EXISTING STORM ROUND CATCH BASIN
- EXISTING STORM MANHOLE
- EXISTING GAS MARKER
- EXISTING FIRE HYDRANT
- UTILITY POLE
- PUBLIC INFORMATION SIGN
- F.I. FOUND IRON
- F.MON. FOUND MONUMENT
- S.I. SET IRON
- P.O.C. POINT OF COMMENCEMENT
- P.O.B. POINT OF BEGINNING

UTILITY DISCLAIMER NOTE:
ALL WATER MAIN, SEWER LINES AND UNDERGROUND UTILITY LINES HAVE BEEN FIELD LOCATED WHERE VISIBLE. WHEN AVAILABLE, UNDERGROUND LOCATIONS HAVE BEEN TAKEN FROM RECORD DOCUMENTS, AND NO GUARANTEE CAN BE MADE TO THE EXACTNESS OF THESE LOCATIONS.

GRAPHIC SCALE
60 0 30 60 120
(IN FEET)
1" = 60'

* MISS DIG NOT CONTACTED FOR SURVEY *

811
3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171
TOLL FREE FOR THE LOCATION OF UNDERGROUND FACILITIES

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ENGINEERING | SURVEYING

CIVIL/SITE ENGINEERING
TRAFFIC ENGINEERING
LAND DEVELOPMENT CONSULTANTS
CIVIL/SITE CONSTRUCTION MANAGEMENT
TRANSPORTATION PLANNING
PAVEMENT MANAGEMENT

CLIENT:
NOVI TEN ASSOCIATES, LLC
7 W. SQUARE LAKE ROAD
BLOOMFIELD HILLS
MICHIGAN 48302
248.909.1308

DRAWN BY: N.G.
DATE: 05-29-23
CHECKED BY: J.R.
JOB No.: 21-006

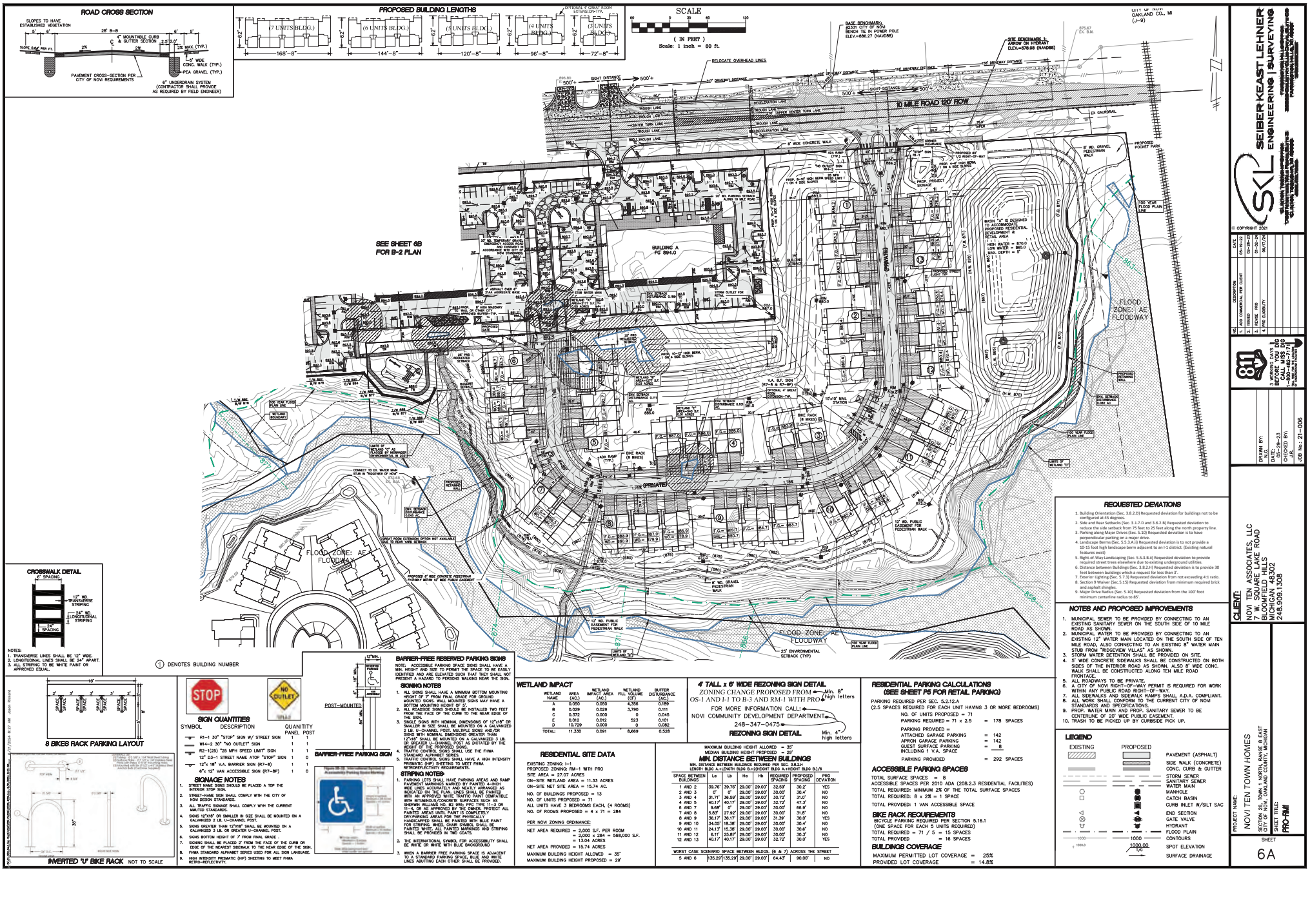
NO.	DESCRIPTION	DATE
1.	ADD COMMERCIAL PER CLIENT	05-19-22
2.	ISSUED	02-28-23
3.	REVISE PRO	01-02-24
4.	PRO ELIGIBILITY	08/17/24

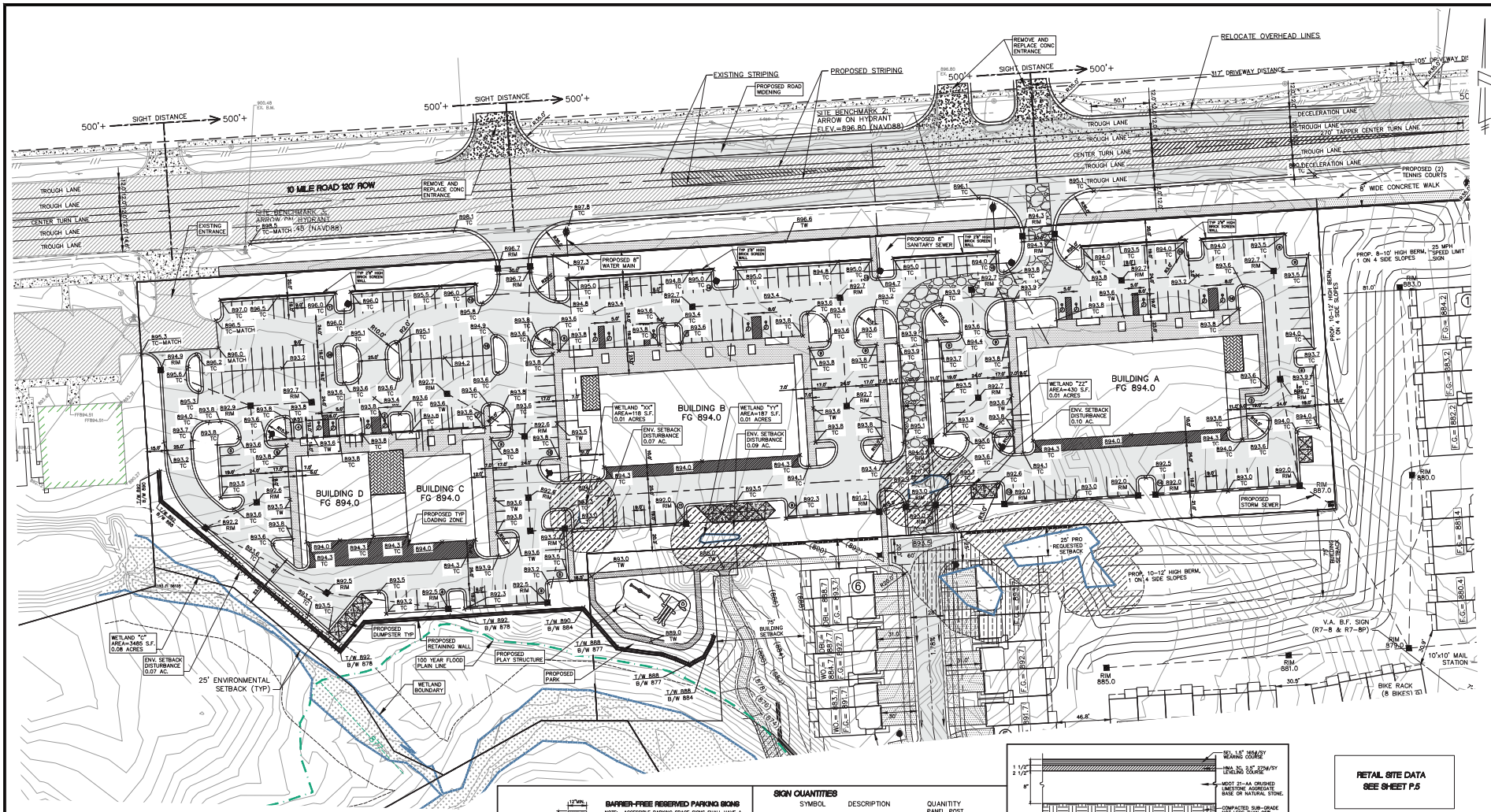
PROJECT NAME:
NOVI TEN TOWN HOMES
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

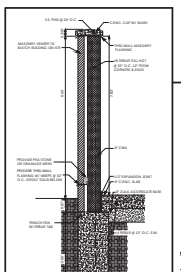
SHEET TITLE:
TOPOGRAPHIC SURVEY

SHEET
3

J:\21-006 Novi Ten North\CAD\PRO PLANS\21006-TPO.dwg 8/19/2024 8:27 AM Jason Rickard

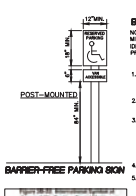

ROAD CROSS SECTION
SLOPES TO HAVE ESTABLISHED VEGETATION
28' B-B
4" MOUNTABLE CURB & GUTTER SECTION
2.5%
2% MAX. (TYP.)
5' WIDE CONC. WALK (TYP.)
PEA GRAVEL (TYP.)
PAVEMENT CROSS-SECTION PER CITY OF NOVI REQUIREMENTS
6" UNDERDRAIN SYSTEM (CONTRACTOR SHALL PROVIDE AS REQUIRED BY FIELD ENGINEER)
PROPOSED BUILDING LENGTHS
(7 UNITS BLDG.)
(6 UNITS BLDG.)
(5 UNITS BLDG.)
(4 UNITS BLDG.)
(3 UNITS BLDG.)
OPTIONAL 4' GREAT ROOM EXTENSION-TYP.
168'-8"
144'-8"
120'-8"
96'-8"
72'-8"
SCALE
(IN FEET)
Scale: 1 inch = 60 ft.
BASE BENCHMARK: ESSX CITY OF NOVI BENCH TIE IN POWER POLE ELEV.=856.27 (NAVD88)
SITE BENCHMARK 1: ARROW ON HYDRANT ELEV.=878.99 (NAVD88)
10 MILE ROAD 120' ROW
RELOCATE OVERHEAD LINES
SIGHT DISTANCE
500'+
DECELERATION LANE
TAPER
TROUGH LANE
EX GALMORAL
8' WIDE CONCRETE WALK
PROPOSED POCKET PARK
8' NO. GRAVEL PEDESTRIAN WALK
100 YEAR FLOOD PLAIN LINE
SEE SHEET 6B FOR B-2 PLAN
BUILDING A FG 894.0
BASIN "A" IS DESIGNED TO ACCOMMODATE PROPOSED RESIDENTIAL DEVELOPMENT & RETAIL AREA
HIGH WATER = 870.0
MAX. WATER = 880.0
MAX. DEPTH = 9'
FLOOD ZONE: AE FLOODWAY
PROPOSED STREET "A"
(PRIVATE)
BIKE RACK (6 BIKES)
10'x10' MAIL STATION
V.A. B.F. SIGN (R7-8 & R7-8P)
OPTIONAL 4' GREAT ROOM EXTENSION-TYP.
PROPOSED RETAINING WALL
DRY SETBACK DISTURBANCE 5,045 SQ.
GREAT ROOM EXTENSION OPTION NOT AVAILABLE DUE TO REAR YARD SETBACK
PROPOSED 8' WIDE CONCRETE PEDESTRIAN PATHWAY WITHIN 12' WIDE PUBLIC EASEMENT
12' WD. PUBLIC EASEMENT FOR PEDESTRIAN WALK
8' NO. GRAVEL PEDESTRIAN WALK
25' ENVIRONMENTAL SETBACK (TYP.)
LIMITS OF WETLAND "A"
LIMITS OF WETLAND "B"
WETLAND BOUNDARY
CONNECT TO EX. WATER MAIN (TAP IN "INSERT-A-VALVE")
PROPOSED 8" WATER MAIN
PROPOSED 8" SANITARY SEWER
PROPOSED STORM SEWER
PROPOSED 6" SANITARY LEAD
PROPOSED 6" WATER LEAD
PROPOSED 8" WATER MAIN
PROPOSED 12" STORM SEWER
PROPOSED 15" STORM SEWER
PROPOSED 18" STORM SEWER
PROPOSED 24" STORM SEWER
PROPOSED 30" STORM SEWER
PROPOSED 36" STORM SEWER
PROPOSED 42" STORM SEWER
PROPOSED 48" STORM SEWER
PROPOSED 54" STORM SEWER
PROPOSED 60" STORM SEWER
PROPOSED 72" STORM SEWER
PROPOSED 84" STORM SEWER
PROPOSED 96" STORM SEWER
PROPOSED 108" STORM SEWER
PROPOSED 120" STORM SEWER
PROPOSED 132" STORM SEWER
PROPOSED 144" STORM SEWER
PROPOSED 156" STORM SEWER
PROPOSED 168" STORM SEWER
PROPOSED





NOTES:

1. ALL ROADWAYS TO BE PRIVATE.
2. A CITY OF NOVI RIGHT-OF-WAY PERMIT IS REQUIRED FOR WORK WITHIN ANY PUBLIC ROAD RIGHT-OF-WAY.
3. ALL SIDEWALKS AND SIDEWALK RAMPS SHALL A.D.A. COMPLIANT.
4. ALL WORK SHALL CONFORM TO THE CURRENT CITY OF NOVI STANDARDS AND SPECIFICATIONS.
5. ALL PAVEMENT MARKINGS, TRAFFIC CONTROL SIGNS, AND PARKING SIGNS SHALL COMPLY WITH THE DESIGN & PLACEMENT REQUIREMENTS OF THE 2011 MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. ALL ROADWAY SIGNS SHOULD BE INSTALLED TWO FEET FROM THE FACE OF CURB OR EDGE OF SIDEWALK TO THE NEAR EDGE OF THE SIGN.
6. PROP. WATER MAIN AND PROP. SANITARY SEWER TO BE CENTERLINE OF 20' WS. PUBLIC EASEMENT.
7. ALL ON-SITE EXISTING POWER POLES AND OVERHEAD WIRES SHOULD BE RELOCATED AND/OR REMOVED.
8. COMPACTED SAND BACKFILL WILL BE PROVIDED FOR ALL UTILITIES WITHIN THE INFLUENCE OF PAVED AREAS.
9. A 3' BUFFER DISTANCE SHALL BE PROVIDED BETWEEN THE SIDEWALK AND ANY FIXED OBJECTS.
10. THE CITY OF NOVI HAS NO RESPONSIBILITY TO IMPROVE OR MAINTAIN PRIVATE STREETS CONTAINED WITHIN OR PRIVATE STREETS PROVIDING ACCESS TO THE PROPERTY DESCRIBED IN THIS PLAN.
11. DEWATERING IS NOT ANTICIPATED FOR THIS PROJECT. IF DEWATERING IS REQUIRED, A DEWATERING PLAN MUST BE SUBMITTED TO NOVI FOR APPROVAL.



BARRIER-FREE RESERVED PARKING SIGNS

NOTE: ACCESSIBLE PARKING SPACE SIGNS SHALL HAVE A MIN. HEIGHT AND SIZE TO PERMIT THE SPACE TO BE EASILY IDENTIFIED AND ARE ELEVATED SUCH THAT THEY SHALL NOT PRESENT A HAZARD TO PERSONS WALKING NEAR THE SIGN.

SIGNING NOTES

1. ALL SIGNS SHALL HAVE A MINIMUM BOTTOM MOUNTING HEIGHT OF 7' FROM FINAL GRADE FOR GROUND MOUNTED SIGNS. WALL MOUNTED SIGNS MAY HAVE A BOTTOM MOUNTING HEIGHT OF 5'.
2. ALL ROADSIDE SIGNS SHOULD BE INSTALLED TWO FEET FROM THE FACE OF THE CURB TO THE NEAR EDGE OF THE SIGN.
3. SIGNS AND SIGNING WITH NOMINAL DIMENSIONS OF 12"x18" OR SMALLER IN SIZE SHALL BE MOUNTED ON A GALVANIZED 2 LB. U-CHANNEL POST. MULTIPLE SIGNS AND/OR SIGNS WITH NOMINAL DIMENSIONS GREATER THAN 12"x18" SHALL BE MOUNTED ON A GALVANIZED 3 LB. OR GREATER U-CHANNEL POST AS DICTATED BY THE WEIGHT OF THE PROPOSED SIGNS.
4. TRAFFIC CONTROL SIGNS SHALL USE THE FHWA STANDARD ALPHABET SERIES.
5. TRAFFIC CONTROL SIGNS SHALL HAVE A HIGH INTENSITY PRISMATIC (HIP) SHEETING TO MEET FHWA RETROREFLECTIVITY REQUIREMENTS.

STRIPING NOTES

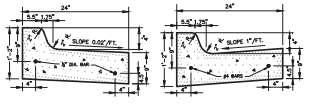
1. PARKING LOTS SHALL HAVE PARKING AREAS AND RAMP PAVEMENT MARKINGS MARKED BY PAINTED 4-INCH WIDE LINES ACCURATELY AND NEATLY ARRANGED AS INDICATED ON THE PLAN. LINES SHALL BE PAINTED WITH AN APPROVED WHITE TRAFFIC PAINT COMPATIBLE WITH BITUMINOUS/CONCRETE SURFACES SUCH AS SHERWIN WILLIAMS NO. 82 9W1; PPG TYPE 11-3 OR 11-4, OR AS APPROVED BY THE OWNER. PROTECT ALL PAINTED AREAS UNTIL PAINT IS COMPLETELY DRY/CURED. ALL PAINTED STRIPING, SYMBOLS, AND HANDICAPPED SIGNS SHALL BE PAINTED WITH BLUE PAINT FOR STRIPING. WHEEL CHAIR SYMBOL SHALL BE PAINTED WHITE. ALL PAINTED MARKINGS AND STRIPING SHALL BE PROVIDED IN TWO COATS.
2. THE INTERNATIONAL SYMBOL FOR ACCESSIBILITY SHALL BE WHITE OR WHITE WITH BLUE BACKGROUND
3. WHEN A BARRIER FREE PARKING SPACE IS ADJACENT TO A STANDARD PARKING SPACE, BLUE AND WHITE LINES ABUTTING EACH OTHER SHALL BE PROVIDED.

SIGN QUANTITIES

SYMBOL	DESCRIPTION	QUANTITY PANEL	POST
R1-1	30" "STOP" SIGN W/ STREET SIGN	2	2
	12"x 18" BARRIER SIGN (R7-8)	14	14
	6"x 12" VAN ACCESSIBLE SIGN (R7-8P)	6	0

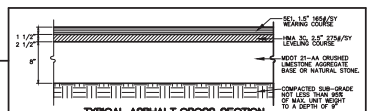
WETLAND IMPACT

WETLAND NAME	AREA (AC.)	WETLAND IMPACT AREA (AC.)	WETLAND FILL VOLUME (CF)	BUFFER DISTURBANCE (AC.)
XX	0.01	0.01	354	0.07
YY	0.01	0.01	561	0.09
ZZ	0.01	0.01	1290	0.10
C	0.08	0	0	0.02
TOTAL:	0.11	0.03	2205	0.28

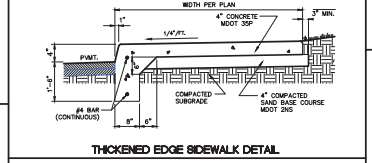


STRAIGHT FACE CONCRETE CURB REVERSE GUTTER DETAIL

STRAIGHT FACE CONCRETE CURB STANDARD GUTTER DETAIL



TYPICAL ASPHALT CROSS-SECTION



THICKENED EDGE SIDEWALK DETAIL



CONCRETE SIDEWALK DETAIL

LEGEND

EXISTING	PROPOSED	
		PAVEMENT (ASPHALT)
		SIDE WALK (CONCRETE) CONC. CURB & GUTTER
		STORM SEWER
		SANITARY SEWER
		WATER MAIN
		MANHOLE
		CATCH BASIN
		CURB INLET W/SILT SAC
		END SECTION
		GATE VALVE
		HYDRANT
		FLOOD PLAIN
1000	1000	CONTOURS
1000.00	1000.00 T/C	SPOT ELEVATION
		SURFACE DRAINAGE

CLIENT:
NOVI TEN ASSOCIATES, LLC
27 W. SQUARE LAKE ROAD
BLOOMFIELD HILLS
MICHIGAN 48302
248.909.1308

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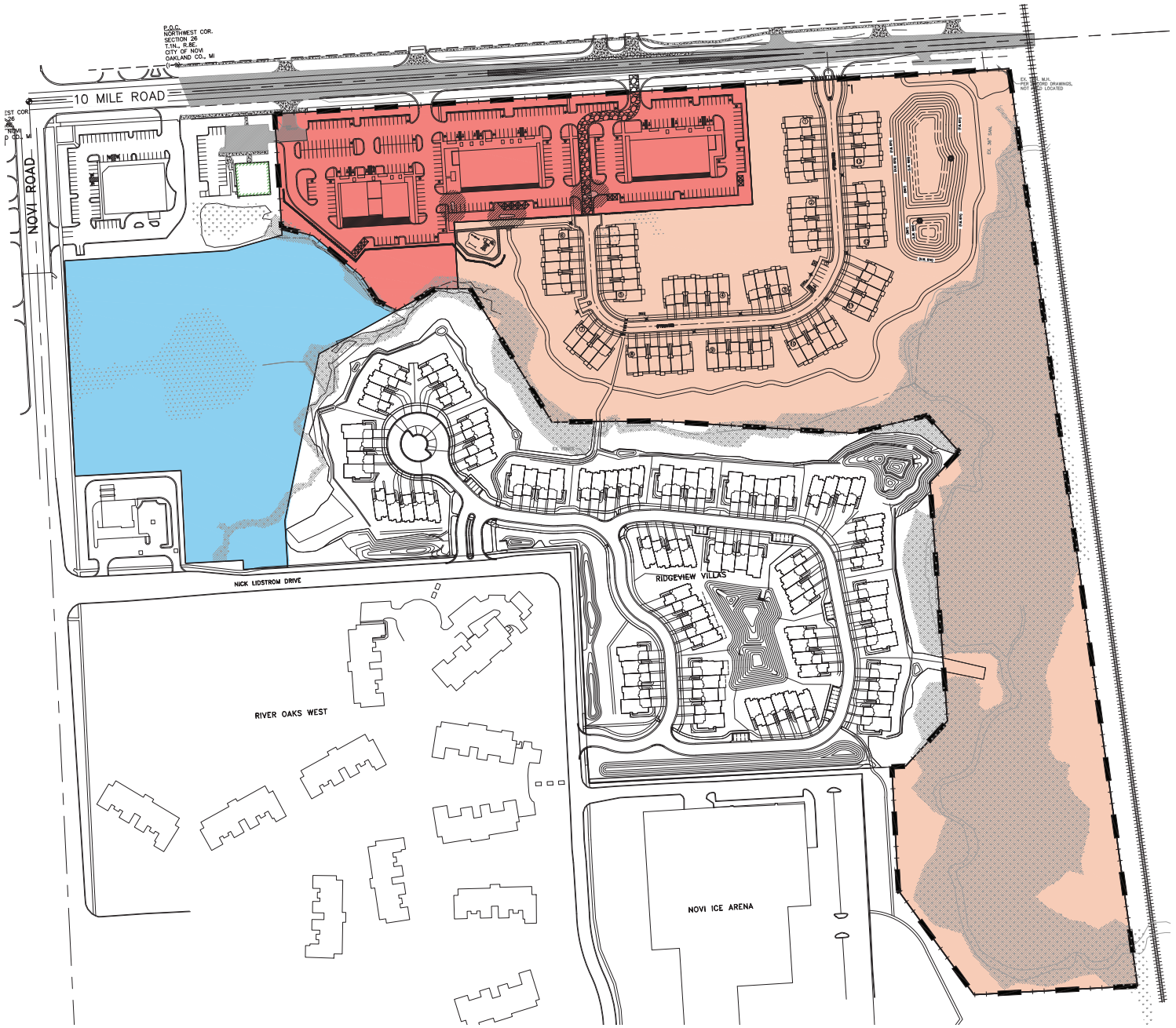
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1.	ADD COMMERCIAL PER CLIENT	05-19-22
2.	REVISED	05-26-23
3.	REVISIONS	06/12/23
4.	PER CLIENT	07/7/23

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JOB No.: 21-006

PROJECT NAME:
NOVI TEN TOWN HOMES
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN
SHEET TITLE:
PRC-B-2

SHEET
6B



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NO.	DESCRIPTION	DATE
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3.	REVISE PRO	04-04-24
4.	PRO CLARIFY	04/17/24

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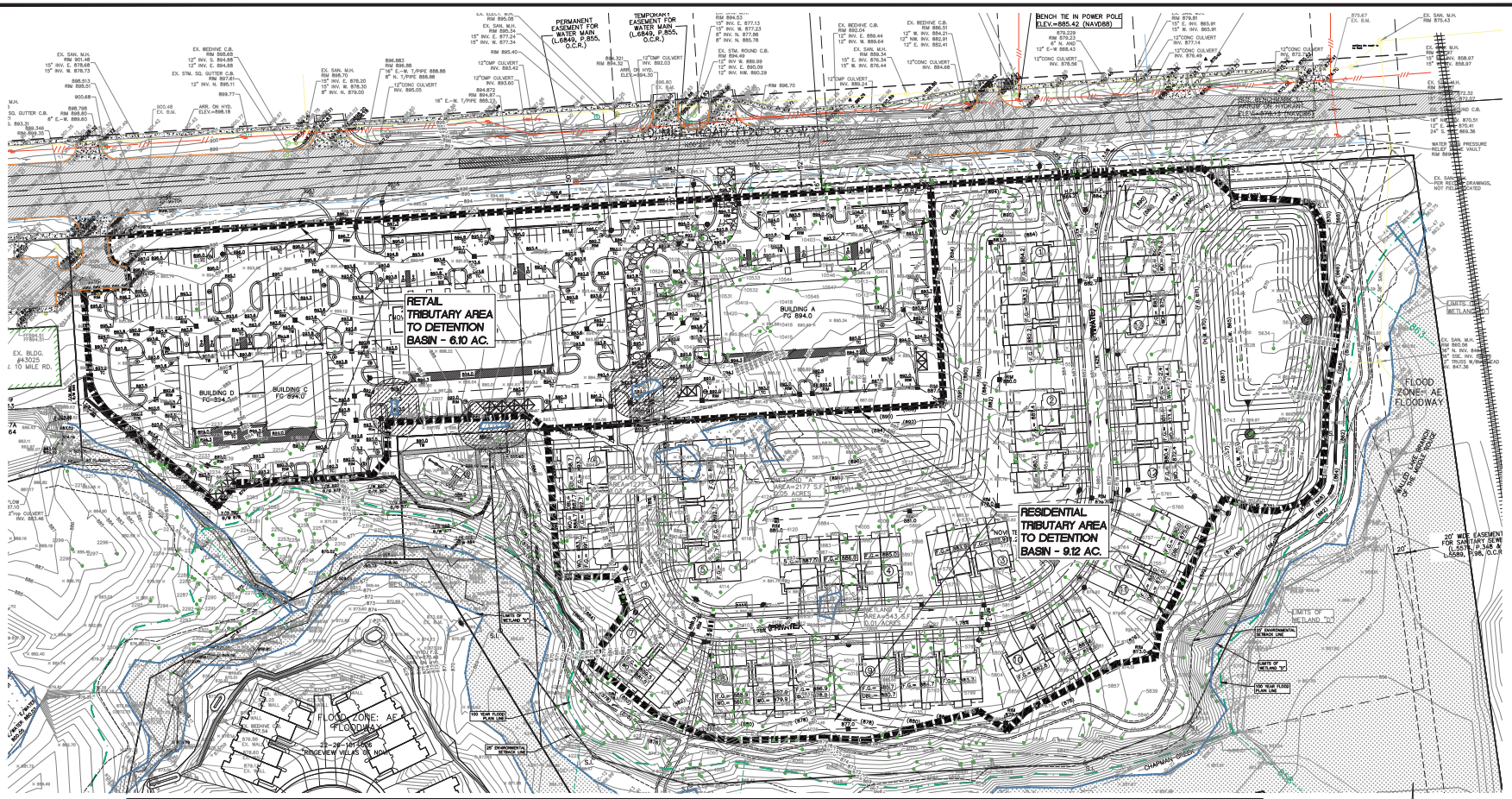
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DATE: 05-29-23
CHECKED BY: AE
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NOVI TEN ASSOCIATES, LLC
41 SOUTH LAKE ROAD
BLOOMFIELD HILLS
MICHIGAN 48302
248.909.1308

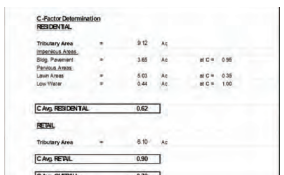
PROJECT NAME:
NOVI TEN TOWN HOMES
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
EXISTING AND PROPOSED ZONING

SHEET
7



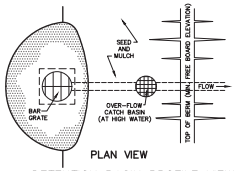
STORM WATER DETENTION CALCULATIONS





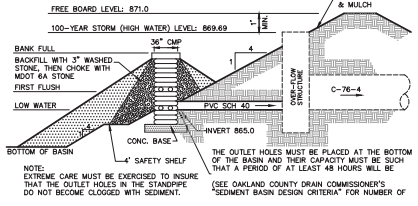


DETENTION BASIN SEDIMENT FILTER DETAIL



PLAN VIEW

DETENTION BASIN PROFILE VIEW



NOTE:
EXTREME CARE MUST BE EXERCISED TO INSURE THAT THE OUTLET HOLES IN THE STANDPIPE DO NOT BECOME CLOGGED WITH SEDIMENT.

THE OUTLET HOLES MUST BE PLACED AT THE BOTTOM OF THE BASIN AND THEIR CAPACITY MUST BE SUCH THAT A PERIOD OF AT LEAST 48 HOURS WILL BE

(SEE OAKLAND COUNTY DRAIN COMMISSIONER'S "SEDIMENT BASIN DESIGN CRITERIA" FOR NUMBER OF

MAINTENANCE SCHEDULE:

THE PROPERTY OWNER IS RESPONSIBLE FOR THE MAINTENANCE OF THE DETENTION BASIN. MAINTENANCE SHOULD BE PERFORMED FOLLOWING ANY STORM AND SHOULD INCLUDE:

1. CHECKING THE DEPTH OF SEDIMENT DEPOSIT TO ENSURE THE CAPACITY OF THE BASIN IS ADEQUATE FOR STORM WATER AND SEDIMENT DEPOSITION, AND FOR THE REMOVING OF SEDIMENT.
2. CHECKING THE BASIN FOR PIPING, SEEPAGE, OR OTHER MECHANICAL DAMAGE.
3. CHECKING FOR THE PRESENCE OF ANY SOIL CAKING, WHICH WOULD PREVENT PROPER DRAINAGE FROM THE BASIN.
4. CHECKING THE OUTFALL TO ENSURE DRAINAGE IS NOT CAUSING ANY ROSIVE VELOCITIES AND TO ENSURE THE OUTLET IS NOT CLOGGED.
5. ANY PROBLEM DISCOVERED DURING THE MAINTENANCE CHECKS SHOULD BE ADDRESSED IMMEDIATELY.
6. SEDIMENT REMOVED DURING CLEANING SHOULD BE PLACED AT AN UPLAND AREA AND STABILIZED SO THAT IT DOES NOT RE-ENTER THE DRAINAGE COURSE.

SCALE

60 0 30 60 120 240

(IN FEET)
Scale: 1 inch = 60 ft.

LEGEND

EXISTING	PROPOSED	
		PAVEMENT (ASPHALT)
		SIDE WALK (CONCRETE) CONCRETE CURB AND GUTTER
		STORM SEWER
		SANITARY SEWER
		WATER MAIN
		MANHOLE
		CATCH BASIN W/STREAM GUARD
		CURB INLET W/SILT SAC
		END SECTION
		GATE VALVE
		HYDRANT
		FLOOD PLAIN
1000	1000	CONTOURS
1000.00	1000.00	SPOT ELEVATION

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SEIBER KEAST ASSOCIATES, LLC
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Fax: 248.844.5124
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Fax: 734.542.9001
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NO.	DESCRIPTION	DATE
1.	ADD COMMERCIAL FOR CLIENT	05-15-22
2.	REVISED PER	02-28-23
3.	REVISED PER	04-07-24
4.	PRC SUBMITTAL	

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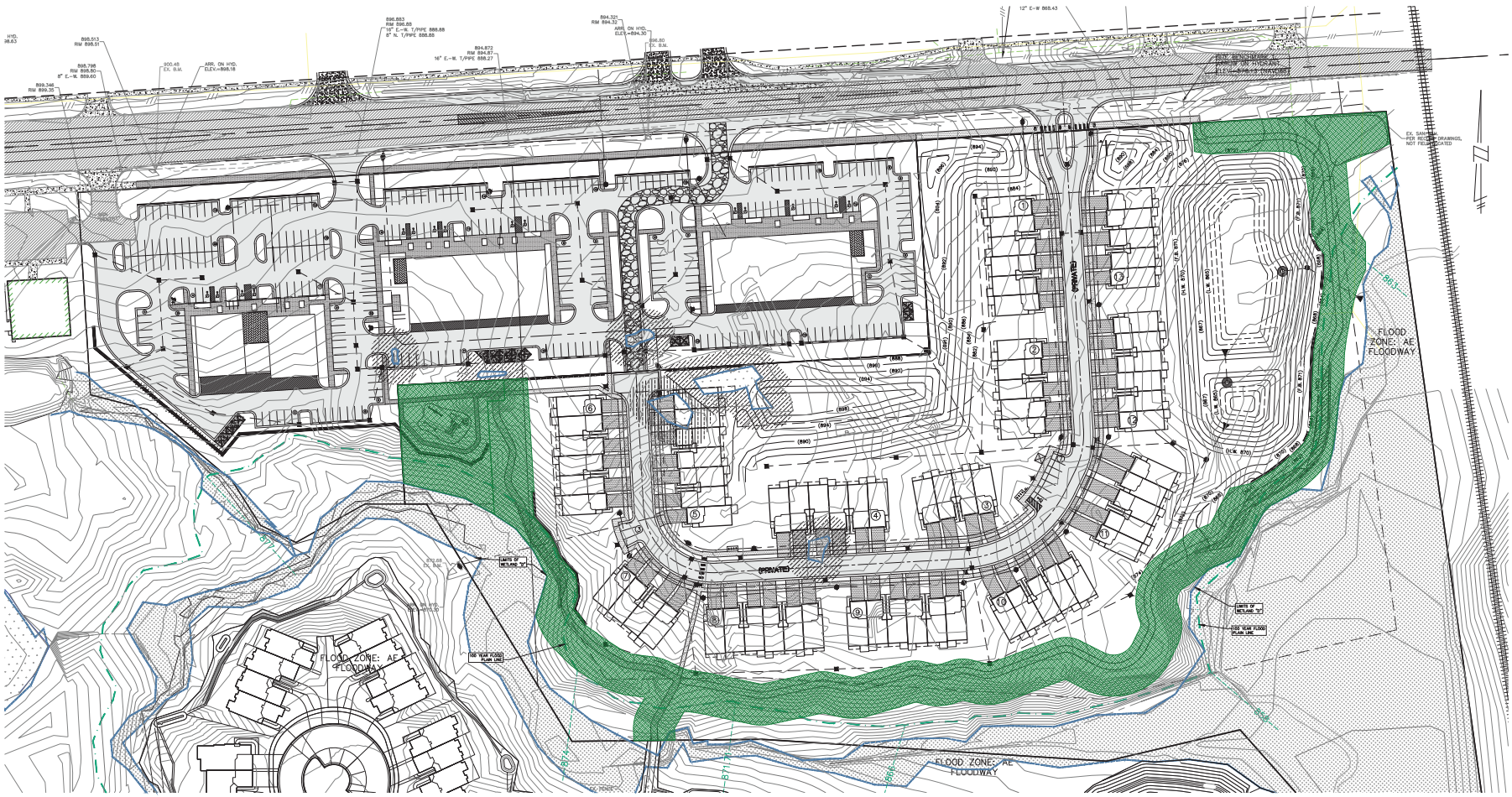
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DATE: 05-29-23
CHECKED BY:
JOB No.: 21-006

CLIENT:
NOVI TEN ASSOCIATES, LLC
7 MILE & BECK LAKE ROAD
BLOOMFIELD HILLS
MICHIGAN 48302
248.909.1308

PROJECT NAME:
NOVI TEN TOWN HOMES
SECTION 25, TOWN 1 NORTH, RANGE 8 EAST
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
STORM WATER MANAGEMENT PLAN

SHEET
8



SCALE

60 0 30 60 120 240

(IN FEET)

Scale: 1 inch = 60 ft.

Residential Usable Open Space Calculations Sec. 3.1.8.D

TOTAL No. OF RESIDENTIAL UNITS	=	71
USABLE OPEN SPACE REQUIRED	=	200 S.F. PER UNIT
	=	14,200 S.F. = 0.32 AC.
USABLE OPEN SPACE PROVIDED	=	107,378 S.F. = 2.46 AC.

= USABLE OPEN SPACE 50' WIDE MIN

LEGEND

EXISTING / PROPOSED

- PAVEMENT (ASPHALT)
- SIDE WALK (CONCRETE)
- CONCRETE CURB AND GUTTER
- STORM SEWER
- SANITARY SEWER
- WATER MAIN
- MANHOLE
- CATCH BASIN
- CURB INLET W/SILT SAC
- END SECTION
- GATE VALVE
- HYDRANT
- FLOOD PLAIN
- CONTOURS
- SPOT ELEVATION
- SURFACE DRAINAGE
- OVERFLOW ROUTE
- TREE FENCE
- SILT FENCE
- PROPOSED DRIVEWAY LOCATION
- LIMIT OF DISTURBANCE

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248.926.3366

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3.	REVISED PER	04-17-24
4.	PRC CLEARANCE	

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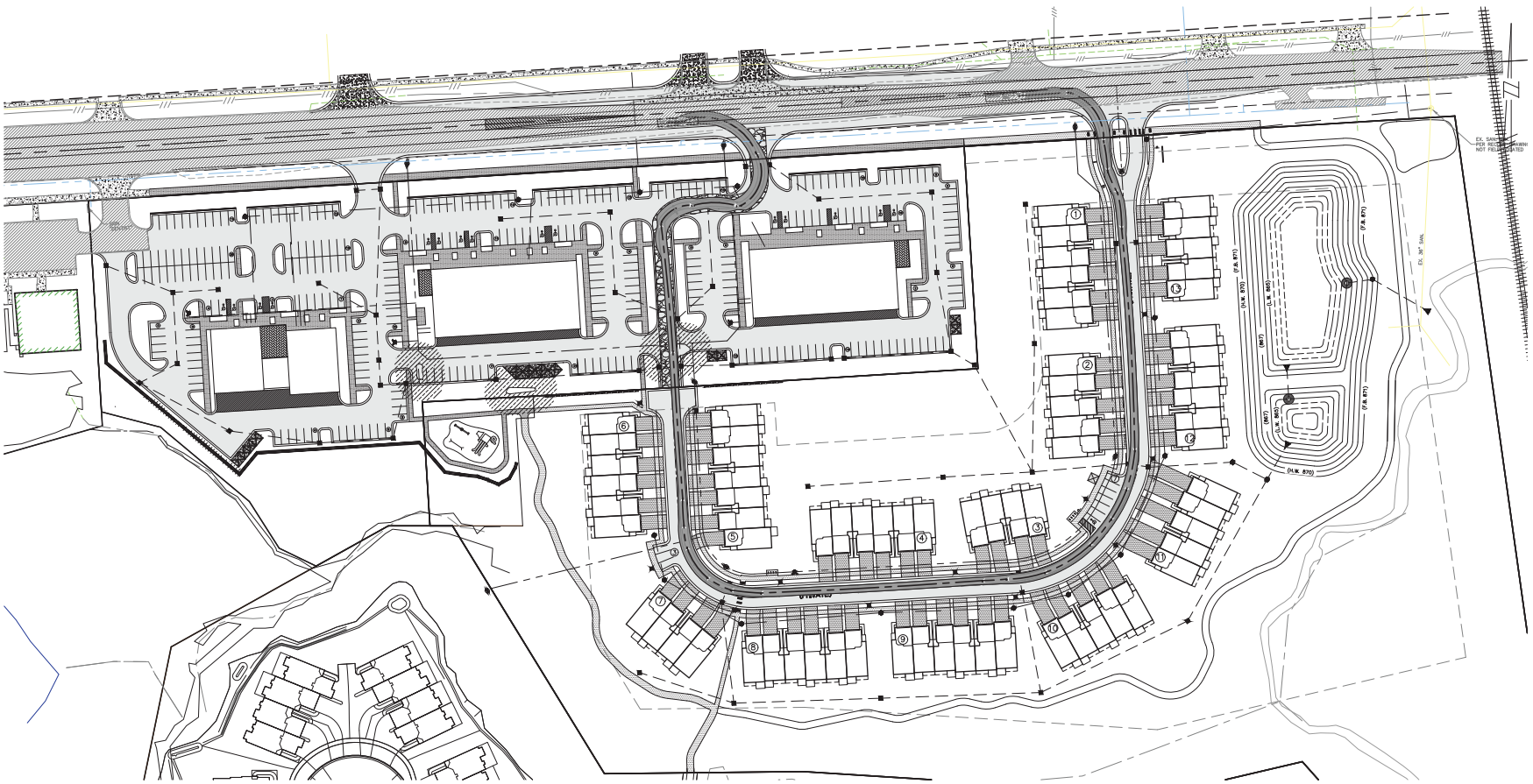
CLIENT:
NOVI TEN ASSOCIATES, LLC
31 W. LONG LAKE ROAD
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MICHIGAN 48302
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PROJECT NAME:
NOVI TEN TOWN HOMES
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
OPEN SPACE PLAN

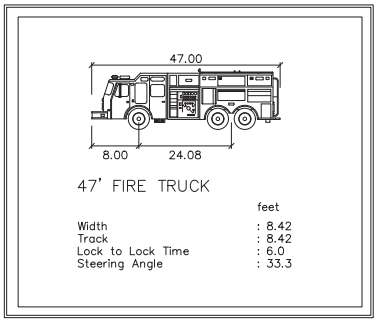
SHEET
9

P:\21-006 Novi Ten North\DWG\PRP PLANS\21006-OSPlan.dwg, 4/21/2024 8:28 AM, Jason Roland



SCALE

(IN FEET)
Scale: 1 inch = 60 ft.



47' FIRE TRUCK

	feet
Width	: 8.42
Track	: 8.42
Lock to Lock Time	: 6.0
Steering Angle	: 33.3

LEGEND

EXISTING	PROPOSED	
		PAVEMENT (ASPHALT)
		SIDE WALK (CONCRETE)
		CONCRETE CURB AND GUTTER
		STORM SEWER
		SANITARY SEWER
		WATER MAIN
		MANHOLE
		CATCH BASIN
		CURB INLET W/SILT SAC
		END SECTION
		GATE VALVE
		HYDRANT
		FLOOD PLAIN
1000	1000	CONTOURS
+ 1000.0	1000.00 T/C	SPOT ELEVATION
		SURFACE DRAINAGE
		OVERFLOW ROUTE
		TREE FENCE
		SILT FENCE
		PROPOSED DRIVEWAY LOCATION
		LIMIT OF DISTURBANCE

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NO.	DESCRIPTION	DATE
1.	ADD COMMERCIAL PER CLIENT	05-15-23
2.	ISSUED PPD	02-28-23
3.	REVISE PPD	01-31-24
4.	PPD CLEARLY	04/17/24

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DATE: 05-29-23
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JOB No.: 21-006

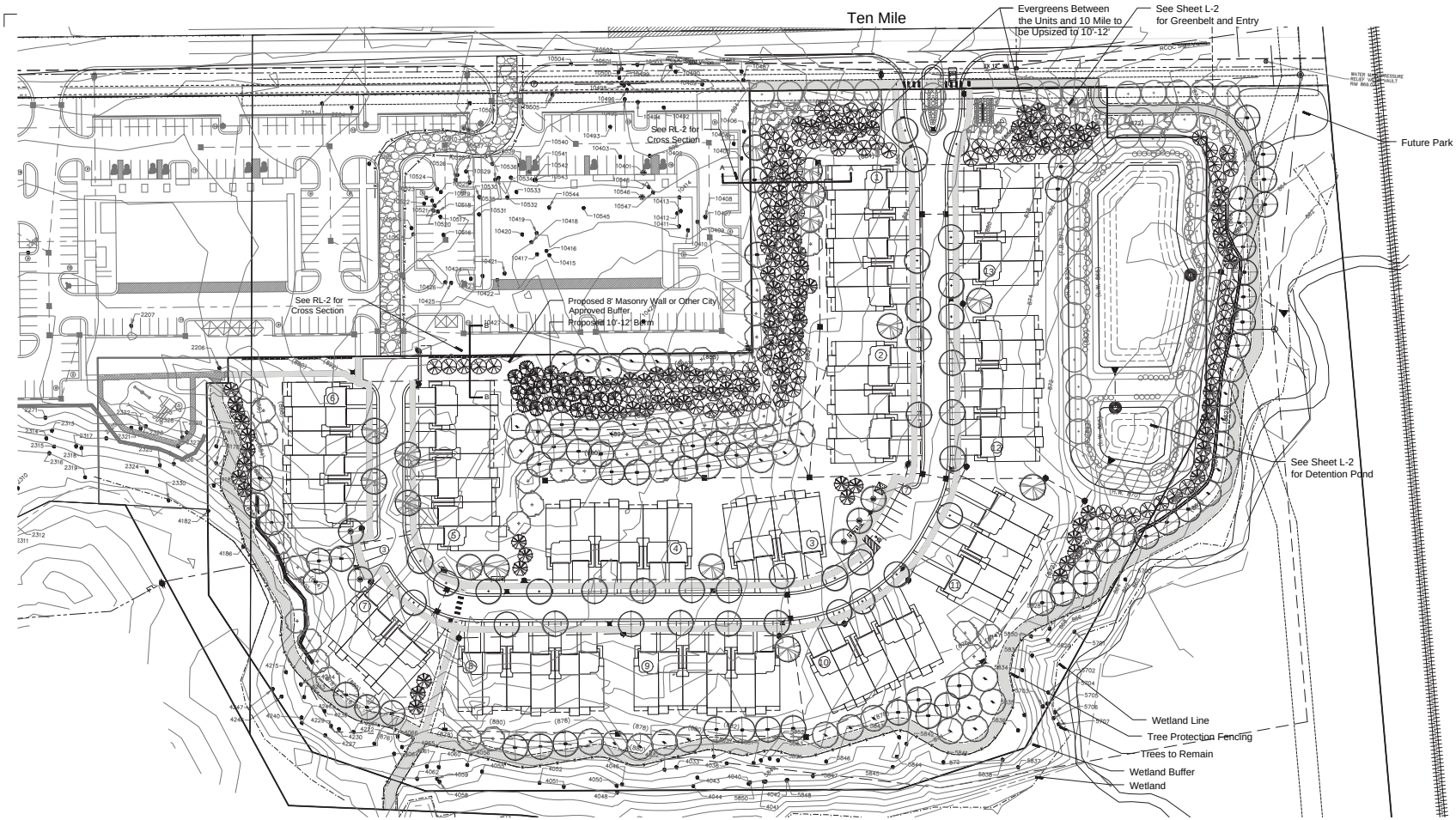
CLIENT:
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SAM ALDEEB
LAKE ROAD
BLOOMFIELD HILLS
MICHIGAN 48302
248.909.1308

PROJECT NAME:
NOVI TEN TOWN HOMES
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

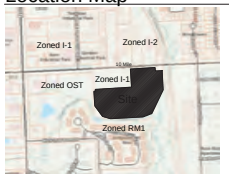
SHEET TITLE:
TRUCK ROUTING PLAN

SHEET
10

P:\21-006 Novi Ten Assn\DADPRO PLANS\2006-4.dwg 5/21/2024 8:28 AM Jason Roland



Location Map



North
No Scale

Landscape Summary

Street Trees
- Street Frontage: 2,368 l.f.
- Less Drives: 1,136 l.f.
- Net Frontage: 1,232 l.f.
- Trees Required: 35 Trees (1,232 / 35)
- Trees Provided: 35 Trees

Multi-Family Trees
- Total Units: 71 Units
- Trees Required: 213 Trees (71 x 3)
- Trees Provided: 213 Trees

Parking Lot Landscaping
- Parking Lot Perimeter: 163 l.f.
- Trees Required: 4.7 Trees (163 / 35)
- Trees Provided: 5 Trees

Woodland Replacement
- Replacement Required: 699 Trees
- Total Trees Provided: 181 Trees
- Trees to be Paid into Fund: 518 Trees

Notes:
- Soils Information is Shown on Sheet 2.
- Trees Shall be Planted 10' from Utility Structures Including Hydrants and 5' from Utility Lines.
- Tree Shall not Be Planted within 4' of Property Lines.
- Snow Shall be Deposited Adjacent to Drives and within the Curb Lawn. Any Damaged Trees Shall be Replaced as Needed.
- All Utility Boxes Shall be Screen per Detail on Sheet L-3. Approximately 8-12 Shrubs will be Required per Box.
- No Overhead Lines Exist.
- Phragmites and Japanese Knotweed and not Present on this Site.
- An Irrigation Plan will be Provided for Stamping Sets.

Requested Waivers:

1. Landscape waiver from Sec. 5.5.3.B.ii for deficiency in required trees along Ten Mile due to Water Main Conflict.

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City of Novi Project Number
JZ23-0009

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ALLENDESIGN
LAND PLANNING / LANDSCAPE ARCHITECTURE
557 Carpenter
Northville, Michigan 48167
e. jca@wideopenwest.com
t. 248.467.4668

Seal:

Title:
Conceptual Landscape Plan

Project:
The Towns at Novi Station
Novi, Michigan

Prepared for:
Toll Brothers
26200 Town Center Drive, Suite 200
Novi, Michigan 48375

Revision:	Issued:
Submission	September 14, 2022
Issued	February 28, 2023
Revised	April 27, 2023
Revised	January 2, 2024
Revised	June 17, 2024

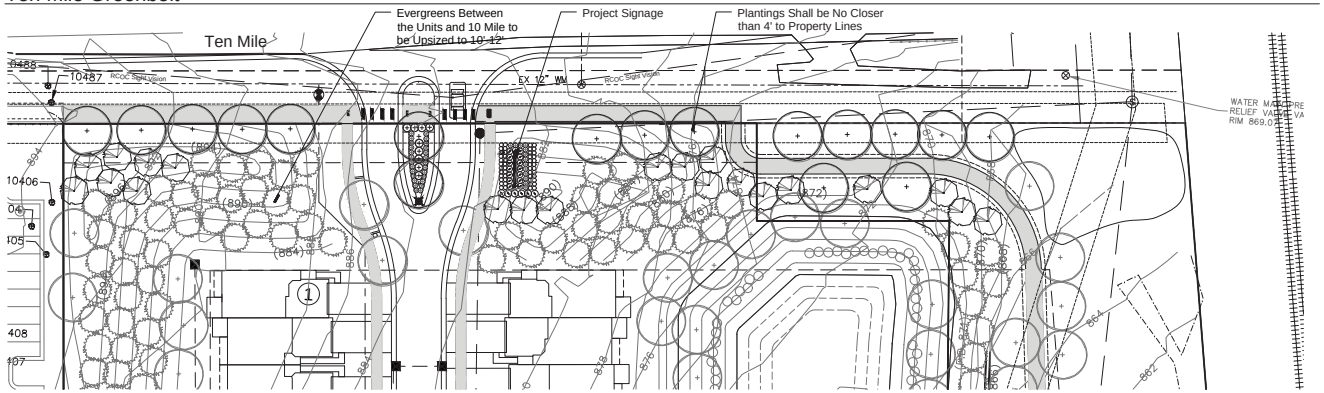
Job Number:
21-027

Drawn By: jca
Checked By: jca

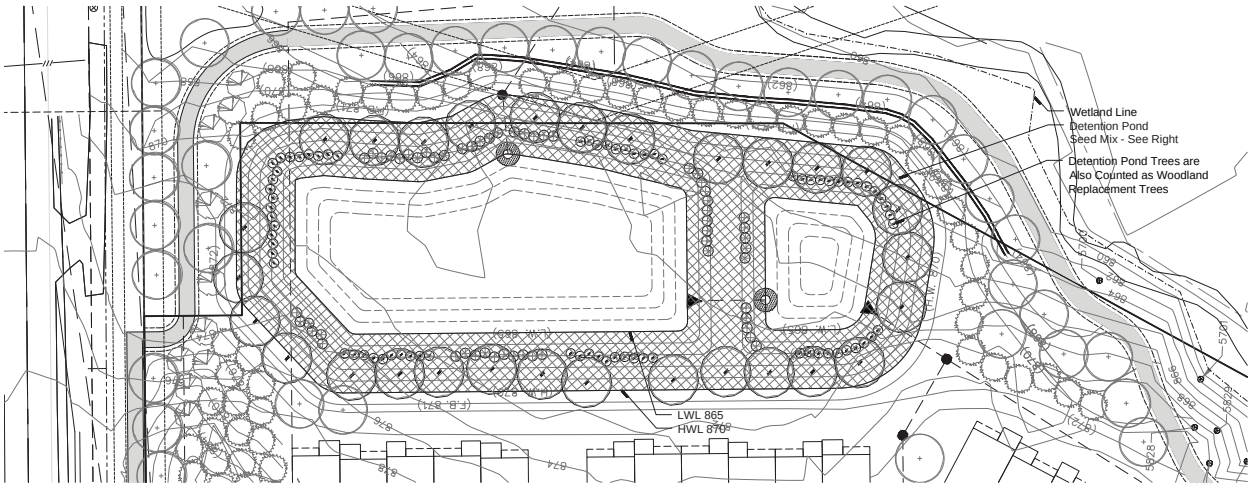
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NORTH
1"=50'

Sheet No.
RL-1

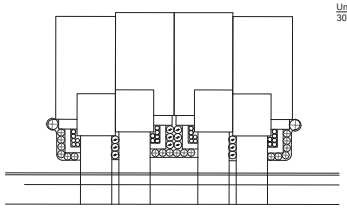
Ten Mile Greenbelt



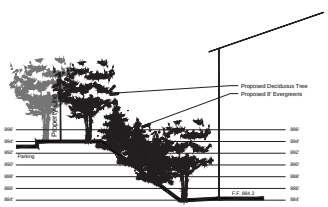
Detention Pond



Typical Unit

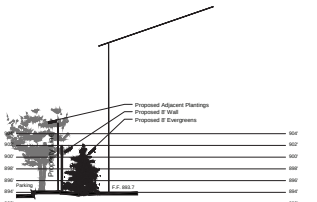


Unit Length	Required Landscape (35%)	Landscape Provided (40.0%)
30'	10.5'	12'



Section A-A'

Horiz. 1"=20'
Vert. 1"=10'



Section B-B'

Horiz. 1"=20'
Vert. 1"=10'

Landscape Summary

Street Lawn	
Total Street Frontage	573 l.f.
Less Drive Opening	149 l.f.
Net Street Frontage	424 l.f.
Trees Required	12.1 Trees (424 / 35)
Trees Provided	0 Trees
Greenbelt Plantings	
Total Street Frontage	573 l.f.
Less Drive Opening	58 l.f.
Net Street Frontage	515 l.f.
Canopy Trees Required	14.7 Trees (515 / 35)
Canopy Trees Provided	15 Trees
Sub-Canopy Trees Required	20.6 Trees (515 / 25)
Sub-Canopy Trees Provided	21 Trees
Detention Pond Plantings	
10' from LWL Elevation	886 l.f.
Required Planting	620 l.f. (70%)
Planting Provided	635 l.f. (72%)
Pond Frontage for Trees	751'
Trees Required	21.5 Trees (751 / 35)
Trees Provided	29 Trees



26,917 s.f. Total Area

34.2 lbs. per Acre Application Rate
21 lbs. of Detention Seed Mix Required
3"-6" of Topsoil with 20%-30% Compost Shall be Placed in this Area.

Note:
Contractor Shall Provide Proof of Seed to be Used in the Form of an Invoice or Photo of the Seed Bag to rmeader@cityofnovi.org for Approval Prior to Installation. If an Unacceptable Seed Mix is Used, the City Reserves the Right to Destroy the Plants and Re-seed with and Acceptable Mix at the Developer's Expense.

North

ALLENDESIGN
LAND PLANNING / LANDSCAPE ARCHITECTURE
557 Carpenter
Northville, Michigan 48167
e. jca@wideopenwest.com
t. 248.467.4668

Seal:

Title:
Greenbelt and Entry

Project:
The Towns at Novi Station
Novi, Michigan

Prepared for:
Toll Brothers
26200 Town Center Drive, Suite 200
Novi, Michigan 48375

Revision:	Issued:
Submission	September 14, 2022
Issued	February 28, 2023
Revised	April 27, 2023
Revised	January 2, 2024
Revised	June 17, 2024

Job Number:
21-027

Drawn By:	Checked By:
jca	jca

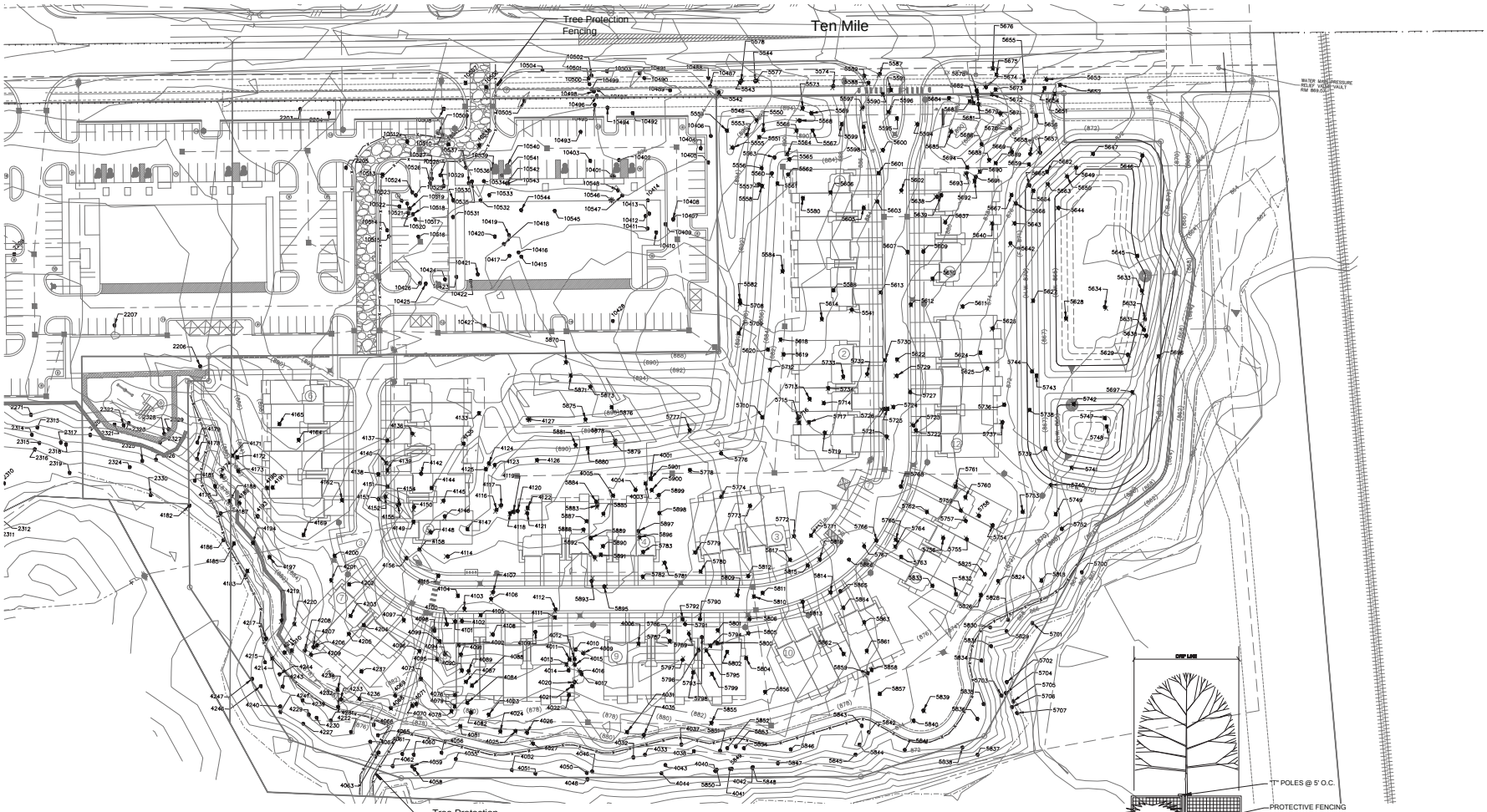
0' 15' 30'
NORTH
1"=30'

City of Novi Project Number
JZ23-0009

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

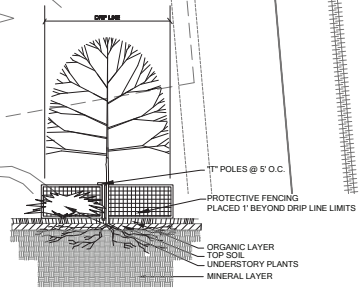
Sheet No.
RL-2

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Notes:

1. The Entire Site is Located within a Regulated Woodland
2. "X" Denotes Trees to Be Removed



1. Either Plastic or Wood Orange Snow Fencing Shall be Installed at or Beyond the Dripline, Unless More Substantial Fencing is Required.
2. Stakes Shall be Metal "T" Poles Spaced no Further than 5' on Center.
3. Fencing Shall not be Installed Closer to the Tree than the Dripline of Those Trees to be Saved. Special Circumstances Shall be Reviewed by the City.
4. Fencing Shall be Erected Prior to Construction. The City Shall be Notified Once the Fencing is Instaled for Inspection.
5. Under no Circumstances Shall the Portective Fencing be Removed Without Proper Approval from the City.
6. No Person Shall Conduct any Activity Within Areas Proposed to Remain. This Shall Include, but not Limited to:
   a. No Solvents or Chemicals Within Protected Areas.
   b. No Building Materials or Construction Equipment Within Protected Areas.
   c. No Grade Changes, Including Fill, Within Protected Areas.
   d. No Removal of Vegetation from the Ground Up Without Permission from the Proper Reviewing Authority, Including the Woodlands Review Board.
   e. Any Required Swale Needs to be Directed Around the Protected Areas. Instances Where Swales are Approved Through a Protected Area, the Swales Need to be HAND DUG. Machinery of Any Kind is Prohibited.
7. Regulated Woodland or Regulated Trees Adjacent to the Property are Also Required to be Protected Whether or not they are Shown on the Plan.

TREE PROTECTION DETAIL

Not to scale

City of Novi Project Number
JZ23-0009

Know what's below. Call before you dig

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ALLENDESIGN
LAND PLANNING / LANDSCAPE ARCHITECTURE
557 Carpenter
Northville, Michigan 48167
e. jca@wideopenwest.com
t. 248.467.4668

Seal:

Title:

Woodland Plan

Project:

The Towns at Novi Station
Novi, Michigan

Prepared for:

Toll Brothers
26200 Town Center Drive, Suite 200
Novi, Michigan 48375

Revision:	Issued:
Submission	September 14, 2022
Issued	February 28, 2023
Revised	April 27, 2023
Revised	January 2, 2024

Job Number:

21-027

Drawn By:	Checked By:
jca	jca

0' 25' 50'

NORTH
1"=50'

Sheet No.

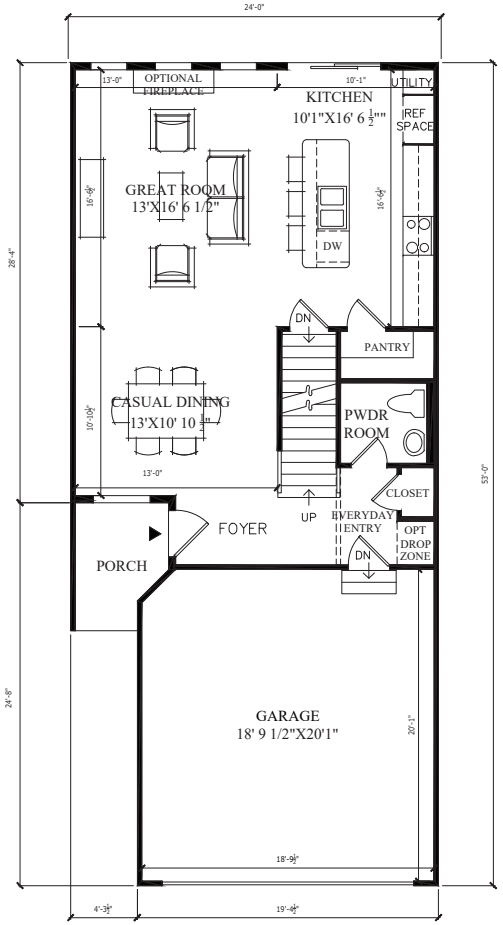
RL-3

Tree List

TAG NO.	DIAMETER	COMMON NAME	BOTANICAL NAME	STATUS	Required Replacement	Multi-Stem Replacement
4001	13	Big Tooth Aspen	Populus grandidentata	Remove	2	
4003	14	Big Tooth Aspen	Populus grandidentata	Remove	2	
4004	13	Big Tooth Aspen	Populus grandidentata	Remove	2	
4005	13	Eastern Cottonwood	Populus deltoides	Remove	2	
4009	11	Eastern Cottonwood	Populus deltoides	Remove	1	
4010	18	Eastern Cottonwood	Populus deltoides	Remove	2	
4011	10	Eastern Cottonwood	Populus deltoides	Remove	1	
4012	10	Eastern Cottonwood	Populus deltoides	Remove	1	
4013	10	Eastern Cottonwood	Populus deltoides	Remove	1	
4014	14	Eastern Cottonwood	Populus deltoides	Remove	2	
4015	9	American Elm	Ulmus americana	Remove	1	
4016	13	Eastern Cottonwood	Populus deltoides	Remove	2	
4017	10	Eastern Cottonwood	Populus deltoides	Remove	1	
4020	16	Eastern Cottonwood	Populus deltoides	Remove	2	
4021	14	Eastern Cottonwood	Populus deltoides	Remove	2	
4022	16	Eastern Cottonwood	Populus deltoides	Remove	2	
4023	15	Box elder	Acer negundo	Remove	2	
4024	15	American Elm	Ulmus americana	Remove	2	
4025	12	Box elder	Acer negundo	Remove	2	
4026	14	Box elder	Acer negundo	Remove	2	
4027	12	Black Walnut	Juglans nigra	Remove	2	
4031	17	Box elder	Acer negundo	Remove	2	
4032	16	Black Cherry	Prunus serotina	Save		
4033	10	Black Cherry	Prunus serotina	Save		
4035	11	Black Walnut	Juglans nigra	Remove	1	
4037	10	Black Walnut	Juglans nigra	Save		
4039	13	Black Cherry	Prunus serotina	Save		
4042	24	Box elder	Acer negundo	Save		
4041	13	American Elm	Ulmus americana	Save		
4042	23	American Elm	Ulmus americana	Save		
4043	8	Hawthorn	Crataegus spp.	Save		
4044	12	Box elder	Acer negundo	Save		
4046	12	Black Cherry	Prunus serotina	Save		
4048	13	American Elm	Ulmus americana	Save		
4050	14,14	Black Cherry	Prunus serotina	Save		
4051	14	Black Cherry	Prunus serotina	Save		
4052	14,14	Box elder	Acer negundo	Save		
4055	14	Box elder	Acer negundo	Save		
4056	12	Box elder	Acer negundo	Save		
4058	8	Box elder	Acer negundo	Save		
4059	10	Box elder	Acer negundo	Save		
4060	9	Black Cherry	Prunus serotina	Save		
4061	12	Black Cherry	Prunus serotina	Save		
4062	16	American Elm	Ulmus americana	Save		
4063	17	Black Cherry	Prunus serotina	Remove	2	
4064	10	Red Oak	Quercus rubra	Save		
4065	15	Black Cherry	Prunus serotina	Save		
4066	17	Black Cherry	Prunus serotina	Save		
4068	12	Box elder	Acer negundo	Remove	2	
4069	24	Common Apple	Malus spp.	Remove	3	
4070	14	Box elder	Acer negundo	Remove	2	
4071	8	Box elder	Acer negundo	Remove	1	
4073	8	Box elder	Acer negundo	Remove	1	
4075	18	Box elder	Acer negundo	Remove	2	
4078	13	Box elder	Acer negundo	Remove	2	
4079	8	Box elder	Acer negundo	Remove	1	
4081	14	Box elder	Acer negundo	Remove	2	
4082	14	Box elder	Acer negundo	Remove	2	
4084	8	Box elder	Acer negundo	Remove	1	
4087	8	Box elder	Acer negundo	Remove	1	
4088	12	Box elder	Acer negundo	Remove	2	
4089	15	Box elder	Acer negundo	Remove	2	
4090	9	Box elder	Acer negundo	Remove	1	
4091	12	Box elder	Acer negundo	Remove	2	
4092	15,15,15	Box elder	Acer negundo	Remove	3	9
4094	12	Box elder	Acer negundo	Remove	2	
4095	13	Box elder	Acer negundo	Remove	2	
4096	15	Box elder	Acer negundo	Remove	2	
4097	12	Box elder	Acer negundo	Remove	2	
4098	10	Box elder	Acer negundo	Remove	1	
4099	10	Box elder	Acer negundo	Remove	1	
4100	8	Box elder	Acer negundo	Remove	1	
4101	8	Box elder	Acer negundo	Remove	1	
4102	16	Eastern Cottonwood	Populus deltoides	Remove	2	
4103	24	Eastern Cottonwood	Populus deltoides	Remove	3	
4104	18	Eastern Cottonwood	Populus deltoides	Remove	2	
4105	18	Box elder	Acer negundo	Remove	2	
4106	14	Eastern Cottonwood	Populus deltoides	Remove	2	
4107	15	Eastern Cottonwood	Populus deltoides	Remove	2	
4108	16	Eastern Cottonwood	Populus deltoides	Remove	2	
4109	16	Eastern Cottonwood	Populus deltoides	Remove	2	
4110	8	Eastern Cottonwood	Populus deltoides	Remove	1	
4112	10	Eastern Cottonwood	Populus deltoides	Remove	1	
4114	6	Box elder	Acer negundo	Remove	1	
4115	12	Black Cherry	Prunus serotina	Remove	2	
4116	9	Box elder	Acer negundo	Remove	1	
4117	8	Box elder	Acer negundo	Remove	1	
4118	8	Box elder	Acer negundo	Remove	1	
4119	18	Box elder	Acer negundo	Remove	2	
4121	12	Box elder	Acer negundo	Remove	2	
4122	10	Box elder	Acer negundo	Remove	1	
4123	18	Box elder	Acer negundo	Remove	2	
4124	18	Box elder	Acer negundo	Remove	2	
4125	22	Box elder	Acer negundo	Remove	3	
4127	8	White Spruce	Picea glauca	Remove	1	
4135	10,10	Box elder	Acer negundo	Save		1
4139	13,15,15	Eastern Cottonwood	Populus deltoides	Remove		6
4137	12	Box elder	Acer negundo	Remove	2	
4138	13	Box elder	Acer negundo	Remove	2	
4140	14	Box elder	Acer negundo	Remove	2	
4142	18	Box elder	Acer negundo	Remove	2	
4144	12	Box elder	Acer negundo	Remove	2	
4145	6	Box elder	Acer negundo	Remove	1	
4149	11	Box elder	Acer negundo	Remove	1	
4147	10	Box elder	Acer negundo	Remove	1	
4148	10	Box elder	Acer negundo	Remove	1	
4150	10	Box elder	Acer negundo	Remove	1	
4152	12	Box elder	Acer negundo	Remove	2	
4151	14	Box elder	Acer negundo	Remove	2	
4152	17	Box elder	Acer negundo	Remove	2	
4153	18	Box elder	Acer negundo	Remove	2	
4154	16	Box elder	Acer negundo	Remove	2	
4155	22	Eastern Cottonwood	Populus deltoides	Remove	3	
4156	12	Box elder	Acer negundo	Remove	2	
4158	13	Box elder	Acer negundo	Remove	2	
4164	10	Black Cherry	Prunus serotina	Remove	1	
4165	8,8	Hawthorn	Crataegus spp.	Save		1
4169	27	American Elm	Ulmus americana	Remove	3	
4171	9	Black Cherry	Prunus serotina	Remove	1	
4172	8,8	Black Cherry	Prunus serotina	Remove		2
4173	13	White Ash	Fraxinus americana	Remove	2	
4174	9	Black Cherry	Prunus serotina	Remove	1	
4175	9	Black Cherry	Prunus serotina	Remove	1	
4178	10	Black Cherry	Prunus serotina	Save		
4179	8	Black Cherry	Prunus serotina	Save		
4181	10	Black Cherry	Prunus serotina	Save		
4182	11	Hawthorn	Crataegus spp.	Save		
4183	9	Box elder	Acer negundo	Remove	1	
4185	9	Black Cherry	Prunus serotina	Remove	1	
4186	12	Box elder	Acer negundo	Save		
4187	11	Black Cherry	Prunus serotina	Remove	1	
4189	9	Black Cherry	Prunus serotina	Remove	1	
4190	14	Black Cherry	Prunus serotina	Remove	2	
4189	11	Box elder	Acer negundo	Remove	1	
4191	12	Common Apple	Malus spp.	Remove	2	
4193	8	Black Cherry	Prunus serotina	Remove	1	
4194	9	Common Apple	Malus spp.	Remove	1	
4197	19	Black Cherry	Prunus serotina	Remove	1	
4201	14	American Elm	Ulmus americana	Remove	2	
4202	10	Black Cherry	Prunus serotina	Remove	1	
4203	12	Black Cherry	Prunus serotina	Remove	2	
4204	12	Black Cherry	Prunus serotina	Remove	2	
4205	9	Common Apple	Malus spp.	Remove	1	
4206	9	Black Cherry	Prunus serotina	Remove	1	
4208	8	Common Apple	Malus spp.	Remove	1	
4209	24	Box elder	Acer negundo	Remove	3	
4219	8,8	Common Apple	Malus spp.	Remove		2
4211	8	Black Cherry	Prunus serotina	Remove	1	
4214	12,12	Black Cherry	Prunus serotina	Remove		5
4215	10,10	Black Cherry	Prunus serotina	Save		
4217	12	Black Cherry	Prunus serotina	Remove	2	
4218	8	Black Cherry	Prunus serotina	Remove	1	
4220	14	Black Cherry	Prunus serotina	Remove	2	
4222	22	American Elm	Ulmus americana	Save		
4227	9	Black Cherry	Prunus serotina	Save		
4229	16	Black Cherry	Prunus serotina	Save		
4230	16	Black Cherry	Prunus serotina	Save		
4231	13	Black Cherry	Prunus serotina	Save		
4232	13	Black Cherry	Prunus serotina	Remove	2	
4233	11	Black Cherry	Prunus serotina	Remove	2	
4234	14	Black Cherry	Prunus serotina	Remove	2	
4235	8	Black Cherry	Prunus serotina	Remove	1	
4237	14	Black Cherry	Prunus serotina	Remove	2	
4239	9	Black Cherry	Prunus serotina	Save		
4240	15	Black Cherry	Prunus serotina	Save		
4241	15	Box elder	Acer negundo	Save		
4243	9	Black Cherry	Prunus serotina	Save		
4244	9	Black Cherry	Prunus serotina	Save		
4245	8	Black Cherry	Prunus serotina	Save		
4247	9	Black Cherry	Prunus serotina	Save		
5541	15	Hawthorn	Crataegus spp.	Remove	2	
5542	12,12	Box elder	Acer negundo	Remove		3
5543	17	Box elder	Acer negundo	Remove	2	
5544	14	Box elder	Acer negundo	Remove	2	
5545	8	Box elder	Acer negundo	Remove	1	
5553	8	Box elder	Acer negundo	Remove	1	
5554	10	Box elder	Acer negundo	Remove	1	
5555	12	Box elder	Acer negundo	Remove	2	
5559	14	Box elder	Acer negundo	Remove	2	
5557	15	Box elder	Acer negundo	Remove	2	
5558	12	Box elder	Acer negundo	Remove	2	
5560	10	Box elder	Acer negundo	Remove	1	
5561	10,10	Box elder	Acer negundo	Remove		3
5562	12,12	Box elder	Acer negundo	Remove		3
5563	14	Box elder	Acer negundo	Remove	2	
5567	12	Box elder	Acer negundo	Remove	2	
5568	9	Box elder	Acer negundo	Remove	1	
5569	11	Box elder	Acer negundo	Remove	1	
5570	19	Box elder	Acer negundo	Remove	2	
5571	13	Box elder	Acer negundo	Remove	2	
5572	18	Box elder	Acer negundo	Remove	2	
5574	19	Box elder	Acer negundo	Remove	2	
5577	13	Box elder	Acer negundo	Remove	2	
5578	18	Box elder	Acer negundo	Remove	2	
5580	19	Common Apple	Malus spp.	Remove	2	
5582	10	Common Apple	Malus spp.	Remove	1	
5584	8	Box elder	Acer negundo	Remove	1	
5585	8	Common Pear	Pyrus spp.	Remove	1	
5587	9	Box elder	Acer negundo	Remove	1	
5588	18	Box elder	Acer negundo	Remove	2	
5589	13	Box elder	Acer negundo	Remove	2	
5590	9	Box elder	Acer negundo	Remove	1	
5591	9	Box elder	Acer negundo	Remove	1	
5594	8	White Ash	Fraxinus americana	Remove	1	
5595	12	Box elder	Acer negundo	Remove	2	
5596	11	Box elder	Acer negundo	Remove	1	
5597	9	Box elder	Acer negundo	Remove	1	
5598	15	Box elder	Acer negundo	Remove	2	
5599	13	Box elder	Acer negundo	Remove	2	
5600	19	Box elder	Acer negundo	Remove	2	
5601	15,15,15	Common Apple	Malus spp.	Remove		9
5602	11	Hawthorn	Crataegus spp.	Remove	1	
5605	28	Eastern Cottonwood	Populus deltoides	Remove	3	
5606	17	Box elder	Acer negundo	Remove	2	
5607	9	Hawthorn	Crataegus spp.	Remove	1	
5609	9	Eastern Cottonwood	Populus deltoides	Remove	1	
5610	19	Eastern Cottonwood	Populus deltoides	Remove	2	
5611	12	Eastern Cottonwood	Populus deltoides	Remove	2	
5612	24	Box elder	Acer negundo	Remove	3	
5613	27	Box elder	Acer negundo	Remove	3	
5618	8	Box elder	Acer negundo	Remove	1	
5620	10	Hawthorn	Crataegus spp.	Remove	1	
5622	11	Hawthorn	Crataegus spp.	Remove	1	
5624	10	Hawthorn	Crataegus spp.	Remove	1	
5625	19	Black Cherry	Prunus serotina	Remove	2	
5626	11	Hawthorn	Crataegus spp.	Remove	1	
5627	18	Box elder	Acer negundo	Remove	2	
5628	13	Box elder	Acer negundo	Remove	2	
5629	13	White Ash	Fraxinus americana	Remove	1	
5630	8	White Ash	Fraxinus americana	Remove	1	
5631	8	White Ash	Fraxinus americana	Remove	1	
5632	11	White Ash	Fraxinus americana	Remove	1	
5633	8	Box elder	Acer negundo	Remove	1	
5634	24,24	Black Cherry	Prunus serotina	Remove		6
5637	11	Box elder	Acer negundo	Remove	1	
5638	9	Box elder	Acer negundo	Remove	1	
5639	12	Box elder	Acer negundo	Remove	2	
5640	12	Box elder	Acer negundo	Remove	2	
5642	12	Box elder	Acer negundo	Remove	2	
5643	15	Box elder	Acer negundo	Remove	2	
5644	15	Box elder	Acer negundo	Remove	2	
5645	8,8	Box elder	Acer negundo	Remove		2
5646	12	Common Apple	Malus spp.	Remove	2	
5647	12	Box elder	Acer negundo	Remove	2	
5649	14	Box elder	Acer negundo	Remove	2	
5650	15	White Ash	Fraxinus americana	Remove	2	
5651	18	Box elder	Acer negundo	Remove	2	
5653	10	Box elder	Acer negundo	Remove	1	
5654	10	Eastern Cottonwood	Populus deltoides	Remove	1	
5655	9	Box elder	Acer negundo	Remove	1	
5656	8,10	Box elder	Acer negundo	Remove		1
5657	19	Box elder	Acer negundo	Remove	2	
5658	10	White Ash	Fraxinus americana	Remove	1	
5659	10	Eastern Cottonwood	Populus deltoides	Remove	1	
5662	8	Eastern Cottonwood	Populus deltoides	Remove	1	
5664	10	Eastern Cottonwood	Populus deltoides	Remove	1	
5665	14	Eastern Cottonwood	Populus deltoides	Remove	2	
5667	15	Eastern Cottonwood	Populus deltoides	Remove	2	
5669	18	Box elder	Acer negundo	Remove	2	
5670	24	Box elder	Acer negundo	Remove	3	
5671	18	Box elder	Acer negundo	Remove	2	
5672	10	Box elder	Acer negundo	Remove	1	
5673	14	Box elder	Acer negundo	Remove	2	
5675	12	American Elm	Ulmus americana	Remove	2	
5676	12	Box elder	Acer negundo	Remove	2	
5678	8	Box elder	Acer negundo	Remove	1	
5681	10	Box elder	Acer negundo	Remove	1	
5682	8	Box elder	Acer negundo	Remove	1	
5683	9	Box elder	Acer negundo	Remove	1	
5684	20	Box elder	Acer negundo	Remove	2	
5685	12	Sugar Maple	Acer saccharum	Remove	2	
5686	12	American Elm	Ulmus americana	Remove	2	
5688	10	Box elder	Acer negundo	Remove	1	
5689	12,12	Box elder	Acer negundo	Remove		3
5690	13	Box elder	Acer negundo	Remove	2	
5691	10	Box elder	Acer negundo	Remove	1	
5692	10	Box elder	Acer negundo	Remove	1	
5693	11	Box elder	Acer negundo	Remove	1	
5694	5,12	Box elder	Acer negundo	Remove	2	
5695	14	Box elder	Acer negundo	Remove	2	
5697	10	Black Walnut	Juglans nigra	Remove	1	
5700	9	Sugar Maple	Acer saccharum	Save		
5701	22	Black Walnut	Juglans nigra	Save		
5702	11	Black Walnut	Juglans nigra	Save		
5703	15	Black Walnut	Juglans nigra	Save		
5704	12	Black Walnut	Juglans nigra	Save		
5705	12	Black Walnut	Juglans nigra	Save		
5706	14	Black Walnut	Juglans nigra	Save		
5707	21	Black Walnut	Juglans nigra	Save		
5708	10	Common Apple	Malus spp.	Remove	1	
5710	8	Eastern Cottonwood	Populus deltoides	Remove	1	
5713	13	Common Apple	Malus spp.	Remove	2	
5714	13	Common Apple	Malus spp.	Remove	2	
5715	12	Common Apple	Malus spp.	Remove	2	
5716	9	Common Apple	Malus spp.	Remove	1	
5717	10	Common Apple	Malus spp.	Remove	1	
5719	9,8	Common Apple	Malus spp.	Remove		3
5721	19	Box elder	Acer negundo	Remove	2	
5722	13	Box elder	Acer negundo	Remove	2	
5723	24	Black Cherry	Prunus serotina	Remove	3	
5724	13	Box elder	Acer negundo	Remove	2	
5725	15	Box elder	Acer negundo	Remove	2	
5726	10	Box elder	Acer negundo	Remove	1	
5727	12	Common Apple	Malus spp.	Remove	2	
5729	8	Common Apple	Malus spp.	Remove	1	
5732	24	Black Cherry	Prunus serotina	Remove	3	
5733	8	Black Cherry	Prunus serotina	Remove	1	
5734	9	White Ash	Fraxinus americana	Remove	1	
5736	12	Black Walnut	Juglans nigra	Remove	2	
5737	23	Black Walnut	Juglans nigra	Remove	2	
5739	10	Black Walnut	Juglans nigra	Remove	1	
5738	22	Black Walnut	Juglans nigra	Remove	3	
5740	15	Black Walnut	Juglans nigra	Remove	2	
5741	20	Black Walnut	Juglans nigra	Remove	2	
5743	14	Box elder	Acer negundo	Remove	2	
5744	12	Box elder	Acer negundo	Remove	2	
5747	13	Box elder	Acer negundo	Remove	2	
5748	16	Box elder	Acer negundo	Remove	2	
5749	10	Black Cherry	Prunus serotina	Remove	1	
5752	26	Box elder	Acer negundo	Remove	3	
5753	10	Hawthorn	Crataegus spp.	Remove	1	
5755	24	Black Cherry	Prunus serotina	Remove	3	
5756	16	Box elder	Acer negundo	Remove	2	
5757	9	Box elder	Acer negundo	Remove	1	
5758	6,13	Box elder	Acer negundo	Remove	2	
5759	22	Box elder	Acer negundo	Remove	3	
5761	20	Box elder	Acer negundo	Remove	2	
5762	12	Box elder	Acer negundo	Remove	2	
5763	10	Box elder	Acer negundo	Remove	1	
5764	11	Box elder	Acer negundo	Remove	1	
5765	9	Box elder	Acer negundo	Remove	1	
5766	15,15,15	Black Cherry	Prunus serotina	Remove		9
5767	12	Black Cherry	Prunus serotina	Remove	2	
5768	18,18	Box elder	Acer negundo	Remove		5
5771	16	Box elder	Acer negundo	Remove	2	
5772	28	Box elder	Acer negundo	Remove	3	
5773	10	Box elder	Acer negundo	Remove	1	
5774	14	Box elder	Acer negundo	Remove	2	
5776	19	Hawthorn	Crataegus spp.	Remove	1	
5777	15,15	Black Walnut	Juglans nigra	Remove		4
5778	19	Black Walnut	Juglans nigra	Remove	2	
5779	12,12,12,12	Black Cherry	Prunus serotina	Remove		5
5780	19	Black Cherry	Prunus serotina	Remove	2	
5781	12	Box elder	Acer negundo	Remove	2	
5782	12	Box elder	Acer negundo	Remove	2	
5783	11,11	Box elder	Acer negundo	Remove		3
5786	10	Box elder	Acer negundo	Remove	1	
5787	19	Box elder	Acer negundo	Remove	2	
5789	8	Box elder	Acer negundo	Remove	1	
5790	19,10	Box elder	Acer negundo	Remove		3
5791	12	Box elder	Acer negundo	Remove	2	
5792	15	Box elder	Acer negundo	Remove	2	
5793	7,13	Box elder	Acer negundo	Remove	2	
5794	15	Box elder	Acer negundo	Remove	2	
5795	10	Box elder	Acer negundo	Remove	2	
5796	13	Box elder	Acer negundo	Remove	2	
5797	8	Box elder	Acer negundo	Remove	1	
5798	8,9	Box elder	Acer negundo	Remove	1	
5799	13	American Elm	Ulmus americana	Remove	2	
5800	17	Box elder	Acer negundo	Remove	2	
5801	8	Box elder	Acer negundo	Remove	1	
5802	19	Eastern Cottonwood	Populus deltoides	Remove	2	
5804	8	Box elder	Acer negundo	Remove	1	
5805	12	Box elder	Acer negundo	Remove	2	
5806	8	Box elder	Acer negundo	Remove	1	
5807	8	Box elder	Acer negundo	Remove	1	
5808	17	Box elder	Acer negundo	Remove	2	
5810	8,8,8	Box elder	Acer negundo	Remove	1	
5811	19	Box elder	Acer negundo	Remove	2	
5812	18	Box elder	Acer negundo	Remove	2	
5813	18	Box elder	Acer negundo	Remove	2	
5814	16	Box elder	Acer negundo	Remove	2	
5815	10,10	Box elder	Acer negundo	Remove		3
5816	12	Box elder	Acer negundo	Remove	2	
5817	19	Box elder	Acer negundo	Remove	1	
5818	13	Black Walnut	Juglans nigra	Remove	2	
5824	8	Hawthorn	Crataegus spp.	Remove	1	
5825	19	Box elder	Acer negundo	Remove	2	
5826	16	Box elder	Acer negundo	Remove	2	
5828	10	Black Walnut	Juglans nigra	Save		
5829	19	Black Walnut	Juglans nigra	Save		
5830	14	American Elm	Ulmus americana	Save		
5831	11	Black Walnut	Juglans nigra	Save		
5832	8	White Ash	Fraxinus americana	Remove	1	
5833	14,14	Box elder	Acer negundo	Remove		4
5834	21	Black Walnut	Juglans nigra	Save		
5835	18	Black Cherry	Prunus serotina	Save		
5836	8	Black Cherry	Prunus serotina	Save		
5837	24	Eastern Cottonwood	Populus deltoides	Save		
5838	8	Common Apple	Malus spp.	Save		
5839	10	Box elder	Acer negundo	Remove	1	
5840	20	Box elder	Acer negundo	Remove	2	
5841	12,12	Box elder	Acer negundo	Save		
5842	15	Black Cherry	Prunus serotina	Save		
5843	17	Black Cherry	Prunus serotina	Save		
5844	10	Black Cherry	Prunus serotina	Save		
5845	12	Black Cherry	Prunus serotina	Save		
5846	19	Hawthorn	Crataegus spp.	Save		
5847	8	Hawthorn	Crataegus spp.	Save		
5848	19	Hawthorn	Crataegus spp.	Save		
5849	10	American Elm	Ulmus americana	Save		
5850	16	Box elder	Acer negundo	Save		
5851	24	Black Cherry	Prunus serotina	Save		
5852	10	Black Cherry	Prunus serotina	Save		
5853	14	Black Cherry	Prunus serotina	Save		
5854	12	Black Cherry	Prunus serotina	Save		
5855	10	Box elder	Acer negundo	Remove	2	
5856	24	Box elder	Acer negundo	Remove	3	
5857	18	Box elder	Acer negundo	Remove	2	
5858	10	Box elder	Acer negundo	Remove	1	
5859	8	Box elder	Acer negundo	Remove	1	
5861	28	Box elder	Acer negundo	Remove	3	
5862	13,13	Box elder	Acer negundo	Remove		4
5863	8	Box elder	Acer negundo	Remove	1	
5864	17	Box elder	Acer negundo	Remove	2	
5865	16,16	Box elder	Acer negundo	Save		
5866	10,10	Box elder	Acer negundo	Save		
5870	12	Box elder	Acer negundo	Remove	2	
5871	11	Box elder	Acer negundo	Remove	1	
5873	13	Eastern Cottonwood	Populus deltoides	Remove	2	
5875	32	Box elder	Acer negundo	Remove	4	
5876	26	Box elder	Acer negundo	Remove	3	
5878	12	Box elder	Acer negundo	Remove	2	
5879	19	Box elder	Acer negundo	Remove	1	
5880	12	Box elder	Acer negundo	Remove	2	
5881	12	Box elder	Acer negundo	Remove	2	
5883	7,12	Eastern Cottonwood	Populus deltoides	Remove	2	
5884	21	Eastern Cottonwood	Populus deltoides	Remove	3	
5885	16,15	Big Tooth Aspen	Populus grandidentata	Remove		4
5887	9	American Elm	Ulmus americana	Remove	1	
5888	11,11,11,11	Eastern Cottonwood	Populus deltoides	Remove		4
5890	13,13	Eastern Cottonwood	Populus deltoides	Remove		4
5891	19,16	Eastern Cottonwood	Populus deltoides	Remove		4
5892	18,16	Eastern Cottonwood	Populus deltoides	Remove		4
5893	12,12	Eastern Cottonwood	Populus deltoides	Remove		3
5896	10,12,14	Eastern Cottonwood	Populus deltoides	Remove		3
5897	12	Box elder	Acer negundo	Remove	2	
5898	15	Box elder	Acer negundo	Remove	2	
5899	12	Big Tooth Aspen	Populus grandidentata	Remove	2	
5900	8	Big Tooth Aspen	Populus grandidentata	Remove	1	
5901	13	Big Tooth Aspen	Populus grandidentata	Remove	2	
10401	17	Eastern Red Cedar	Juniperus virginiana	Save		
10402	8,9	Honey Locust	Gleditsia triacanthos	Save		
10403	18	Box elder	Acer negundo	Save		
10404	16	Box elder	Acer negundo	Save		
10405	14	Box elder	Acer negundo	Save		
10406	11	Box elder	Acer negundo	Save		
10407	22	Box elder	Acer negundo	Save		
10408	8	Box elder	Acer negundo	Save		
10409	12	Box elder	Acer negundo	Save		
10410	15	Box elder	Acer negundo	Save		
10411	8	Box elder	Acer negundo	Save		
10412	15	Box elder	Acer negundo	Save		
10413	8	Box elder	Acer negundo	Save		
10414	13	Box elder	Acer negundo	Save		
10415	24	Box elder	Acer negundo	Save		
10416	20	Box elder	Acer negundo	Save		
10417	10,22	Box elder	Acer negundo	Save		
10418	10,15	Box elder	Acer negundo	Save		
10419	8	Box elder	Acer negundo	Save		
10420	12	Box elder	Acer negundo	Save		
10421	8	Box elder	Acer negundo	Save		
10422	12	Box elder	Acer negundo	Save		
10423	10	Box elder	Acer negundo	Save		
10424	16	Box elder	Acer negundo	Save		
10425	15	Common Apple	Malus spp.	Save		
10426	8	Box elder	Acer negundo	Save		
10427	12,12,18	Box elder	Acer negundo	Save		
10428	10,13	Eastern Cottonwood	Populus deltoides	Save		
10487	11,13	Honey Locust	Gleditsia triacanthos	Save		
10488	18	Honey Locust	Gleditsia triacanthos	Save		
10489	24	Unknown Tree		Save		
10490	13	Honey Locust	Gleditsia triacanthos	Save		
10491	24	Unknown Tree		Save		
10492	18	Honey Locust	Gleditsia triacanthos	Save		
10493	36	Black Cherry	Prunus serotina	Save		
10494	9	Honey Locust	Gleditsia triacanthos	Save		
10495	9	Honey Locust	Gleditsia triacanthos	Save		
10496	8	Honey Locust	Gleditsia triacanthos	Save		
10497	8,8	Box elder	Acer negundo	Save		
10498	8	Box elder

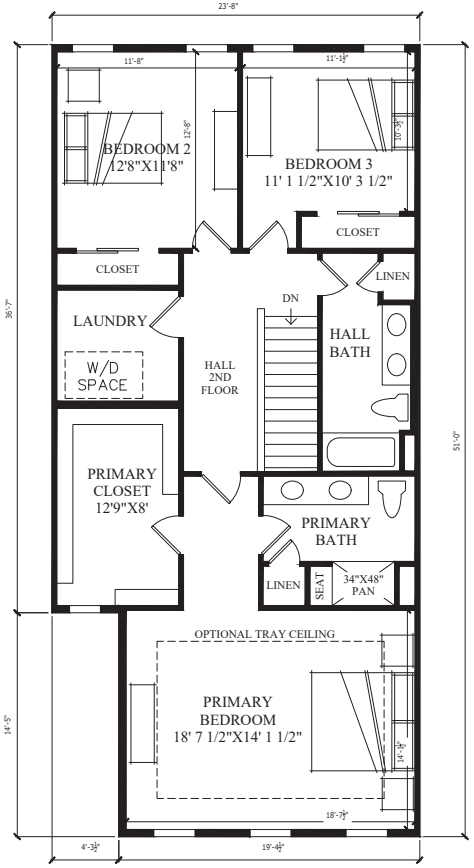
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HOWE - FIRST FLOOR PLAN

SCALE: 1/8"=1'-0"



HOWE - SECOND FLOOR PLAN

SCALE: 1/8"=1'-0"

TOLLARCHITECTURE
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DALLAS - LOS ANGELES - SEATTLE
1140 Virginia Drive, Fort Washington, PA 19034
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A Division of Toll Brothers

SHEET REVISION INFO

SET REVISION INFO

PRODUCT LINE

MODEL/PROJECT NAME

ELEVATION NAME

DRAWN BY -

CHECKED BY -

SHEET DATE - 6-30-2023

SHEET DESCRIPTION: HOWE FLOOR PLANS

SHEET NUMBER: TB-1

SERIAL NUMBER

DATE: Friday, April 28, 2023 - 9:27:49 am

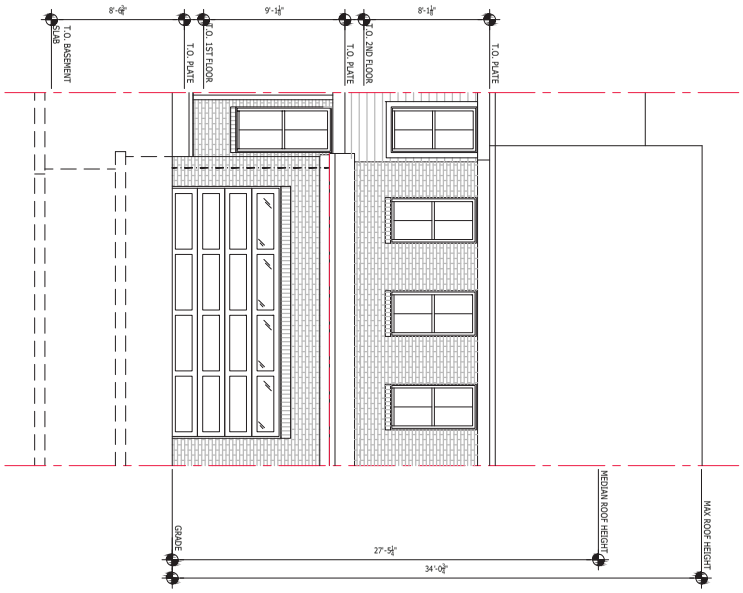
DATE: Friday, June 30, 2023 - 10:27:49 am

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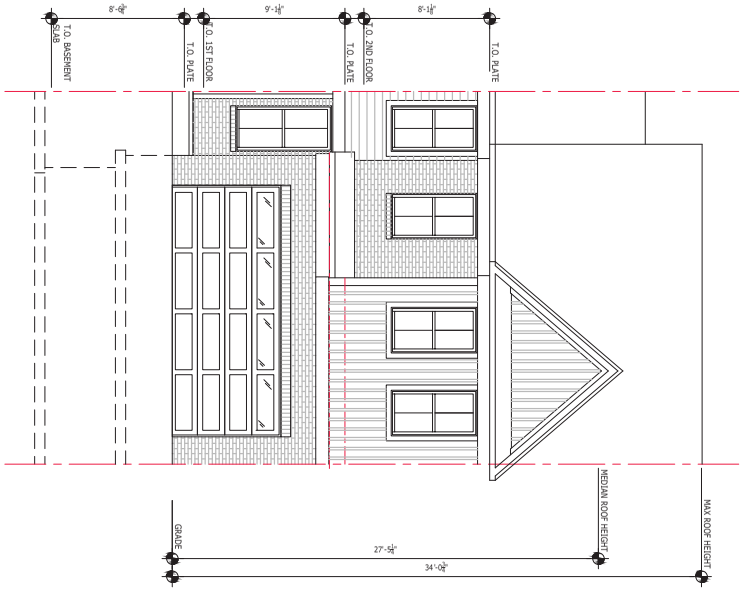
HOWE NEWHAVEN - FRONT ELEVATION

SCALE: 1/8"=1'-0"



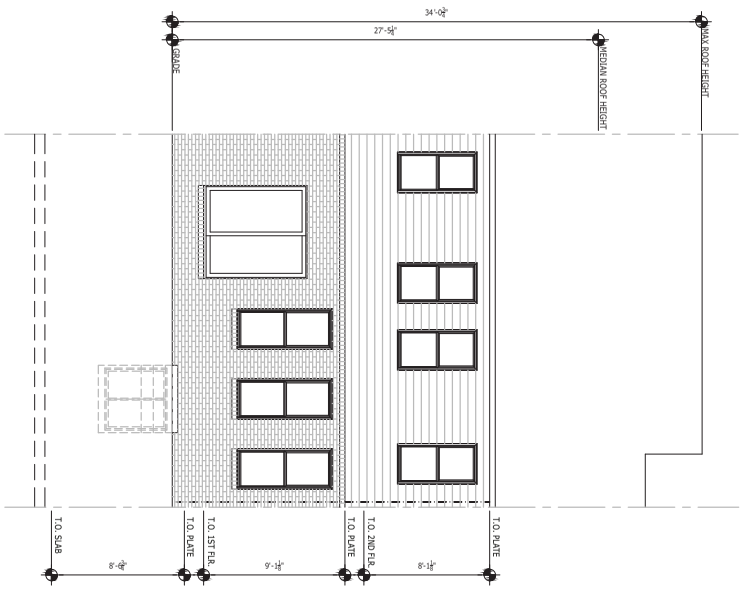
HOWE WETHERBY - FRONT ELEVATION

SCALE: 1/8"=1'-0"



HOWE ALL ELEVATIONS - REAR ELEVATION

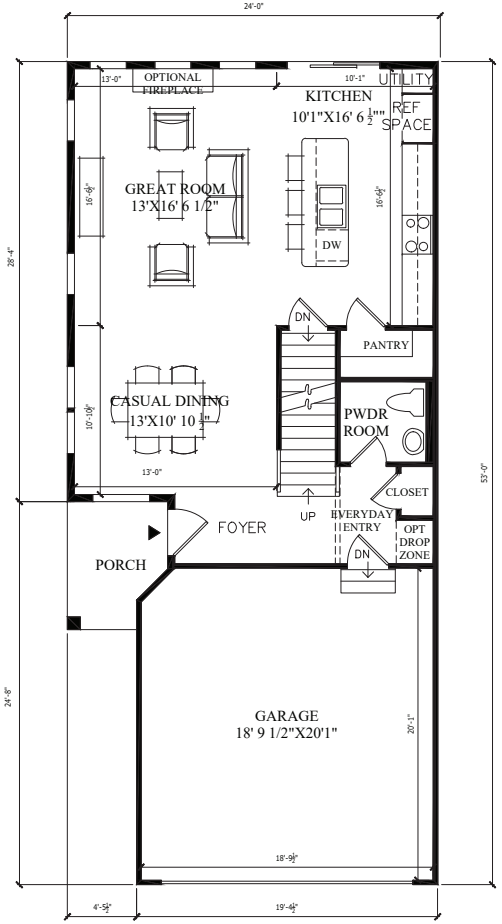
SCALE: 1/8"=1'-0"



SERIAL NUMBER	SHEET DESCRIPTION: HOWE ELEVATIONS	DRAWN BY -	PRODUCT LINE	SHEET REVISION INFO	TOLLARCHITECTURE PHILADELPHIA - ORLANDO DALLAS - LOS ANGELES - SEATTLE 1140 Virginia Drive, Fort Washington, PA 19034 P 215-295-5300 | F 215-295-5314 A Division of Toll Brothers
		CHECKED BY -	MODEL/PROJECT NAME		
		SHEET DATE 6-30-2023		SET REVISION INFO	
	SHEET NUMBER: TB-2		ELEVATION NAME		

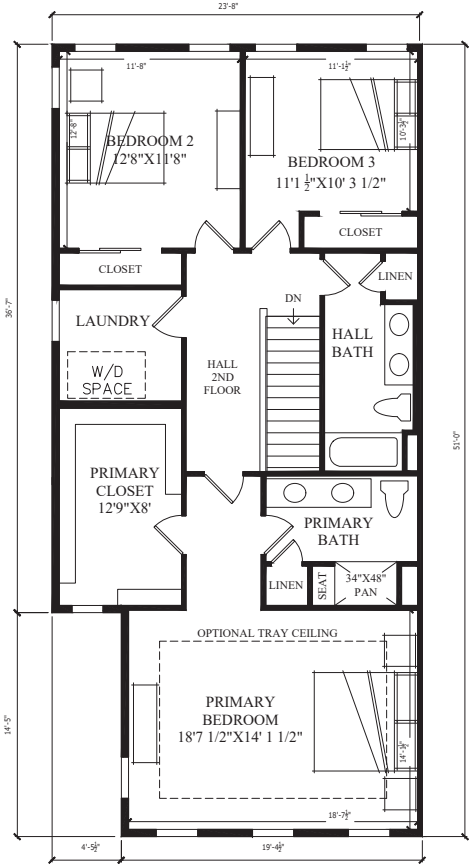
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HOWE ELITE - FIRST FLOOR PLAN

SCALE: 1/8"=1'-0"



HOWE ELITE - SECOND FLOOR PLAN

SCALE: 1/8"=1'-0"

TOLLARCHITECTURE
PHILADELPHIA - ORLANDO
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SHEET REVISION INFO

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PRODUCT LINE

MODEL/PROJECT NAME

ELEVATION NAME

DRAWN BY -

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SHEET DATE - 6-30-2023

SHEET DESCRIPTION: HOWE ELITE FLOOR PLANS

SHEET NUMBER: TB-3

SERIAL NUMBER

DATE: Friday, April 28, 2023 - 9:27:49 am

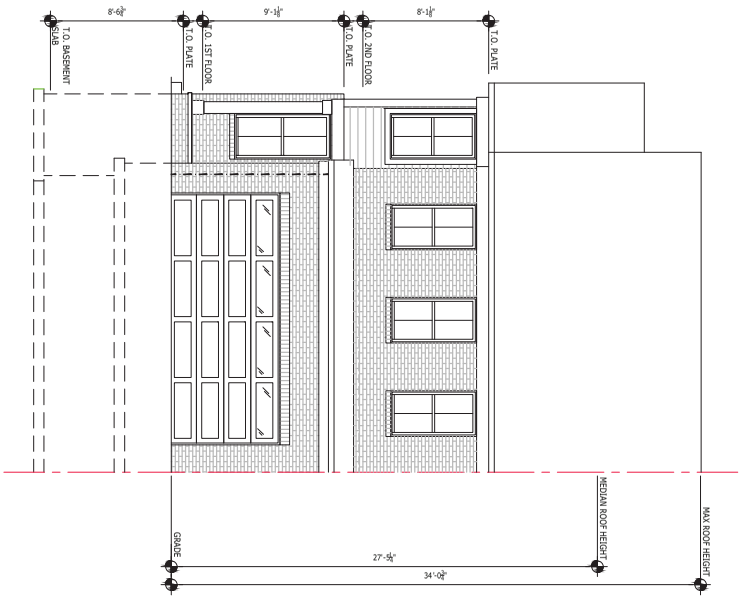
DATE: Friday, June 30, 2023 - 10:27:50 am

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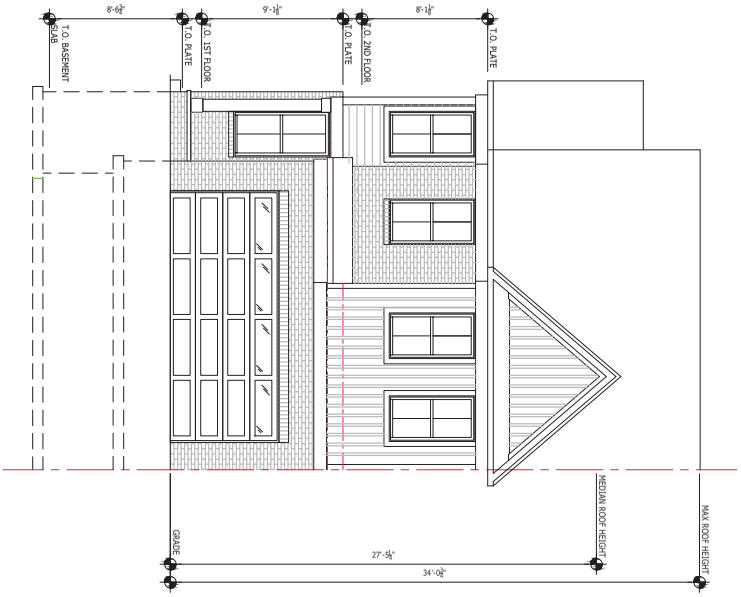
HOWE ELITE NEWHAVEN - FRONT ELEVATION

SCALE: 3/8"=1'-0"



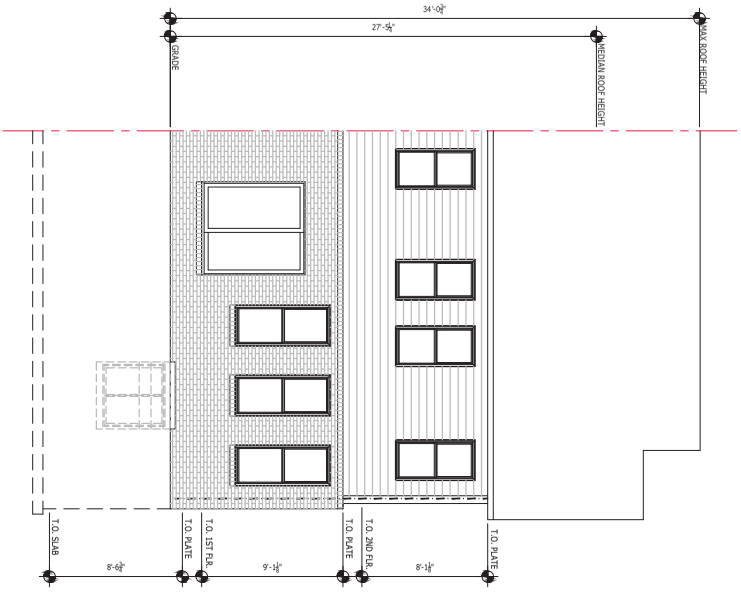
HOWE ELITE WETHERBY - FRONT ELEVATION

SCALE: 3/8"=1'-0"



HOWE ELITE ALL ELEVATIONS - REAR ELEVATION

SCALE: 3/8"=1'-0"



SERIAL NUMBER	SHEET DESCRIPTION: HOWE ELITE ELEVATIONS	DRAWN BY -	PRODUCT LINE	SHEET REVISION INFO	TOLLARCHITECTURE PHILADELPHIA - ORLANDO DALLAS - LOS ANGELES - SEATTLE
		CHECKED BY -	MODEL/PROJECT NAME	SET REVISION INFO	1140 Virginia Drive, Fort Washington, PA 19034 P 215-295-5300 | F 215-295-5314 A Division of Toll Brothers
	SHEET NUMBER: TB-4	SHEET DATE - 6-30-2023	ELEVATION NAME		

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HOWE ELITE WETHERBY - SIDE ELEVATION

SCALE: $\frac{1}{8}$"=1'-0"



HOWE ELITE NEWHAVEN - SIDE ELEVATION

SCALE: $\frac{1}{8}$"=1'-0"

TOLLARCHITECTURE
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PRODUCT LINE

MODEL/PROJECT NAME

ELEVATION NAME

DRAWN BY -

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SHEET DATE - 6-30-2023

SHEET DESCRIPTION: HOWE ELITE ELEVATIONS

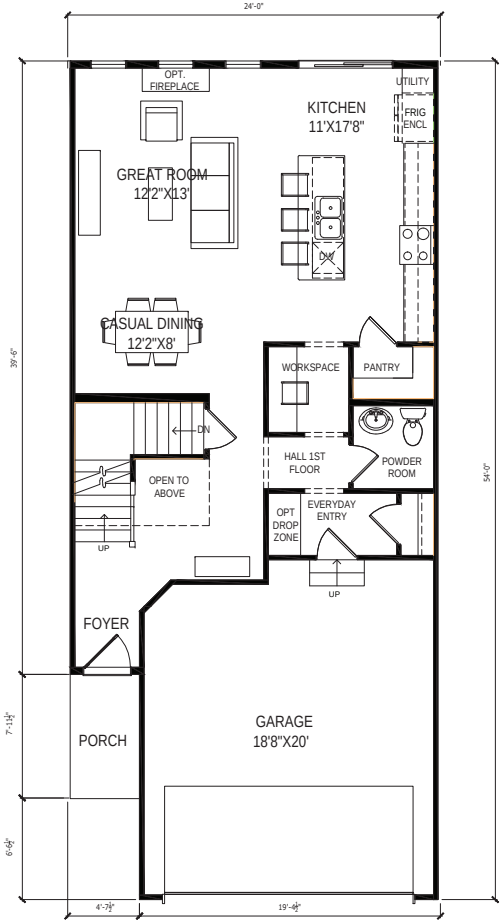
SHEET NUMBER: TB-5

SERIAL NUMBER

DATE: Friday, April 28, 2023 - 9:27:55 am

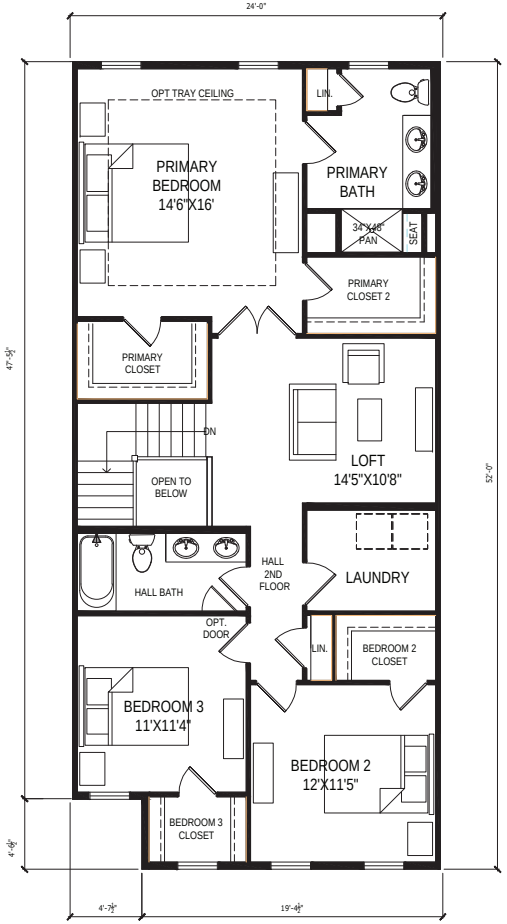
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SANDERS - FIRST FLOOR PLAN

SCALE: $\frac{1}{8}$"=1'-0"



SANDERS - SECOND FLOOR PLAN

SCALE: $\frac{1}{8}$"=1'-0"

TOLLARCHITECTURE
PHILADELPHIA - ORLANDO
DALLAS - LOS ANGELES - SEATTLE
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T 215.938.8000 | F 215.938.8314
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SHEET REVISION INFO

SET REVISION INFO

PRODUCT LINE

MODEL/PROJECT NAME

ELEVATION NAME

DRAWN BY -

CHECKED BY -

SHEET DATE - 6-30-2023

SHEET DESCRIPTION: SANDERS FLOOR PLANS

SHEET NUMBER: TB-6

SERIAL NUMBER

DATE: Friday, April 28, 2023 - 9:27:51 am

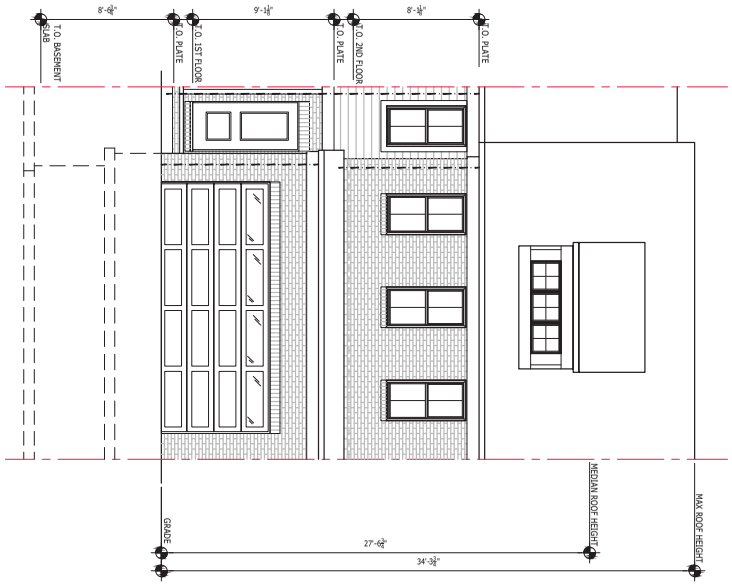
DATE: Friday, June 30, 2023 - 10:27:52 am

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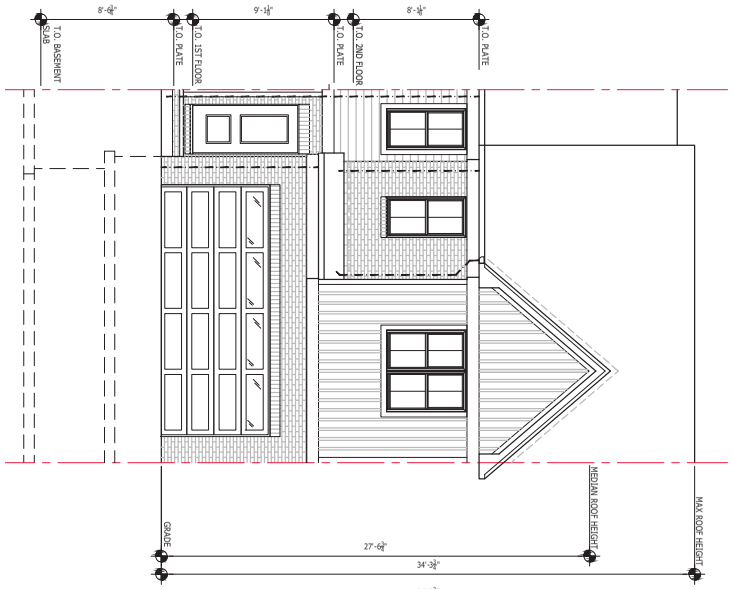
SANDERS NEWHAVEN - FRONT ELEVATION

SCALE: 1/8"=1'-0"



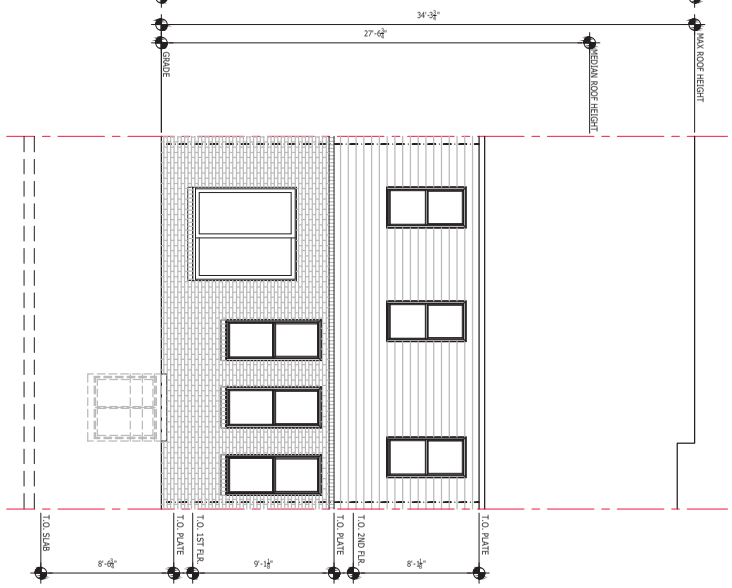
SANDERS WETHERBY - FRONT ELEVATION

SCALE: 1/8"=1'-0"



SANDERS ALL ELEVATIONS - REAR ELEVATION

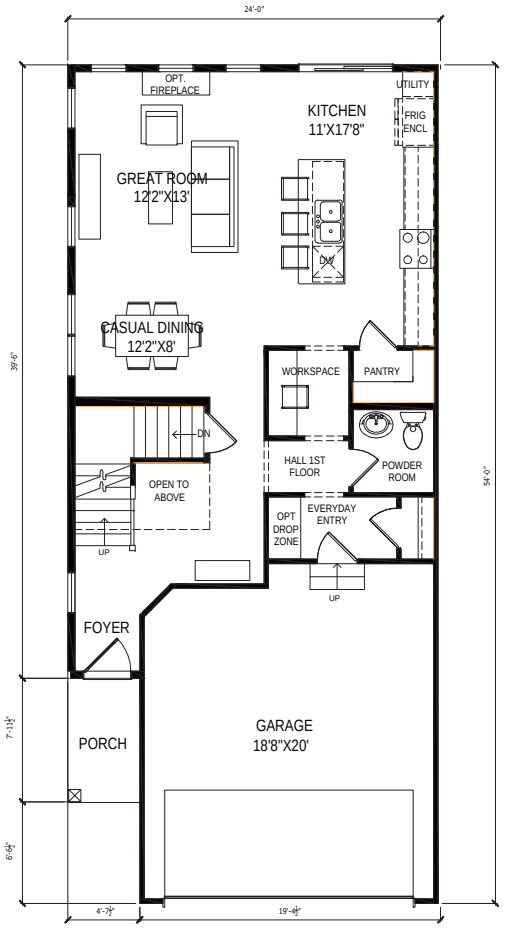
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SERIAL NUMBER	SHEET DESCRIPTION: SANDERS ELEVATIONS	DRAWN BY -	PRODUCT LINE	SHEET REVISION INFO	TOLLARCHITECTURE PHILADELPHIA - ORLANDO DALLAS - LOS ANGELES - SEATTLE
		CHECKED BY -	MODEL/PROJECT NAME	SET REVISION INFO	1140 Virginia Drive, Fort Washington, PA 19034 P 215-295-5300 | F 215-295-5314 A Division of Toll Brothers
	SHEET NUMBER: TB-7	SHEET DATE: 6-30-2023	ELEVATION NAME		

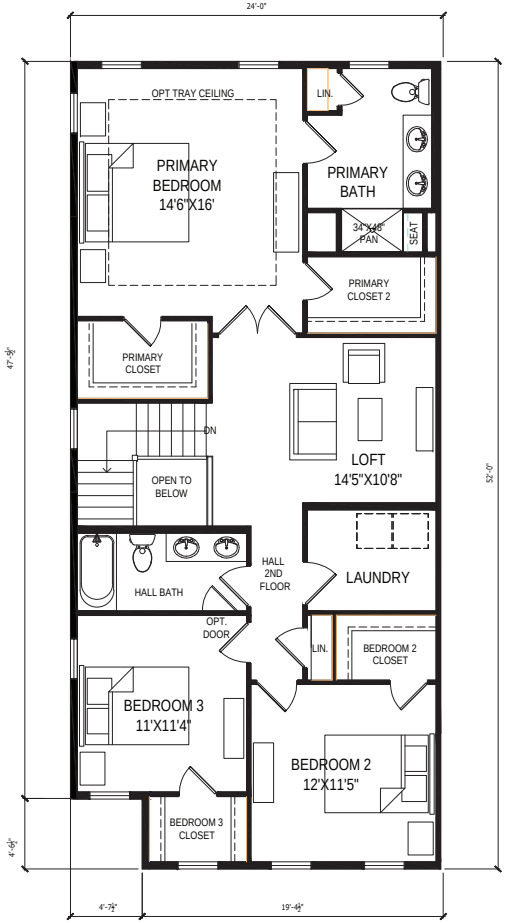
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SANDERS ELITE- FIRST FLOOR PLAN

SCALE: $\frac{1}{8}$"=1'-0"



SANDERS ELITE- FIRST FLOOR PLAN

SCALE: $\frac{1}{8}$"=1'-0"

TOLLARCHITECTURE

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DALLAS - LOS ANGELES - SEATTLE

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MODEL/PROJECT NAME

ELEVATION NAME

DRAWN BY -

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SHEET DATE - 6-30-2023

SHEET DESCRIPTION: SANDERS ELITE FLOOR PLANS

SHEET NUMBER: TB-8

SERIAL NUMBER

DATE: Friday, April 28, 2023 - 9:27:23 am

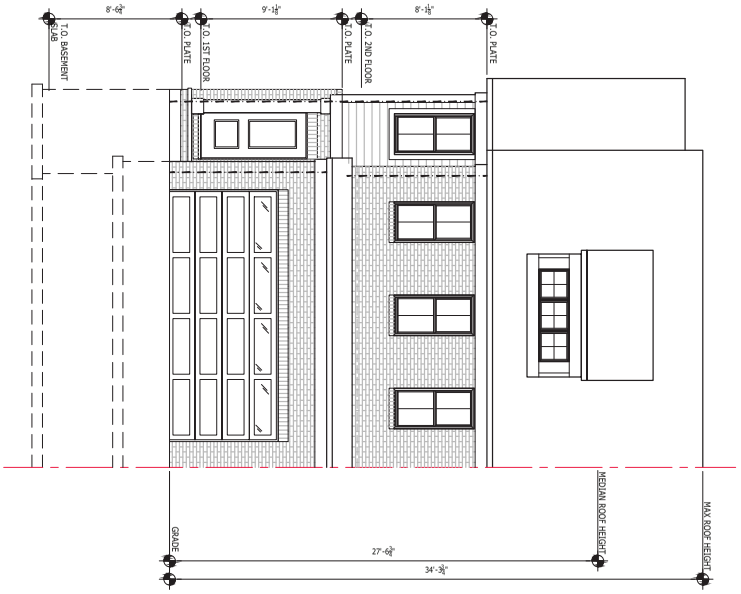
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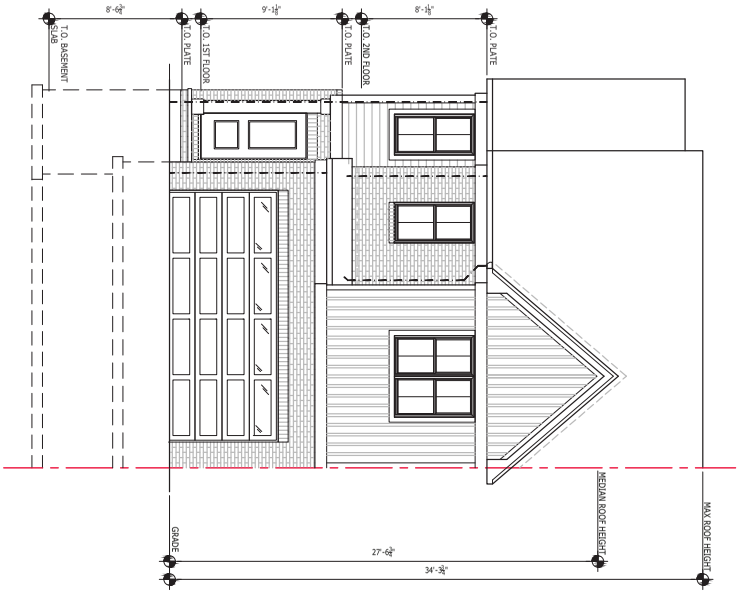
SANDERS ELITE NEWHAVEN - FRONT ELEVATION

SCALE: 1/8"=1'-0"



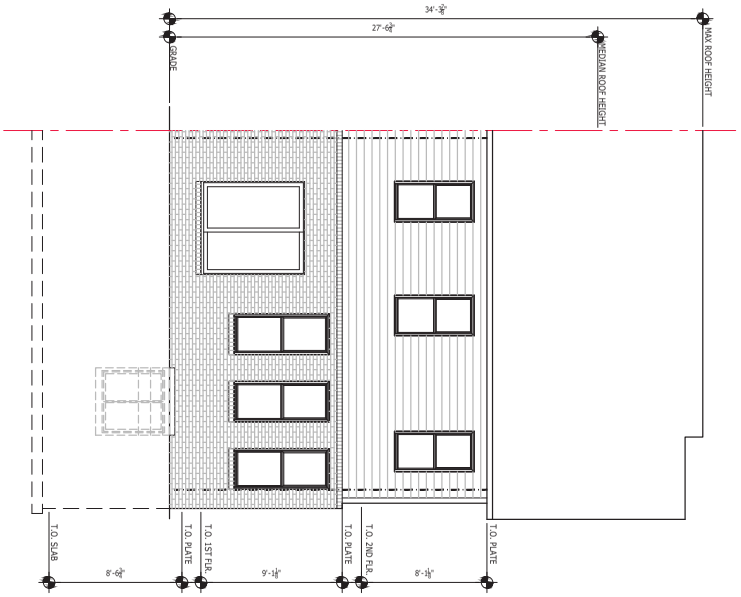
SANDERS ELITE WETHERBY - FRONT ELEVATION

SCALE: 1/8"=1'-0"



SANDERS ELITE ALL ELEVATIONS - REAR ELEVATION

SCALE: 1/8"=1'-0"



SERIAL NUMBER	SHEET DESCRIPTION: SANDERS ELITE ELEVATIONS	DRAWN BY -	PRODUCT LINE	SHEET REVISION INFO	TOLL ARCHITECTURE PHILADELPHIA - ORLANDO DALLAS - LOS ANGELES - SEATTLE
		CHECKED BY -	MODEL/PROJECT NAME	SET REVISION INFO	1140 Virginia Drive, Fort Washington, PA 19034 P 215-285-5300 | F 215-285-5314 A Division of Toll Brothers
	SHEET NUMBER: TB-9	SHEET DATE: 6-30-2023	ELEVATION NAME		

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SANDERS ELITE NEWHAVEN - SIDE ELEVATION

SCALE: $\frac{1}{8}$"=1'-0"



SANDERS ELITE WETHERBY - SIDE ELEVATION

SCALE: $\frac{1}{8}$"=1'-0"

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MODEL/PROJECT NAME

ELEVATION NAME

DRAWN BY -

CHECKED BY -

SHEET DATE - 6-30-2023

SHEET DESCRIPTION
SANDERS ELITE ELEVATIONS

SHEET NUMBER
TB-10

SERIAL NUMBER

DATE: Friday, April 28, 2023 - 9:27:23 am

DATE: Friday, April 28, 2023 - 9:27:5 am

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	5.15 Schedule Regulating Façade Materials - RM-1 - Region 1					
	Ordinance					
	Brick Natural Clay - Minimum 30%		Wood Siding, painted, t&g and batten siding - Maximum 50%		Asphalt Shingles - Maximum 50%	
Model/ Elevation	Meets	Deviation Req'd	Meets	Deviation Req'd	Meets	Deviation Req'd
Howe/ Newhaven - Front Elevation	X		X			X-55%
Howe/ Wetherby - Front Elevation		X-22%	X		X	
Howe/ All Elevations - Rear Elevation		X-27%	X		X	
Howe Elite/ Newhaven - Front Elevation	X		X			X-55%
Howe Elite/ Wetherby - Front Elevation		X-22%	X		X	
Howe Elite/ All Elevations- Rear Elevation		X-27%	X		X	
Howe Elite/ Newhaven - Side Elevation	X			X-62%	X	
Howe Elite/ Wetherby - Side Elevation	X			X-59%	X	
Sanders/ Newhaven - Front Elevation	X		X		X	
Sanders/ Wetherby - Front Elevation		X-21%	X		X	
Sanders/ All Elevations - Rear Elevation		X-26%	X		X	
Sanders Elite/ Newhaven - Front Elevation	X		X		X	
Sanders Elite/ Wetherby - Front Elevation		X-22%	X		X	
Sanders Elite/ All Elevations- Rear Elevation		X-26%	X		X	
Sanders Elite/ Newhaven- Side Elevation	X			X-62%	X	
Sanders Elite/ Wetherby- Side Elevation	X			X-58%	X	

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SET REVISION INFO

PRODUCT LINE

MODEL/PROJECT NAME

ELEVATION NAME

DRAWN BY -

CHECKED BY -

SHEET DATE - 6-30-2023

SHEET DESCRIPTION
FACADE MATERIAL SQUARE FOOTAGES

SHEET NUMBER
TB-11

SERIAL NUMBER

PROJECT NARRATIVE

`NARRATIVE – INCLUDING BENEFITS & DEVIATIONS

August 09, 2024,

To: City of Novi, Attn: Ms. Barbara McBeth, Novi City Planner
Staff/ Planning Commission/ City Council
Re: Narrative: Novi 10 Property PRO Rezoning Project JZ23-09 -

Dear members:

SUMMARY

The project drawing package for the 34.04 acre Novi 10 PRO was previously submitted for pre-application review on October 4, 2023 and again on January 2, 2024, with changes based on the previous city review. Subsequently this PRO had a Planning Commission public hearing on February 21, 2024 and a City Council meeting review for eligibility on April 8, 2024. The June 17,2024 submission revised the commercial rezoning proposal from a B-3 to B-2 and modified the site plan to eliminate the restaurant drive-through and add more planting and bench areas at the retail/ restaurant areas.

We believe this PRO conforms with city of Novi's master plan goals of good urban planning, for a "Walkable Community ", as well as traditional good urban design and planning goals. Major key elements include 27.07 acres of proposed RM-1 zoning containing 71 residential owner occupied townhouses with 2 car garages bounded by marshland, river, and natural wildlife park area. A new 15.87 acre conservation easement will be located on the east side of the townhouses, wrapping around the south side with nature overlooks and containing a new pocket park at the new trailhead on 10 Mile Road and a new pocket park on the west end of the wetland. The conservation easement extends south as far as the Novi Dog Park. North and west of the residential property is a 6.97 acre 35,900 square foot area local retail and restaurant that will have B-2 zoning. This will have new amenities such as a sidewalk café, other locally oriented shops, and services. Restrictions will be placed in the PRO agreement that prevents certain undesirable retail uses.

The goal is to create a **walkable community:** a walkable village type atmosphere with easy pedestrian walking paths connecting local retail uses and city amenities like the dog park, sports club, and ice arena, with services like childcare, yoga, and party rooms park area with picnic areas and playground equipment. This should benefit existing residents in surrounding areas and residents of the proposed new residential development.

Additionally, an 18 Acre certified charitable donation was requested by the city (Dog Park and Arena Facility land), as detailed in the city's Letter of Commendation at the

end of this narration. Novi- 10 gave this land to the city of Novi and would like this to please be considered.

Overall, this PRO creates a cohesive array of walkable areas which are benefits to the community. As required by the city PRO process, an additional listing of new community benefits is listed below.

KEY DETAILS

This 34.04 acre PRO proposes to replace the existing industrial zoning and office zoning districts with multi-family zoning and a commercial zoning district to better reflect the needs of the community. These OS-1 and I-1 zoned properties have been on the market for sale for many years. We believe the current zoning and the future land use plan do not reflect the actual market conditions for this site. Changing lifestyles & Covid-19 have contributed to less suburban office space demand and Costar Realty Information Services show a 35% drop in Novi industrial leasing demand during 2023.

Conversely, our market study shows a demand for an additional 344,000 SF of commercial space in Novi by 2027. The 2022 market study was updated with this August 09, 2024 submission and is attached. The update showed that commercial demand still exists. This PRO proposes 35,900 SF of local shopping and restaurant area, with no drive-throughs, in a 6.97 acre B-2 zoning district. To ensure that this family friendly local shopping, the PRO agreement, leasing will exclude certain incompatible proposed uses, that will be listed in the Benefits section of this narration, which follows.

The proposed 27.07 acre RM-1 zoning district contains 71 new 2-story townhouse units on 11.2 acres, which is a short walk from the new local commercial, and north of existing Ridgeview Villa townhouses (from a previous PRO). These are connected by sidewalks and a pedestrian path system. The path system can a crushed limestone material to blend with the surrounding natural environment. The balance of the proposed RM-1 zoning district is a 15.87 acre natural marshland and woodland which will be protected from future development by a conservation easement. This conservation easement follows the railroad tracks along the east side and wraps south around the new townhouses. This RM-1 zoning is consistent with adjacent existing multi-family developments. The 15.87 acre natural area will contain a trail network and new overlooks and have a small pocket park, donated by the PRO developer at the 10 Mile Road trailhead and a second pocket park with playground equipment, and owned by the townhouse HOA, on the west end of the townhouses.

The closest new townhouse is located 300 feet away from the closest I-2 industrial building in an I-2 Industrial zoning district, located across 10 Mile Road. Currently there is no heavy industry on those I-2 parcels. To provide additional separation, the PRO

proposes visual and sound separation by a 10 FT- 12 FT high densely landscaped berm along 10 Mile Road.

The updated traffic analysis accompanying this PRO shows that the level of service, with the proposed B-2 and the RM-1 zoning, is not degraded compared to development under the current OS-1 and I-1 zoning. In addition, the traffic analysis indicates that peak traffic will be less than with development under the current zoning. To facilitate the traffic movement to and from the proposed commercial and townhouses, the PRO proposes to add a center left turn lane and eastbound and westbound lanes on 10 Mile Road. The PRO developer's engineer is working with Novi's traffic consultant and the Road Commission of Oakland County, which has 10 Mile Road jurisdiction.

The current OS-1 zoning would permit a 30 foot high 2 story, 54,000 SF office building and the current I-1 zoning along 10 Mile Road would permit a quarter million square foot light industrial building 40 feet high. These would create a massive wall of buildings compared with the proposed commercial buildings at 21 feet in height, and the 71 two-story townhouses with many trees saved and new trees planted. More open space is provided due to less building mass and density in the PRO than if developed with current office and industrial zoning.

At the preliminary Planning Commission public hearing, certain audience members were concerned about flooding onto their property from the new development. As was indicated at the hearing, the new townhouse and commercial sites will have site engineering and be in compliance with Novi's latest stormwater management criteria.

ECONOMIC IMPACT

It is estimated that this development will create a minimum of 100 new permanent full and part time jobs in the new retail stores and restaurants. It is anticipated that combined construction costs for the commercial and the residential projects will be in excess of $35,000,000, creating numerous construction jobs.

CONFORMANCE & FURTHERANCE OF NOVI MASTER PLAN GOALS

The proposed PRO successfully implements many of the primary stated goals of Novi's 2016 Master Plan including such key elements as a "Walkable Community", protection of natural features and natural marshland habitats, connectivity, and consistency with the patterns of existing uses on adjacent. The Novi 10 PRO plan presented here directly addresses and furthers these stated goals in numerous ways, which create improvements to accommodate the Master Plan, far improved over the existing industrial and office zoning it replaces at this location. Some specific descriptions which demonstrate these improvements from the PRO and further implementations of the Novi Master Plan's stated goals are as follows:

1. PARKS AND RECREATION: Master Plan Page 6 – "The city maintains a diverse park system that includes a growing trail network along with active and passive recreation opportunities ... Maintaining and enhancing these strengths will be important to continue the City's success into the future..." benefitting its residents. In furtherance of this same goal, this proposed Novi 10 PRO provides additional park areas and additional walking paths connecting the existing residential developments to the south and additional residential areas to the northeast along 10 Mile Road, thru this proposed development to access the existing nature trails, and community recreational facilities. (Dog park, sports club, ice arena). The new paths complete connections between such park and recreation spots for all the various residential developments and bring all these features into a walkable, and especially bikeable easy to reach neighborhood system. Per the city Parks and recreation Department, nature trails have been consistently mentioned in public surveys, including ones conducted for Novi's 5 year Parks master Plan.

2. CONNECTIVITY: Master Plan Page 8 –... The walking and bike path system through and around the proposed PRO, as indicated above, provides neighborhood connectivity, which includes the PRO neighborhood retail, and the various separate existing Novi recreation facilities to the south, as well as the proposed local retail/services area and others in the area. The PRO street adds to the existing vehicular connectivity beyond the walkable and bikeable distance.

3. DIVERSITY: Master Plan Page 10 – "Diversity of housing is important for a balanced community ... young professionals and empty nesters seek a smaller home with lower maintenance..." The townhomes and local retail/services development of the proposed Novi 10 PRO is the correct solution for this recognized goal, especially when factoring in connectivity and reduced auto trips. And this project simply implements more of the City's same judgments that this is a great location for such types of smaller condominium homes.

4. ENVIRONMENT & OPEN SPACE: Master Plan Page 18 – "... Such features contribute greatly to the character of the community, and they can be used to enhance development and improve the quality of life." In furtherance of this goal, the Novi 10 PRO substantially provides a trail system, which goes along with Novi-10's previous contributions of trails. These trails provide generous areas for hiking and enjoying the natural wetland, wildlife area, along the south and east boundary of the PRO, and are accessible to other multi-family developments on the around Nick Lidstrom Drive. Substantial additional areas of this nature marshland area will now be defined and protected from potential undesirable future development and encroachments, with an area on 10 Mile Road at the end of the trail to be donated to the city of Novi for a pocket park. It is estimated that the townhouse open space is 6.5 times the city ordinance requirement.

5. BENEFICIAL SCENIC NATURE VIEWS AREAS: Master Plan Page 20 – "…floodplains can serve as a great 'viewshed' for development…" The multi-family residential, proposed picnic area and orientation of the local retail/services development of the proposed Novi 10 PRO respects and takes advantage of the beautiful wildlife views in the wetland area, much as the existing, very successful recently built Ridgeview Villa development to the south also does. This entire natural area is now contained within the proposed PRO. Further, the nature path system along the natural marshland area with long expansive hiking areas and bench overlooks, creates more such nature viewing areas. In addition, eliminating the permitted industrial development that could occur under the current zoning, prevents a massive industrial building that would block views and **devalue** the life quality of surrounding existing residents.

6. SUPPORTIVE LOCAL RETAIL: Master Plan Page 35 & 36 – "As the number of households increase, new demand for goods and services is created. By 2025, the community can support about 590,000 additional square feet of retail goods space at any and all locations. Accommodating the current and future newly generated demand will provide the opportunity for infills of extra retail amenities such as this plan accomplishes, in addition to filling of other vacancies." The proposed Novi 10 PRO retail plan again addresses this by providing a modest quantity of local retail and services within walking range of many surrounding residents. At this time the specific retail and service providers are not known, but market studies confirm there is current demand and will include small retail and personal services, including uses such as sidewalk café, small restaurants, a specialty market, a small medical or other professional office, childcare, exercise, yoga club, etc. These services will be walkable for the new residents, as well as for the existing residents to the south, and those east on 10 Mile Road. As part of the proposed PRO, there will be a prohibition of uses that are objectionable, and not in the community's best interest at this location: Automobile uses are not permitted per the proposed zoning, and Hotels, Motels, Check Cashing, and Pawn Shop. Marijuana sales (already not permitted in the city of Novi) will also be excluded by the PRO documents in case the city's law is changed to allow it in the future. The PRO drawings indicate locations for four retail buildings on the B-2 portion, along with the required parking, walkways, and landscaping.

7. "GENERAL GOAL: ENVIRONMENTAL STEWARDSHIP": Master Plan Page 40 "Item13. Protect and maintain natural features…" Please refer to the comments in Nos. 4 and 5 above, which apply to this as well.
"Item 14. Increase recreational opportunities…" The connecting paths increase pedestrian access to the sports club, ice arena and dog park., as well as an opportunity for walkers and runners.
Item 15. Encourage energy-efficient and environmentally sustainable development through raising awareness and standards that support best practices. The proposed

Novi 10 PRO addresses this directly by providing diverse natural areas for families and individuals to have easy access.

8. WALKABLE ACTIVITIES ACCESS: Master Plan Page 41 – "The City should provide more activities and shopping within walking/cycling distance, such as cities like Ann Arbor or Northville or Plymouth offer." The Novi 10 PRO does exactly this; promoting connectivity and walkability to local shops and restaurants, and potentially reducing day-to-day auto trips.

9. PROTECTING NATURE AREAS: Master Plan Page 59 – "The City of Novi has a long history of protecting natural features." The Novi 10 PRO accomplishes this by preserving the 15.87 acres of open natural land along the east and south sides of the PRO with a conservation easement.

CONCLUSIONS: As demonstrated above, the Novi-10 PRO will be an asset to the community, conforming with sound urban planning and urban design practices and to the goals and recommendations of the City of Novi Master Plan.

BENEFITS, DEVIATIONS, AND SUBSTANTIAL CONSIDERATIONS

Per PRO Application process, additional info: Many of these items summarized here for this list, are described in greater detail above.

In the Novi 10 PRO plan, both Novi Ten Associates and Toll Brothers will provide the following:

A. **Benefits**
B. **Deviations**.
C. **Supplemental Substantial Positive Considerations**.

A. BENEFITS:

1. The complete east portion adjacent to the railroad tracks and the south 50 foot wide strip along the wetland of the proposed PRO (15.87 acres of the 27.07 RM-1 rezoning) are being retained as natural area with a conservation easement to preserve and protect its existing marshland and wildlife. This natural area, with wetlands, wraps around the PRO and includes on the west end a proposed new

0.4 acre park/playground located between the proposed residential and retail sites. The proposed trail system, with its overlooks near the Novi Athletic Club becomes a usable and accessible community resource.

2. To help achieve walkability and connectivity of the entire area, a trail system is being added which consists of new crushed limestone paths, overlooks, and existing sidewalks. This walkway system provides connectivity between surrounding existing residential areas and new proposed PRO residential area with all the marshland nature areas, the proposed tennis courts/ pickleball courts, the Novi Athletic Club, Ice Arena, and Dog Park, and with the new proposed local along Ten Mile Road. The retail consists of the new proposed retail and restaurant areas, and the existing Walgreen's and dental office .The new walkways and bike paths wind through the natural area, overlook 15.87 acre wildlife area and connect this PRO development to the recreation areas: (The $3.2 million dollars' worth of Novi 10 land previously donated to the city, initiated by Novi request (18 Acres of land): For the Novi Arena Facility and the Novi Dog Park)

3. Two (2) pocket parks added: One added at the trail head on 10 Mile Road at the north end of the new conservation easement area. The second is on the west end of the trail townhouses to include playground equipment.

4. A planted plaza over 20 feet deep, with benches and other amenities is proposed to be continuous along the storefronts of the new local retail area including a variety of planter sizes and types with a variety of trees and flowers.

5. Proposed use restrictions not permitting certain automotive and other business uses in the proposed B-2 commercial zoning (Sec. 3.1.11.B & C) are to be part of the PRO. Not permitted uses are:
   A. Vehicle oriented uses- Gas Station, Automotive Repair, Car Sales and Car Wash
   B. Other excluded uses- Hotels, Motels, Check Cashing, Pawn shop (Marijuana sales already not permitted in the city of Novi) will also be excluded by the PRO documents in case the city's law is changed to allow it in the future.)

6. EV Charging Stations will be located at each of the commercial buildings. 240 outlets for EV chargers will be provided in each townhouse garage.

7. Open Space: (Sec. 3.1.7.D) The amount of open space provided for the RM-1 townhouses exceeds the ordinance requirements.

8. Commercial Building Setbacks: (Sec. 3.1.11.D)
   Front- 40 ft. min. required.....101 ft. provided
   Rear- 30 ft. min. required..... 74 ft. provided

Side- 15 ft. min. required……88 ft. provided

9. Residential Building Height (Sec. 3.1.7.D)
   35 ft. permitted…..29 ft. max. proposed

10. Commercial Building Height (Sec. 3.1.11.D)
    30 ft. permitted…..23 ft. max. proposed

11. Residential Lot Coverage (Sec. 3.1.7.D)
    25% max. permitted
    14% provided

B. DEVIATIONS: *(Deviation 2 added)*

1. Zoning Ordinance section 3.8.2.D – deviation for proposed residential buildings not to be configured 45 degrees at the property lines normally for aesthetic reasons. Most of the buildings are not on any main road and they front to a substantial irregular shaped 20 acre wetland nature area of a minimum 200 feet wide separation across from Toll's existing multi-family Ridgeview project. Also, please note, this is one of the most common easily granted variance requests: where layouts are dictated by natural land features such as two rivers and large canyon, not created by the applicant.

2. Zoning Ordinance section 3.8.2.H – deviation proposed for residential buildings of less than 3 feet for the 30 foot requirement between buildings.

3. Zoning Ordinance sections 3.1.7.D and 3.6.2.B – deviation for the two residential buildings at the northwest corner of the RM-1 are set back 25 feet from the proposed B-2 district in lieu of the required 75 feet. This has been granted elsewhere in the city and still includes screening between the residential and commercial. That screening is located on the residential edge of the zoning line that separates the residential from the commercial and functions with same screening effect. (Only a small portion, at northwest corner being wall plus landscape, instead of berm). Is on Residential side and none will be on the commercial side of the line. Deviates from Zoning Ordinance section 5.5.3.A.ii but provides same screening! Is still located between the residential and commercial.

4. Zoning Ordinance Section 5.10 – request deviation allowing perpendicular parking on a 'major' drive in the residential.

5.. Zoning Ordinance section 5.5.3.A.ii – requires a 10-15 foot high berm with a 6 foot crest next to I-1 district. A PRO deviation is requested to wave this requirement to

preserve open viewing to the beautiful natural features instead of the usual berm screening that blocks the views from Industrial.

6. Zoning Ordinance Section 5.5.3.B.ii requires trees along 10 Mile Rd. A PRO deviation is requested due to a conflict with the existing water main location, but the total tree count remains in compliance with the ordinance.

7.. Zoning Ordinance Section 3.8.2.H, the distance formula for side-to-side building separation requires 37.56 feet maximum (at the residential buildings) based on the equations provided. 30 feet is provided, being a deviation of 7.56 feet to enable this project to be more viable and provide all such benefits to a modest amount of more residents. This is still far less than density such as R6.

8. Zoning Ordinance Section 5.7.3, Exterior Lighting shall not exceed 4:1 ratio. That is typical commercial practice. For residential, we request a small deviation to conform with common municipal lighting standards for residential areas.

9. Section 9 Waiver (Sec.5.15) Requested deviation from minimum required brick and asphalt shingles.

10. Major Drive Radius (Sec. 5.10) Requested deviation from the 100' foot minimum

11. Foundation Landscape (Sec. 5.5.3.D) Request deviation to allow planters as the landscape on walkway in front of the retail to be part of foundation landscaping.

12. Deviation for no street trees at commercial. Utility conflicts with trees along 10 Mile Road. (LDM2.e.(4))

13. Deviation for a 3 ft. high wall at the commercial instead of a berm (Sec. 5.5.A)

14. Deviation requested for foundation landscape front percentage at commercial buildings A and C. (Sec. 5.5.3.D.d) - Building B foundation landscape to be increased to comply in next drawing submission. Building D foundation landscape complies.

C. SUPPLEMENTAL SUBSTANTIAL CONSIDERATIONS:

To provide a more comprehensive picture to the City of Novi administration, staff and expert consultants please note the following:

Regarding Master Plan Goals:

1. SP Designation: Historically, the designations in the Master Plan ((in this case; industrial and office) are not the only uses that are in the best interest of the city.

In many instances other zoning or uses have been permitted because they benefit the city. This site and the entire parent parcels, from 10 Mile Road to Arena Drive/Lindstrom Drive comprise well over 100 acres and have substantial geographical features, these include a large deep canyon and low marshland nature area varying from 100 to 400 feet wide in sections and over 1000 feet long and includes a large wetland of over 25 acres. The wetland has a "T" shaped intersection of three substantial river flows that naturally zig zag a bit and crisscross through this property. For these reasons, this property was designated for years by the City as "SP" (Special Planning District), which needed extra attention to accommodate such geographic realities not created by the applicant landowner.

2. Historical Improvements to Master Plan and Zoning: This SP Master Plan overall Property including the adjacent parent parcel, contains uses approved by the city that were not designated in the master plan, but approved because they were determined by the city to be in the best interest of the community, overall. These prior approved uses include:

    a. The land use for the dog park was approved.
    b. The land designated as the Arena building (multi-use facility) was approved.
    c. The Sports Club of Novi was approved.
    d. The residential Ridgeway Villa was approved.
    e. These new uses here presented are simply implementing more of the same SP approach, being very compatible and consistent with those same residential and commercial type adjacent uses, approved, in this good pattern of SP special review and the many other clearly stated goals of the city (Walkable amenities etc.).

Conclusion: As with the previous PRO, these same uses and elements are present, including bordering large canyons and wetlands that affected those other portions of this overall area. And as with the previous parcels, this proposed Novi 10 PRO also is constant with and further implements the ideals and goals of the Master Plan (e.g., walkability, etc.) even though the uses are not specifically named in the Master Plan or on the zoning map.

The same adjacent beneficial uses are currently in place in the immediate surroundings. For example, on directly adjacent lands there is commercial on adjacent street corners and residential to the south. Accordingly, we ask that this same pattern of good planning be approved for continuance here, of what exists on the adjacent lands which fulfill the written goals of the Master Plan: walkable community, with good recreation and other stated benefits etc.

This Novi-10 PRO, all ALONE, is a great community benefit per traditional urban planning concepts with extra community benefit added by the project's listed benefits. Please consider also that I have been a member of this community for decades and the City of Novi formally came to me many years ago, solely on its own initiative, and City asked that I help them out with a donation of land that they needed for the Novi Arena facility and the Novi Dog Park area but were far short on funds to do so. (we were proposing no development or any action at all) I did accommodate their request, never asking nor receiving anything then or EVER in exchange for that large donation (18 acres, appraised at $ 3.2 million dollars and audited by the IRS as a pure charitable donation.) The only deed restriction is that such lands be used for children's recreation and other direct resident recreational beneficial uses

This land donation was completely initiated and asked for by the City of Novi, for its own goals, etc., and not any Novi 10 Associates goals. The city recognized that charitable good deed with the attached official NOVI LETTER OF COMMENDATION.

Further Perspective: While this previous donation does not count as one of the NEW extra benefits required for the PRO evaluation, it is in fact part of our same parent land parcel, from same owner, same family applicant and Novi is empowered to consider ALL relevant facts in their totality. And so accordingly, I hereby respectfully request that this prior 18 acre ($3.2 million dollar land donation) be recognized for its benefit to the City of Novi. While certainly not determinative, it should not be totally discounted either. Please further note, the reason this is mentioned lastly in the analysis is, as detailed above, even if this was no factor, this proposed project is, on its own, beneficial to the community and in conformance with sound urban planning and the city's stated goals, without any extra such benefits given to the city. And this application is not as some mere typical real estate developer but is from a demonstrated solid member of this community for over 40 years, having lived and worked here for over three generations, and caring about the welfare of our community. And we humbly ask for this project to please be approved expeditiously, as submitted here.

SUMMARIZING: There are numerous examples where the City's actions have recognized that current zoning and/or Master Plan designations can evolve and be updated and improved, including right at this location., to benefit the community and its residents. This site, with its 15.87 acres of meandering wetland marsh wildlife areas to be put in a conservation easement, does deserve such special consideration such as designated SP (Special Planning) in the past. Here the surrounding parcels previously developed – the arena facility, the sports club, the dog park, the Ridgeway Villas multifamily, were all uses recognized as beneficial and approved, though none were designated in the zoning or Master Plan at the time. This development also protects the nature features of the larger property and provides new and improved connectivity, for recreation and retail access as recognized and desired by the community in the Master Plan stated goals. This proposed Novi 10 PRO plan is

likewise a natural extension of the previous concepts and benefits to the community for residential development and local commercial uses. Easier access is provided here for all aged people to walk to nearby stores rather than walk or drive greater distances.

We believe the proposed Novi 10 PRO, with its proposed RM-1 residential and B-2 retail development should all be considered beneficial to the city,

We have for decades always been good citizens and caring and contributing to this community. Please keep all these benefits in mind during your review process and don't hesitate to contact us if you have any questions or comments. Thank you for your consideration.

Dan Weiss

Dan Weiss, Novi 10 Associates
Cc: DW/eo

CITY OF NOVI
city of novi
45175 west ten mile road / novi, michigan 48375-3024 / (248) 347-0460 general information
www.ci.novi.mi.us

CITY COUNCIL
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City Manager
Edward F. Kriewall
City Clerk

January 28, 2000

Mr. Dan Weiss
Novi Ten Associates
400 Renaissance Center, Suite 2170
Detroit, Michigan 48243

Re: Letter of Commendation

Dear Mr. Weiss:

The City of Novi has been very fortunate to receive several gifts over the past thirty years that have made a difference in terms of providing community services that may otherwise not be available. In the instance of the Novi Ice Arena, the City of Novi was very fortunate to be able to work with Mr. Dan Weiss and others to assemble a recreational property that will benefit the residents for many generations.

The City of Novi extends it's sincere "Thanks" to the families of Dan Weiss, Al Weiss, Roland Redner, Ray Maedel and John Cassella for their generous gift. Their donation of 18 acres of land given here, to the whole community, and "especially for the kids", has made the Novi Ice Arena and Recreation Facilities a reality. They have donated this land in the spirit of giving, with this message to all:

> "May we each do whatever we can, something, however big or small, some charitable acts to make our world a better place in which to live, work or play."

This was a substantial donation having a documented value of $3.2 Million dollars. It has promoted the wholesome development of our children and our community. Be it known that this exemplary action by these contributors is highly commended by the City of Novi, as helping to make the world a better place.

For this great deed, on behalf of the residents of Novi, I, Mayor Richard Clark, extend our community appreciation for all that has been given to our City.

Sincerely,

Richard J. Clark

Richard Clark, Mayor
City of Novi

COMMUNITY IMPACT STATEMENT

UPDATE

t|c|g
THE CHESAPEAKE GROUP, INC
BUILDING A FOUNDATION FOR THE FUTURE

August 7, 2024

Prepared for

Daniel S. Weiss, CEO
Weiss Construction
41001 Grand River Avenue
Novi, Michigan 48375

The following is a brief update on the market feasibility assessment for commercial development just east of the intersection of Ten Mile and Novi Roads in Novi, Michigan. The proposed development originally comprised of about 60,000 square feet of mixed-use retail and service space on approximately ten acres of land fronting on Ten Mile Road is now about 40,000 square feet. The Chesapeake Group, Inc. (TCG) prepared The original assessment just two years ago.

TCG is the premier economic analysis and development firm in the United States, having prepared more than 1,700 analyses and plans since its inception. TCG has established a national reputation for all commercial, residential, industrial, entrepreneurial, entertainment, arts, technology, and institutional development in established and emerging communities.

The Chesapeake Group's mission is to facilitate sustainable land use, business development, redevelopment, and expansion in rural, suburban, and urban settings. TCG has been involved in numerous projects in Michigan for more than twenty-five years and maintains an office in the state. Current public sector client efforts in Michigan are in Battle Creek, Oshtemo Township, Rochester Hills, Sterling Heights, Dearborn, Delhi Township, and Detroit. TCG project areas during Covid include Adrian, Cadillac, Chesterfield Township, Genoa Township, Hillsdale, Laingsburg, Madison Heights, Meridian, Orion Township, and Sparta. Those since Covid also include White Lake Township, Baldwin, Burton,

Before Covid, some additional project areas in Michigan include Ada Township, Allendale Township, Canadian Lakes, Fennville, Grand Rapids, Hastings, Holt-Delhi Township, Hudsonville, Huron County, Kalamazoo, Lathrup Village, Mackinaw, Manton, Muskegon, Muskegon Heights, Northville, Norton Shores, Prot Huron, Shelby Township, Spring Lake, Troy, Walker-Standale, Wixom, and Zeeland.

TCG is also the only consultant engaged with the State of Michigan's Redevelopment Ready Community Certification Program for recent administrations and the former "Cool Cities Neighborhood Program" during previous administrations.

TCG has previously been involved with several efforts in Novi, including previous public and private sector plans.

The following are highlights from the 2022 analysis.

- ✓ Existing rooftops in municipal areas like Novi drive spending on retail goods and related services. New rooftops increase expenditures and demand for retail goods and related supportable space.
- ✓ The estimates of demand for retail goods and related services were based on the existing households, the rooftop growth, and an assumed modest income growth after 2022 (average annual rate of less than one-half percent) over and beyond inflation.
- ✓ Novi resident-generated retail goods and related services sales were estimated at $2.3 billion at the beginning of 2022. The sales were expected to grow to about $2.4 billion or $94 million by 2027.
- ✓ At the beginning of 2022, Novi residents were expected to support 7.25 million square feet of space at any and all locations. An additional 229,000 square feet of retail goods and services space would be supportable by 2027. There is also the potential to capture exported space in "Eat/Drink" or food services, "General Merchandise," and "Miscellaneous" retail.
- ✓ Vehicle-oriented purchase and service activity was eliminated from future growth opportunities To enhance walkability with surrounding housing and non-residential anchors. Therefore, Novi residents could support about 6 million square feet of non-vehicle space by 2027, increasing space by about 240,000 square feet over 2022.
- ✓ Three markets were defined based on travel distances and purchasing from households within those areas. The site's development would represent only 0.8 percent of the space supported by Novi residents, slightly less than one percent of the space supported by Novi residents alone, excluding vehicle sales and services space, about twenty percent of the anticipated growth space supported by Novi residents alone by 2027, slightly less than 0.7 percent of the space supported by three-mile area residents alone, excluding vehicle sales and services space, about fourteen percent of the anticipated growth space supported by three-mile area residents by 2027, and represent about 17% of the expected growth space supported by three-mile area residents by 2027.
- ✓ The development will generally consist of non-big box operations that, by nature, impede walking to and through development. Several operations are expected to be in the food and food services arena, enhancing the potential to serve the noted anchors in the area for lunch, dinner, and other times without having to get in and out of a vehicle.
- ✓ Collectively, with the enhanced linkages to existing anchors, the food and food service composition of much of the site's activity, and the proposed adjacent housing development with direct pedestrian linkages to the site, the commercial will act as a "village center" serving the neighboring residential and anchor activity.

All of the assumptions on which TCG's conclusions were based have proven to be accurate and would not change, including those that follow.

1. Novi continues to grow by adding rooftops.

   About 110 new units were permitted during 2022 and 2023.

2. The analysis assumed a modest income growth after 2022 at an average annual rate of less than one-half percent.

   This remains relatively accurate particularly for households who have homes, other investments, and other income sources or employees working for larger corporate entities.

3. Walkability continues to be desired.

   In the last two years, TCG has surveyed more than 2,500 households in surrounding Michigan communities. Safety and walkability are the two most important issues for residents.

4. The development will generally consist of non-big box operations.

   The contraction by box stores, majors and those with fewer sites around the country, continues. Every month, from the biggest boxes like Walmart to most others, the downward location trajectory continues.

5. Several operations were expected to be in the food and food services arena, enhancing the potential to serve the noted anchors in the area for lunch, dinner, and other times without having to get in and out of a vehicle.

   While some food service activity is contracting, overall demand continues to be strong. Chains like Panera Breads have faced consumer challenges head-on with success and continue to thrive. Some other chains have raised prices to an unacceptable level for the consumer. Those that have adjusted thrive, and those that do not contract.

   TCG's large-sample surveys conducted in eastern Michigan communities consistently indicate that "non-chain, local full-service restaurants are the preference for lunch and dinner.

One critcal assumption is noted. "Demand is sufficient to support the original proposal of 60,000 square feet." The proposed modified submittal is for roughly 40,000 square feet or one-third less space. The implication to conclusions is as follows



- ✓ The site's development would represent only 0.53% versus 0.8% of the space supported by Novi residents in the 2022 analysis.

Conclusions

TCG prides itself on the accuracy of its projections to benefit both the community served and, where appropriate, private interests. With the assumptions proving accurate two years later, the market-based conclusions remain the same.

With the many municipalities that seek TCG services in Michigan, TCG recommends updating the assessments every five years.

Respectfully submitted

Howard Kohn, President (*Howard Kohn electronic*)

The Chesapeake Group, Inc. (TCG)

COMMERCIAL MARKET ANALYSIS

t|c|g

THE CHESAPEAKE GROUP, INC

BUILDING A FOUNDATION FOR THE FUTURE



MARKET FEASIBILITY ANALYSIS FOR COMMERCIAL DEVELOPMENT NEAR THE INTERSECTION OF TEN AND NOVI ROADS IN NOVI

JULY, 2022

PREPARED BY

Corporate Office: 8516 Green Lane, Baltimore, Maryland 21244
Offices in Maryland, Michigan, Florida, and Pennsylvania
410.265.1784/800.745.0185 tcgroup@rcn.com www.chesapeakegroup.com

Market Assessment

t|c|g
THE CHESAPEAKE GROUP, INC
BUILDING A FOUNDATION FOR THE FUTURE

The following is a market feasibility assessment for the development of commercial development just east of the intersection of Ten Mile and Novi Roads in Novi, Michigan. The proposed development consists of about 60,000 square feet of mixed-use retail and service space on approximately ten acres of land fronting on Ten Mile Road.

The assessment was prepared by The Chesapeake Group (TCG). TCG is the premier economic analysis and development firm in the United States, having prepared more than 1,500 analyses and plans since its inception. TCG has established a national reputation with all commercial, residential, industrial, entrepreneurial, entertainment, arts, technology, and institutional development in established and emerging communities.

The Chesapeake Group's mission is to facilitate sustainable land use, business development, redevelopment, and expansion in rural, suburban, and urban settings. TCG has been involved in numerous projects in Michigan for more than twenty-five years and maintains an office in the state. Current public sector client efforts in Michigan are located in White Lake Township, Novi, and the City of Cadillac. TCG project areas during Covid include those in Adrian, Cadillac, Chesterfield Township, Novi, Genoa Township, Hillsdale, Laingsburg, Madison Heights, Meridian, Orion Township, and Sparta.

Before Covid, additional project areas in Michigan include Ada Township, Allendale Township, Canadian Lakes, Fennville, Grand Rapids, Hastings, Holt-Delhi Township, Hudsonville, Huron County, Kalamazoo, Lathrup Village, Mackinaw, Manton, Muskegon, Muskegon Heights, Northville, Norton Shores, Prot Huron, Shelby Township, Spring Lake, Troy, Walker-Standale, Wixom, and Zeeland.

TCG has previously been involved with several efforts in Novi. TCG is also the only consultant involved with the State of Michigan's Redevelopment Ready Community Certification Program for recent administrations and the former "Cool Cities Neighborhood Program" during previous administrations.

CONTEXT

Novi is one of the most dynamic cities within the growing households in Oakland County. Growth in homes or rooftops creates new demand for commercial activity through increased spending and need for more services.

Oakland County has seen substantial household growth since 2011, or the close of the Great Recession. More than 29,000 new housing units were permitted in Oakland County between 2011 and 2021. Of these units, about 23,000 were single-family, detached homes, and roughly 6,000 were attached multi-household units.

*Table 1 - New Housing Units Permitted in Oakland County for Select 2011 through 2021 Time Period**

Oakland County	Total	Annual Average
Total Units	29,022	2638
Units in Single-Family Structures	23,060	2096
Units in All Multi-Family Structures	5,962	542
Units in 2-unit Multi-Family Structures	208	19
Units in 3- and 4-unit Multi-Family Structures	725	66
Units in 5+ Unit Multi-Family Structures	5,029	457

*Developed by The Chesapeake Group, Inc., 2022. Based on HUD's permit database.

Novi reported growth in housing units permitted between 2011 and 2021. A total of just over 2,750 new homes were permitted during those years. The increase represents about 9.5 percent of the Oakland County total.

*Table 2 - New Housing Units Permitted in Novi for Select Periods from 2011 through 2021**

Total 2011 through 2021	Annual Average 2011 - 2021	2018-2021	Annual Average 2018-2921
2758	251	772	193

*Developed by The Chesapeake Group, Inc., 2022. Based on HUD's permit database.

Future growth in rooftops can be based on recent history. Utilization of the historical patterns indicates a range for new units for Oakland County and Novi. For Oakland County, the range in annual average units permitted range is from about 2,640 to 2,780. Utilization of the lower estimate for future projects results in the potential growth by 2030 of about 23,750 new permitted units. Utilizing the lower units contributes to a lower estimation of demand for commercial goods and services. It allows for short-term downturns due to fluctuating national and regional economic conditions.

For Novi, the average annual permits issued for 2011 through 2021 was 251, and the yearly average number permitted between 2018 and 2021 was 193. Employing the smaller number results in the potential for about an additional 1,740 units by 2030.

*Table 3 - New Housing Units Permitted in Novi for Select Periods from 2011 through 2021 and Low Estimate for 2030**

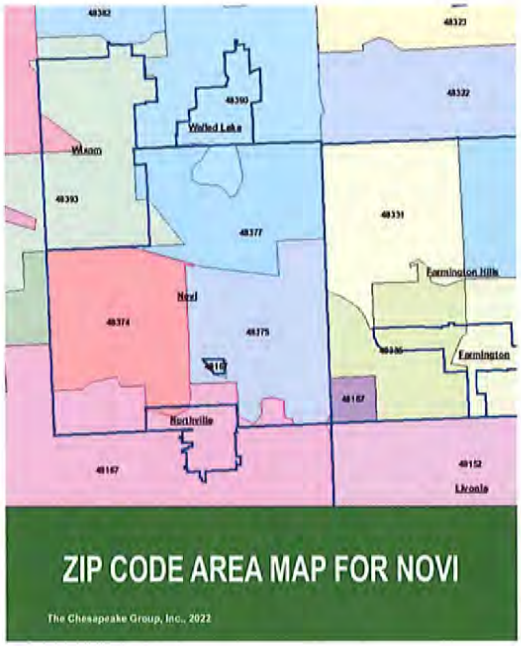
Total 2011-2021	Annual Average 2011-2021	Annual Average 2018-2021	Units added 2030 (low estimate)
2758	251	193	1737

*Developed by The Chesapeake Group, Inc., 2022. Based on HUD's permit database.

Household incomes are the primary source of spending in a community for commercial goods and services. According to the United States Census, the population for 2021 in Novi was estimated at about 66,500. The number of households was 24,130, and the median average household income was estimated at around $93,940.

The median household income is generally well below, often forty to sixty percent below the mean household income, with the latter income a better reflection of actual purchasing ability.

There are three zip code areas in which residents of Novi reside. These three zip codes are 48375, 48377, and 48374. Surveys conducted by TCG in the past two years in other communities near Novi contained a significant number of residents of those zip codes. The compilation of those responses indicates that the mean average income is over $120,000. Yet, to provide the most conservative estimate of current and future demand for commercial goods and services, the Census's median average income is used to define the demand.



SURROUNDINGS

The site is within walking distance of both residential and non-residential activity. Most demand for commercial results from household spending often near homes but also near employment or other activity generators.

One significant facility within walking distance is the Novi Ice Arena. The Arena opened over twenty years ago. The Arena offers two NHL-regulation-sized ice sheets, heated viewing areas with capacities of 200 and 750, skate rentals, and meeting space. The Arena hosts numerous programs, including the Novi Youth Hockey Association, Figure Skating Club of Novi, Novi High School, Northville High School, and the City of Novi after-school programs. Its offerings include adult hockey, tournaments, instructional programs for hockey and skating, drop-in open hockey and skating, and private lessons attracting people throughout the year.



Adjacent to the Novi Ice Arena and closer to the site is the Novi Athletic Club. West of the site within a reasonable walk is the Novi Civic Center, including municipal offices, meeting and event spaces for lease for a range of activities, and sports fields at the Ella Mae Power Park. Within a few block radius is also multi and single-family housing developments.

RETAIL GOODS AND RELATED SERVICES DEMAND FORECASTS

Existing rooftops in municipal areas like Novi drive spending on retail goods and related services. New rooftops also increases spending and demand for retail goods and related supportable space. It is noted that no jurisdiction can be expected to capture all demand created by any market, including its residents. Spending will occur in many places, including operations near home and work. Online purchases, vacation spending, and other activity diminish local sales. On the other hand, people living nearby, working within the area, employed nearby, and those coming to the site for various purposes will spend money in Novi and the specific location, as proven by the existing Walgreens and other adjacent or near non-residential activity. Some dollars are exported, while others are imported.

The estimates of demand for retail goods and related services are based on the existing households, the growth in rooftops, and an assumed modest income growth after 2022 (average annual rate of less than one-half percent) over and beyond inflation. The noted sales are inconstant dollars, excluding inflation.

Three market areas are defined, providing different estimates of opportunities but all reaching similar conclusions as to the viability of retail goods and related services space on the site at Ten Mile and Novi Roads.

The first market area is the smallest of the three based on rooftops, including only those within the municipal boundaries of the City of Novi.

- Novi resident-generated retail goods and related services sales are estimated at $2.3 billion at the beginning of 2022.
- The sales are expected to grow to about $2.4 billion, or $94 million by 2027, based on the anticipated growth in rooftops and a very modest increase in real income,

*Table 4 – Novi Resident Generated Retail Goods and Related Services Sales for 2022 and 2027 and the Change from 2022 to 2027**

Category	2021	2027	change 2021-27
Food	204,479,000	212,909,000	8,430,000
Eat/Drink	330,715,000	344,349,000	13,634,000
General Merchandise	292,731,000	304,799,000	12,068,000
Furniture	70,510,000	73,417,000	2,907,000
Transportation	273,170,000	284,432,000	11,262,000
Drugstore	166,040,000	172,885,000	6,845,000
Apparel	176,958,000	184,253,000	7,295,000
Hardware	179,005,000	186,384,000	7,380,000
Vehicle Service	232,683,000	242,276,000	9,593,000
Miscellaneous	348,229,000	362,585,000	14,356,000
TOTAL	$2,274,520,000	$2,368,290,000	$93,770,000

*Developed by The Chesapeake Group, Inc., 2022. Further breakdown of retail goods and related services demand is found in the appendix.

- Novi residents are expected to support 7.25 million square feet of space at any and all locations at the beginning of 2022.
- An additional 229,000 square feet of retail goods and services space will be supportable by 2027.
- There is also the potential to capture exported space in "Eat/Drink" or food services, "General Merchandise," and "Miscellaneous" retail.

*Table 5 – Novi Resident Generated Retail Goods and Related Services Space in Square Feet for 2022 and 2027 and the Change from 2022 to 2027**

Category	2021	2027	2021-27
Food	325,270	338,679	13,409
Eat/Drink	787,417	819,879	32,462
General Merchandise	1,737,439	1,809,064	71,627
Furniture	162,289	168,979	6,691
Transportation	895,278	932,188	36,909
Drugstore	162,784	169,495	6,711
Apparel	490,979	511,221	20,241
Hardware	729,441	759,510	30,073
Vehicle Service	566,463	589,817	23,354
Miscellaneous	1,390,669	1,448,000	57,331
TOTAL	7,248,029	7,546,832	298,808

*Developed by The Chesapeake Group, Inc., 2022. Further breakdown of retail goods and related services demand is found in the appendix.

- Most commercial opportunities are appropriate for the site. However, to enhance walkability with surrounding housing and non-residential anchors, vehicle-oriented purchase and services activity is eliminated from future growth opportunities. Therefore, Novi residents will support about 6 million square feet of non-vehicle space by 2027, increasing space by about 240,000 square feet over 2022.
- Retail and entertainment are today and will continue to be linked in the future linked so that one creates an experience, not merely a shopping trip or a trip to a restaurant. The catalytic activity and focus would be food service establishments as Covid-19's impact diminishes.

*Table 6 – Novi Resident Generated Retail Goods and Related Services Space in Square Feet for 2022 and 2027 and the Change from 2022 to 2027, Excluding Vehicle Service and Purchase Space**

Category	2021	2027	2021-27
Food	325,270	338,679	13,409
Eat/Drink	787,417	819,879	32,462
General Merchandise	1,737,439	1,809,064	71,627
Furniture	162,289	168,979	6,691
Drugstore	162,784	169,495	6,711
Apparel	490,979	511,221	20,241
Hardware	729,441	759,510	30,073
Miscellaneous	1,390,669	1,448,000	57,331
TOTAL	5,788,309	6,026,854	238,545

*Developed by The Chesapeake Group, Inc., 2022. Further breakdown of retail goods and related services demand is found in the appendix.

The second market area is a three-mile radius. In this case, it closely resembles the first market area in scale and resident households.

- Novi and very nearby residents generate retail goods and related services sales of about $3.3 billion at the beginning of 2022.
- The sales are expected to grow to $3.4 billion, or by $108 million by 2027, based on the anticipated growth in rooftops and a very modest increase in real income,

*Table 7 – Residents of a Three-Mile Radius Generated Retail Goods and Related Services Sales for 2022 and 2027 and the Change from 2022 to 2027**

Category	2021	2027	change 2021-27
Food	295,029,000	304,736,000	9,707,000
Eat/Drink	477,166,000	492,865,000	15,699,000
General Merchandise	422,361,000	436,257,000	13,896,000
Furniture	101,734,000	105,081,000	3,347,000
Transportation	394,138,000	407,105,000	12,967,000
Drugstore	239,568,000	247,450,000	7,882,000
Apparel	255,320,000	263,720,000	8,400,000
Hardware	258,274,000	266,771,000	8,497,000
Vehicle Service	335,723,000	346,768,000	11,045,000
Miscellaneous	502,436,000	518,966,000	16,530,000
TOTAL	$3,281,750,000	$3,389,721,000	$107,971,000

*Developed by The Chesapeake Group, Inc., 2022. Further breakdown of retail goods and related services demand is found in the appendix.

- Residents with a three-mile radius are expected to support about 10.5 million square feet of space at any and all locations at the beginning of 2022.
- An additional 344,000 square feet of retail goods and related services space will be supportable by 2027.

*Table 8 – Residents of a Three-Mile Radius Supportable Retail Goods and Related Services Space in Square Feet for 2022 and 2027 and the Change from 2022 to 2027**

Category	2021	2027	2021-27
Food	469,310	484,750	15,442
Eat/Drink	1,136,110	1,173,488	37,379
General Merchandise	2,506,825	2,589,304	82,477
Furniture	234,154	241,858	7,704
Drugstore	234,871	242,598	7,727
Apparel	708,399	731,705	23,306
Hardware	1,052,459	1,087,085	34,625
Vehicle Service	817,312	844,201	26,889
Miscellaneous	2,006,500	2,072,514	66,012
TOTAL	10,457,675	10,801,734	344,058

*Developed by The Chesapeake Group, Inc., 2022. Further breakdown of retail goods and related services demand is found in the appendix.

- Suppose vehicle-oriented activity is eliminated from the future growth opportunities. N that case, residents within the three-mile radius will support about 8.6 million square feet of non-vehicle space by 2027, increasing space by about 275,000 square feet over the beginning of 2022.

*Table 9 – Residents of a Three-Mile Radius Supportable Retail Goods and Related Services Space in Square Feet for 2022 and 2027 and the Change from 2022 to 2027, Excluding Vehicle Purchase and Service Space**

Category	2021	2027	2021-27
Food	469,310	484,750	15,442
Eat/Drink	1,136,110	1,173,488	37,379
General Merchandise	2,506,825	2,589,304	82,477
Furniture	234,154	241,858	7,704
Drugstore	234,871	242,598	7,727
Apparel	708,399	731,705	23,306
Hardware	1,052,459	1,087,085	34,625
Miscellaneous	2,006,500	2,072,514	66,012
TOTAL	8,350,649	8,625,329	274,672

*Developed by The Chesapeake Group, Inc., 2022. Further breakdown of retail goods and related services demand is found in the appendix.

The third is the largest in terms of both geographic area and rooftops. The five-mile radius associated with this market is the typical or normal area served by neighborhood and community scale retail goods and related services associated with the roughly ten-acre scale of the site.

- Residents within a five-mile radius generate an estimated $7.2 billion in retail goods and related services sales at the beginning of 2022.
- The sales are expected to grow to about $7.3 billion, or $133 million by 2027, based on the anticipated growth in rooftops and a very modest increase in real income,

*Table 10 – Residents of a Five-Mile Radius Generated Retail Goods and Related Services Sales for 2022 and 2027 and the Change from 2022 to 2027**

Category	2021	2027	change 2021-27
Food	645,160,000	657,181,000	12,021,000
Eat/Drink	1,043,451,000	1,062,894,000	19,443,000
General Merchandise	923,605,000	940,814,000	17,210,000
Furniture	222,469,000	226,614,000	4,145,000
Transportation	861,888,000	877,947,000	16,060,000
Drugstore	523,878,000	533,640,000	9,761,000
Apparel	558,325,000	568,729,000	10,403,000
Hardware	564,784,000	575,308,000	10,524,000
Vehicle Service	734,147,000	747,827,000	13,679,000
Miscellaneous	1,098,709,000	1,119,182,000	20,472,000
TOTAL	$7,176,417,000	$7,310,135,000	$133,718,000

*Developed by The Chesapeake Group, Inc., 2022. Further breakdown of retail goods and related services demand is found in the appendix.

- Residents with a five-mile radius are expected to support about 22.9 million square feet of space at any and all locations at the beginning of 2022.
- An additional 426,000 square feet of retail goods and related services space will be supportable by 2027.

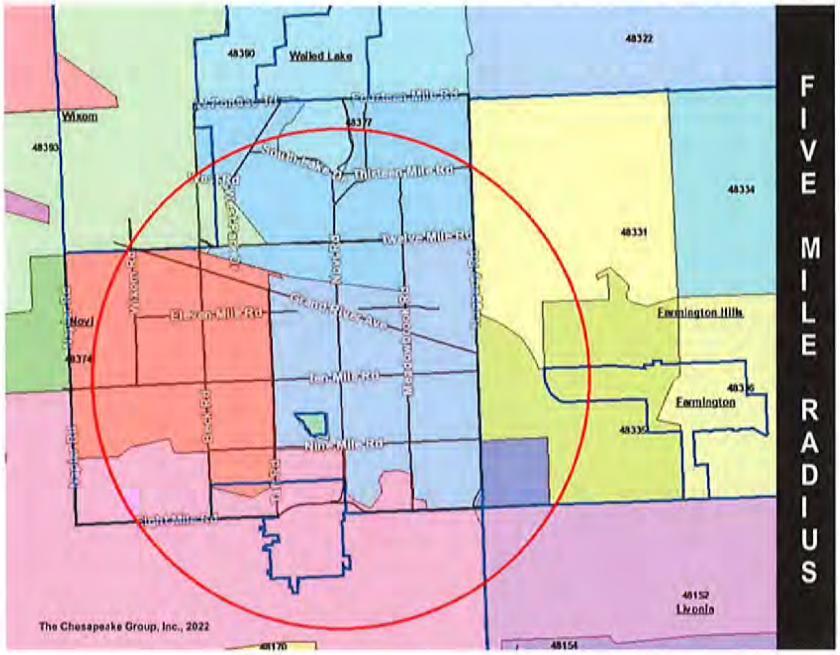


*Table 11 – Residents of a Five-Mile Radius Supportable Retail Goods and Related Services Space in Square Feet for 2022 and 2027 and the Change from 2022 to 2027**

Category	2021	2027	2021-27
Food	1,026,272	1,045,395	19,122
Eat/Drink	2,484,407	2,530,700	46,293
General Merchandise	5,481,844	5,583,984	102,147
Furniture	512,043	521,583	9,540
Transportation	2,824,722	2,877,353	52,634
Drugstore	513,606	523,176	9,570
Apparel	1,549,102	1,577,970	28,864
Hardware	2,301,479	2,344,365	42,885
Vehicle Service	1,787,268	1,820,572	33,301
Miscellaneous	4,387,743	4,469,505	81,758
TOTAL	22,868,486	23,294,603	426,114

*Developed by The Chesapeake Group, Inc., 2022. Further breakdown of retail goods and related services demand is found in the appendix.

- Suppose vehicle-oriented purchase and service activity is eliminated from the future growth opportunities. Residents within the five-mile radius will support about 18.3 million square feet of non-vehicle space by 2027, increasing space by about 340,000 square feet over the beginning of 2022.

*Table 12 – Residents of a Five-Mile Radius Supportable Retail Goods and Related Services Space in Square Feet for 2022 and 2027 and the Change from 2022 to 2027, Excluding Vehicle Purchase and Service Space**

Category	2021	2027	2021-27
Food	1,026,272	1,045,395	19,122
Eat/Drink	2,484,407	2,530,700	46,293
General Merchandise	5,481,844	5,583,984	102,147
Furniture	512,043	521,583	9,540
Drugstore	513,606	523,176	9,570
Apparel	1,549,102	1,577,970	28,864
Hardware	2,301,479	2,344,365	42,885
Miscellaneous	4,387,743	4,469,505	81,758
TOTAL	18,258,517	18,598,705	340,179

*Developed by The Chesapeake Group, Inc., 2022. Further breakdown of retail goods and related services demand is found in the appendix.

Site Development Potential

As previously defined, the proposed development consists of about 60,000 square feet of mixed-use retail and service space on approximately ten acres of land fronting on Ten Mile Road. While the specific tenant mix is currently unknown now, food and food services are likely to be a significant component of the development. Tenants may include a small market, sidewalk cafes, a bakery, and "Panera Breads-type" operations mixed with other miscellaneous retail and services. The proposed development is viable given current and anticipated growth in supportable space based on the three defined markets.

Novi Residents Only

- The site's development would represent only 0.8 percent of the space supported by Novi residents alone.
- The site's development would represent slightly less than one percent of the space supported by Novi residents alone, excluding vehicle sales and services space.
- The site's development would represent about twenty percent of the anticipated growth space supported by Novi residents alone by 2027.

Three-mile Area Residents

- The site's development would represent only 0.6 percent of the space supported by residents within three miles.
- The site's development would represent slightly less than 0.7 percent of the space supported by three-mile area residents alone, excluding vehicle sales and services space.
- The site's development would represent about fourteen percent of the anticipated growth space supported by three-mile area residents by 2027.

Five-mile Area Residents or the Traditional Market Area for Neighborhood and Community Commercial

- The site's development would represent only 0.26 percent of the space supported by residents within five-miles or the traditional neighborhood and community-scaled commercial centers.
- The site's development would represent slightly more than 0.3 percent of the space supported by five-mile area residents alone, excluding vehicle sales and services space.
- The site's development would represent about seventeen percent of the anticipated growth space supported by three-mile area residents by 2027.

The following is also noted for the above three market estimates.

- Amounts less than three percent are considered insignificant from a statistical perspective. Therefore and in all cases, the proposed development does not adversely impact demand for existing commercial. The development does not hinder and affords the opportunity for further growth in retail space on other sites.
- From the smallest to the largest market, space supported by growth should have no adverse impact on any existing businesses that maintain their competitiveness since the sales and space are derived from new households and income that does not presently exist.
- As part of the effort, TCG conducted a survey of available retail spaces in Novi that indicates the following.
    - The retail space market is viable based on achievable rent levels.
    - Rent levels for spaces built between 2010 and the present, rents range generally range from $30 to $40 per square foot. Most spaces built since 2010 lease for $35 to $40 per square foot.
    - Even those built before 2010 most often lease for $20 to $30 per square foot, with some exceeding $30 per square foot.

COMPATIBILITY AND WALKABILITY

The site has significant potential to enhance the walkable nature of this area of Novi.

1. The development will generally consist of non-big box operations that, by nature, impede walking to and through development.

2. Several operations are expected to be in the food and food services arena, enhancing the potential to serve the noted anchors in the area for lunch, dinner, and other times without having to get in and out of a vehicle.

3. Adjacent to the site on the east and south is an additional fourteen acres of new housing. The development will likely contain about seventy-three-bedroom condominiums and will have walking and driving access to the commercial site.

4. This additional housing will also create the opportunity for enhanced pedestrian linkage to some of the area's anchors, like the ice arena and Novi Athletic Club. It also provides the opportunity for improved connections to other existing residential neighborhoods to the east and south.

5. Collectively, with the enhanced linkages to existing anchors, the food and food service composition of much of the activity on the site, and the proposed adjacent other housing development with direct pedestrian linkages to the site, the commercial will act as a "village center" serving the neighboring residential and anchor activity.

Appendix

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*Permits Issued for New Housing Units for Oakland County from 2011 through 2021**

Oakland County	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Total Units	3,174	2,475	2,842	2,642	3,707	3,196	2,645	2,458	2,705	1,901	1,277
Units in Single-Family Structures	2,044	1,935	1,976	2,482	2,744	2,143	2,180	2,114	2,296	1,880	1,266
Units in All Multi-Family Structures	1,130	540	866	160	963	1,053	465	344	409	21	11
Units in 2-unit Multi-Family Structures	20	14	0	16	4	60	58	16	14	6	0
Units in 3 & 4-unit Multi-Fam Structures	127	111	83	71	105	49	44	49	60	15	11
Units in 5+ Unit Multi-Family Structures	983	415	783	73	854	944	363	279	335	0	0

*Developed by The Chesapeake Group, Inc., 2022, based on HUD data.

*Permits Issued for New Housing Units for Novi from 2011 through 2021**

Novi	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Total Units	114	321	190	147	516	184	289	203	197	322	275
Units in Single-Family Structures	114	218	190	147	181	184	173	198	197	316	275
Units in All Multi-Family Structures	0	103	0	0	335	0	116	5	0	6	0
Units in 2-unit Multi-Family Structures	0	0	0	0	0	0	0	0	0	6	0
Units in 3 & 4-unit Multi-Fam Structures	0	0	0	0	32	0	0	0	0	0	0
Units in 5+ Unit Multi-Family Structures	0	103	0	0	303	0	116	5	0	0	0

*Developed by The Chesapeake Group, Inc., 2022, based on HUD data.

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*Novi Resident Generated Retail Goods and Related Services Sales and Space in Square Feet for 2022 and 2027 and the Change from 2022 to 2027, Excluding Vehicle Service and Purchase Space**

Sub-category	2021 Sales	2027 Sales	2021-27 Sales	2021 Space	2027 Space	2021-27 Space
Food	204,479,000	212,909,000	8,430,000	325,270	338,679	13,409
Supermarkets	170,739,965	177,779,015	7,039,050	258,697	269,362	10,665
Independents	16,358,320	17,032,720	674,400	40,896	42,582	1,686
Bakeries	4,498,538	4,683,998	185,460	14,995	15,613	618
Dairies	2,658,227	2,767,817	109,590	7,384	7,688	304
Others	10,223,950	10,645,450	421,500	3,298	3,434	136
Eat/Drink	330,715,000	344,349,000	13,634,000	787,417	819,879	32,462
General Merchandise	292,731,000	304,799,000	12,068,000	1,737,439	1,809,064	71,627
Dept. Stores	103,626,774	107,898,846	4,272,072	431,778	449,579	17,800
Variety Stores	21,076,632	21,945,528	868,896	123,980	129,091	5,111
Jewelry	20,198,439	21,031,131	832,692	28,449	29,621	1,173
Sporting Goods/Toys	31,907,679	33,223,091	1,315,412	127,631	132,892	5,262
Discount Dept.	109,774,125	114,299,625	4,525,500	997,947	1,039,088	41,141
Antiques, etc.	1,463,655	1,523,995	60,340	6,364	6,626	262
Others	4,683,696	4,876,784	193,088	21,290	22,167	878
Furniture	70,510,000	73,417,000	2,907,000	162,289	168,979	6,691
Furniture	10,647,010	11,085,967	438,957	34,345	35,761	1,416
Home Furnishings	14,666,080	15,270,736	604,656	54,319	56,558	2,239
Store/Office Equip.	11,140,580	11,599,886	459,306	23,210	24,166	957
Music Instr./Suppl.	3,031,930	3,156,931	125,001	15,160	15,785	625
Radios,TV, etc.	31,024,400	32,303,480	1,279,080	35,255	36,709	1,454
Transportation	273,170,000	284,432,000	11,262,000	895,278	932,188	36,909
New/Used Vehicles	95,609,500	99,551,200	3,941,700	239,024	248,878	9,854
Tires, Batt., Prts.	120,467,970	125,434,512	4,966,542	501,950	522,644	20,694
Marine Sales/Rentals	14,478,010	15,074,896	596,886	39,130	40,743	1,613
Auto/Truck Rentals	42,614,520	44,371,392	1,756,872	115,174	119,923	4,748
Drugstore	166,040,000	172,885,000	6,845,000	162,784	169,495	6,711
Apparel	176,958,000	184,253,000	7,295,000	490,979	511,221	20,241
Men's and Boy's	23,181,498	24,137,143	955,645	57,954	60,343	2,389
Women's and Girl's	58,750,056	61,171,996	2,421,940	158,784	165,330	6,546
Infants	3,716,118	3,869,313	153,195	12,387	12,898	511
Family	49,194,324	51,222,334	2,028,010	196,777	204,889	8,112
Shoes	36,984,222	38,508,877	1,524,655	42,028	43,760	1,733
Jeans/Leather	707,832	737,012	29,180	2,359	2,457	97
Tailors/Uniforms	3,185,244	3,316,554	131,310	15,926	16,583	657
Others	1,238,706	1,289,771	51,065	4,764	4,961	196
Hardware	179,005,000	186,384,000	7,380,000	729,441	759,510	30,073
Hardware	86,638,420	90,209,856	3,571,920	315,049	328,036	12,989
Lawn/Seed/Fertil.	3,401,095	3,541,296	140,220	10,003	10,416	412
Others	88,965,485	92,632,848	3,667,860	404,389	421,058	16,672
Vehicle Service	232,683,000	242,276,000	9,593,000	566,463	589,817	23,354
Gasoline	79,112,220	82,373,840	3,261,620	54,560	56,810	2,249
Garage, Repairs	153,570,780	159,902,160	6,331,380	511,903	533,007	21,105
Miscellaneous	348,229,000	362,585,000	14,356,000	1,390,669	1,448,000	57,331
Advert. Signs, etc.	5,571,664	5,801,360	229,696	20,261	21,096	835
Barber/Beauty shop	21,241,969	22,117,685	875,716	106,210	110,588	4,379
Book Stores	16,018,534	16,678,910	660,376	88,992	92,661	3,669
Bowling	8,009,267	8,339,455	330,188	80,093	83,395	3,302
Cig./Tobacco Dealer	2,437,603	2,538,095	100,492	4,875	5,076	201
Dent./Physician Lab	13,929,160	14,503,400	574,240	42,859	44,626	1,767
Florist/Nurseries	26,117,175	27,193,875	1,076,700	61,452	63,986	2,533
Laundry, Dry Clean	11,839,786	12,327,890	488,104	39,466	41,093	1,627
Optical Goods/Opt.	8,357,496	8,702,040	344,544	23,879	24,863	984
Photo Sup./Photog.	24,027,801	25,018,365	990,564	68,651	71,481	2,830
Printing	28,206,549	29,369,385	1,162,836	102,569	106,798	4,228
Paper/Paper Prod.	14,973,847	15,591,155	617,308	74,869	77,956	3,087
Gifts/Cards/Novel.	49,796,747	51,849,655	2,052,908	165,989	172,832	6,843
Newsstands	2,785,832	2,900,680	114,848	5,572	5,801	230
Video Rent/Sales	45,269,770	47,136,050	1,866,280	226,349	235,680	9,331
Others	69,645,800	72,517,000	2,871,200	278,583	290,068	11,485
TOTAL	2,274,520,000	2,368,289,000	93,770,000	7,248,029	7,546,832	298,808

*Developed by The Chesapeake Group, Inc., 2022,

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*Residents of a Three-Mile Radius Sales and Supportable Retail Goods and Related Services Space in Square Feet for 2022 and 2027 and the Change from 2022 to 2027, Excluding Vehicle Purchase and Service Space**

Sub-category	2021 Sales	2027 Sales	2021-27 Sales	2021 Space	2027 Space	2021-27 Space
Food	295,029,000	304,736,000	9,707,000	469,310	484,750	15,442
Supermarkets	246,349,215	254,454,560	8,105,345	373,256	385,537	12,281
Independents	23,602,320	24,378,880	776,560	59,006	60,947	1,941
Bakeries	6,490,638	6,704,192	213,554	21,635	22,347	712
Dairies	3,835,377	3,961,568	126,191	10,654	11,004	351
Others	14,751,450	15,236,800	485,350	4,759	4,915	157
Eat/Drink	477,166,000	492,865,000	15,699,000	1,136,110	1,173,488	37,379
General Merchandise	422,361,000	436,257,000	13,896,000	2,506,825	2,589,304	82,477
Dept. Stores	149,515,794	154,434,978	4,919,184	622,982	643,479	20,497
Variety Stores	30,409,992	31,410,504	1,000,512	178,882	184,768	5,885
Jewelry	29,142,909	30,101,733	958,824	41,046	42,397	1,350
Sporting Goods/Toys	46,037,349	47,552,013	1,514,664	184,149	190,208	6,059
Discount Dept.	158,385,375	163,596,375	5,211,000	1,439,867	1,487,240	47,373
Antiques, etc.	2,111,805	2,181,285	69,480	9,182	9,484	302
Others	6,757,776	6,980,112	222,336	30,717	31,728	1,011
Furniture	101,734,000	105,081,000	3,347,000	234,154	241,858	7,704
Furniture	15,361,834	15,867,231	505,397	49,554	51,185	1,630
Home Furnishings	21,160,672	21,856,848	696,176	78,373	80,951	2,578
Store/Office Equip.	16,073,972	16,602,798	528,826	33,487	34,589	1,102
Music Instr./Suppl.	4,374,562	4,518,483	143,921	21,873	22,592	720
Radios,TV, etc.	44,762,960	46,235,640	1,472,680	50,867	52,541	1,674
Transportation	394,138,000	407,105,000	12,967,000	1,291,735	1,334,231	42,497
New/Used Vehicles	137,948,300	142,486,750	4,538,450	344,871	356,217	11,346
Tires, Batt., Prts.	173,814,858	179,533,305	5,718,447	724,229	748,055	23,827
Marine Sales/Rentals	20,889,314	21,576,565	687,251	56,458	58,315	1,857
Auto/Truck Rentals	61,485,528	63,508,380	2,022,852	166,177	171,644	5,467
Drugstore	239,568,000	247,450,000	7,882,000	234,871	242,598	7,727
Apparel	255,320,000	263,720,000	8,400,000	708,399	731,705	23,306
Men's and Boy's	33,446,920	34,547,320	1,100,400	83,617	86,368	2,751
Women's and Girl's	84,766,240	87,555,040	2,788,800	229,098	236,635	7,537
Infants	5,361,720	5,538,120	176,400	17,872	18,460	588
Family	70,978,960	73,314,160	2,335,200	283,916	293,257	9,341
Shoes	53,361,880	55,117,480	1,755,600	60,639	62,634	1,995
Jeans/Leather	1,021,280	1,054,880	33,600	3,404	3,516	112
Tailors/Uniforms	4,595,760	4,746,960	151,200	22,979	23,735	756
Others	1,787,240	1,846,040	58,800	6,874	7,100	226
Hardware	258,274,000	266,771,000	8,497,000	1,052,459	1,087,085	34,625
Hardware	125,004,616	129,117,164	4,112,548	454,562	469,517	14,955
Lawn/Seed/Fertil.	4,907,206	5,068,649	161,443	14,433	14,908	475
Others	128,362,178	132,585,187	4,223,009	583,464	602,660	19,195
Vehicle Service	335,723,000	346,768,000	11,045,000	817,312	844,201	26,889
Gasoline	114,145,820	117,901,120	3,755,300	78,721	81,311	2,590
Garage, Repairs	221,577,180	228,866,880	7,289,700	738,591	762,890	24,299
Miscellaneous	502,436,000	518,966,000	16,530,000	2,006,500	2,072,514	66,012
Advert. Signs, etc.	8,038,976	8,303,456	264,480	29,233	30,194	962
Barber/Beauty shop	30,648,596	31,656,926	1,008,330	153,243	158,285	5,042
Book Stores	23,112,056	23,872,436	760,380	128,400	132,625	4,224
Bowling	11,556,028	11,936,218	380,190	115,560	119,362	3,802
Cig./Tobacco Dealer	3,517,052	3,632,762	115,710	7,034	7,266	231
Dent./Physician Lab	20,097,440	20,758,640	661,200	61,838	63,873	2,034
Florist/Nurseries	37,682,700	38,922,450	1,239,750	88,665	91,582	2,917
Laundry, Dry Clean	17,082,824	17,644,844	562,020	56,943	58,816	1,873
Optical Goods/Opt.	12,058,464	12,455,184	396,720	34,453	35,586	1,133
Photo Sup./Photog.	34,668,084	35,808,654	1,140,570	99,052	102,310	3,259
Printing	40,697,316	42,036,246	1,338,930	147,990	152,859	4,869
Paper/Paper Prod.	21,604,748	22,315,538	710,790	108,024	111,578	3,554
Gifts/Cards/Novel.	71,848,348	74,212,138	2,363,790	239,494	247,374	7,879
Newsstands	4,019,488	4,151,728	132,240	8,039	8,303	264
Video Rent/Sales	65,316,680	67,465,580	2,148,900	326,583	337,328	10,745
Others	100,487,200	103,793,200	3,306,000	401,949	415,173	13,224
TOTAL	3,281,749,000	3,389,719,000	107,970,000	10,457,675	10,801,734	344,058

*Developed by The Chesapeake Group, Inc., 2022,

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*Residents of a Five-Mile Radius Sales and Supportable Retail Goods and Related Services Space in Square Feet for 2022 and 2027 and the Change from 2022 to 2027, Excluding Vehicle Purchase and Service Space**

Sub-category	2021 Sales	2027 Sales	2021-27 Sales	2021 Space	2027 Space	2021-27 Space
Food	645,160,000	657,181,000	12,021,000	1,026,272	1,045,395	19,122
Supermarkets	538,708,600	548,746,135	10,037,535	816,225	831,434	15,208
Independents	51,612,800	52,574,480	961,680	129,032	131,436	2,404
Bakeries	14,193,520	14,457,982	264,462	47,312	48,193	882
Dairies	8,387,080	8,543,353	156,273	23,297	23,732	434
Others	32,258,000	32,859,050	601,050	10,406	10,600	194
Eat/Drink	1,043,451,000	1,062,894,000	19,443,000	2,484,407	2,530,700	46,293
General Merchandise	923,605,000	940,814,000	17,210,000	5,481,844	5,583,984	102,147
Dept. Stores	326,956,170	333,048,156	6,092,340	1,362,317	1,387,701	25,385
Variety Stores	66,499,560	67,738,608	1,239,120	391,174	398,462	7,289
Jewelry	63,728,745	64,916,166	1,187,490	89,759	91,431	1,673
Sporting Goods/Toys	100,672,945	102,548,726	1,875,890	402,692	410,195	7,504
Discount Dept.	346,351,875	352,805,250	6,453,750	3,148,653	3,207,320	58,670
Antiques, etc.	4,618,025	4,704,070	86,050	20,078	20,452	374
Others	14,777,680	15,053,024	275,360	67,171	68,423	1,252
Furniture	222,469,000	226,614,000	4,145,000	512,043	521,583	9,540
Furniture	33,592,819	34,218,714	625,895	108,364	110,383	2,019
Home Furnishings	46,273,552	47,135,712	862,160	171,384	174,577	3,193
Store/Office Equip.	35,150,102	35,805,012	654,910	73,229	74,594	1,364
Music Instr./Suppl.	9,566,167	9,744,402	178,235	47,831	48,722	891
Radios,TV, etc.	97,886,360	99,710,160	1,823,800	111,235	113,307	2,073
Transportation	861,888,000	877,947,000	16,060,000	2,824,722	2,877,353	52,634
New/Used Vehicles	301,660,800	307,281,450	5,621,000	754,152	768,204	14,053
Tires, Batt., Prts.	380,092,608	387,174,627	7,082,460	1,583,719	1,613,228	29,510
Marine Sales/Rentals	45,680,064	46,531,191	851,180	123,460	125,760	2,300
Auto/Truck Rentals	134,454,528	136,959,732	2,505,360	363,391	370,161	6,771
Drugstore	523,878,000	533,640,000	9,761,000	513,606	523,176	9,570
Apparel	558,325,000	568,729,000	10,403,000	1,549,102	1,577,970	28,864
Men's and Boy's	73,140,575	74,503,499	1,362,793	182,851	186,259	3,407
Women's and Girl's	185,363,900	188,818,028	3,453,796	500,984	510,319	9,335
Infants	11,724,825	11,943,309	218,463	39,083	39,811	728
Family	155,214,350	158,106,662	2,892,034	620,857	632,427	11,568
Shoes	116,689,925	118,864,361	2,174,227	132,602	135,073	2,471
Jeans/Leather	2,233,300	2,274,916	41,612	7,444	7,583	139
Tailors/Uniforms	10,049,850	10,237,122	187,254	50,249	51,186	936
Others	3,908,275	3,981,103	72,821	15,032	15,312	280
Hardware	564,784,000	575,308,000	10,524,000	2,301,479	2,344,365	42,885
Hardware	273,355,456	278,449,072	5,093,616	994,020	1,012,542	18,522
Lawn/Seed/Fertil.	10,730,896	10,930,852	199,956	31,561	32,150	588
Others	280,697,648	285,928,076	5,230,428	1,275,898	1,299,673	23,775
Vehicle Service	734,147,000	747,827,000	13,679,000	1,787,268	1,820,572	33,301
Gasoline	249,609,980	254,261,180	4,650,860	172,145	175,353	3,207
Garage, Repairs	484,537,020	493,565,820	9,028,140	1,615,123	1,645,219	30,094
Miscellaneous	1,098,709,000	1,119,182,000	20,472,000	4,387,743	4,469,505	81,758
Advert. Signs, etc.	17,579,344	17,906,912	327,552	63,925	65,116	1,191
Barber/Beauty shop	67,021,249	68,270,102	1,248,792	335,106	341,351	6,244
Book Stores	50,540,614	51,482,372	941,712	280,781	286,013	5,232
Bowling	25,270,307	25,741,186	470,856	252,703	257,412	4,709
Cig./Tobacco Dealer	7,690,963	7,834,274	143,304	15,382	15,669	287
Dent./Physician Lab	43,948,360	44,767,280	818,880	135,226	137,745	2,520
Florist/Nurseries	82,403,175	83,938,650	1,535,400	193,890	197,503	3,613
Laundry, Dry Clean	37,356,106	38,052,188	696,048	124,520	126,841	2,320
Optical Goods/Opt.	26,369,016	26,860,368	491,328	75,340	76,744	1,404
Photo Sup./Photog.	75,810,921	77,223,558	1,412,568	216,603	220,639	4,036
Printing	88,995,429	90,653,742	1,658,232	323,620	329,650	6,030
Paper/Paper Prod.	47,244,487	48,124,826	880,296	236,222	240,624	4,401
Gifts/Cards/Novel.	157,115,387	160,043,026	2,927,496	523,718	533,477	9,758
Newsstands	8,789,672	8,953,456	163,776	17,579	17,907	328
Video Rent/Sales	142,832,170	145,493,660	2,661,360	714,161	727,468	13,307
Others	219,741,800	223,836,400	4,094,400	878,967	895,346	16,378
TOTAL	7,176,416,000	7,310,136,000	133,718,000	22,868,486	23,294,603	426,114

*Developed by The Chesapeake Group, Inc., 2022,

PLANNING REVIEW

PLAN REVIEW CENTER REPORT

Planning Review

September 16, 2024

JZ23-09 NOVI-TEN PRO

Zoning Map Amendment No. 18.740

PETITIONER

Novi Ten Associates

REVIEW TYPE

Revised Formal PRO Plan

Rezoning Request from OS-1 Office Service and I-1 Light Industrial to Low-Density Multiple Family RM-1 and B-2 Community Business with a Planned Rezoning Overlay

PROPERTY CHARACTERISTICS

Section	26	
Site Location	South of Ten Mile Road, East of Novi Road;	
Site School District	Novi Community School District	
Current Site Zoning	OST, Office Service Technology	
Proposed Site Zoning	RM-1, Low-Density Multiple Family	
Adjoining Zoning	North	I-1 Light Industrial and I-2 General Industrial
	East	I-1 Light Industrial
	West	OS-1, Office Service and B-1 Local Business
	South	RM-1, Low-Density Multiple Family with PRO
Current Site Use	Vacant	
Adjoining Uses	North	Warehouse, Machine suppliers, Contractors, Software/Computer services, Outdoor storage
	East	Vacant, Railroad ROW
	West	Pharmacy, Dental Office
	South	Ridgeview Villas multiple family residential
Site Size	34 acres proposed for rezoning: 6.97 to B-2 and 27 to RM-1	
Parcel ID's	50-22-26-101-024, 50-22-26-101-028 (portions)	
Plan Date	June 17, 2024	

PROJECT SUMMARY

The subject property is located on the south side of Ten Mile Road, east of Novi Road in Section 26 of the City of Novi. The property to be rezoned totals about 34 acres. About 27 acres is proposed to be rezoned to RM-1, Low-Density Multiple Family. The applicant is proposing to develop 71-unit multiple-family residential units in 14 townhouse-style buildings (2-story) on a portion, while preserving 15.87 acres as a natural area. To the west and north of the residential area, 6.97 acres is proposed to be rezoned to B-2, Community Business. The commercial area would be developed with approximately 35,900 square feet of restaurant and retail uses. Three new access points to Ten Mile Road would be constructed – one for the residential section and two for the commercial portion. The commercial piece would also utilize the existing driveway shared with the dental office. A pocket park on the eastern side of the property would have a separate access drive from 10 Mile. The applicant is requesting to rezone with a Planned Rezoning Overlay.

PRO OPTION

The PRO option creates a "floating district" with a conceptual plan attached to the rezoning of a parcel. As part of the PRO, the underlying zoning is proposed to be changed (in this case from OS-1 and I-1 to RM-1 and B-2), and the applicant submits a detailed conceptual plan for development of the site, along with site-specific conditions relating to the proposed improvements. After Staff and consultant review, the proposed request goes through initial review by the Planning Commission and City Council to review and comment on whether the project meets the requirements of eligibility for a PRO. The applicant can then make any changes to the Concept Plan based on the feedback received and resubmit for formal review. The Planning Commission holds a public hearing and makes a recommendation to City Council. The City Council reviews the Concept Plan, and if the plan receives tentative approval, it directs the preparation of an agreement between the City and the applicant, which also requires City Council approval. Following final approval of the PRO concept plan and PRO agreement, the applicant will submit for Preliminary and Final Site Plan approval under standard site plan review procedures. If development is not commenced within two years from the effective date of the PRO Agreement it will expire, unless otherwise agreed to by the parties.

RECOMMENDATION

Staff has noted concerns about the proposed residential uses' compatibility with the heavy industrial zoning to the north, inconsistency with the recommendations of the Master Plan's Future Land Use Map, and the estimated increase in traffic. However, most of those concerns have been eased as the applicant has eliminated some of the screening issues, changed the request from B-3, General Business to B-2, Community Business and eliminated auto-oriented uses, and provided conditions that will represent an overall benefit of the project. The number of daily trips are also much closer to the traffic that would be expected from development under the current zoning designations since the commercial area was reduced from 60,000 square feet to 36,000 square feet. The proposal provides community benefits that would not be possible to achieve in the absence of the Planned Rezoning Overlay. **Planning Staff recommends approval to move forward to Planning Commission and City Council consideration of the PRO request.**

PROJECT HISTORY

Conceptual documents for the project were submitted and reviewed by City staff and consultants in a pre-application submittal in July 2021. Comments were provided on the information submitted based on compliance with the Zoning Ordinance and City Codes, but no recommendations for approval were made at that time. Since then, a revised Planned Rezoning Overlay ordinance was adopted by City Council.

In March 2023, the Initial PRO Concept Plan was submitted for review. Staff determined that several aspects of the B-3 component did not meet the standards of the PRO Ordinance, as there were no detailed plans, use or size restrictions, or any other conditions presented that would provide an overall benefit to the public that would outweigh the detriments. As presented at that time, the B-3 rezoning would not be eligible for the optional rezoning with Planned Rezoning Overlay.

Since then, the applicant submitted a revised concept plan in October, 2023 with more details on the (then proposed) B-3 portion of the site, clarification of benefits and deviations, and additional area to be rezoned to RM-1 rather than remaining I-1 Light Industrial. Based on comments received from staff on that review, the applicant asked to have their full traffic study reviewed by the City's consultant, and have again submitted revisions to their concept plan.

On February 21, 2024, a public hearing was held and the Planning Commission offered initial feedback on the proposal. Those comments are summarized below. On April 8, 2024, City Council considered the request and provided feedback to the applicant. Those comments are also summarized on the following pages.

PLANNING COMMISSION

The Planning Commission held a Public Hearing on February 21, 2024, to review and make comments on the proposal's eligibility for using the Planned Rezoning Overlay option. Comments made at that time are reflected in the meeting minutes and are summarized here:

- The proximity of the railroad tracks crossing 10 Mile Road just east of this site poses some concerns. When the train passes through, or sometimes stops on the tracks, traffic on 10 Mile Road can get very backed up. Additional traffic in this area could make that worse.
- The applicant should provide clear depictions of what could be developed under the current I-1 District, to show what development might occur if the rezoning is not approved.
- The applicant should clearly show how stormwater detention system will work to alleviate concerns residents raised regarding flooding.
- More woodland replacement credits could be planted on-site to provide more screening between the residents to the south.
- The proposal has a very small amount of wetland impact (0.1 acre) and a large amount of wetland (15.87 acres) is planned to be permanently protected in a conservation easement.
- The residential use being proposed next to the Ridgeview development would be better in the long run to have compatible zoning rather than an industrial use adjacent to residential.
- There were questions about the existing public sidewalk easement that was granted as a public amenity when the Ridgeview PRO was approved, and it could be a nice amenity to be able to walk to the Novi Athletic Club or the dog park or up to the businesses along 10 Mile Road. However, signage might be needed to distinguish the private sidewalks from the public portion in Ridgeview.
- The proximity of the proposed pickleball courts to residents caused concerns. They tend to make a lot of noise and should be located a good distance away from homes.
- The commercial area should not be another strip mall and the project should be designed avoid it looking like one. The individual buildings are laid out in a manner different from a strip retail center.
- Data should be provided related to whether trails in proximity to neighborhoods lead to an increase in crime, as many residents were suggesting.
- The applicant should provide data on the occupancy rate of townhomes and retail/restaurant businesses that might occupy the commercial buildings so they can make their decisions based on the expected viability of the development. The data that has been provided up to now is rather dated.
- Given the concerns about traffic in this area, there are serious concerns about the drive-thru restaurant proposed, and whether there was enough consideration to ensure traffic from that use would back up onto 10 Mile.

CITY COUNCIL

The City Council provided feedback at its meeting on April 8, 2024, on the proposal's eligibility for using the Planned Rezoning Overlay option. Comments made at that time are reflected in the meeting minutes, and comments are summarized here:

- The pickleball courts do not seem to be right for this location, and perhaps the applicant should consider a pocket park for that area instead.
- Pathways connecting two neighborhoods have been a point of resistance for residents for a long time, and the trail behind the homes on the south side would likely receive complaints from the owners of those units. Maybe if they had been developed at the same time that

would have worked. Other members thought the trail connection would be seen as a positive given time.

- Developments for owners are preferable over those for renters.
- Homes that provide first-floor living opportunities are needed in the city, as is heard repeatedly in the Older Adult Needs Committee.
- To accommodate the anticipated traffic demand, there should be coordination between construction of the traffic improvements on 10 Mile at the same time as the development construction. You wouldn't want new residents living there before those improvements are finished.
- Given the area is adjacent to the floodplain, the applicant should make it very clear how the stormwater management system is going to mitigate any risk of flooding to the downstream occupants.
- Screening between the residential development to the south was a concern, and the applicant should show how the existing and proposed trees would provide a buffer between the developments. A rendering showing the perspective from the Ridgeview site would be helpful.
- Screening along 10 Mile was also mentioned as a concern.
- The preservation of the wetland/floodplain area was seen as a positive, especially since this area is part of the headwaters of the Rouge River.
- Energy efficiency, including solar panels or geothermal heating options, good windows and insulation, etc. should all be taken into consideration in the building of these projects.
- The applicant should consider reducing the number of units to reduce the impact on the existing residential development and preserve more open space. The housing should also be similar to the housing to the south.
- The development of the residential and commercial portions of the project should be completed concurrently.
- There was concern about the drive-thru restaurant use shown on the plans, which doesn't seem appropriate for this area. The applicant was asked to consider B-2 uses only, and also restrict certain uses that are not appropriate.
- Along the 10 Mile Road frontage, there appears to be a lot of parking lot area and it would be more interesting to see the buildings closer to the road or something more creative.

The applicant has revised their response letter to directly address the issues raised by the Planning Commission and City Council.

REVIEW COMMENTS

This project was reviewed for conformance with the Zoning Ordinance with respect to Article 3 (Zoning Districts), Article 4 (Use Standards), Article 5 (Site Standards), Section 7.13 (Amendments to Ordinance) and any other applicable provisions of the Zoning Ordinance. **Please see the attached chart for additional information pertaining to ordinance requirements.** Items in **bold** below must be addressed and incorporated as part of future submittals or in the PRO Agreement:

1. Supporting Documentation: The applicant has provided the following studies as part of their application packet:
   a. **Narrative:** The statement provided indicates that the proposed rezoning allows for development of a walkable community that will connect existing residents to the south to a commercial destination, and new residents with a pathway network within the site and to nearby destinations. The off-site pedestrian connections, such as direct connections to the River Oaks Apartments, as shown on Sheet P.4, are intended to be coordinated as a part of the project, and built by the applicant.

      The narrative statement also notes the conditions and deviations proposed for the project, as well as public benefits. Those are detailed later in this review.

b. **Community Impact Statement**: The statement provided was revised March 11, 2024, and the applicant has provided more recent data as requested. The statement anticipates the proposed uses would have a minor impact on City services, roads and utilities, and environmental features. Positive social and economic impacts are anticipated with increased property tax collections and activating an area of the community.

c. **Rezoning Traffic Impact Study:** The revised submitted study (updated March 11, 2024) notes that the change of use will result in a modest increase in traffic on the local road network compared to likely development under the current zoning. The anticipated daily trips are 2,970 from the proposed uses, whereas the potential uses under the existing zoning is 2,566 trips (16% increase). However, the proposed mix of uses is estimated to generate approximately 35% fewer morning peak hour trips compared to potential development under the existing zoning, and about 1% fewer afternoon peak hour trips. The applicant indicates that they intend to complete the following improvements identified in the study to mitigate the traffic impacts when the commercial portion of the project is developed:

   - *Widen eastbound 10 Mile Road to two through lanes, ending with a right-turn deceleration lane at the site's easternmost residential driveway.*
   - *Widen westbound 10 Mile Road to two through lanes west from the 3rd site driveway to help provide additional capacity for outbound site traffic.*
   - *Extend the center left-turn lane along 10 Mile Road from where it currently ends at Catherine Industrial Road to service all commercial driveways.*

   The applicant will need to coordinate improvements with the Road Commission for Oakland County as 10 Mile Road is under its jurisdiction.

d. **Commercial Market Analysis:** The applicant has previously provided a Market Feasibility Analysis for Commercial Development prepared by The Chesapeake Group, Inc. updated August 7,2024. The report indicates there will be a growth in the number of homes and income for Novi residents, which will increase sales to $94 million from 2021-2027. This would support an additional 229,000 square feet of retail goods and services by 2027. The report specifically points out that while most commercial establishments are appropriate for this site, vehicle-oriented purchase and service activity should be excluded based on the goal to enhance walkability of the area. *"Collectively, with the enhanced linkages to existing anchors, the food and food service composition of much of the activity on the site, and the proposed adjacent other housing development with direct pedestrian linkages to the site, the commercial will act as a "village center" service the neighboring residential and anchor activity."* The report notes that survey results from households in the area reveal that safety and walkability are the two most important issues for choosing where to live.

e. **Wetland Delineation Reports:** Prepared by Niswander Environmental, dated February 2021, the report covers the area of the RM-1 residential site. Five wetland areas were identified, including 3 small areas that are proposed to be impacted. A separate report prepared by Niswander Environmental, dated June 2023, includes the Commercial area of the site. Three small wetland areas (0.12-acre total) that would be impacted, and one large wetland/floodplain surrounding Chapman Creek, which is not proposed to be impacted.

f. **Sign Location Plan:** Detail of signage on sheet 3 of Civil drawings. The sign location plan is provided in the binder of materials, and notes the change of wording needed for each sign. **The sign locations and sign details met the requirements of the Site Plan & Development Manual, and signage has been posted on the site.**

2. Intent of the Commercial District: It is the applicant's stated goal to create a Walkable Community, with the commercial area serving as a village center "for functional life needs and

recreation." Previously the applicant was asked to consider the B-2 Community Business district, which would be more consistent as it is "established to maintain a more pedestrian-friendly environment and to foster a physical development pattern that is well-planned, supportive of moderately intense commercial uses, and aesthetically appealing from both abutting thoroughfares and from within the district." The uses permitted in that district would be more suited to a village center. **The applicant has revised the request to rezone from the previously requested B-3 District to the B-2 District. In addition, they propose to prohibit the following uses: Hotel/Motel, Gas Station, Automobile Repair, Car Wash, Marijuana sales, Check Cashing, and Pawn Shop. Marijuana sales are not permitted in the City of Novi. By changing to the B-2 District, Automobile repair/service/maintenance uses and car washes would not be permitted.**

3. Land Division: The applicant proposes to rezone a portion of two larger parcels. It appears that the applicant intends to create three new parcels. Legal descriptions of the three parcels have been provided.

4. Density: In the RM-1 district, low-rise multiple family residential units are permitted, with the maximum density allowed based on the size of the proposed dwelling units. The applicant indicates all 71 proposed units will be three-bedroom units. The maximum density for 3-bedroom units is 5.4 dwelling units per acre (du/ac). This is also confirmed by the room count described in Section 3.8, which states the maximum number of rooms permitted is the land area in square feet divided by 2000. The applicant's room count is 284. For 284 rooms, the parcel size should be a minimum of 13.04 acres.

   The size of the RM-1 area is 27.07 acres for the townhome parcel. To calculate density, the net site area of a site should exclude any wetlands greater than 2 acres, and right of way. Sheet 6 (revised) shows the total area of Wetland D is 10.729 acres. The net site area of the RM-1 development parcel as calculated by the applicant is 15.74 acres (excludes all 11.33 acres of wetlands on the site). As a result, the density proposed is 4.5 dwelling units per acre (71 units/15.74 acres), which is within the ordinance standard.

5. Adjacent Industrial Uses: On the eastern side of the subject site, the proposed RM-1 residential uses will be directly opposite I-2 General Industrial zoning to the north. The I-2 district permits the most intensive industrial uses in the City, and "is designed primarily for manufacturing, assembling and fabrication activities including large scale or specialized industrial operations, whose physical effects will be felt to some degree by surrounding districts." Because of those likely physical effects, including vibration, noise, and odors, and heavy truck traffic, I-2 zoning has historically not been permitted adjacent to residential uses. Currently the uses on the north side of 10 Mile in the I-2 district include building and landscape contractors, instructional and recreation centers, a metal machinery supplier, outdoor storage yards of building supplies and heavy machinery, and an office building. Other uses permitted in the I-2 district could replace those uses in the future, including auto engine and body repair shops, freight/trucking facilities, concrete operations, junkyards, and other production and manufacturing uses. Here and elsewhere in the city, I-2 areas are often separated from residential uses by railroad tracks, or by transitional and less intense zoning districts. Rezoning the property on the south side of Ten Mile to residential might further limit the industrial uses that are currently permitted on the north side of Ten Mile Road and/or require additional landscaping requirements if the industrial uses redevelop per Section 4.57 of the Zoning Ordinance. **The plan shows landscaped berms along the south side of Ten Mile Road (8-10 feet high on the west, 4-6 feet high on the east of the entrance drive) which would partially buffer the residential units from the existing industrial uses.**

6. Usable Open Space: The applicant shows the usable open space for the residential portion of the project is a 50-foot wide area along the southern edge of the property, and indicates an 8-foot pathway in a public easement within it. **The pathway was previously shown as all concrete, however the section that extends east on the south side of the units is now shown as gravel (but**

a note indicates it may be paved if the City wishes). Staff would prefer a concrete path. Also included is the 0.4 acre park on the west side (between the residential and retail uses – a gazebo and picnic tables, as well as a playground amenity indicated), and the pocket park on the northeast side of the site. **The total usable open space proposed is 107,423 square feet, or 2.47 acres, which exceeds the amount required by the ordinance by 6.5 times.**

7. Wetland Impact: Wetland delineation was originally only completed for the RM-1 portion of the site. A wetland delineation report dated June 2023 evaluated the B-2 commercial area, and appears to show 3 more small wetland areas. The Wetland impacts are now quantified on Sheet 6, including buffer disturbance. The plans show a total wetland impact area of 0.12-acre, which is below the City's threshold to require mitigation.

8. Non-Motorized Access: The plan proposes the required 8-foot sidewalk along the frontage of 10 Mile Road, and 5-foot sidewalks on both sides of the private drive. Additional 8-foot-wide concrete and gravel pathways are proposed along the south side of the project, connecting to the commercial portion on the west side, the existing stub path at Ridgeview of Novi to the south, and continuing along the southern edge of the property and back up to 10 Mile Road (approximately 1,900-2,000 linear feet total). The path largely follows the floodplain line. In some areas it appears there are steep grades – the applicant's engineer should verify whether the pathway will be ADA accessible or will encounter any issues with constructability due to grading, flooding, woodland tree impacts, etc. **If the general public would be permitted to use the trails, an easement would be needed to be provided to permit such use – a 12-foot-wide public easement is indicated on the plans. The applicant would be responsible for maintaining the pathway not in the public right of way. This would be included as a condition within the PRO Agreement. In the applicant states that the two pathway access points to River Oaks West would also be constructed. This would be dependent on them obtaining easements from that property owner.**

9. Plan Review Chart: **The attached chart provides additional comments on many of the Ordinance review standards. Please refer to it in detail.**

10. Other Reviews:
    a. **Engineering:** Engineering indicates no objection to the PRO Plan, with additional comments to be addressed in the Site Plan process. Negative impacts to public utilities are not expected with the requested change to residential and commercial use.
    b. **Landscape:** Landscape recommends approval of the PRO Plan. There are some deviations required that are not supported, but these could be corrected during the Site Plan stage.
    c. **Traffic:** Traffic review notes that the applicant would need a deviation for the parking areas on the major drive for the RM-1 area. An opposite-side driveway spacing waiver is also likely to be required. The revised traffic study shows that the proposed rezoning would result in fewer vehicle trips during peak hours compared to possible development under current zoning.
    d. **TIS Review: AECOM reviewed the revised traffic study and recommended approval with the mitigations/improvements proposed.** Based on the reduction in the commercial area from 60,000 to 36,000 square feet, the total daily trip generation was reduced from 6,560 trips to 2,970 trips. Therefore, the overall daily trip generation is improved for the proposed project, and is about 16% higher than the estimated trips for potential development under the existing zoning (2,566 trips). Compared to potential development under the existing zoning, the study indicates "35% less morning peak hour trips and 1% less afternoon peak hour trips."
    e. **Woodlands:** The tree removal plan proposes a total of 484 tree removals requiring 927 Woodland Replacement Credits, which will require a Woodland Permit. The plans show 215 credits to be planted on site, and 712 credits paid into the Tree Fund. The project complies with the Woodland Protection Ordinance.

f. **Wetlands:** The Wetland review recommends approval. The plans show a total wetland impact of 0.12-acre, which will require a Wetland Permit, but does not meet the threshold for mitigation. A wetland buffer impact of 0.81-acre is also proposed. The project complies with the Wetland and Watercourse Protection Ordinance.

g. **Façade:** Façade notes that the residential elevations provided are not compliant with ordinance standards in some areas where the brick component is under the minimum by a small amount. A Section 9 waiver would be supported. The Commercial building elevations are in full compliance with the Façade Ordinance, and the amount of brick-stone significantly exceeds the 30% required.

h. **Fire**: Fire recommends conditional approval if comments are addressed in site plan submittals.

LAND USE AND ZONING: FOR SUBJECT PROPERTY AND ADJACENT PROPERTIES

Figure 1: Current Zoning

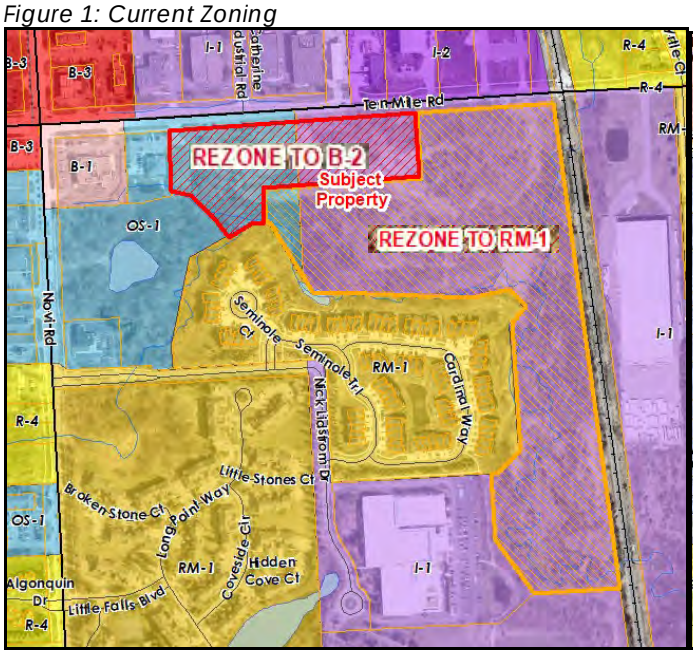
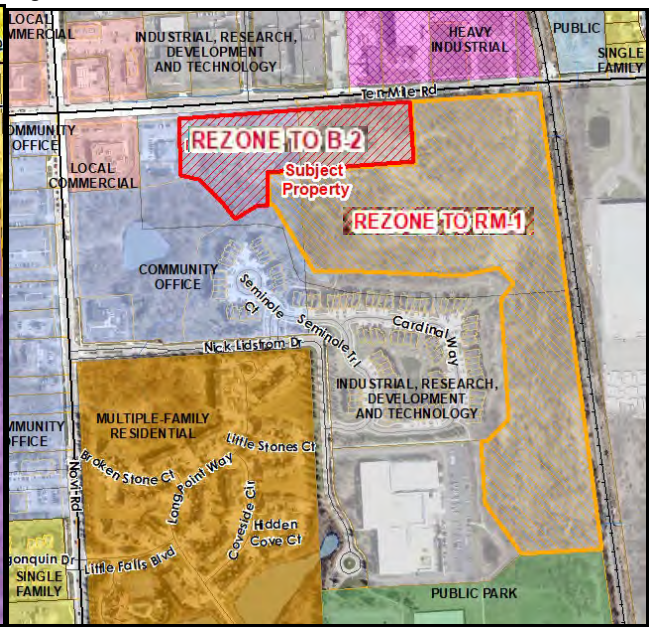


Figure 2: Future Land Use



The following table summarizes the zoning and land use status for the subject property and surrounding properties.

	Existing Zoning	Existing Land Use	Master Plan Land Use Designation
Subject Property	OS-1 Office Service I-1 Light Industrial	Vacant	Industrial Research Service and Technology; Heavy Industrial (Uses consistent with I-1 and I-2, respectively)
Northern Parcels	I-1 Light Industrial I-2 General Industrial	Warehouse, Contractors, Outside Storage, Office	
Eastern Parcels	I-1 Light Industrial	Vacant	Industrial Research Service and Technology
Western Parcels	OS-1: Office Service	Dental Office; Vacant	Community Office
Southern Parcels	RM-1 with PRO	Multifamily residential	Community Office Industrial Research Service and Technology

Compatibility with Surrounding Land Use

The subject property is located along the south side of Ten Mile Road and east of Novi Road. The north side of Ten Mile Road is developed with office, warehouse, outdoor storage and other industrial uses. The area to the south is developed as a multiple-family townhouse development, Ridgeview of Novi, which was approved as a Planned Rezoning Overlay in 2015. To the west is a dental office, and the remaining vacant portion of land owned by the applicant, which fronts on Novi Road. On the east side of the project is the remaining land owned by the applicant, which abuts the railroad tracks and contains a large area of wetland and floodplain associated with the Middle Rouge River. The southern portion is now proposed for rezoning to RM-1, although it appears unlikely that it could ever be developed due to the floodplain (See Figure 4 for floodplain area)**.**



Figure 3: Names of surrounding developments and businesses

The most noticeable impact of the proposed development on adjacent properties and 10 Mile Road users would be the increase in traffic, as shown in the applicant's traffic study. However, compared to potential development under the current zoning, there is a small overall increase in daily trips and a 35% decrease during the morning peak hour. See additional comments regarding the Rezoning Traffic Study on page 3 and in AECOM's review letter attached.

The residential use to the south may benefit from having a similar residential use to the north rather than an industrial development, as well as convenient access to commercial goods and services. The residential units are proposed to be set back over 100 feet from the southern property line, which is the same setback an I-1 use would be required to have on this parcel under the current zoning.

The applicant's narrative notes the commercial area will be developed with "*new end users such as neighborhood sidewalk café, small market, etc.*" The applicant has changed the proposed district from B-3 General Business to B-2 Community Business, which will preclude the development of drive-thru restaurants, auto dealerships, mini-lube and oil change establishments, car washes, tattoo parlors, and microbreweries. Other uses the applicant agrees to exclude include fueling stations and hotel/motels, and marijuana facilities.



Figure 4: FEMA Floodplain areas

Comparison of Zoning Districts

The following tables provide comparisons of the current and proposed zoning classifications. The proposed B-2 district is compared to OS-1 (although there is some area proposed for B-2 that is currently I-1) and the proposed RM-1 area is compared to the current I-1 zoning. It is not a direct comparison, given that the character of the districts are clearly distinct from each other. It represents a change of use from Office to Commercial/Retail, and Industrial to Residential. The requirements for building and parking setbacks, height, buffering and lot coverage are similar for the OS-1 and B-3 districts.

	OS-1 (EXISTING)	B-2 (PROPOSED)
Intent	The OS-1, Office Service District is designed to accommodate uses such as offices, banks, facilities for human care and personal services which can serve as transitional areas between residential and commercial districts and to provide a transition between major thoroughfares and residential districts.	The B-2, Community Business district is characterized by an integrated cluster of establishments served by a common parking area. The district is meant to establish a more pedestrian-friendly environment that is well-planned, supportive of moderately intense commercial

	OS-1 (EXISTING)	B-2 (PROPOSED)
		uses, and aesthetically appealing.
Principal Permitted Uses	Professional and medical office; Facilities for human care; Financial institutions with accessory drive-in facilities; Personal service establishments; Parking lots; Places of worship; Publicly owned and operated parks, parkways and outdoor recreational facilities; Public or private health and fitness facilities and clubs	Retail business and business service uses; Business establishments performing services on premises, professional services; Professional services; Dry cleaning, Service establishments of an office showroom or workshop nature; Restaurants (sit-down), banquet facilities or other food and beverage; Day care and adult day care centers; Private clubs, fraternal organizations and lodge halls; Places of Worship; Hotels and motels; Professional and medical offices **See Section 3.1.11.B for full list
Special Land Uses	Mortuary establishments; Publicly owned buildings, telephone exchange, and public utility offices; Day care and adult day care centers; Public or private indoor and private outdoor recreation	Fueling Station; Veterinary hospitals or clinics; Sale of produce and seasonal plant materials outdoors;
Lot Size	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 requirements as set forth in this Ordinance.	2 acres
Lot Coverage		
Building Height	30 feet	30 feet or 2 stories, whichever is less
Building Setbacks	Front: 20 feet Rear: 20 feet Side: 15 feet Exterior side yard setbacks same as front yard	Front: 40 feet Rear: 30 feet Side: 30 feet Exterior side yard setbacks same as front yard
Parking Setbacks See 3.6.2. for additional conditions	Front: 20 feet Rear: 10 feet Side: 10 feet Exterior side yard setbacks same as front	Front: 20 feet Rear: 10 feet Side: 10 feet Exterior side yard setbacks same as front

	I-1 (EXISTING)	RM-1 (PROPOSED)
Intent	The I-1 district is designed so as to primarily accommodate research, office, and light industrial uses, including wholesale activities, warehouses, and industrial operations whose external, physical effects are restricted to the area of the district and in no manner negatively affect any of the surrounding districts.	The RM-1 district is designed to provide sites for multiple-family structures, and related uses, which will generally serve as zones of transition between the non-residential districts, major thoroughfares and freeways and single family districts.

	I-1 (EXISTING)	RM-1 (PROPOSED)
Principal Permitted Uses	Professional office, office sales and service, medical offices; Publicly owned and operated parks, parkways and outdoor recreational facilities; Public or private health and fitness facilities and clubs; Research & Development, technical training and design of pilot/experimental products; Data processing & computer centers; Warehousing & wholesale establishments; Manufacturing; Industrial office sales, service and industrial office related uses; Trade or industrial schools; Laboratories experimental, film or testing; Greenhouses; Public utility, telephone exchange, electrical transformer stations and substations, etc. Public or private indoor, private outdoor recreation facilities; Pet boarding facilities; Veterinary hospitals and clinics; Motion picture, television, ratio and photographic production facilities; **See attached copy of Section 3.1.18.B for full list	Multiple-family dwellings; Independent and congregate elderly living facilities; Two-family dwellings; Shared elderly housing; One-family dwellings; Farms & greenhouses; Public parks, parkways, and outdoor recreation; Cemeteries; Home occupations; Family day care homes
Special Land Uses	See attached copy of Section 3.1.18.C, which would not be permitted on the subject property as it is adjacent to residential	Convalescent homes, assisted living facilities, hospice care facilities and child care centers
Lot Size	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 requirements as set forth in this Ordinance.	See Section 3.8.1
Lot Coverage		25%
Building Height	40 feet	35 ft or 2 stories, whichever is less
Building Setbacks	Front: 40 feet Side: 20 feet Rear: 20 feet **Setback increased to 100-feet where adjacent to residential district	Front: 75 feet Rear: 75 feet Side: 75 feet Exterior side yard setbacks same as front
Parking Setbacks See 3.6.2. for additional conditions	Front: 20 feet Rear: 10 feet Side: 10 feet Exterior side yard setbacks same as front **Setback increased to 100-feet where adjacent to residential district	Front: 75 feet Rear: 20 feet Side: 20 feet Exterior side yard setbacks same as front
Usable Open Space	Not applicable	200 square feet per unit

DEVELOPMENT POTENTIAL

The land is currently vacant. Development under the current OS-1 and I-1 zoning could result in a substantial amount of various types of Office, Warehouse, or Research & Development buildings being constructed on the upland area. On sheet P.2 of the Concept Plan provided, the applicant shows a 54,000 square foot office building on the OS-1 portion, and 291,200 square foot industrial building. However, this plan has not been reviewed in detail to determine if it would comply with Ordinance requirements. The plan is not considered an approved site plan, as it hasn't been reviewed and approved by the Planning Commission.

In 2009, the applicant submitted a PRO Concept Plan proposing to rezone portions of the property to B-2 and the rest to OS-1. Within the B-2 commercial portion a 64,245 square foot Kroger grocery store was proposed, with an additional 26,000 square feet of additional B-2 uses. A neighborhood shopping center with 40,978 square feet, and 18,000 square foot medical office building were also proposed.

The current concept plan proposes a development of 71 units (density of 4.5 dwellings per acre) for a low-density multifamily development which is less than the 5.4 maximum density allowed for three-bedroom units in the RM-1 zoning district on 15.75 acres (343 total number of rooms allowed, 284 rooms proposed). The Master Plan for Land Use does not anticipate residential uses of this property, so no density guidelines are provided on the future land use plan.

2016 MASTER PLAN FOR LAND USE: GOALS AND OBJECTIVES

The proposed use is currently not recommended by the 2016 Master Plan for Land Use. The following objectives as listed in the Master Plan are applicable for the proposed development. **The applicant should consider revisions to the plan to comply with as many goals as possible. Please refer to staff comments in bold and revisions recommended in <u>bold and underline.</u>**

1. **General Goal: Quality and Variety of Housing**
    a. Provide residential developments that support healthy lifestyles. Ensure the provision of neighborhood open space within residential developments. **The development proposes the required sidewalks along the public and private streets, as well as a walking path behind the units that connect to the development to the south. A pocket park is proposed on the east side of the site, as well as two scenic overlook points to the east of Novi Athletic Club. The residential units would be within walking distance of several civic amenities as well as retail areas.**
    b. Safe housing and neighborhoods. Enhance the City of Novi's identity as an attractive community in which to live by maintaining structurally safe and attractive housing choices and safe neighborhoods. **The housing units would be evaluated for safety during the building permit review process and inspected by the City prior to occupancy. The units appear to offer an attractive housing option.**
    c. Maintain existing housing stock and related infrastructure. **The proposed plan does not remove any existing housing stock.**
    d. Provide a wide range of housing options. Attract new residents to the City by providing a full range of quality housing opportunities that meet the housing needs of all demographic groups including but not limited to singles, couples, first time home buyers, families and the elderly. **The for-sale units proposed would provide a low-maintenance housing option for buyers interested in a walkable context.**
2. **General Goal: Community Identity**
    a. Maintain quality architecture and design throughout the City. **The proposed elevations are mostly compliant with Façade Ordinance standards but would require a Section 9 waiver, which is supported. Please refer to the façade review letter.**
3. **General Goal: Environmental Stewardship**
    a. Protect and maintain the City's woodlands, wetlands, water features, and open space. **The concept plan proposes removal of regulated woodland trees and impacts to**

several small wetland areas (approximately 0.1 acre). The narrative indicates a 15.87-acre area will be preserved within a wetland/woodland conservation easement.

b. Increase recreational opportunities in the City. **The Concept plan proposes recreational opportunities for future residents and the general public, primarily in the form of a pedestrian path behind the townhome buildings. The path is shown in a public easement, so would be available to other users besides the residents. Details for the park area should also be provided. The narrative also indicates two nature overlook areas with benches would be provided in the area east of the Novi Athletic Club, as well as a trailhead area in the northeast corner of the property that would be available to the public.**

c. Encourage energy-efficient and environmentally sustainable development through raising awareness and standards that support best practices. **The applicant should consider sustainable, energy-efficient and best-practice design for site elements and building materials, such as LEED recommended strategies.**

4. General Goal: Infrastructure

a. Provide and maintain adequate water and sewer service for the City's needs. **Please refer to the Engineering memo. No concerns are noted.**

b. Provide and maintain adequate transportation facilities for the City's needs. Address vehicular and non-motorized transportation facilities. **The traffic study indicates that the surrounding road network will need some improvements to optimize the road network. The applicant has proposed to complete those improvements.**

5. General Goal: Economic Development / Community Identity

a. Ensure compatibility between residential and non-residential developments. **Please refer to comments about compatibility with surrounding development earlier in this review.**

MAJOR CONDITIONS OF PLANNED REZONING OVERLAY AGREEMENT

The Planned Rezoning Overlay process involves a PRO concept plan and specific PRO conditions in conjunction with a rezoning request. The submittal requirements and the process are codified under the PRO ordinance (Section 7.13.2). Within the process, which is initiated by the applicant, the applicant and City Council can agree on a series of conditions to be included as part of the approval which must be reflected in the Concept Plan and or the PRO agreement.

The PRO conditions must be in material respects, more strict or limiting than the regulations that would apply to the land under the proposed new zoning district. *Development and use of the property shall be subject to the more restrictive requirements shown or specified on the PRO Plan, and/or in the PRO Conditions imposed, and/or in other conditions and provisions set forth in the PRO Agreement.*

The applicant has listed the following benefits/conditions for development:

1. *"The complete east portion adjacent to the railroad tracks and the south 50-foot-wide strip along the wetland of the proposed PRO (15.87 acres of the 27.07 RM-1 rezoning) are being retained as a natural area with a conservation easement to preserve its existing marshland and wildlife. This natural area, with wetlands, wraps around the PRO and includes on the west end a proposed new 0.4-acre park/playground located between the proposed residential and retail sites. The proposed trail system, with its overlooks near the Novi Athletic Club becomes a usable and accessible community resource."* **This is a benefit to both residents and the environment to have additional natural resources preserved in perpetuity.**

2. *"To help achieve walkability and connectivity of the entire area, a trail system is being added which consists of new crushed limestone paths, overlooks, and existing sidewalks. This walkway system provides connectivity between surrounding existing residential areas and*

new proposed PRO residential area with all the marshland nature areas, the proposed pocket park, the Novi Athletic Club, Ice Arena, and Dog Park, and with the new proposed local (retail) along Ten Mile Road. The retail consists of the new proposed retail and restaurant areas, and the existing Walgreen's and dental office. New walkways and bike paths wind through the natural area, overlook 15.87 acre wildlife area and connect this PRO development to the recreation areas: The $3.2 million dollars worth of Novi 10 land previously donated to the city, initiated by Novi request (18 acres of land): For the Novi Arena Facility and the Novi Dog Park." **This is a benefit as future residents as well as the general public will have access to a pleasant area for walking that connects various community amenities. The City would prefer the pathway be concrete rather than crushed limestone.**

3. *"Two pocket parks are added: One added at the trail head on 10 Mile Road at the north end of the new conservation area. The second is on the west end of the trail townhouses to include playground equipment."* **This is a benefit as future residents as well as the general public will have access to the pocket parks and trails. The applicant states the trailhead area will be dedicated to the City. The applicant should clarify the property boundaries of the area that would be dedicated as it is not shown on the plan. It remains unclear if they will be providing amenities and responsible for maintaining it. There are no details currently provided.**

4. *"A planted plaza over 20 feet deep, with benches and other amenities is proposed to be continuous along the storefronts of the new local retail area including a variety of planter sizes and types with a variety of trees and flowers."* **This goes beyond what the ordinance requires and is considered an enhancement of the project area that could be used by any customers of the retail area.**

5. *Proposed use restrictions not permitting certain automotive and other business uses in the proposed B-2 commercial zoning (Sec. 3.1.12.B & C) are to be part of the PRO. Not permitted uses are:*
    a. *Vehicle Oriented Uses: gas/fueling station,*
    b. *Other excluded uses: Check cashing, Pawn shop, Hotel/motel (Marijuana sales already not permitted in the City of Novi will also be excluded by the PRO documents in case the city's law is changed to allow it in the future.)*

    This is an enhancement of the property as the City can be assured that the future tenants of the property will not include certain less desirable uses, and is more restrictive than the ordinance requires.

6. *EV Charging Stations will be located at each of the commercial buildings (8 indicated in total). Outlets for 240-volt EV chargers will be provided in each townhouse garage.*
    This is an amenity that goes beyond what the ordinance requires.

7. *Open Space (Section 3.1.7.D) the amount of open space provided for the RM-1 townhouses exceeds ordinance requirements.* **This is a benefit as future residents as well as the general public will have access to the trails and trailhead area.**

8. *Commercial Building Setbacks:*
    a. *Front: 40 feet required….101 feet provided*
    b. *Rear: 30 feet required….74 feet provided*
    c. *Side: 30 feet required…..88 feet provided*

9. *Residential Building Height* (Sec. 3.1.7.D)**:** 29 feet maximum proposed is more limiting than the 35 feet permitted. **This is a benefit as the buildings will be less obtrusive than the 35-feet otherwise permitted.**

10. *Commercial Building Height* (Sec. 3.1.12.D)*:* Twenty-three feet maximum proposed is more limiting than the 30 feet permitted. **This is a benefit as the buildings will be lower profile than the 30-feet otherwise permitted.**

11. *Residential Lot Coverage* (Sec. 3.1.7.D)**:** *25% maximum is permitted, 14% is proposed.* **This is a benefit as more permeable surface will be preserved, which allows stormwater to permeate and more green space is available.**

Staff notes the following additional conditions that may meet the standard of being more strict and limiting:

12. *Residential Setback (Sec. 3.1.7.D.):* The development standards of the RM-1 District require a minimum rear yard setback of 75 feet. The applicant proposes a greater setback of 100 feet minimum. **This benefits the neighborhood to the south as buildings are further away than the ordinance requires, with less of the existing trees to be cleared.**

13. *Residential Density (Sec. 3.1.7.D): In the RM-1 District, a development of 3-bedroom units can have up to 5.4 dwelling units per acre. This development proposes 4.5 dwelling units per acre.* **This is 17% more limiting than otherwise permitted in the district.**

14. *10 Mile Road Improvements:* The applicant states they will off-set their impacts on 10 Mile Road by constructing the following improvements:
    a. *Widen eastbound 10 Mile Road to two through lanes, ending with a right-turn deceleration lane at the site's easternmost residential driveway.*
    b. *Widen westbound 10 Mile Road to two through lanes west from the 3rd site driveway to help provide additional capacity for outbound site traffic.*
    c. *Extend the center left-turn lane along 10 Mile Road from where it currently ends at Catherine Industrial Road to service all commercial driveways.*

    As noted in the Engineering Review letter, these improvements will require the acquisition of Right of Way on the north side of 10 Mile Road, and the approval of those property owners, as well as the approval of the design by the RCOC.

ORDINANCE DEVIATIONS

Section 7.13.2.D.i.c(2) permits deviations from the strict interpretation of the Zoning Ordinance within a PRO agreement. These deviations must be accompanied by a finding by City Council that "***each Zoning Ordinance provision sought to be deviated would, if the deviation were not granted, prohibit an enhancement of the development that would be in the public interest, and that approving the deviation would be consistent with the Master Plan and compatible with the surrounding areas.***" Such deviations must be considered by City Council, who will make a finding of whether to include those deviations in a proposed PRO agreement. A PRO agreement would be considered by City Council only after tentative approval of the proposed concept plan and rezoning.

Staff has reviewed the applicant's Concept Plan in as much detail as possible to determine what deviations from the Zoning Ordinance are currently shown. The applicant may choose to revise the concept plan to better comply with the standards of the Zoning Ordinance, or may proceed with the plan as submitted with the understanding that those deviations would have to be approved by City Council in a proposed PRO agreement.

The following are Ordinance deviations that have been requested by the applicant *shown in italics*. **Staff comments are in bold.**

1. Building Orientation *(Sec. 3.8.2.D): deviation is requested for proposed residential building to not be configured 45 degrees to the property lines normally for aesthetic reasons. Most of the*

buildings are not on any main road and they front to a substantial irregular shaped 20-acre wetland nature area of a minimum 200 feet wide separation across from Toll's existing multifamily Ridgeview project. Also, please note, this is one of the most common easily granted variance requests: where layouts are dictated by natural land features such as two rivers and large canyon, not created by the applicant. **This deviation has been commonly requested and granted in both PRO development projects and in by-right multiple family site plan projects.**

2. Side and Rear Setbacks *(Sec 3.1.7.D and Sec 3.6.2.B): A Zoning Ordinance deviation is requested to reduce the side setback from 75 feet to 25 feet along the north property line for two residential buildings abutting the proposed commercial area (B-2). This has been granted elsewhere in the city and still includes screening between the residential and commercial. That screening is located on the residential edge of the zoning line that separates the residential from the commercial and functions with the same screening effect. (Only a small portion, at northwest corner being wall plus landscape, instead of berm.) Deviates from Section 5.5.3.A.ii but provides same screening, as it is located between the uses.*

3. Distance between Buildings *(Sec 3.8.2.H): A Zoning Ordinance deviation is requested to reduce the building separation distance from the calculated formula (resulting in 31-32.72 feet required) to a distance of 30 feet between all buildings.* **This deviation of less than 3 feet is considered minor and enables the layout of this project to fit within the available space while minimizing wetland and woodland impacts.**

4. Parking along Major Drives *(Sec. 5.10): A Zoning Ordinance deviation is requested to allow for perpendicular parking on a major drive.* **Angled and perpendicular parking is permitted on a minor drive, but not on a major drive; a total of 8 spaces of on-street perpendicular parking for guests is proposed the Major Drive in two locations. Not granting the deviation would result in no visitor parking space being provided.**

5. Major Drive Radius *(Sec. 5.10):* Deviation from the ordinance requirement for a minimum centerline radius of 100 feet, to allow the 85-foot radius shown at the western curve. **The reduced radius does not impede the fire truck access route, and may serve to slow traffic speeds, creating a safer roadway.**

6. Landscape Berms (Section 5.5.3.A.ii): *A Zoning Ordinance deviation is requested to not provide a 10 to 15-foot-high landscape berm on a proposed RM-1 district adjacent to an I-1 district. This deviation is requested to wave this requirement to preserve open viewing to the beautiful natural features instead of the usual berm screening that blocks the views from industrial.* **The berm would be unnecessary in this case as the adjacent I-1 area is east of the railroad tracks and would likely result in greater wetland and woodland impacts, as well as fill in the floodplain.**

7. Right-of-Way Landscaping (Section 5.5.3.B.ii): *A deviation for the lack the required street trees and berm along 10 Mile Road due to underground utilities.* **The required trees are to be provided elsewhere. This deviation is supported due to the utility conflicts.**

8. Adjacent to Public Rights-of-Way – Berm/Wall (Zoning Sec. 5.5.3.B.ii, iii)*:* The required 3-foot-tall berm is not proposed, however an alternative brick screening wall 3-feet in height is proposed. **This deviation is now supported with the screening wall.**

9. Building Foundation Landscaping (Zoning Sec 5.5.3.D): None of the commercial buildings meet the requirements for building foundation landscaping along the front side, and allow the planter landscaping to count toward foundation requirements. **However, Buildings A, C and D are only slightly deficient, so the waiver is supported. The applicant states Building B landscaping will be increased to lessen the deviation or eliminate it.**

10. Section 9 Waiver (Section 5.15): Proposed elevations for residential buildings have an underage of minimum required brick on all rear and some front facades (26-27% proposed, 30% minimum required) and an overage of Asphalt shingles (56% front side, 50% maximum allowed). **As the deviations are minor and do not adversely affect the aesthetic quality of the facades, the waiver is supported.**

11. Opposite-Side Driveway Spacing Waiver (Code of Ordinances, 11.216.d.1.d & e.): The Design and Construction Standards indicate a minimum of 150 feet is required between a new driveway and an existing "downstream" driveway. The proposed driveways are 105 feet and 118 feet. **The applicant indicates they have RCOC approval of the proposed driveway locations, however the City would also need to approve a waiver from its standards.**

12. Color Spectrum Management (Sec. 5.7.3.F): A recent amendment to the Zoning Ordinance has a requirement that light fixtures shall not have a Correlated Color Temperature (CCT) greater than 3000 Kelvin (K). The photometric sheets show light fixtures measuring 4000K. **Staff supports the deviation as the industry standard appears to be 4000K, and that level still represents a warm tone that is pleasing to the eye rather than a cool or unnaturally bright light.**

See other review letters for additional possible deviations to be addressed in future submittals. All deviations from the ordinance requirements shall be identified and included in PRO Agreement. Any additional deviations identified during Site Plan Review (after the Concept Plan and PRO Agreement is approved), will require amendment of the PRO Agreement.

APPLICANT'S BURDEN UNDER PRO ORDINANCE

The Planned Rezoning Overlay ordinance (PRO) requires the applicant to demonstrate that certain requirements and standards are met. The applicant should be prepared to discuss these items, especially in number 1 below, where the ordinance suggests that the enhancement under the PRO request would be unlikely to be achieved or would not be assured without utilizing the Planned Rezoning Overlay. Section 7.13.2.D.ii states the following:

1. *(Sec. 7.13.2.D.ii.a) The PRO accomplishes the integration of the proposed land development project with the characteristics of the project area in such a manner that results in an enhancement of the project area as compared to the existing zoning that would be unlikely to be achieved or would not be assured in the absence of the use of a Planned Rezoning Overlay.*
2. *(Sec. 7.13.2.D.ii.b) Sufficient conditions shall be included on and in the PRO Plan and PRO Agreement such that the City Council concludes, in its discretion, that, as compared to the existing zoning and considering the site specific land use proposed by the applicant, it would be in the public interest to grant the Rezoning with Planned Rezoning Overlay. In determining whether approval of a proposed application would be in the public interest, the benefits which would reasonably be expected to accrue from the proposal shall be balanced against, and be found to clearly outweigh the reasonably foreseeable detriments thereof, taking into consideration reasonably accepted planning, engineering, environmental and other principles, as presented to the City Council, following recommendation by the Planning Commission, and also taking into consideration the special knowledge and understanding of the City by the City Council and Planning Commission.*

IDENTIFYING BENEFITS TO PUBLIC RESULTING FROM THE REZONING AND THE PROPOSED DEVIATIONS

Section 7.13.2.D.ii states that the City Council must determine that the proposed PRO rezoning would be in the public interest and that the benefits to the public of the proposed PRO rezoning would clearly outweigh the detriments. The following benefits suggested by the applicant (*as listed in their narrative*) appear to qualify as public benefits as resulting from the development proposal:

1. *"The complete east portion adjacent to the railroad tracks and the south 50-foot-wide strip along the wetland of the proposed PRO (15.87 acres of the 27.07 RM-1 rezoning) are being retained as a natural area with a conservation easement to preserve its existing marshland and wildlife. This natural area, with wetlands, wraps around the PRO and includes on the west end a proposed new 0.4 acre park/playground located between the proposed residential and retail sites. The proposed trail system, with its overlooks near the Novi Athletic Club becomes a usable and accessible community resource."* **It would be beneficial to the City to have these wetland and woodland areas permanently protected within conservation easements. This area is covered by floodplain associated with the Walled Lake Branch of the Middle Rouge River, and Chapman Creek, so protecting the land around the streams would benefit the watershed and wildlife habitat. It is unlikely that this area would ever be proposed for development because of the floodplain.**

2. *"To help achieve walkability and connectivity of the entire area, a trail system is being added which consists of new crushed limestone paths, overlooks, and existing sidewalks. This walkway system provides connectivity between surrounding existing residential areas and new proposed PRO residential area with all the marshland nature areas, the proposed [pocket park], the Novi Athletic Club, Ice Arena, and Dog Park, and with the new proposed local [retail] along Ten Mile Road. The retail consists of the new proposed retail and restaurant areas, and the existing Walgreen's and dental office. New Walkways and bike paths that overlook 15.87-acre wildlife area and connect this PRO development to the recreation areas: The $3.2 million dollars worth of Novi 10 land previously donated to the city, initiated by Novi request (18 acres of land): For the Novi Arena Facility and the Novi Dog Park."* **The applicant will be arranging and conducting off-site improvements. Off-site easements would be required to do some of this work.**

15. *"Two pocket parks are being added: One added at the trail head on 10 Mile Road at the north end of the new conservation area. The second is on the west end of the townhouses to include playground equipment."* **No amenities or schematics have been shown for this area (formerly pickleball courts), and the parking spaces have been removed. Additional study of the area proposed for the trail head will be needed. The applicant states the trailhead area will be dedicated to the City. The applicant should clarify the property boundaries of the area that would be dedicated as it is not shown on the plan. It remains unclear if they will be providing amenities and responsible for maintaining it. There are no details currently provided.**

3. *A planted plaza over 20 feet deep, with benches and other amenities is proposed to be continuous along the storefronts of the new local retail area including a variety of planter sizes and types with a variety of trees and flowers.* **The planters and benches at the storefronts could be an attractive amenity which isn't found in many retail developments in Novi. This is an enhancement that goes beyond what the ordinance requires.**

4. The applicant also mentions a previous donation of 18 acres of land he made at the City's request, which was used to create the Novi Ice Arena and the Dog Park, and was not associated with any other development project proposed by the applicant. In his narrative, Dan Weiss states:

> *While this previous donation does not count as one of the NEW extra benefits required for PRO evaluation, it is in fact part of our same parent land parcel, from same owner, same family applicant and Novi is empowered to consider ALL relevant facts in their totality. And so accordingly, I hereby respectfully request that this prior 18-acre ($3.2 million dollar) land donation be recognized for its benefit to the City of Novi. While certainly not determinative, it should not be*

totally discounted either. Please further note, the reason this is mentioned lastly in the analysis is, as detailed above, even if this was no factor, this proposed project is, on its own, beneficial to the community and in conformance with sound urban planning and the city's stated goals, without any extra such benefits given to the city. And this application is not as some mere typical real estate developer but is from a demonstrated solid member of this community for over 40 years, having lived and worked here for over three generations, and caring about the welfare of the community. And we humbly ask for this project to please be approved expeditiously, as submitted here.

5. **The applicant should clarify whether the dedication of Right of Way along 10 Mile Road is also proposed. This could be an additional benefit to the public.**

This is a PRO in which the applicant seeks both a rezoning and a list of ordinance deviations. In Staff's opinion the proposed benefits to the City can be considered an enhancement to the area that provides benefits that outweigh the detriments.

NEXT STEP: PLANNING COMMISSION PUBLIC HEARING

Planning Commission will hold a public hearing on the rezoning request from OS-1 (Office Service) and I-1 (Light Industrial) to B-3 (General Business) and RM-1 (Multiple Family Low Rise Residential) with a Planned Rezoning Overlay. Following the public hearing, they will make a recommendation to City Council whether to approve or deny the request, or may postpone making a recommendation if they determine additional information or changes are needed.

The next available meeting date is October 30, 2024. Please let me know if you are interested in being placed on that agenda.

CITY COUNCIL CONSIDERATION

After the Planning Commission makes its recommendation, the PRO Concept Plan will be scheduled for consideration by the City Council. If the City Council grants tentative approval at that time, they will direct the City Attorney to draft a PRO Agreement describing the terms of the rezoning approval. Once the PRO Agreement has been drafted and approved by the applicant's attorney, it will return City Council for final approval.

If the applicant has any questions concerning the above review or the process in general, do not hesitate to contact me at 248.347.0484 or lbell@cityofnovi.org.



Lindsay Bell, *AICP,* Senior Planner

PLANNING REVIEW CHART: B-2 and RM-1 with PRO Rezoning

Review Date: July 18, 2024
Review Type: Formal PRO Submittal
Project Name: JZ23-09 Novi-Ten Mile
East of Novi Road, South of Ten Mile
Plan Date: June 17, 2024
Prepared by: Lindsay Bell, Senior Planner
E-mail: lbell@cityofnovi.org; **Phone:** (248) 347-0484

*Items in **Bold** need to be addressed by the applicant with next submittal. Items in **Underlined Bold** are possible deviations identified. Underlined items need to be addressed during the Site Plan phase. Italic items are to be noted.*

Item	Required Code	Proposed	Meets Code	Comments
Zoning and Use Requirements				
Master Plan (adopted July 27, 2017)	West: Community Office; East: Industrial, R&D, Tech	6.97 acres with 35,900 sf of commercial/office; 71-unit residential development with PRO overlay on 27.07 acres;	**No**	*Proposed rezoning is not consistent with the 2016 Master Plan*
Area Study	The site does not fall under any special category	NA	NA	
Zoning (Effective January 8, 2015)	OS-1 Office Service; I-1 Light Industrial	B-2 Community Business; RM-1 Low Density Low-rise Multi-Residential District	**No**	**Planned Rezoning Overlay proposed – see detailed comments in Planning Review letter**
Uses Permitted (Sec 3.1.21.B & C)	Office and Service Uses Sec. 3.1.21.B. - Principal Uses Permitted. Sec. 3.1.21.C. – Special Land Uses Permitted.	3 commercial buildings ~35,900 square feet shown for B-2 area (assumes restaurants and retail uses) Multiple Family Residential – 71 units	**TBD**	**B-2 use proposed - exclusions are gas station, auto repair, car wash, car sales, hotels & motels, marijuana sales, check cashing and pawn shop**
Phasing	Provide phases lines and detail description of activities in each phase	Applicant indicates Phasing not proposed	NA	
Planned Rezoning Overlay Document Requirements (Section 7.13.2 and SDM: Site development Manual)				
Written Statement (Section 7.13.2) The statement should include the following:	Statement of eligibility for PRO Approval: Describe the rezoning requested including uses proposed, justification for why it makes sense	Provided in narrative	**TBD**	
	How does the project constitute an overall benefit to the public that outweighs any material detriments or could otherwise be accomplished without	Provided in narrative	Yes	**See detailed comments in Planning Review letter**

Item	Required Code	Proposed	Meets Code	Comments
	the rezoning?			
	Deviations and Conditions proposed for inclusion in the PRO Agreement (i.e., Zoning Ordinance deviations, limitation on total units, height or uses, etc)	Some deviations and conditions proposed; Limitation on uses for B-2 portion	**TBD**	**See detailed comments and suggested conditions in Planning Review**
Rezoning Traffic Impact Study Site development Manual	Required regardless of site size, with requirements in SDM	Provided	Yes	*See TIS Review from AECOM*
Community Impact Statement (Sec. 2.2)	Required according to site plan manual (SDM link: Site development Manual)	Provided	Yes	
Rezoning Signs *(Site Plan Development Manual)*	Sign location plan Mock-up of sign details	Provided in binder Provided Sheet 6	Yes Yes	
B-2 Commercial: Height, bulk, density and area limitations (Sec 3.1.11.D)				
Frontage on a Public Street. (Sec. 5.12)	Frontage on a Public Street is required	The site has frontage and access to Ten Mile Road	Yes	
Minimum Lot Size	2 acres	**6.97 acres to be rezoned to B-2**	Yes	*Remaining acreage excluded from PRO to remain OS-1 District*
Minimum Zoning Lot Size for each Unit: Width in Feet	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	
Maximum % of Lot Area Covered (By All Buildings)	Section 3.6.2.D			
Building Height	30 ft. (See Sec. 3.10.2.B. for additional height to 42 ft)	23 ft max proposed	Yes	**Building height could be a condition that is more limiting than ordinance allows**

Item	Required Code	Proposed	Meets Code	Comments
B-2 Building Setbacks (Sec 3.1.11.D)				
Front (along 10 Mile Rd)	40 ft.	101 ft	Yes	**Building setbacks could be a condition that is more limiting than ordinance allows**
Rear (South)	30 ft.	74 ft	Yes	
Side (East & West)	30 ft.	133 ft (west) 88 ft (east)	Yes	
B-2 Parking Setback (Sec 3.1.11.D) Refer to applicable notes in Sec 3.6.2				
Front (along 10 Mile Rd)	20 ft.	20 ft	Yes	
Rear (South)	10 ft.	20 ft	Yes	
Side (East & West)	10 ft.	60 ft. (west) 10 ft. (east)	Yes	
B-2: Note To District Standards (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.	No exterior side yards	NA	
Off-Street Parking in Front Yard (Sec 3.6.2.E)	Front yard parking permitted if setback requirements of district and landscaping standards of Section 5.5.3 are observed	Front yard parking proposed		**See Landscape review letter for comments**
Setback Abutting a Residential District (Sec 3.6.2.L)	Minimum yard setback shall be 20 feet	74 ft. min proposed on south side	Yes	
Wetland/Watercourse Setback (Sec 3.6.2.M)	A setback of 25ft from wetlands and from high watermark course shall be maintained	Buffers are now shown on the plan and area of impact quantified	Yes	**Requires a natural features encroachment authorization**
Parking setback screening *(Sec 3.6.2.P)*	Required parking setback area shall be landscaped per Section 5.5.3.			**See Landscape review letter for comments**
Modification of parking setback requirements *(Sec 3.6.2.Q)*	The Planning Commission may modify parking setback requirements based on conditions listed in Sec 3.6.2.Q		NA	
B-2 District Required Conditions *(Sec. 3.10)*				
Business Establishments *(Sec. 3.10.1.A)*	All business establishments shall be retail or service establishments dealing directly with customers. All goods produced on the premises shall be sold at retail on premises	Shall comply		

Item	Required Code	Proposed	Meets Code	Comments
Building Height *(Sec. 3.10.2.A)*	The maximum height of buildings may be increased to 42 feet (up to 3 stories) for a development that does not abut a residential district	Max height of 23 ft	Yes	
Business, Servicing, Processing *(Sec. 3.10.2.B.)*	All business, servicing or processing except for off-street parking, loading/unloading, and those outdoor sales uses permitted in Section 3.1.11.C, shall be conducted within completely enclosed buildings	No outdoor activities proposed at this time	Yes	**Outdoor patios for restaurants can be permitted**
Loading Requirements *(Sec. 3.10.3.A)*	No truck well, loading dock, overhead door or other type of service bay door shall face a major thoroughfare, nor an abutting residential district. Pedestrian exits or emergency door are permitted on such building facades.	No truck wells or overhead doors indicated	Yes	
Off-Street Loading and Unloading (Sec. 5.4)	Required in the rear yard at a ratio of 10 sf for each front foot to building. Bldg A: 1,700 sf Bldg B: 1,700 sf Bldg C: 600 sf Bldg D: 700 sf	Bldg A: 1,700 sf Bldg B: 1,700 sf Bldg C: 870 sf Bldg D: 1,276 sf	Yes	
Number of Parking Spaces Restaurants Retail (Sec.5.2.12.A)	Restaurant (sit Down): 1 for each 70 sf GFA Retail: 1 for each 200 sf GLFA Assume: Restaurant – 10,700 @ 70 sf = 153 spaces Retail – 26,700 sf / 200 sf = 134 spaces **309 spaces total**	Plan shows total of 323 spaces provided for commercial area	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Parking Space Dimensions and Maneuvering Lanes (Sec. 5.3.2)	- 90° Parking: 9 ft. x 19 ft. - 24 ft. two way drives 9 ft. x 17 ft. parking spaces allowed along 7 ft. wide interior sidewalks as long as detail indicates a 4" curb at these locations and along landscaping	- 28 ft. two-way drives	Yes	**Refer to Traffic comments for comments on parking dimensions**
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	Does not apply	NA	
Barrier Free Spaces Barrier Free Code	2 accessible space (including 1 Van accessible) for every 26 to 50 spaces		**TBD**	This would be reviewed in site plan submittal
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		**TBD**	This would be reviewed in site plan submittal
Barrier Free Signs Barrier Free Code	One sign for each accessible parking space.		**TBD**	This would be reviewed in site plan submittal
Corner Clearance (Sec. 5.9)	No fence, wall, plant material, sign or other obstruction shall be permitted within the clear view zone above a height of 2 feet from established street grade		**TBD**	Note Corner Clearance zone on site plan and landscape plans – this will be reviewed in site plan submittal
Minimum number of Bicycle Parking (Sec. 5.16.1) Retail/Restaurants/ Business Offices	5% of required auto spaces, min. 2 spaces		TBD	This would be reviewed in site plan submittal along with bike parking layout
Bicycle Parking General requirements *(Sec. 5.16)*	- No farther than 120 ft. from the entrance being served - When 4 or more spaces are required for a building with multiple entrances, the spaces shall be provided in multiple locations - Spaces to be paved and the bike rack shall be inverted "U" design		TBD	

Item	Required Code		Proposed	Meets Code	Comments
	- Shall be accessible via 6 ft. paved 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			TBD	
RM-1 Residential: Height, bulk, density and area limitations (Sec 3.1.7.D)					
Frontage on a Public Street. (Sec. 5.12)	Frontage on a Public Street is required		The site has frontage and access to Ten Mile Road via private street	Yes	
Minimum Parcel Size for each Unit: in Acres (Sec 3.8.1)	RM-1 and RM-2 Required Conditions			Yes	
Minimum Zoning Lot Size for each Unit: Width in Feet (Sec 3.8.1)					
Usable Open Space Area (Sec 3.1.7.D)	200 sf Minimum usable open space per dwelling unit For a total of 71 dwelling units, <u>required Open Space: 14,200 SF</u> <u>Refer to definitions for Usable Open Space and Open Space</u>		Sheet 6 indicates 107,378 sf of usable open space provided - Consists of 50' width surrounding walking path, park with picnic tables/gazebo, and pocket park area	Yes	**<u>Open space could be a condition that exceeds what the ordinance requires</u>**
Maximum % of Lot Area Covered (By All Buildings)	25%		14%	Yes	**<u>Lot Coverage could be a condition that is more strict than ordinance requires</u>**
Building Height (Sec. 3.1.7)	35 ft. or 2 stories whichever is less		29 feet	Yes	**<u>Building height could be a condition that is more strict than ordinance requires</u>**
Minimum Floor Area per Unit (Sec. 3.1.7.D)	Efficiency	400 sq. ft.	Not proposed	NA	
	1 bedroom	500 sq. ft.	Not proposed	NA	
	2 bedroom	750 sq. ft.	Not proposed	NA	
	3 bedroom	900 sq. ft.	1,600-1,900 sq. ft.	Yes	
	4 bedroom	1,000 sq. ft.	Not Proposed	NA	
Maximum Dwelling	Efficiency	5%	Not proposed	Yes	**Will ROW be dedicated?**

Item	Required Code		Proposed	Meets Code	Comments
Unit Density/Net Site Area (Sec. 3.1.7.D)	1 bedroom	10.9 Max 20%	Not proposed	Yes	**Indicate size. Could be considered additional public benefit**
	2 bedroom	7.3	Not proposed		
	3+ bedroom	5.4	4.5 DUA Total site: 27.07 Acres ROW Area: ?? Acres Wetland: 11.33 **Net Site Area (given by applicant): 15.74 Acres**		
Residential Building Setbacks (Sec 3.1.8.D)					
Front (along 10 Mile Rd)	75 ft.		75 ft.	Yes	*Additional setbacks required by Sec 3.6.2.B* **<u>This would be a deviation.</u>**
Rear (South)	75 ft.		75 ft.	Yes	
Side	75 ft.		75 ft. **<u>25 ft adjacent to B-2 portion</u>**	Yes **<u>No</u>**	
Parking Setback (Sec 3.1.8.D) (Sec 3.1.12.D) Refer to applicable notes in Sec 3.6.2					
Front (along 10 Mile Rd)	75 ft.		20 ft. on all sides. Parking is provided in the garage and in front of the garage. Proposed parking along the streets meets the setback requirements	Yes	
Rear (West)	20 ft.			Yes	
Side (North & South)	20 ft.			Yes	
Residential: Note to District Standards (Sec 3.6.2)					
Building structure setback (Sec 3.6.2.B)	Other than single family or 2-family, building setback shall be minimum of <u>whichever is greater</u>: 1) height of main building; 2) 75 feet; or 3) setback listed in Section 3.1 (50 ft front)		Setbacks of 25 feet for 2 buildings adjacent to B-2 area	**No**	**<u>This would be a deviation for side yard setbacks for 2 buildings adjacent to B-2 area.</u>**
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.		No exterior side yards	NA	
Wetland/Watercourse Setback (Sec 3.6.2.M)	A setback of 25 ft from wetlands and from high watermark course shall be maintained		Wetlands exist in several areas of the site; impacts proposed	Yes	**See Wetland Review letter for detailed comments**
RM-1 and RM-2 Required Conditions (Sec 3.8) & (Sec 3.10)					
Total number of rooms (Sec. 3.8.1)	Total No. of rooms < Net site area in SF/2000		Total number of rooms = 71 units x 4 rooms = **284 rooms**	Yes	*<u>17% less than permitted</u>*

Item	Required Code		Proposed	Meets Code	Comments
	686,070 SF/2000 = 343				
Public Utilities (Sec. 3.8.1)	All public utilities should be available		All public utilities are available	Yes	**See Engineering Review for detailed comments**
Maximum Number of Units (Sec. 3.8.1.A.ii)	Efficiency < 5 percent of the units		Not Proposed	NA	
	1 bedroom units < 20 percent of the units		Not Proposed	NA	
	Balance should be at least 2 bedroom units		All are 3-bedroom units	Yes	
Room Count per Dwelling Unit Size (Sec. 3.8.1.C) *An extra room such as den, library or other extra room count as an additional bedroom	**Dwelling Unit Size**	**Room Count ***		Yes	
	Efficiency	1	Not proposed		
	1 bedroom	2	Not proposed		
	2 bedroom	3	Not proposed		
	3 or more bedrooms	4	4		
For the purpose of determining lot area requirements and density in a multiple-family district, a room is a living room, dining room or bedroom, equal to at least eighty (80) square feet in area. A room shall not include the area in kitchen, sanitary facilities, utility provisions, corridors, hallways, and storage. Plans presented showing one (1), two (2), or three (3) bedroom units and including a "den," "library," or other extra room shall count such extra room as a bedroom for the purpose of computing density.					
Setback along natural shoreline (Sec. 3.8.2.A)	A minimum of 150 feet along natural shoreline is required.		No natural shoreline exists within the property	NA	
Structure frontage (Sec. 3.8.2.B)	Each structure in the dwelling group shall front either on a dedicated public street or approved private drive.		All structures front on proposed private major drive	Yes	
Maximum length of the buildings (Sec. 3.8.2.C)	A single building or a group of attached buildings cannot exceed 180 ft.		Max of ~170 proposed, building entrances proposed	Yes	
Modification of maximum length (Sec. 3.8.2.C)	Planning Commission may modify the extra length up to 360 ft. if			NA	
	Common areas with a minimum capacity of 50 persons for recreation or social purposes				
	Additional setback of 1 ft. for every 3 ft. in excess of 180 ft. from all property lines.				

Item	Required Code	Proposed	Meets Code	Comments
Building Orientation (Sec. 3.8.2.D)	Where any multiple dwelling structure and/ or accessory structure is located along an outer perimeter property line adjacent to another residential or nonresidential district, said structure shall be oriented at a minimum angle of forty-five (45) degrees to said property line.	Buildings orientations do not appear to meet the minimum requirement for all buildings	**No**	**Applicant requests a deviation in the PRO Agreement**
Yard setback restrictions (Sec. 3.8.2.E)	Within any front, side or rear yard, off-street parking, maneuvering lanes, service drives or loading areas cannot exceed 30% of yard area	No off-street parking or loading area is proposed in exterior yard areas	Yes	
Off-Street Parking or related drives (Sec. 3.8.2.F) Off-street parking and related drives shall be…	No closer than 25 ft. to any wall of a dwelling structure that contains openings involving living areas or	Complies – 25 feet	Yes	
	No closer than 8 ft. for other walls or	In conformance	Yes	
	No closer than 20 ft. from ROW and property line	In conformance	Yes	
Pedestrian Connectivity (Sec. 3.8.2.G)	5 feet sidewalks on both sides of the Private drive are required to permit safe and convenient pedestrian access.	5-foot Sidewalks shown along the private drive	Yes	
	Where feasible sidewalks shall be connected to other pedestrian features abutting the site.	Sidewalks shown to connect to Ridgeview pathway	Yes	
	All sidewalks shall comply with barrier free design standards			This would be reviewed in site plan submittal
Minimum Distance between the buildings (Sec. 3.8.2.H)	**(**Total length of building A **+** total length of building B **+** 2(height of building **+** height of building B)**)/**6 **Calculations show 31-36 feet required**	30-31 feet	**No**	**Applicant requests deviation for distance between buildings in a few locations (variance of 1- 3 feet)**
Minimum Distance between the buildings (Sec. 3.8.2.H)	In no instance shall this distance be less than thirty (30) feet unless there is a corner-to-corner relationship in	Buildings are min. of 30 ft. from each other	Yes	

Item	Required Code	Proposed	Meets Code	Comments
	which case the minimum distance shall be fifteen (15) feet.			
Number of Parking Spaces Residential, Multiple-family (Sec.5.2.12.A)	Two (2) for each dwelling unit having two (2) or less bedrooms and two and one-half (2 ½) for each dwelling unit having three (3) or more bedrooms **For 71 Three-BR units, required spaces = 178 spaces**	142 garage spaces 142 driveway spaces 10 visitor spaces **294 spaces total**	Yes	
Parking Space Dimensions and Maneuvering Lanes (Sec. 5.3.2)	- 90° Parking: 9 ft. x 19 ft. - 24 ft. two way drives - 9 ft. x 17 ft. parking spaces allowed along 7 ft. wide interior sidewalks as long as detail indicates a 4" curb at these locations and along landscaping	- 28 ft. two-way drives - Parking shown in garages and driveways - Parking spaces along drive - would need a deviation	Yes	**Refer to Traffic comments for comments on parking dimensions**
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	Does not apply	NA	
Barrier Free Spaces Barrier Free Code	2 accessible space (including 1 Van accessible) for every 26 to 50 spaces	1 spaces provided		This would be reviewed in site plan submittal
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			
Barrier Free Signs Barrier Free Code	One sign for each accessible parking space.			
Corner Clearance (Sec. 5.9)	No fence, wall plant material, sign or other obstruction shall be permitted within the clear view zone above a height of 2 feet from established street grade			This would be reviewed in site plan submittal
Minimum number of Bicycle Parking (Sec. 5.16.1)	One (1) space for each five (5) dwelling units	8 spaces in two locations; 16 spaces	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Multiple-family residential	**Required: 15 Spaces**			
Bicycle Parking General requirements (Sec. 5.16)	No farther than 120 ft. from the entrance being served	4 racks – 2 separate locations	Yes	
	When 4 or more spaces are required for a building with multiple entrances, the spaces shall be provided in multiple locations			
	Spaces to be paved and the bike rack shall be inverted "U" design Shall be accessible via 6 ft. paved 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	Shown	Yes	**See new layout dimensions of recently adopted text amendment**
5.10 Additional Road Design, Building Setback, And Parking Setback Requirements, Multiple-Family Uses				
Road standards *(Sec. 5.10)*	A private drive network within a cluster, two - family, multiple-family, or non-residential uses and developments shall be built to City of Novi Design and Construction Standards for local street standards (28 feet back-to-back width)	Major drive 28 feet wide	Yes	*Proposed road is "major drive" with direct access to exterior public road*
Major Drives	- Width: 28 feet	Proposed major drive is 28 feet wide	Yes	
Minor Drive	- Cannot exceed 600 feet - Width: 24 feet with no on-street parking - Width: 28 feet with parking on one side - Parking on two sides is not allowed - Needs turn-around if longer than 150 feet	No minor drive proposed	NA	
Parking on Major and Minor Drives (Sec. 5.10)	- Angled and perpendicular parking, permitted on minor	**On-street perpendicular parking is proposed on the Major Drive**	**No**	**Deviation for major road standards: on-street perpendicular parking,**

	drive, but not from a major drive; - minimum centerline radius: 100 feet - Adjacent parking and on-street parking shall be limited near curves with less than two-hundred thirty (230) feet of centerline radius - Minimum building setback from the end of a parking stall shall be 25 feet in residential districts.	**Minimum centerline radius is 85-120'**	**No**	**<u>minimum centerline radius, and parking near curve greater than 230 ft</u>**
Accessory and Roof top Structures				
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	Individual trash pick-up for residential units Dumpsters shown for commercial appear to be 20 feet from residential	Yes	
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 - Posts or bumpers to protect the screening - Hard surface pad. - Screening Materials: Masonry, wood or evergreen shrubbery	Trash screening enclosures shown	Yes	*Details will be reviewed in site plan submittals*
Roof top equipment and wall mounted utility 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	Not shown	TBD	*Details will be reviewed in site plan submittals*
Roof top appurtenances screening	Roof top appurtenances shall be screened in	No roof top equipment for residential	TBD	

	accordance with applicable facade regulations, and shall not be visible from any street, road or adjacent property.			
Sidewalks and Other Requirements				
Non-Motorized Plan	Proposed Off-Road Trails and Neighborhood Connector Pathways.	8-foot crushed gravel pathway proposed; Mid-block crossings?	Yes	
Sidewalks (Subdivision Ordinance: Sec. 4.05)	Sidewalks are required on both sides of proposed drives	5-ft Sidewalks are proposed on both sides of the proposed private drive	Yes?	
Public Sidewalks (Chapter 11, Sec.11-276(b), Subdivision Ordinance: Sec. 4.05)	A 8-foot sidewalk is required along 10 Mile Road	Sidewalk proposed	Yes	
Entryway lighting Sec. 5.7	One street light is required per entrance.			Applicant to work with engineering and DTE on the location and type of the fixtures proposed in the right of way for residential community
Building Code and Other Requirements				
Building Code	Building exits must be connected to sidewalk system or parking lot.		NA	**Barrier-free requirements?**
Design and Construction Standards Manual	Land description, Sidwell number (metes and bounds for acreage parcel, lot number(s), Liber, and page for subdivisions).			**Provide a legal description of proposed parcels with formal Concept Plan submittal**
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).	Generally provided	Yes	**Refer to all review letters for additional information requested.**
Economic Impact	- Total cost of the proposed building & site improvements - Number of anticipated	- $35 million construction cost - 100 new permanent full and part-time		

	jobs created (during construction & after building is occupied, if known)	jobs, numerous construction jobs		
Other Permits and Approvals				
Development/ Business Sign (City Code Sec 28.3) Sign permit applications may be reviewed an part of Preliminary Site Plan or separately for Building Office review.	The leading edge of the sign structure shall be a minimum of 10 ft. behind the right-of-way. Entranceway shall be a maximum of 24 square feet, measured by completely enclosing all lettering within a geometric shape. Maximum height of the sign shall be 5 ft.			**Show the location of any entranceway signs if proposed; Deviations from sign ordinance may be included in PRO submittal if variances are anticipated**
Development and Street Names	Development and street names must be approved by the Street Naming Committee before Preliminary Site Plan approval	Novi Ten Commercial and Towns at Novi Station proposed		Submit a Project & Street Naming Application to get all names approved
Property Split	The proposed property split must be submitted to the Assessing Department for approval.			Property combinations/splits must be approved before final site plan approval
Other Legal Requirements				
PRO Agreement (Sec. 7.13.2.D(3)	A PRO Agreement shall be prepared by the City Attorney and the applicant (or designee) and approved by the City Council, and which shall incorporate the PRO Plan and set forth the PRO Conditions and conditions imposed			If tentative approval is granted, Council will direct City Attorney to prepare the agreement, which will then be shared with applicant for negotiation
Master Deed/Covenants and Restrictions	Applicant is required to submit this information for review with the Final Site Plan submittal	Not applicable at this moment		If proposed, Master Deed draft shall be submitted prior to Stamping Set approval.
Conservation easements	Conservation easements may be required for woodland impacts	Conservation easements would be required if a condition in the PRO Agreement		Draft documents would be required prior to stamping set approval.
Lighting and Photometric Plan (Sec. 5.7)				
Intent (Sec. 5.7.1)	Establish appropriate minimum levels, prevent unnecessary glare, reduce spillover onto		Yes	

	adjacent properties & reduce unnecessary transmission of light into the night sky			
Lighting Plan (Sec. 5.7.A.i)	Site plan showing location of all existing & proposed buildings, landscaping, streets, drives, parking areas & exterior lighting fixtures	Provided separately for commercial and residential area	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.	Not provided		**Provide commercial lighting on building elevations at time of site plan submittal**
Lighting Plan (Sec.5.7.2.A.ii)	Specifications for all proposed & existing lighting fixtures	Provided	Yes	**Provide hours of operation**
	Photometric data	Provided	Yes	
	Fixture height	25 feet commercial	Yes	
	Mounting & design	Provided	Yes	
	Glare control devices (Also see Sec. 5.7.3.D)			
	Type & color rendition of lamps	Provided – see below	TBD	
	Hours of operation	Not shown		
Required Conditions (Sec. 5.7.3.A)	Height not to exceed maximum height of zoning district (or 25 ft. where adjacent to residential districts or uses)	Commercial: 25 feet max Residential: 6-10 feet proposed	Yes	
Required Conditions (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	Notes provided	Yes	
Indoor Lighting *(Sec. 5.7.3.H)*	- Indoor lighting shall not be the source of exterior glare or spillover		TBD	
Security Lighting (Sec. 5.7.3.H) Lighting for security	- All fixtures shall be located, shielded and aimed at the areas to be secured.		TBD	

purposes shall be directed only onto the area to be secured.	- Fixtures mounted on the building and designed to illuminate the facade are preferred			
Color Spectrum Management *(Sec. 5.7.3.F)*	Non-Res and Multifamily: For all permanent lighting installations - minimum Color Rendering Index of 70 and Correlated Color Temperature of no greater than 3000 Kelvin	CRI 70 for all fixtures Appears 4000K CCT is proposed	**No**	*Clarify Correlated Color Temperature of fixtures – may not exceed 3000 Kelvin* **– or request a deviation**
Parking Lot Lighting *(Sec. 5.7.3.J)*	- Provide the minimum illumination necessary to ensure adequate vision and comfort. - Full cut-off fixtures shall be used to prevent glare and spillover.	Appears to be proposed		
Min. Illumination (Sec. 5.7.3.L)	Parking areas: 0.2 min	0.4 fc	Yes	**Provide missing minimum illumination levels**
	Loading & unloading areas: 0.4 min	1.3 fc min	Yes	
	Walkways: 0.2 min			
	Building entrances, frequent use: 1.0 min			
	Building entrances, infrequent use: 0.2 min			
Average Light Level *(Sec.5.7.3.L)*	Average light level of the surface being lit to the lowest light of the surface being lit shall not exceed 4:1	Commercial: 4.2:1 Residential: 2.5:1	Yes	*Revise calculations to show only lit areas (exclude 0.0 fc values to calculate ratio)*
Max. Illumination adjacent to Non-Residential *(Sec. 5.7.3.L)*	When site abuts a non-residential district, maximum illumination at the property line shall not exceed 1 foot candle	0.5 max shown	Yes	
Max. Illumination adjacent to Residential *(Sec. 5.7.3.M)*	- Fixture height not to exceed 25 feet - Cut off angle of 90 degrees or less - No direct light source shall be visible at the property line adjacent to residential at ground level - Maximum illumination at the prop line not to exceed 0.5 fc.	Max 25 feet shown 0.2 fc max shown at residential property line	Yes	

Residential Developments *(Sec. 5.7.3.O)*	- Shall provide lighting at each entrance intersecting with a major thoroughfare sufficient to illuminate the entrance (0.2 FC min), and not to exceed 25 ft - May deviate from the minimum illumination levels and uniformity requirement of Sec. 5.7.3.L so long as off-street parking lots, property lines, and security lighting is sufficient	- 10 ft height fixture provided at 10 Mile entrance - Min. 0.2 fc at entrance Complies	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. 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

7/18/2024

Engineering Review

Novi Ten
JZ23-0009

APPLICANT

Novi Ten Associates, LLC

REVIEW TYPE

Formal PRO Plan

PROPERTY CHARACTERISTICS

- Site Location: South side of Ten Mile Road east of Novi Road
- Site Size: 42.90 acres
- Plan Date: 6/17/2024
- Design Engineer: Seiber Keast Lehner Engineering

PROJECT SUMMARY

- Proposed Rezoning from OS-1 to B-3 and RM-1, construction of 3 commercial/office buildings with associated parking and 71-unit residential development.
- Water service would be provided by an 8-inch extension from the existing 16-inch water main along the south side of 10 Mile Road and the existing 8-inch water main stub located in Ridgeview.
- Sanitary sewer service would be provided by connecting to an existing sanitary sewer along the south side of 10 Mile Road. County approval will be needed the 36-inch sanitary main on the east side of the property.
- Storm water would be collected by a single storm sewer collection system and detained in a basin sized for the 100-year storm event. The basin would subsequently dewater into the existing wetland east of the proposed basin.

RECOMMENDATION

Approval of the Formal PRO Plan is recommended with the following items addressed at the time of Site Plan Submittal.

Comments:

The Formal PRO 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 Site Plan Submittal:

General

1. Based on the McDowell soils investigation report, a dewatering plan will be needed for this site.
2. RCOC approval will be required for the widening of Ten Mile Road, right-of-way dedication will be needed from the norther property owners as well. All off-site easements will need to be approved prior to stamping set approval.
3. Approval from property owners on the north side of Ten Mile Road will be needed for the work associated with the Ten Mile widening.
4. The dedication of the master-planned right-of-way is requested for the project on Ten Mile Road. The master planned right-of-way for Ten Mile is 120-feet.
5. An opposite-side driveway spacing **Waiver**, granted by the Planning Commission, will be needed. The Engineering Division supports this waiver request contingent upon RCOC approval.
6. Label slopes for proposed 8' gravel pedestrian walkway, show proposed grades around the walkway. Grading for walkway may impact wetland buffer, provide all grading details for walkway in next submittal.
7. The proposed public portion of the 8-foot-wide gravel pathways require a 12-foot wide easement.
8. **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), paving (2 sheets) and Boardwalks/Pathways (1 sheet). The most updated details can be found on the City's website under Engineering Standards and Construction Details.
9. A Right-of-Way Permit will be required from the City of Novi and RCOC.
10. Provide a traffic control plan for the proposed road work activity on Ten Mile Road, provide an approximate timeline for road widening and project construction.
11. Provide a construction materials table on the utility plan listing the quantity and material type for each utility (water, sanitary and storm) being proposed.
12. 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.
13. Generally, all proposed trees shall remain outside utility easements. Where proposed trees are required within a utility easement, the trees shall maintain a minimum 5-foot horizontal separation from water main and storm sewer and 10-foot horizontal separation from sanitary sewer. All utilities shall be shown on the landscape plan, or other appropriate sheet, to confirm the separation distance.
14. Show the locations of all light poles on the utility plan and indicate the typical foundation depth for the pole to verify that no conflicts with utilities will occur. Light poles in a utility easement will require a License Agreement.

Water Main

15. All water main easements shall be 20-feet wide. Show the proposed easement on utility plans.
16. A tapping sleeve, valve and well is required at the connection to the existing water main.
17. Generally, the distribution system in all developments is required to have the ability to serve at least; three thousand (3,000) gallons per minute in apartment, cluster residential and similar complexes, institutional and school areas; and at least four thousand (4,000) gallons per minute in office, industrial and shopping centers is essential. Water mains are required to be extended along all road frontages abutting the proposed development at the direction of the city in accordance with the City of Novi Master Plan current edition for water main construction.
18. Provide additional valves to limit pipe runs to a maximum of 800 feet between valves.
19. Per current EGLE requirement, provide a profile for all proposed water main 8-inch and larger.
20. 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.
21. 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".
22. Valves shall be arranged so that no single line failure will require more than eight hundred (800) feet of main to be out of service.
23. Provide a separate domestic lead and, if required by the Fire Marshal, a minimum 6-inch fire lead for each building with a unique shut-off valve for each.
24. In the general notes and on the profile, add the following note: "Per the Ten States Standards Article 8.8.3, one full 20-foot pipe length of water main shall be used whenever storm sewer or sanitary sewer is crossed, and the pipe shall be centered on the crossing, in order to ensure 10-foot separation between water main and sewers." Additionally, show the 20-foot pipe lengths on the profile.
25. 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

26. Irrigation plans will be needed at the time of preliminary site plan submittal.

Sanitary Sewer

27. Provide sanitary sewer monitoring manholes, for the commercial buildings. If not in the right-of-way, provide a 20-foot-wide access easement to the monitoring manhole from the right-of-way.
28. 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).
29. Section 11-164 (g)-4 states the maximum length of a sanitary sewer lead shall not exceed 100-feet unless otherwise approved. Extend Sanitary Sewer so that leads are not more than 100-feet long **or** provide clean-outs every 100-feet.
30. Note on the construction materials table that 6-inch sanitary leads shall be a minimum SDR 23.5, and mains shall be SDR 26.
31. 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.
32. Illustrate all pipes intersecting with manholes on the sanitary profiles.
33. 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

34. A minimum cover depth of 3 feet shall be maintained over all proposed storm sewer. An explanation shall be provided where the cover depth cannot be provided.
35. Provide a four-foot-deep sump and an oil/gas separator in the last storm structure prior to discharge to the storm water basin.
36. The minimum pipe size for storm sewers receiving surface runoff shall be 12-inch diameter. Provide profiles for all storm sewer 12-inch and larger. All storm pipes accepting surface drainage shall be 12-inch or larger.
37. Plastic pipe is not allowed in the right-of-way, the maximum allowable size for plastic storm sewer is 12-inch. (Smaller diameters are allowed for roof drains)
38. 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.
39. Illustrate all pipes intersecting storm structures on the storm profiles.
40. 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.
41. Show and label all roof conductors and show where they tie into the storm sewer.

Storm Water Management Plan

42. 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)**
43. C factor calculations should be updated per the updated storm standards, C factor for green area is determined by the hydrologic soil type.
44. Verify that calculations are accurate based on the current C factor our calculations do not match what is show on the plans.
45. V_{CP-R} can only be subtracted from 100-year storage volume if infiltration, if possible, on-site, based on the soil's investigation infiltration is not possible.
46. An adequate maintenance access route to the basin outlet structure and any other pretreatment structures shall be provided (15 feet wide, maximum running slope of 1V:5H, maximum cross slope of 3%, and able to withstand the passage of heavy equipment). Verify the access route does not conflict with proposed landscaping.
47. Provide a 5-foot-wide stone bridge/access route allowing direct access to the standpipe from the bank of the basin during high-water conditions (i.e. stone 6-inches above high water elevation). Provide a detail and/or note as necessary.
48. 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.
49. 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).
50. A 4-foot-wide safety shelf is required one foot below the permanent water surface elevation within the basin.

Paving & Grading

51. Provide a construction materials table on the Paving Plan listing the quantity and material type for each pavement cross-section being proposed.
52. Sidewalks on private roadways should be located such that the outside edge of the sidewalk is a minimum of 15 feet from back of curb.
53. Provide typical driveway dimensions, contact engineering division if a variance is requested. City standard driveway dimensions are 16-foot-wide driveway with 3-foot tapers.
54. Provide an emergency access gate, the City's break-away gate detail (Figure VIII-K) can be found in Section 11-194 of the Code of Ordinances.
55. Provide a note on the plan stating that the emergency access gate is to be installed and closed prior to the issuance of the first building permit in the subdivision.

56. Provide existing and proposed contours on the Grading Plan at the time of the Final Site Plan submittal.
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. Site grading shall be limited to 1V:4H (25-percent), excluding landscaping berms.
59. Per MDOT Special Provision for Crushed Concrete; the use of crushed concrete is prohibited on the project within 100 feet of any water course (stream, river, county drain, etc.) and lake, regardless of the application of location of the water course or lake relative to the project limits.
60. The end islands shall conform to the City standard island design, or variations of the standard design, while still conforming to the standards as outlined in Section 2506 of Appendix A of the Zoning ordinance (i.e. 2' minor radius, 15' major radius, minimum 10' wide, 3' shorter than adjacent 19' stall).
61. Provide top of curb/walk and pavement/gutter grades to indicate height of curb adjacent to parking stalls or drive areas. Indicate where 4-inch curb and 6-inch curb is proposed, show line 2-foot overhang on plans.
62. Sheets showing retaining wall details shall be signed and sealed by the design engineer responsible for the proposed retaining wall design and all associated calculations.
63. A License Agreement will be required if there are proposed retaining wall within any utility easements.
64. Retaining walls that are 48-inches or larger shall need a permit from Building Department. A retaining wall that has a grade change of 30" or more within a 3' horizontal distance will require a guardrail.
65. Show proposed grades around retaining walls.
66. Per Section 26.5-35(c), a statement is required on any plan containing a private street with the following language: "City of Novi has no responsibility to improve or maintain the private streets contained within or private streets providing access to the property described in this [plan/plat]".

Flood Plain

67. ***Connection to the water main stub on the Ridgeview property will require impact to the floodplain.*** A City of Novi Floodplain Use Permit will be required for the proposed floodplain impact. This should be submitted as soon as possible. Contact the Building Department for submittal information. **A Joint Permit Application (JPA) through the Michigan Department of Environment, Great Lakes & Energy (EGLE) and U.S. Army Corps of Engineers (USACE) may also be required for the proposed floodplain impact prior to site plan approval.**

Off-Site Easements

68. Any off-site utility easements anticipated must be executed **prior to Stamping Set Approval**. Indicate if any off-site easements are anticipated for the water main connection or the widening of Ten Mile Road.

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: Lindsay Bell, Community Development
Ben Nelson, Engineering
Ben Croy, City Engineer

LANDSCAPE REVIEW

PLAN REVIEW CENTER REPORT

July 17, 2024

Novi-Ten

Revised PRO Concept Site Plan - Landscaping

Review Type	**Job #**
Revised PRO Concept Plan – Landscaping Review	JZ23-0009

Property Characteristics

- Site Location: Ten Mile Road east of Novi Road
- Site Acreage: 19.6 ac. (residential section is 11.2 ac.)
- Site Zoning: Current: I-1.
  Proposed: Commercial B-3, Residential RM-1
- Adjacent Zoning: North: I-1 and I-2, East: I-1, South: RM-1 PRO, West: OS-1
- Plan Date: June 17, 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. 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.

Items in **bold** below must be addressed and incorporated as part of the PRO review. Underlined items should be included for the Preliminary Site Plans and *Underlined and italicized* items must be included on Final Site Plans.

RECOMMENDATION:

This project is **recommended for Conceptual Plan Approval.** The residential portion of the project is mostly acceptable and the commercial section requires deviations that are not supported by staff but could be corrected on the Preliminary Site Plans.

LANDSCAPE DEVIATIONS REQUIRED PER PLANS PROVIDED:

Residential:

- No street trees along are proposed along 10 Mile Road – *supported by staff due to utility conflicts (would also be supported for Commercial section if utility conflicts were there too)*
- Lack of berm between commercial and residential north of Buildings 5 and 6 – *supported by staff as wall and screening landscaping are proposed, drive-thrus have been removed from the plans*

Commercial:

- No street trees can be planted along 10 Mile Road due to a conflict with the existing water main – *supported by staff*
- Lack of greenbelt berm along 10 Mile Road – *supported by staff because a 3 foot tall brick wall is proposed to screen the parking lot*
- Deficiency in foundation landscaping for every building – *not supported by staff for Building B.*
- The bay north of Building A is 16 spaces long – *not supported by staff*

General Notes:

- **Please put the City's Project Number, JZ23-0009, on the STA cover sheet as well.**

Please work to remove the unsupported deviations noted above.

Ordinance Considerations

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

1. Tree survey and charts are provided for both sections.
2. Woodland replacement calculations are provided for both sections.
   a. **Commercial:** 228 replacements are required. 34 are proposed to be planted on site and a deposit to the tree fund will be made for the remaining credits**.**
   b. **MF Residential:** 699 replacements are required. 181 are proposed to be planted on site and a deposit to the tree fund will be made for the remaining credits**.**
3. **The calculations need to be revised for both sections to reflect that evergreens only count as 0.67 woodland replacement credits and the proposed deposits to the tree fund corrected.**
4. Please show conservation easement boundaries for all woodland replacement trees.

Adjacent to Residential - Buffer (Zoning Sec. 5.5.3.A.ii and iii) (Both sections)

1. The project is adjacent to commercial property on the west, to multi-family residential on the south and to industrial property and the railroad to the east. Within the site, residential abuts commercial.
2. A 6-8 foot tall wall or landscaped berm is required between residential property and office/commercial uses.
3. The plan indicates a landscaped berm between Residential Buildings 1-4 and Commercial Building A. The berm crests are only 2-3 feet above the commercial parking lot and approximately 8-12 feet above the bottom of the slope. The slope is heavily landscaped with evergreen trees. If the berm uses a 1:3 slope, the crests can be raised 2-5 feet, eliminating the need for a deviation. **Please do that.**
4. The plan also shows two 8-foot masonry walls north of Residential Buildings 5 and 6 with evergreen trees planted along the adjacent parking lot perimeter**.** Large evergreen trees are now provided south of the walls to provide better buffering for those residential buildings. **A landscape deviation is required to provide a wall instead of a berm, but *it would be supported by staff*.**

COMMERCIAL SECTION

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

1. The required 3-foot-tall berm is not proposed but a 3-foot tall brick wall is proposed instead of the berm. **This would require a landscape deviation**. *It would be supported by staff.*
2. The required canopy and subcanopy trees are proposed, and the number of required shrubs also appear to be proposed.
3. A utility conflict along Ten Mile Road between the existing water main and the sidewalk prevents the required street trees from being planted so they are not proposed. This requires a landscape deviation. *It is supported by staff.*

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

1. The required parking lot interior area and trees, and perimeter trees, are provided, but some islands still do not have trees and the perimeter trees need to be rearranged somewhat.
2. **See the landscape chart for a more detailed discussion of the parking lot landscaping.**

Building Foundation Landscaping (Zoning Sec 5.5.3.D)

1. The calculations need to be corrected per the ordinance requirement for at least 75% of the buildings' perimeter to be landscaped.

2. In total, the required foundation landscaping for the four buildings is provided, but some individual building's landscaping is deficient. As the total is met, this is required.
3. **3.** Three of the four buildings' frontage facing Ten Mile Road has less than the 60% landscaping as required by the ordinance. Building B is significantly less than the requirement. **The minor deficiencies for Buildings A and C are accepted, but Building B requires a deviation that** *is not supported by staff.* **Please increase the frontage landscaping for Building B.**

RESIDENTIAL SECTION

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

1. The required greenbelt berm and landscaping appear to be provided.
2. As with the Commercial section, the utility conflict along Ten Mile road prevents the required street trees from being planted. **A landscape deviation is required for the lack of street trees.** *It will be supported by staff.*

Multi-Family Residential/Attached Dwelling Unit Landscaping (Zoning Sec 5.5.3.F.iii)

1. Multi-family unit trees
   a. As 71 townhouse units are proposed, 213 trees are required, up to 25% of which can be subcanopy trees.
   b. 213 trees are proposed on the site, some of which are along the interior drive, many of which are on the berm between the residential portion of the development and the commercial section, and some of which are in the greenbelt. Until species are proposed, it's difficult to determine the makeup of the trees proposed.
2. Interior Drive Trees
   a. Based on the length of the interior drive, 35 interior drive trees are required. 35 trees, plus 4 multi-family unit trees are proposed along the streets.
3. Building Foundation Landscaping
   a. A sample foundation detail shows that 40% of the building fronts will be landscaped, exceeding the 35% required.
   b. Please include plant labels on the Final Site Plans at the latest and add the plants to the plant list and cost estimate.

GENERAL REQUIREMENTS APPLICABLE TO BOTH SECTIONS

Plant List (LDM 4, 10)

1. Not provided.
2. Please add plant labels to the plan view and provide a plant list on the Preliminary Site Plans, or Final Site Plans at the latest.
3. The plants should meet the requirements detailed on the landscape chart.

Planting Notations and Details (LDM 10)

1. Provided for the Residential plans but not the Commercial Plans.
2. As the Commercial and Residential landscaping may well be done by different contractors, please include the planting notes and details with each set of plans.

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

1. Conceptual landscaping indicates that all landscaping will be provided.
2. Woodland replacement trees may be used to meet the tree requirement, but they must be protected by an easement.

Irrigation (LDM 10)

Please provide the plans for an automatic irrigation system, or alternative plans for providing sufficient water for the plants' establishment and long-term survival on the Final Site Plans.

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.

Rick Meader – Landscape Architect

LANDSCAPE REVIEW SUMMARY CHART – Formal PRO Concept Plan

Review Date: July 15, 2024
Project Name: JZ23-09: Novi Ten
Project Location: Ten Mile Road east of Novi Road
Plan Date: June 17, 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 PRO Concept Plan. Underlined items need to be addressed on Preliminary Site Plans. *Underlined and italicized* items need to be addressed for Final Site Plan.

LANDSCAPE DEVIATIONS REQUIRED PER PLANS PROVIDED:
Residential:

- No street trees along 10 Mile Road in residential section – *supported by staff due to utility conflicts (would also be supported for Commercial section if utility conflicts were there too)*
- Lack of berm between commercial and residential north of Buildings 5 and 6 – *supported by staff as wall and screening landscaping are proposed, drive-thrus have been removed from the plans.*

Commercial:

- No street trees can be planted along 10 Mile Road due to a conflict with the existing water main – *supported by staff*
- Lack of greenbelt berm along 10 Mile Road in the Commercial section – *supported by staff because a 3 foot tall screening wall is proposed in lieu of the berm*
- Deficiency in screening foundation landscaping for every building – *not supported by staff for Building B.*
- The bay north of Building A is 16 spaces long – *not supported by staff*

General Notes:

- **Please put the City's Project Number, JZ23-0009, on the STA cover sheet as well.**

Item	Required	Proposed	Meets Code	Comments
Landscape Plan Requirements – Basic Information (LDM (2))				
Landscape Plan *(Zoning Sec 5.5.2, LDM 2.e)*	• 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	• Residential Landscape Plan is 1"=50' • Residential greenbelt, detention pond and foundation plans are 1"=30' • Commercial Landscape Plan is 1"=40' • No Commercial Foundation plans are provided	• Yes • Yes • Yes • TBD	*When they are provided, the commercial foundation landscape plans should be no smaller than 1"=20'*
Project Name/Address *(LDM 2.a.)*	Name and location of the project	• Yes • Location map is provided on	Yes	*Please add the location map to the Commercial landscape*

Item	Required	Proposed	Meets Code	Comments
		residential landscape plan		*plans.*
Owner/Developer Contact Information *(LDM 2.a.)*	Name, address and telephone number of the owner and developer or association	• Commercial: Weiss Construction • Residential: Toll Brothers	Yes	
Landscape Architect contact information *(LDM 2.b.)*	Name, Address and telephone number of RLA/PLA/LLA who created the plan	• Commercial: James Gray – Vert Verde • Residential: Jim Allen – Allen Design	Yes	
Sealed by LA. *(LDM 2.g.)*	Requires original signature	Yes – copies		
Survey information *(LDM 2.c.)*	Legal description or boundary line survey	Civil Sheets 2 and 3	Yes	
Miss Dig Note (800) 482-7171 *(LDM.3.a.(8))*	Show on all plan sheets	• Commercial: No • Residential: Yes	No Yes	
EXISTING CONDITIONS				
Existing plant material Existing woodlands or wetlands *(LDM 2.e.(2))*	• Show location type and size. • Label to be saved or removed. • Plan shall state if none exists.	• Wetlands are delineated • Commercial tree survey and removals are on the Commercial Landscape Plans Sheets PL-1 and PL-2 • Residential Tree survey and removals are on the Residential Landscape Plans Sheets RL-3 and LR-5 • Commercial tree replacement calculations are on PL-1 • Residential tree replacement calculations on RL-5.	• Yes • Yes • Yes • Yes • Yes	Please correct the calculations for both sections to reflect that evergreen trees only receive 0.67 credits per tree.
Natural Features protection		25-foot environmental setbacks are shown on both the Commercial and Residential	Yes	

Item	Required	Proposed	Meets Code	Comments
		Landscape Plans		
Soil type *(LDM.2.r.)*	As determined by Soils survey of Oakland county	Civil Cover Sheet	Yes	
Zoning *(LDM 2.f.)*	Site: I-1 and OS-1 Proposed: RM and B3 North: I-1 and I-2 East: I-1; West: OS-1 South: RM-1	<u>Shown on Civil Cover Sheet</u> • Site: I-1 • Proposed RM-1 for Residential, B-3 for Commercial • East: I-1 • South: RM-1 PRO • West: OS-1 • North: I-1 & I-2	Yes	
PROPOSED IMPROVEMENTS				
Existing and proposed improvements *(LDM 2.e.(4))*	Existing and proposed buildings, easements, parking spaces, vehicular use areas, and R.O.W	• Detailed residential plan and conceptual commercial plans are shown on the PRO Concept Plan. • All Residential and Commercial elements are shown on the landscape plans.	• Yes • Yes	
Existing and proposed utilities *(LDM 2.e.(4))*	• Overhead and underground utilities, including hydrants, water, sanitary and storm lines and structures. • Light posts should also be shown.	• Conceptual utility structures and lines are shown on the Commercial and Residential landscape plans • Light posts are shown on the Commercial and Residential landscape plans • The sanitary line passes through some of the landscape islands such that the trees can't be located in the islands.	• Yes • Yes • No	**Please revise the utility layout so all required landscape plantings can be planted per the ordinance.**
Proposed topography - 2' contour minimum *(LDM 2.e.(1))*	Provide proposed contours at 2' interval	• Proposed contours are shown on P3, Civil Sheets 6A and 6B, and the	• Yes • No • No	**1. Please show all required berms on a grading plan.** **2. Please label the contours on 6B with**

Item	Required	Proposed	Meets Code	Comments
		residential landscape plan. • Contours are not shown on the Commercial plans • Contours on residential berm are not consistent with those shown on PRO plan or residential		**their elevations and verify that the contours work.** 3. Show contours between the parking lot and the residential section and make sure they tie together correctly. **4. Show all berms consistently between plan sheets.**
Clear Zones *(LDM 2.e.(5))*	RCOC clear vision zones for 10 Mile Road entry points	• RCOC clear vision zone is shown on the Residential Landscape Plan. • No clear vision zone is shown on the Commercial Landscape Plan.	• Yes • No	**1.** *Please provide RCOC clear vision zones on the Commercial landscape plans* **2.** *Keep all trees and shrubs over 30" out of clear zones.*
LANDSCAPING REQUIREMENTS				
Berms and ROW Planting				
• 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)*	Residential adjacent to Commercial requires: • 6-8 foot high landscaped berm or wall • 10-15 foot high wall or berm for drive-in restaurants. • 10-15 foot high wall or berm for industrial • Opacity 80% winter, 90% summer. Residential adjacent to Industrial requires: • 10-15 foot high wall or berm for industrial • Opacity 80% winter, 90% summer. • As the development does not directly abut the industrial property to the east, no screening berm is	• A landscaped berm approximately 2-3 feet tall is proposed between the Residential Buildings 1 and 2 and Commercial Building A (the crest is approximately 3 feet higher than the commercial parking lot and 6-8 feet higher than the bottom of the slope). • An 8-foot high masonry wall is provided between the commercial section and the	• No • Yes	**1. A landscape deviation will be required for the masonry wall.** *2. It would be supported by staff as dense large evergreen trees are now proposed on the residential side.* *3.* **If a 3:1 slope instead of 4:1 slope is used for the berm between the commercial and residential properties, the berm can increase the height of the berm relative to the parking lot by 2-5 feet and be acceptable to staff. Please do that.** 4. No berm is required

Item	Required	Proposed	Meets Code	Comments
	required.	north side of the westernmost residential buildings. Evergreen plantings are indicated in front of the wall. • No berm is provided along the east side of the property. • Cross sections indicate that the berm does not provide sufficient height on the commercial side. Dense landscaping is provided on the berm to increase the buffering.		along the east side of the property as the adjoining industrial property there is on the other side of the railroad.
Planting requirements *(LDM 1.a.)*	LDM Novi Street Tree List	• Dense plantings are proposed on berm • Large evergreens are proposed south of the screening walls.	• Yes • Yes	
Adjacent to Public Rights-of-Way (Sec 5.5.B) and (LDM 1.b)				
ROW Landscape Screening Requirements Chart *(Sec 5.5.3.B. ii)*				
Greenbelt width (2)(3) (5)	• **Commercial (B3) adj to pkg:** 20 ft • **MF Residential:** Not adj to pkg: 34 ft	• **Commercial:** 20 ft • **MF Residential:** 75 ft	• Yes • Yes	
Min. berm crest width	• **Commercial (B3) adj to pkg:** 2 ft • **MF Residential:** 2 ft	• **Commercial:** 0 ft • **MF Residential:** 2 ft A 3 foot tall brick wall is proposed in lieu of the berm	• No • Yes • No	**1. Please provide the required berms in the commercial section.** **2. Lack of the required berm is a deficiency that would require a landscape deviation.** **3.** *It would be supported by staff because the proposed wall will provide the required screening.*
Min. berm height (9)	• **Commercial (B3) adj to pkg:** 2 ft	• **Commercial:** 0 ft • **MF Residential:**	• Yes • TBD	**1. See above** **2. Please add contour**

Item	Required	Proposed	Meets Code	Comments
	• **MF Residential:** 2 ft	unclear		**labels to the residential section's berms so their heights can be determined.**
3' wall	(4)(7)	3 foot wall is proposed along the 10 Mile Road frontage in place of the required berm		*The deviation for the lack of berm is supported by staff because the wall will provide the required screening.*
Canopy deciduous or large evergreen trees Notes (10)(12)	**Commercial: (B3) adj to pkg:** • 1 tree per 70 lf • (1020-30-30-30)/70 = 13 trees **MF Residential (not adj to pkg):** • 1 tree per 35 lf • (570-56)/35 = 15 trees	• Commercial: 18 trees • MF Residential: 15 trees	• Yes • Yes	
Sub-canopy deciduous trees Notes (10)(12)	**Commercial: (B3) adj to pkg:** • 1 tree per 40 lf • (1020-30-30-30)/40 = 23 trees **MF Residential (not adj to pkg):** • 1 tree per 35 lf • (570-56)/25 = 21 trees	• Commercial: 27 trees • MF Residential trees: 21	• Yes • Yes	
Shrubs Notes (10)(12)	**Commercial: (B3) adj to pkg:** • 3 shrubs per 40 lf • 3*(1020-30-30-30)/40 = 70 shrubs	93 shrubs per plan calculation	TBD	1. As the plan does not include plant counts or IDs, confirmation of the number of shrubs provided will need to be done when those are provided. **2. It is assumed that the 93 shrubs will be provided on those plans so no deviation will be required.**
Canopy deciduous trees in area between sidewalk and curb	**Commercial: (B3) adj to pkg:** • 1 tree per 40 lf • (1020-30-30-30)/40 = 23 trees **MF Residential:**	No trees are proposed in the right-of-way in front of the MF residential section or Commercial section due to	• No • No	**1. A landscape deviation is required to not provide the trees.** *2. As the existing 12" water main along 10 Mile Road does not*

Item	Required	Proposed	Meets Code	Comments
	• 1 tree per 35 lf • (570-56)/25 = 21 trees	conflicts with existing utilities in the right-of-way.		*allow room for the street trees, the requested deviation is supported by staff.*
Multi-Family Residential (Sec 5.5.3.F.ii)				
Building Landscaping *(Zoning Sec 5.5.3.E.ii.)*	• 3 deciduous canopy trees or large evergreen trees per dwelling unit on the first floor. • 71 units * 3 = 213 trees • 25% can be subcanopy trees.	• Calculations are provided. • It appears that 213 trees are provided	Yes	Please provide tree IDs and counts on the Preliminary Site Plans.
Interior Street Landscaping	• 1 deciduous canopy tree along interior roads for every 35 lf (both sides), excluding driveways, interior roads adjacent to public rights-of-way and parking entry drives. • Trees in boulevard islands do not count toward street tree requirement • (2368-1136)/35=35 trees	• Calculations are provided. • 35 trees plus 4 multi-family unit trees	Yes	
Foundation Landscaping	35% of building façades facing road should be landscaped	A standard unit landscaping detail is provided on Sheet L-2 that shows 40% of the units façade will be landscaped	Yes	*Please add detailed landscaping on the Final Site Plans.*
Woodland Replacements (Section 37-8) – Both Commercial and Residential				
Woodland Replacement Trees	Requirements per Section 37 **Commercial:** 228 replacements are required **MF Residential:** 699 replacements are required	**Commercial:** • 34 trees (30 canopy trees and 4 evergreen trees) • Contribution to tree fund for 194 credits **MF Residential:** • 181 trees – 22 appear to be evergreen trees • Contribution to tree fund for 518 credits	TBD	1. Evergreen replacements only receive 0.67 credits per tree. ***2.* Please revise the calculations to include this. A greater contribution to the tree fund than I shown may be necessary.**

Item	Required	Proposed	Meets Code	Comments
		• Woodland replacement trees are used to meet the detention basin tree requirement – this is allowed by the ordinance • No more than 10% of the credits planted are evergreens		
Parking Area Landscape Requirements (Zoning Sec 5.5.3.C & LDM 5) – Commercial only				
General requirements *(LDM 1.c)*	• Clear sight distance within parking islands • No evergreen trees	It does not appear that any plantings will block visibility across islands in the Commercial section but not all plantings are shown at this time.	TBD	
Name, type and number of ground cover (LDM 1.c.(5))	As proposed on planting islands	Not indicated	TBD	
General *(Zoning Sec 5.5.3.C)*				
Parking lot Islands *(a, b. i)*	• A minimum of 200 SF to qualify • 200sf landscape space per tree planted in island. • 6" curbs • Islands minimum width 10' BOC to BOC	**Commercial:** • Island areas are sufficiently sized. • Not all have trees in them **MF Residential:** No islands are proposed	TBD	
Curbs and Parking stall reduction *(c)*	Parking stall can be reduced to 17' with 4" curb adjacent to a sidewalk of minimum 7 ft.	**Commercial:** Spaces are 17 or 19 feet long **MF Residential:** All spaces are 17 feet long with a 7 foot adjacent walk	• Yes • Yes	
Contiguous space limit *(i)*	Maximum of 15 contiguous spaces	The bay north of Building A is 16 spaces.	No	**1. A landscape deviation would be required for this.** *It would not be supported by staff.* **2. Please shorten or break up that bay to reduce it to 15 spaces or less.**

Item	Required	Proposed	Meets Code	Comments
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.iii)*				
A = Total square footage of vehicular use areas x 7.5%	• A = x SF x 7.5% • A = 50,000 sf * 7.5% = 3750 sf	Calculation provided	Yes	
B = Total square footage of additional paved vehicular use areas over 50,000 SF x 1 %	• B = x SF x 1% • B = (139,449-50,000)sf * 1% = 895 sf	Calculation provided	Yes	
All Categories				
C = A+B Total square footage of landscaped islands	• C = A + B • C = 3750+895 = 4645sf	15,230 sf	Yes	**1. Please remove the island area that is used for parking lot perimeter trees from the interior area provided total.** **2. Add the area of islands where trees will be added.**
D = C/200 Number of canopy trees required	• D = C/200 = x trees • D = 4645/200 = 23 trees	38 trees	Yes	**1. Please add trees to the islands at the northeast corner of Building C and the northwest corner of Building D. They are required as those are endcap islands.** **2. Please add a tree in the interior island with a lamp north of Building C.** **3. Please move the trees at the north edges of the islands in the northern edge islands into those islands' interior. The sanitary line will need to be adjusted to allow for that.**
Parking Lot Perimeter Trees	• 1 Canopy tree per 35 lf • Interior drive trees should be used as perimeter trees along the two bays (1 per bay, based on their length) • Interior drive widths can be deducted from the perimeter	• Along 10 Mile Rd: 18 trees • Remaining perimeter: 35 trees	No	**1.** Greenbelt canopy trees may be double-counted as parking lot perimeter trees if they are within 15 feet of the parking lot. **2. Only 12 of the greenbelt canopy trees may be**

Item	Required	Proposed	Meets Code	Comments
	• Along 10 Mile Rd: 842/70 = 12 trees • Remaining perimeter: (1495-30-34-42)/35 = 40 trees			**counted toward the total requirement of trees provided. The remaining perimeter trees must be completely met with the calculated requirement.** **3.** Since the requirement for interior trees can be met, parking lot perimeter trees can be moved in the perimeter interior islands. **4.** Please spread out the non-greenbelt perimeter trees that are closer than 30 feet apart around the rest of the site so there is consistent coverage. **5.** All trees must be within 15 feet of the perimeter to count as perimeter trees. **Please move those that aren't.** **6. If there are questions about this, the landscape architect is encouraged to call me.**
Building Foundation Landscaping Requirements - for Commercial only (*Sec 5.5.3.D)*				
Interior Site Landscaping SF	• Equal to entire perimeter of the building (less entrances) x 8 • Landscape areas may be no less than 4 feet wide/deep • No less than 75% of a building's perimeter should be landscaped, but ideally all but entries should be landscaped • Landscaping does not count lawn areas	• Calculations are provided on P.5 • The entire loading area wall is deleted from the calculation for every building. • Building A: 2320sf • Building B: 4009sf • Building C: 2210sf • Building D: 1525sf • TOTAL: 10064sf	Yes	**1. Please revise the calculations for each building such that a maximum of 25% of the building perimeter is deducted.** **2. Label the SF of each foundation on Sheet PL-3.** **3. The applicant is encouraged to shorten the loading zones for Buildings A & B so at least 75% of the total building**

Item	Required	Proposed	Meets Code	Comments
	• Building A: (500*.75)*8=3000sf • Building B: (500*.75)*8=3000sf • Building C: (266*.75)*8=1596sf • Building D: (266*.75)*8=1596sf • TOTAL: 9192sf			**perimeter is landscaped.**
Frontage landscaping *(Sec 5.5.3.D.d)*	No less than 60% of a façade facing a public road shall be landscaped with a mix of trees, shrubs, perennials, annuals and/or ornamental grasses	• Building A: 99/170=58.2% • Building B: 71/170=41.8% • Building C: 33/58= 56.9% • Building D: 41/58=70.6%	• No • No • No • Yes	**1. A deviation is required for the deficient buildings.** *2. It would be supported by staf for Buildings A and C, but not B.* **3. Please provide the required frontage landscaping for Building B.**
Parking land banked	NA	None		
Miscellaneous Landscaping Requirements				
Plantings around Fire Hydrant *(d)*	• No plantings with matured height greater than 12' within 10 ft. of fire hydrants, manholes, catch basins or other utility structures. • Trees may also not be planted within 10 feet of an underground sanitary sewer line.	**Commercial:** No landscaping is provided near hydrants **MF Residential:** Correct spacing appears to have been provided	• Yes • Yes	Please add a tree in the island near the northwest corner of Building D as there appears to be room for the tree and the hydrant in that island.
Landscaped area *(g)*	Areas not dedicated to parking use or driveways exceeding 100 sq. ft. shall be landscaped	No groundcovers or detailed landscaping is shown on the Commercial landscape plan	TBD	1. *Please indicate groundcovers or areas of other landscaping with hatching at a minimum.* 2. *Detailed plans can be provided on the Final Site Plans.*
Name, type and number of ground cover (LDM 1.c.(5))	As proposed on planting islands	Not indicated on either plan except for the detention pond	No	*See above*
Snow deposit *(LDM.2.q.)*	Show snow deposit areas on plan in locations where landscaping won't be damaged	**Commercial:** Not indicated **MF Residential:** A note indicates	• No • Yes	*Please show at least 2 potential snow deposit areas on the Commercial section.*

Item	Required	Proposed	Meets Code	Comments
		that snow will be deposited along the street in the curb lawn		
Transformers/Utility boxes *(LDM 1.e from 1 through 5)*	• A minimum of 2 ft. separation between box and the plants • Ground cover below 4" is allowed up to pad. • No plant materials within 8 ft. from the doors	• City screening detail is included on Sheet RL-4 • A note on RL-1 indicates that all transformer boxes shall be screened per that detail. • No notes or details regarding transformers are on the Commercial Plans. • No transformers are shown on either landscape plan	TBD	1. *Please show transformers and other utility boxes when their locations are determined.* 2. *Add an estimated number of shrubs for each transformer's screening to the plant list per the city utility landscape detail.* 3. *Add the city detail with the other details on the Commercial plans.*
Detention/Retention Basin Planting requirements *(Sec. 5.5.3.E.iv)*	• Clusters of large native shrubs shall cover 70-75% of the basin rim area, 10 feet above the permanent water level. • Canopy trees shall be placed along east, west and south sides of the pond to help shade the pond. Woodland replacement trees may be used to meet this requirement if a conservation easement protecting them is provided. • 10" to 14" tall grass along sides of basin • Refer to wetland for basin mix • Include seed mix details on landscape plan	• Conceptual shrubs are shown that meet the requirement. • Woodland replacement trees are shown meeting the requirement for the canopy trees. This is allowed. • A seed mix is shown on Sheet L-2.	• Yes • Yes • Yes	
Phragmites and Japanese Knotweed Control	Any populations of Phragmites australis or Invasive Knotweed found on the site must be eliminated	A note indicates that no Phragmites or Japanese Knotweed were found on the site	Yes	1. *If any is found during construction, it must be chemically treated to completely eliminate*

Item	Required	Proposed	Meets Code	Comments
				it from the site. 2. *Please add a note stating the above to both the Commercial and Residential landscape plans.*
Plant List (LDM 2.h. and 4) – Include all cost estimates				
Quantities and sizes		No plant list is provided.		*Provide a plant list on the landscape plans for each section (separate plant lists)*
Root type		No	No	*See above*
Botanical and common names	• At least 50% of the species used shall be native to Michigan • Non-woodland replacement tree diversity must follow guidelines of Landscape Design Manual Section 4. • Species on the City's Prohibited Species List (LDM Table 11.b(2)b may not be used	No plant list is provided	TBD	1. *See above* 2. *Please label all plantings on the plan view on the Final Site Plans, at the latest.*
Type and amount of lawn		Not indicated	TBD	*Need for final site plan*
Cost estimate (LDM 2.t)	For all new plantings, mulch and sod as listed on the plan	Not provided	TBD	*Need for final site plan*
Landscape Notes and Details– Utilize City of Novi Standard Notes – as the areas are likely to be built by different contractors, please include the below information with both the Residential and Commercial sets of plans.				
Planting Details/Info (LDM 2.i) – Utilize City of Novi Standard Details				
Canopy Deciduous Tree	Refer to LDM for detail drawings	Sheet RL-4	Yes	*Add to commercial set*
Evergreen Tree		Sheet RL-4	Yes	
Shrub		Sheet RL-4	Yes	*Add to commercial set*
Multi-stem tree		Sheet RL-4	Yes	*Add to commercial set if multi-stem trees will be used*
Perennial/ Ground Cover		Sheet RL-4	Yes	*Add to commercial set*
Tree stakes and guys	Wood stakes, fabric guys.	Sheet RL-4	Yes	*Add to commercial set*
Cross-Section of Berms (LDM 2.j)				
Slope, height and width	• Label contour lines • Maximum 33% slope	Cross sections for the area between	No	*Provide details on landscape plans for all*

Item	Required	Proposed	Meets Code	Comments
	• Constructed of loam • 6" top layer of topsoil	the commercial and residential areas are provided		*berms*
Type of Ground Cover		No	No	*Indicate on cross section*
Setbacks from Utilities	Overhead utility lines and 15 ft. setback from edge of utility or 20 ft. setback from closest pole, 10 feet from structures, hydrants	No overhead utilities exist on the site or along 10 Mile Road.	NA	
Walls (LDM 2.k & Zoning Sec 5.5.3.vi)				
Material, height and type of construction footing	Freestanding walls should have brick or stone exterior with masonry or concrete interior	• Two 8-foot screening walls are proposed between the westernmost residential buildings and the Commercial sections • Several retaining walls are indicated, but none in the right-of-way	TBD	*Please add TW/BW elevations for retaining walls.*
Walls greater than 3 ½ ft. should be designed and sealed by an Engineer		Detailed wall plans for screening walls and retaining walls taller than 3.5 feet should be submitted for review with building drawings.	TBD	
Notes (LDM 2.i) – Utilize City of Novi Standard Details				
Installation date *(LDM 2.l. & Zoning Sec 5.5.5.B)*	• Provide intended date • Between Mar 15 – Nov 15	• Sheet RL-4 • Between Mar 15-Nov 15 2024 or 2025	Yes/No	*Please add installation dates for the Commercial section.*
Maintenance & Statement of intent *(LDM 2.m & Zoning Sec 5.5.6)*	• 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.	Notes included on Sheet RL-4	Yes/No	*Please add notes for the Commercial section.*
Plant source *(LDM 2.n & LDM 3.a.(2))*	Shall be northern nursery grown, No.1 grade.	Note included on Sheet RL-4	Yes/No	*Please add note for the Commercial section.*

Item	Required	Proposed	Meets Code	Comments
Establishment period *(Zoning Sec 5.5.6.B)*	**2 yr. Guarantee**	Note included on Sheet RL-4	Yes/No	*Please add note for the Commercial section.*
Approval of substitutions. *(Zoning Sec 5.5.5.E)*	City must approve any substitutions in writing prior to installation.	Note included on Sheet RL-4	Yes/No	*Please add note for the Commercial section.*
General Landscape Requirements (LDM 3)				
General Conditions *(LDM 3.a)*	Plant materials shall not be planted within 4 ft. of property line	No	No	*Please add a callout stating this on the west end of the Commercial landscape plan.*
Irrigation plan *(LDM 2.s.)*	A method of providing water for establishment and long-term survival must be provided	No		1. *Please add the irrigation plan or information as to how plants will be watered sufficiently for establishment and long- term survival on the Final Site Plans.* 2. *If xeriscaping is used, please provide information about plantings included.* 3. *This information is required on the Final Site Plans.* 4. *If an irrigation system will be used, it should meet the requirements stated at the bottom of this chart.*
Other information *(LDM 2.u)*	Required by Planning Commission	NA		
Landscape tree credit *(LDM3.b.(d))*	• Substitutions to landscape standards for preserved canopy trees outside woodlands and wetlands should be approved by LA. • Refer to Landscape tree Credit Chart in LDM	None taken		
Plant Sizes for ROW, Woodland replacement and others (*LDM 3.c)*	Canopy Deciduous shall be 3" and sub-canopy deciduous shall be 2.5" caliper. Refer to section for more details	No plant lists are provided	TBD	*Include correct sizes on plant list.*
Plant size credit *(LDM3.c.(2))*	NA	No		

Item	Required	Proposed	Meets Code	Comments
Prohibited Plants *(LDM 3.d)*		No		
Recommended trees for planting under overhead utilities *(LDM 3.e)*	Label the distance from the overhead utilities	A note indicates that there are no overhead utilities on the site.	Yes	A site visit confirms that overhead wires along 10 Mile Road are on the north side of the road.
Collected or Transplanted trees *(LDM 3.f)*		None proposed		
Nonliving Durable Material: Mulch *(LDM 4)*	• 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.	Indicated on details on Sheet L-3	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.

Irrigation System Requirements

1. Any booster pump installed to connect the project's irrigation system to an existing irrigation system must be downstream of the RPZ.
2. The RPZ must be installed in accordance with the 2015 Michigan Plumbing Code.
3. The RPZ must be installed in accordance with the manufacture installation instructions for winterization that includes drain ports and blowout ports.
4. The RPZ must be installed a minimum of 12-inches above FINISHED grade.
5. Attached is a handout that addresses winterization installation requirements to assist with this.
6. A plumbing permit is required.
7. The assembly must be tested after installation with results recorded on the City of Novi test report form.

WOODLAND AND WETLAND REVIEW

merjent

p 612.746.3660 ▪ f 612.746.3679 ▪ www.merjent.com

1 Main Street SE ▪ Suite 300 ▪ Minneapolis, Minnesota ▪ 55414

July 16, 2024

Lindsay Bell
Planner – Community Development
City of Novi
45175 Ten Mile Road
Novi, MI 48375

Submitted electronically to lbell@cityofnovi.org

Re: Novi Ten Planned Rezoning Overlay Wetland and Woodland Review (Formal Application; JZ23-09)

Dear Lindsay,

Merjent, Inc. (Merjent) has conducted a site plan review of the planned rezoning overlay (PRO) for the formal PRO application for Novi Ten Town Homes and Retail (site). Two sets of site plans were provided:

- One plan prepared by Siegel/Tuomaala Associates, Architects, and Planners, Inc. (STA) dated June 17, 2024. This site plan is for the northwestern portion of the site where a B-2 Zone is proposed.
- One plan prepared by Seiber Keast Lehner (SKL) dated June 17, 2024 with Landscape Plans prepared by Allen Design dated June 17, 2024. This site plan is for the eastern portion of the site where an RM-1 Zone is proposed.

Merjent reviewed the plans for conformance with the City of Novi's (City) current Woodland Protection Ordinance, Chapter 37, and Wetlands and Watercourse Protection Ordinance, Chapter 12 Article V. The site is located southeast of the intersection of Novi Road and Ten Mile Road in Section 26 of the City. Development is proposed within parcels 50-22-26-101-028 and 50-22-26-101-024. The site contains City-regulated woodlands and City-regulated wetlands (**Figure 1** and **Figure 2**). It should be noted that **Figure 1** and **Figure 2** only contain portions of the site parcels where development is proposed in the provided site plans. For ease of review, the impacts from both site plans have been combined in the reviews below.

In addition to the site plans, Merjent reviewed a Wetland Boundary Review conducted by the Mannik and Smith Group (MSG) in 2023 and subsequent Wetland Delineation Reports prepared by Niswander Environmental, LLC (Niswander) for both the commercial (February 2021) and residential (June 2023) portions of the site.

Woodlands

Woodland Recommendation: Merjent **recommends approval** of the Novi Ten PRO application, pending clarification on tree tags. A list of comments is provided below to meet the requirements of the Woodland Protection Ordinance. The following Woodland Regulations apply to this site:

Woodland Regulation	Required
Woodland Permit (Chapter 37, Section 37-26)	Yes
Tree Replacement (Chapter 37, Section 37-8)	Yes
Tree Protection (Fence; Chapter 37, Section 37-9)	Yes
Woodland Conservation Easement (Chapter 37-30[e])	Yes, if feasible

Woodland Review Comments

1. City-regulated woodlands, as identified on the City of Novi Woodlands interactive map website, are present onsite. **Note that both the woodlands and property limits depicted on the City map are considered approximations** (**Figure 1**)**.** Pursuant to Section 37-2 and Section 37-4 of Chapter 37, Woodlands Protection, woodland areas can be identified by additional features such as soil quality, habitat quality, tree species and diversity, health and vigor of tree stand, understory species and quality, presence of wildlife, and other factors such as the value of the woodland area as a scenic asset, wind block, noise buffer, healthy environment, and the value of historic or specimen trees. A site visit was performed on July 12, 2024 to verify and review the extent of woodlands on-site. Merjent has determined that all of the trees on-site should be considered regulated woodland due to the stand density and connectivity to other larger regulated woodland areas. Select photos from the site visit are included in **Attachment A**.

2. When a proposed site plan is located within a regulated woodland, any tree proposed for removal with a diameter at breast height (DBH) greater than or equal to eight inches will require tree replacement and a Woodland Use Permit per Section 37-8. This also applies to any tree that will be preserved, but where impacts to critical root zones are proposed.

3. Regardless of the presence of regulated woodlands onsite, a Woodland Use Permit is required to perform construction on any site containing the removal of trees larger than 36 inches in diameter at breast height (DBH).

4. The plans have proposed the cumulative removal of 484 trees. A **Woodland Use Permit** is required to perform construction on any site containing regulated woodlands. The permit for this site would require Planning Commission approval because there are more than three trees proposed to be impacted/removed by construction. Comment seven (below) may affect the total number of proposed trees for removal.

5. **Woodland Replacement**. Based on review of the plans, the following woodland replacements are currently listed:

Tree Size (DBH, inches)	**Number of Trees** (commercial site + residential site)	**Ratio Replacement/Removed Tree**	**Total Replacements Required** (commercial site + residential site)
8-11	180 (40+140)	1	180 (40+140)
12-20	225 (45+180)	2	450 (90+360)
21-29	30	3	90

Tree Size (DBH, inches)	Number of Trees (commercial site + residential site)	Ratio Replacement/Removed Tree	Total Replacements Required (commercial site + residential site)
	(9+21)		(27+63)
30+	3 (2+1)	4	12 (8+4)
Multi-stem	46 (12+34)	Sum of Stem DBH/8 (rounded up)*	195 (63+132)
Total	**484** (108+376)	**-**	**927** (228+699)

- Sheet PL-1 lists that 102 regulated trees will be removed but the sum of trees listed under the required replacements section is 108 trees (40+45+9+2+12). A potential error in summing the number of trees removed may have occurred. However, this does not impact the number of replacements required.

6. For tree replacement credits that will be planted on-site, a financial guarantee of $400/tree replacement credit is required to ensure the planting of the on-site woodland replacement credits. The financial guarantee will be released after trees have been planted and approved by the City of Novi. The applicant must request a tree planting inspection. For the Novi Ten PRO, the applicant has proposed planting 215 (34+181) replacement trees on-site. A **Woodland Replacement Financial Guarantee of $86,000** (215 trees x $400/tree) is required as part of the Woodland Use Permit fees to ensure a successful planting of on-site Woodland Replacement Tree Credits.

   The Applicant shall guarantee trees for two growing seasons after installation and the City's acceptance, per the City's Performance Guarantees Ordinance. A **two-year maintenance bond in the amount of 25% ($21,500)** of the value of the trees, but in no case less than $1,000, shall be required to ensure the continued health of the trees following acceptance (Chapter 26.5, Section 26.5-37).

   Note that the Applicant is responsible for requesting an inspection of the installed on-site Woodland Replacement Trees.

   While not necessary for PSP approval, a list of trees proposed for replacement will need to be provided in the final site plan. Approximate locations are provided in the associated landscape plans. Section 37-8 of the City of Novi Woodlands Protection Ordinance and the City of Novi Landscape Design Manual provide guidelines for replacement trees.

7. The Applicant will be required to pay into the **City of Novi Tree Fund $284,800** for the remaining 712 woodland replacements not planted on site (712 woodland replacement credits x $400/credit). This fee is non-refundable.

8. **Critical root zone**. Accurate critical root zones must be depicted on the site plan for all regulated trees within 50 feet of the proposed grading or construction activities. Tree symbols are present on the plan but are relatively small. Additionally, it is unclear whether the tree symbol on the plan represents the trunk, dripline, or critical root zone of the tree. The tree symbol should be clarified in the legend or

elsewhere on the plan. Critical root zones should be identified using a separate symbol on the site plans.

9. Regulated woodland disturbance includes impacts to the critical root zone of regulated trees, including but not limited to encroachment by grading, landscaping, and construction. If impacts to the critical root zone of regulated woodland trees are proposed – woodland replacements are required. Revised woodland replacement calculations or plan revisions may be necessary to address any unclear encroachments into the critical root zone.

10. A **woodland fence guarantee of $6,000** ($5,000 x 120%) is required per Chapter 26.5-37. The financial guarantee shall be paid prior to issuance of the City of Novi Woodland Use Permit.
    a. The cost to stake, install, and remove the tree protection fencing should be added to Sheets PL-1 and RL-3 in order to calculate woodland fence inspection fees.
    b. The location and extent of tree protection fence should be added to the commercial site plan prior to final site plan approval; locations and diagrams of tree protection fencing have been included in the residential site plan. This can be added to Sheet PL-1 for the commercial site plan.

11. **Woodland Replacement Inspection** – The Applicant is responsible for walking the entire site to confirm that all woodland replacement trees/shrubs have been planted on site according to the approved site plan stamping set. If any material is missing, dead or dying, replacements should be made prior to requesting the inspection. The applicant should also provide an as-built landscape plan if the trees planted do not match the species and/or location shown on the approved site plan stamping set. Once this occurs the Applicant should contact the Bond Coordinator to schedule the inspection (Angie Sosnowski at asosnowski@cityofnovi.org; 248-347-0441) and complete the inspection request form. If additional inspections are needed, then additional inspection fees will be required to be paid by the applicant.

12. **Woodland Guarantee Inspection –** Prior to requesting the 2-year woodland guarantee inspection, the Applicant is responsible for walking the entire site to confirm that all plant material has survived and is healthy. If any material is missing, dead or dying, replacements should be made prior to requesting the inspection. Once this occurs the Applicant should contact the Bond Coordinator to schedule the 2-year guarantee inspection (Angie Sosnowski at asosnowski@cityofnovi.org / 248-347-0441) and complete the inspection request form. If additional inspections are needed, then additional inspection fees will be required to be paid by the applicant. Based upon a successful inspection for the 2-year warranty the Landscape/Woodland/Street trees financial guarantee will be returned to the Applicant.

    If the woodland replacements, street trees, or landscaping guarantee period is scheduled to end during the period when inspections are not conducted (November 15th – April 15th) the Applicant is responsible for contacting the Bond Coordinator and Woodland/Landscape Inspector in the late summer/early fall prior to the 2-year expiration to schedule an inspection.

13. The Applicant may be required to provide preservation/conservation easements as directed by the City of Novi Community Development Department for any areas of woodland replacement trees. The applicant shall demonstrate that all proposed woodland replacement trees and existing regulated woodland trees to remain will be guaranteed to be preserved as planted with a conservation easement or landscape easement to be granted to the city. This language shall be submitted to the City Attorney

for review. The executed easement must be returned to the City Attorney within 60 days of the issuance of the City of Novi Woodland permit. Any associated easement boundaries shall be indicated on the Plan.

14. Pursuant to Section 37-28, all trees should be identified via a tag affixed loosely with a single nail. All trees on-site were appropriately tagged, there may be an inconsistency between the tag numbers and the provided tree survey. An example photo is provided in **Attachment A** of a tree tagged with tree tag number 507 but is more consistent with the approximate location of Tree 10493. The applicant should clarify the tree tag numbers relative to the numbers provided in the survey.

Wetlands

Wetland Recommendation: Merjent **recommends approval** of the Novi Ten PRO formal application based on the comments provided below.

Upon review of published resources, the Site appears to contain or immediately borders:

☒ City-regulated wetlands, as identified on the City of Novi interactive map website. Note that both wetland and property limits depicted on the City's map are considered approximations (**Figure 2**).

☒ Wetlands that are regulated by the Michigan Department of Environment, Great Lakes, and Energy (EGLE).

☒ Wetlands as identified on National Wetland Inventory (NWI) and Michigan Resource Inventory System (MIRIS) maps, as identified on the EGLE Wetlands Viewer interactive map website (**Attachment B**). NWI and MIRIS wetlands are identified by the associated governmental bodies' interpretation of topographic data and aerial photographs.

☒ Hydric (wetland) soil as mapped by the U.S. Department of Agriculture, Natural Resources Conservation Service, as identified on the EGLE Wetlands Viewer interactive map website (**Attachment B**).

Permits and Regulatory Status

Due to the comments below, the following wetland-related items will be required for this project:

Item	Required/Not Required
Wetland Permit (specify Non-minor or Minor)	Required, Non-minor
Wetland Mitigation	Not City Required (May be required by EGLE)
Environmental Enhancement Plan	Required
Wetland Buffer Authorization	Required
EGLE Wetland Permit	Likely Required
Wetland Conservation Easement	Not required unless mitigation is constructed within the City

Wetland Review Comments

1. Merjent conducted a site visit on July 12, 2024 to become familiar with the site in conjunction with the previous review(s) conducted by MSG. Select photographs are included in **Attachment A**.

2. Impacts have been proposed to six wetlands on-site, totaling approximately 0.12 acre loss of wetland. The impacts are summarized below.

Wetland ID	Classification	Acres On-site	Wetland Impact Area (acre)	Wetland Impact Volume (cu. ft.)	Buffer Impact Area (acre)	Buffer Impact Volume (cu. ft.)
A	Emergent	0.050	0.050	4,356	0.189	Not provided
B	Emergent	0.029	0.029	3,790	0.111	Not provided
C	Emergent/Scrub-shrub	0.452	--	--	0.065	Not provided
D	Emergent/Scrub-shrub	10.73	--	--	0.082	Not provided
E	Emergent	0.012	0.012	523	0.101	Not provided
XX	Forested	0.01	0.01	354	0.07	Not provided
YY	Emergent/Forested	0.01	0.01	561	0.09	Not provided
ZZ	Emergent	0.01	0.01	1290	0.10	Not provided
Total	-	**11.30**	**0.12**	**10,874**	**0.81**	--

3. In addition to wetlands, the City of Novi regulates wetland and watercourse buffers/setbacks. Article 24 of the Zoning Ordinance, Schedule of Regulations, states: "There shall be maintained in all districts a wetland and watercourse setback, as provided herein, unless and to the extent, it is determined to be in the public interest not to maintain such a setback. The intent of this provision is to require a minimum setback from wetlands and watercourses". The established wetland and watercourse buffer/setback limit is 25 horizontal feet, regardless of grade change.
    a. Appropriate setbacks have been incorporated into the site plans. Prior to final site plan approval, the applicant shall provide fill volumes for the associated buffer impacts similar to the areas provided on Sheet 6A and Sheet 6B. Total setback disturbance sizes are summarized in Comment two above.

4. As stated in MSG's Wetland Boundary Review, when a project permanently impacts 0.25 acre or more of essential wetland, the City of Novi requires mitigation at a ratio of 2:1 for forested wetlands and 1.5:1 for emergent and scrub-shrub wetlands. The total proposed impact to City and EGLE-regulated wetlands is approximately 0.12 acre. Based on the total being less than 0.25 acre, mitigation is not required by the City but an environmental enhancement plan will be required.
    a. The applicant has included additional tree plantings and supplementary native herbaceous plantings around the proposed detention basin. The applicant will need to communicate with whomever will maintain this area upon construction completion that mowing will not be allowed in native planting areas to allow full growth of native plants..

5. EGLE's *MiEnviro Portal Site Explorer* was reviewed for the site *63-West 10 Mile Rd-Novi* and it was found that a Pre-application Meeting was held with EGLE on or around March 31, 2021 and that a permit will be required from EGLE for the project. A City of Novi Wetland Use Permit cannot be granted until a permit is received from EGLE authorizing impacts to water resources.

6. The City of Novi requires the boundary lines of any watercourses or wetlands on the Site to be clearly flagged or staked and such flagging/staking shall remain in place throughout the conduct of permit activity. During Merjent's site visit on July 12, 2024 it was noted that the flagging from the delineation was still present. Select photos are included in **Attachment A**. The site does not need to be re-flagged during the site plan review process, but prior to granting a Wetland Use Permit and construction the wetlands should be verified as being accurately staked or flagged.

7. The cost to perform any wetland protection and restoration shall be listed on the site plan, per Chapter 26.5, Section 26.5-7 (b) of the City of Novi Code of Ordinances. A **Wetland Financial Performance Guarantee** in the amount of 120% of the cost to perform any wetland protection, restoration, and development will be collected prior to the granting of a Wetland Use Permit.

8. The Applicant is encouraged to provide wetland conservation easements for any areas of remaining wetland and 25-foot wetland buffer. The Applicant shall provide wetland conservation easements as directed by the City of Novi Community Development Department for any areas of proposed wetland mitigation areas (if necessary). Additionally, EGLE may request conservation easements around remaining wetlands on-site if a permit is required from EGLE. This requirement would be unrelated to the requirements of the City of Novi Wetland Use Permit. This language shall be submitted to the City Attorney for review. The executed easement must be returned to the City Attorney within 60 days of the issuance of the City of Novi Wetland Use Permit.
    a. An existing conservation easement is present south of the site associated with the Ridgeview of Novi construction. Additional wetlands on-site (Wetland D) can be added to the existing conservation easement associated with the Ridgeview of Novi.

Should you have any questions or concerns with this review, please contact me via email at jason.demoss@merjent.com or via phone at (619) 944-3835.

Sincerely,

Merjent, Inc.

Jason DeMoss, PWS
Environmental Consultant

Enclosures:

Figure 1 – City of Novi Woodlands Map
Figure 2 – City of Novi Wetlands Map
Attachment A – Site Photographs
Attachment B – Wetland Resource Documents

CC:
Diana Shanahan, City of Novi, dshanahan@cityofnovi.org
Rick Meader, City of Novi, rmeader@cityofnovi.org
Barbara McBeth, City of Novi, bmcbeth@cityofnovi.org
Robb Roos, Merjent, robb.roos@merjent.com



Figure 1. City of Novi Regulated Woodlands Map
Approximate Site boundary is shown in red.
(Approximate) Regulated Woodland areas are shown in green.

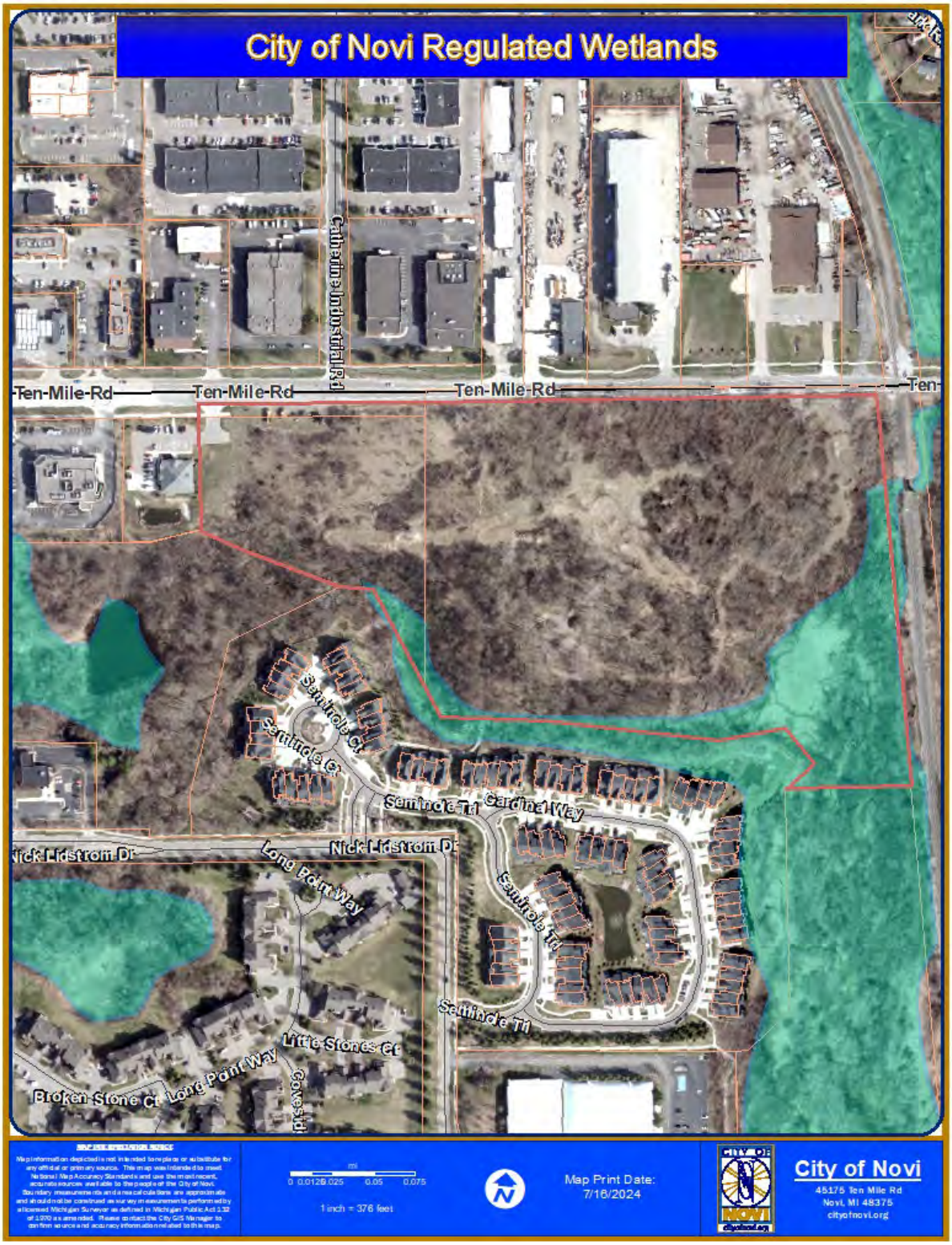


Figure 2. City of Novi Regulated Wetlands Map
Approximate Site boundary is shown in red.
(Approximate) Regulated Wetland areas are shown in turquoise.

Attachment A
Site Photographs



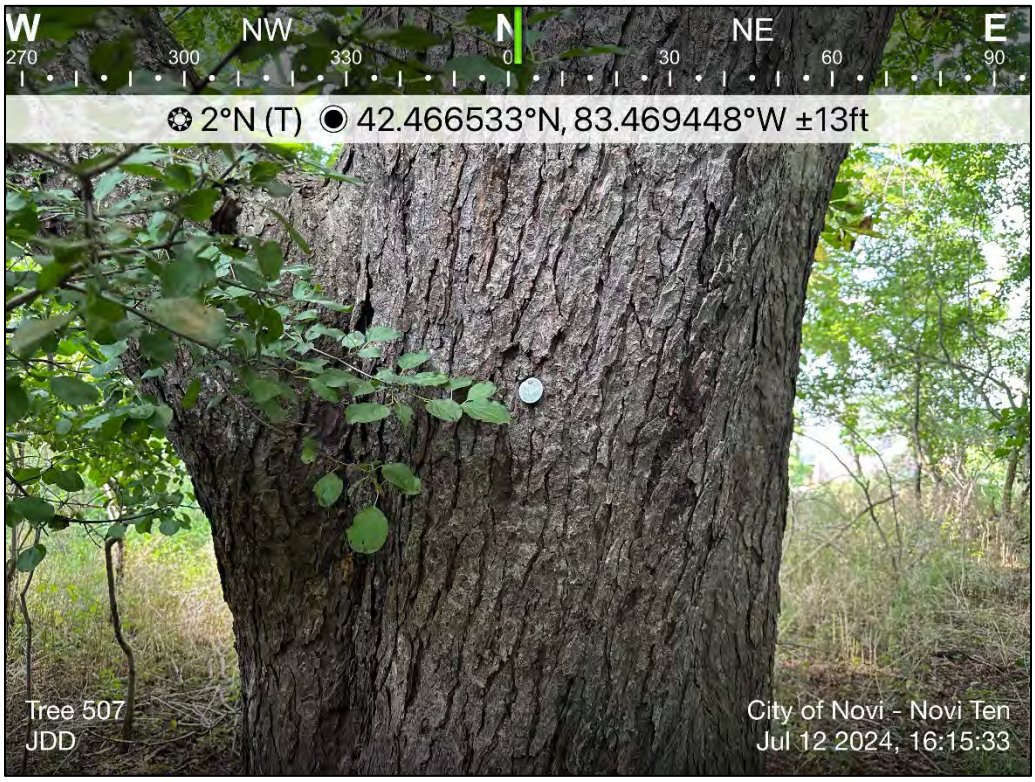
Overview of the upland within the eastern portion site



Overview of a typical forested area within the site



Overview of the northern forested portion of the site



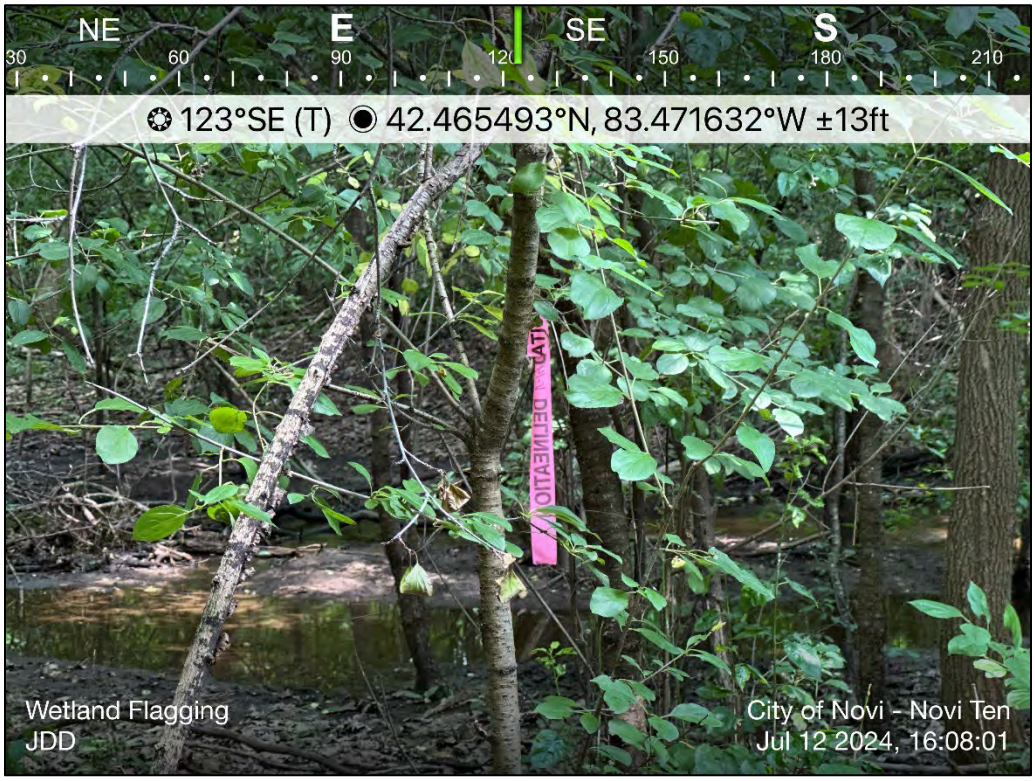
Overview of a typical tree tag on-site; view of Tree tag 507. However, this tree is likely more consistent with Tree 10493 or Tree 1050



Overview of typical tree tag on-site – Tree 2213



Overview of the western portion of the site



Overview of typical flagging on-site

Attachment B
Wetland Resource Documents

Novi Ten PRO Existing Easement



7/16/2024

1:4,523

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Esri Community Maps Contributors, City of Novi, MI, Province of Ontario, Oakland County, Michigan, SEMCOG, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Maxar

Wetlands Map Viewer



July 16, 2024

Part 303 Final Wetlands Inventory

- Wetlands as identified on NWI and MIRIS maps
- Soil areas which include wetland soils
- Wetlands as identified on NWI and MIRIS maps and soil areas which include wetland soils

National Wetlands Inventory 2005

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

1:6,385

0 0.04 0.08 0.16 mi

0 0.05 0.1 0.2 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Disclaimer: This map is not intended to be used to determine the specific

TRAFFIC REVIEW

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

Project name:
JZ23-09 – Novi Ten Formal PRO Traffic Review

From:
AECOM

Date:
July 15, 2024

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

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

Memo

Subject: JZ23-09 – Novi Ten Formal PRO Traffic Review

The formal PRO site plan was reviewed to the level of detail provided and AECOM recommends **denial** for the applicant to move forward until the comments below are addressed to the satisfaction of the City.

GENERAL COMMENTS

1. The applicant, Novi Ten Associates, is proposing a residential and commercial development consisting of 71 housing units, as of this time 35,900 SF total of retail/restaurants, and a park area. An architectural plan for the commercial phase was provided and the comments for that phase are *italicized* below.
2. The development is located on 10 Mile Road, east of Novi Road. 10 Mile Road is under the jurisdiction of the Road Commission for Oakland County.
3. The site is zoned OS-1 and I-1. The applicant is seeking to rezone the commercial area to B-2 and the residential to RM-1 through a PRO Agreement.
4. The following traffic-related deviations are being requested by the applicant:
    a. Perpendicular parking on a major drive.
    b. Major drive curve of radius less than 100'.
5. The following traffic-related deviations will be required if plans are not changed and required to be obtained at the PRO stage:
    a. Opposite driveway spacing. **The applicant noted that they have obtained permission from RCOC allowing the location of the proposed residential driveway with the addition of a passing lane on WB 10 Mile Road. The applicant is not requesting this deviation and should verify with the City that it will not be required.**

TRAFFIC IMPACTS

1. AECOM performed an initial trip generation based on the ITE Trip Generation Manual, 10th Edition, as follows. This does not include the business area, due to lack of information from the applicant.

    ITE Code: 220 – Multifamily Housing (Low-Rise) and Strip Retail Plaza <40K (822), High Turnover (Sit-Down) Restaurant (932)
    Development-specific 71 Dwelling Units and 35,900 SF (26,700 SF assumed retail, 9,200 SF assumed restaurant)
    Zoning Change: OS-1 and I-1 to RM-1 and B-3

Trip Generation Summary				
	Estimated Trips	Estimated Peak-Direction Trips	City of Novi Threshold	Above Threshold?
AM Peak-Hour Trips	196 (45+63+88)	120 (34+38+48)	100	Yes
PM Peak-Hour Trips	310 (51+176+83)	171 (32+88+51)	100	Yes
Daily (One-Directional) Trips	2,970 (530+1454+986)	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**
RTIS (not reviewed at this stage)	Zoning change for OS-1 and I-1 to RM-1 and B-2. RTIS portions of the provided TIS have been reviewed in a separate letter. Conclusion of the RTIS review: the daily trips (6,560) are **significantly higher for the proposed land uses** under the new zoning vs daily trips (2,566) under the existing zoning. However, the applicant is proposing to reduce the gross floor area to 35,900 SFT from 60,000 SFT as part of the second revised PRO concept plan since the RTIS study was submitted. The applicant could revise the RTIS to show the changes in the net impact.
TIS (not reviewed at this stage)	A TIS review was previously provided under a separate letter. The TIS study indicates a large number of trips from this proposed development on the surrounding road networks and driveways. The study concluded with a list of **significant roadway improvements** including the addition of through lanes and a central left turn lane on 10 Mile Road within the study area in support of the shopping plaza. However, we do not agree with the widening of 10 Mile Road only tied to the site driveways as suggested in the report rather it should be tied to the major intersection movements for the safety and drivers' expectancy. **The commercial part of this project is dependent on these mitigations/improvements being implemented.**

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	35’	Met	Could reduce to meet standard of 25’ for local street.
2	Driveway Width | O Figure IX.3	22’ and *30’*	**Partially Met**	**Indicate the length of island.**
3	Driveway Taper | O Figure IX.11			
3a	Taper length	75’	Met	
3b	Tangent	50’	Met	
4	Emergency Access | O 11-194.a.19	2 access points	Met	Applicant has indicated commercial property not to be developed at this time. A 30’ wide gravel access road for the residential section will be built at the same time as the residential section. Detail of the gate provided. **Label gate location on site plan.**
5	Driveway sight distance | O Figure VIII-E	500+	Met	
6	Driveway spacing			
6a	Same-side | O 11.216.d.1.d	Not indicated but measured on maps to be over 230’ requirement	Met	The applicant indicated they have preliminary approval from RCOC on the driveway locations.
6b	Opposite side | O 11.216.d.1.e	105’ and 118’, *Directly across from existing driveways*	**Partially Met**	The applicant indicated they have preliminary approval from RCOC on the driveway locations. **The applicant should verify with the City that a deviation will not be required.**
7	External coordination (Road agency)	Applicant indicated permit required	**Partially Met**	Include details of what work is to occur in the RCOC right of way and maintenance of traffic plans for the work. **Proposed striping is only labeled for the center lane, include for all proposed lanes.**
8	External Sidewalk | Master Plan & EDM	8’	Met	
9	Sidewalk Ramps | EDM 7.4 & R-28-K	Indicated as typical	**Partially Met**	**Update R-28-I sidewalk ramp detail to latest R-28-K detail.**
10	Any Other Comments:			

INTERNAL SITE OPERATIONS				
No.	**Item**	**Proposed**	**Compliance**	**Remarks**
11	Loading zone | ZO 5.4	N/A and *170’ x 10’, 170’ x 10’, 58’ x 15’, and 58’ x 22’*	Met	

INTERNAL SITE OPERATIONS				
No.	**Item**	**Proposed**	**Compliance**	**Remarks**
12	Trash receptacle | ZO 5.4.4	Individual trash collection and *provided for each of the 4 buildings*	Met	
13	Emergency Vehicle Access	Turning movements provided	Met	
14	Maneuvering Lane | ZO 5.3.2	N/A and *24'*	Met	
15	End islands | ZO 5.3.12			
15a	Adjacent to a travel way	N/A and *partially dimensioned*	**Partially Met**	***Provide radii dimensions for commercial phase end islands in future submittal. Note end islands adjacent to travel way are to be 3' shorter than adjacent space.***
15b	Internal to parking bays	N/A and *partially dimensioned*	**Partially Met**	***Provide radii dimensions for commercial phase end islands in future submittal. Internal islands in traffic bays are not required to be 3' shorter than adjacent space.***
16	Parking spaces | ZO 5.2.12	10 backing onto street	**Not Met**	Perpendicular parking on major drive, see No.30. See Planning review letter for number of parking spaces required.
17	Adjacent parking spaces | ZO 5.5.3.C.ii.i	<15 spaces without an island	Met	
18	Parking space length | ZO 5.3.2	19' typical and *17' and 19'*	Met	
19	Parking space Width | ZO 5.3.2	9' typical and *9'*	Met	
20	Parking space front curb height | ZO 5.3.2	6" and *not indicated*	**Partially Met**	***Provide for commercial phase in future submittal. Note 4" curb/sidewalk required in front of 17' parking space and 6" everywhere else. Curb detail on sheet 6B only shows 4" height.***
21	Accessible parking – number | ADA	1 and *14*	Met	
22	Accessible parking – size | ADA	8' with 8' aisle and *8' with 8' aisle or 5' aisle*	Met	Applicant could consider providing the aisle on the passenger side of the space.

INTERNAL SITE OPERATIONS				
No.	**Item**	**Proposed**	**Compliance**	**Remarks**
23	Number of Van-accessible space | ADA	1 and *not indicated*	**Partially Met**	One (1) space is required to be van accessible. *Label which spaces are van accessible in future submittal.*
24	Bicycle parking			
24a	Requirement | ZO 5.16.1	16 spaces *and 2 spaces at each retail building*	**Partially Met**	One (1) space for every 5 dwellings, total of 15 spaces required. ***5% of required automobile spaces, minimum two (2) spaces. Buildings A, B and D require more than 2 spaces.***
24b	Location | ZO 5.16.1	2 locations and *indicated*	Met	Applicant could consider providing 4 locations with 4 spaces each instead of 2 locations with 8 spaces each.
24c	Clear path from Street | ZO 5.16.1	6' clear path	Met	
24d	Height of rack | ZO 5.16.5.B	3' and *not indicated*	**Partially Met**	***Include rack detail in commercial phase.***
24e	Other (Covered / Layout) | ZO 5.16.1	Layout provided and *layout not provided*	**Not Met**	**Refer to Text Amendment 18.301 for revised standard layout details.**
25	Sidewalk – min 5' wide | Master Plan	5' and 7' and *5' and 7'*	Met	
26	Sidewalk ramps | EDM 7.4 & R-28-K	Partially indicated and *not indicated*	**Partially Met**	**Update R-28-I sidewalk ramp detail to R-28-K. A proposed ramp is not indicated at the van accessible space. *Label ramps in commercial phase in future submittal.***
27	Sidewalk – distance back of curb | EDM 7.4	6' and *0'*	Met	
28	Cul-De-Sac | O Figure VIII-F	N/A	**-**	-
29	Drive-Thru | ZO 5.3.11.I	N/A	-	
30	Minor/Major Drives | ZO 5.10	Private road qualifies as major drive. 10 perpendicular spaces and 85', 100', and 120' curves	**Not Met**	Major drives are not permitted perpendicular parking. Minimum curve radius allowed for major drives is 100', applicant is proposing 85' curve. **Applicant has indicated they are requesting both deviations.**
31	Any Other Comments:			

SIGNING AND STRIPING				
No.	**Item**	**Proposed**	**Compliance**	**Remarks**
32	Signing: Sizes | MMUTCD	Included and *not included*	**Partially Met**	***Provide for commercial phase in future submittal.***
33	Signing table: quantities and sizes	Included and *not included*	**Partially Met**	***Provide for commercial phase in future submittal.***
34	Signs 12" x 18" or smaller in size shall be mounted on a galvanized 2 lb. U-channel post | MMUTCD	Included and *not included*	**Partially Met**	***Provide for commercial phase in future submittal.***
35	Signs greater than 12" x 18" shall be mounted on a galvanized 3 lb. or greater U-channel post | MMUTCD	Included and *not included*	**Partially Met**	***Provide for commercial phase in future submittal.***
36	Sign bottom height of 7' from final grade | MMUTCD	Included and *not included*	**Partially Met**	***Provide for commercial phase 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	Included and *not included*	**Partially Met**	***Provide for commercial phase in future submittal.***
38	FHWA Standard Alphabet series used for all sign language | MMUTCD	Included and *not included*	**Partially Met**	***Provide for commercial phase in future submittal.***
39	High-Intensity Prismatic (HIP) sheeting to meet FHWA retro-reflectivity | MMUTCD	Included and *not included*	**Partially Met**	***Provide for commercial phase in future submittal.***
40	Parking space striping notes	Included and *not included*	**Partially Met**	***Provide for commercial phase in future submittal.***
41	The international symbol for accessibility pavement markings | ADA	Included and *not included*	**Partially Met**	***Provide detail for commercial phase in future submittal. Rotate symbol to meet standard.***
42	Crosswalk pavement marking detail	Included and *not proposed*	Met	*Provide detail for commercial phase if proposing in future submittal.*
43	Any Other Comments:	Applicant could provide crosswalk signs at the mid-block crossing.		

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

TRAFFIC IMPACT STUDY REVIEW

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

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

From:
AECOM

Date:
August 2, 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: JSP23-09 – Novi Ten TIS Traffic Review

The Traffic Impact Study was reviewed to the level of detail provided and AECOM recommends **approval of the Traffic Impact Study with the mitigations/improvements**.

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 on the south side of 10 Mile Road between Novi Road and the Railroad tracks.
3. The development consists of 71 townhouse residential units (low rise) and approximately 35,900 SF (reduced from 60,000 SF under the last traffic study) of neighborhood retail/restaurant space and two tennis/pickleball courts.
4. The development is a PRO plan, and the site would need to be rezoned from its existing mix of I-1 and OS-1.

BACKGROUND DATA

1. The site is currently zoned for OS-1 and I-1 for which there is a parallel plan with 54,000 SF of office space and 291,200 SF of light industrial space.
2. The following roadways were included in the study:
    a. 10 Mile Road: East/West, 45 mph, 2 lanes divided
    b. The intersections and site driveways were included in the study.
        - 10 Mile Road & Novi Road
        - 10 Mile Road & Meadowbrook Road
        - Site Driveways (4 shown in concept plan)
        - Other Existing Driveways
3. Applicant collected turning movements that occurred between the hours of 6:00 AM-7:00 PM on March 16th, 2022 at 2 intersections (10 Mile Road and Novi Road and Meadowbrook Road) and 4 driveways.

EXISTING CONDITIONS

1. The overall Level of Service (LOS) at the major road intersections is D or better while following movement experiencing higher delay LOS E or F at:
    a. Eastbound left at 10 Mile and Novi Road (LOS F) during the PM peak hour. (Table 8.2.1)
    b. Southbound Third Driveway/Double Driveway at 10 Mile Road (LOS E) during PM peak hour. (Table 8.5.1)
    c. Northbound and southbound movements at 10 Mile and Meadowbrook Road (LOS E) during AM and PM peak hours. (Table 8.7.1)

BACKGROUND (NO BUILD) CONDITIONS 2024

1. A conservative 0.2% annual growth rate was used to determine the build year five years from 2022, based on the SEMCOG traffic volume forecasts.
2. Overall operations at the intersections are not expected to change significantly compared to existing conditions.

SITE TRIP GENERATION

1. A total of 2970 (reduced from 6560 trips under the last traffic study) daily trips are anticipated based on the ITE trip generation codes.
2. A total of 43% of trips are considered as pass-by trips during the afternoon peak hours and a relevant reference is provided in the Appendix from the ITE manual. And a net increase of approx. 200 trips during the morning peak hour and approx. 285 trips (reduced from 400 trips under the last traffic study) during the evening peak hour are considered for a traffic impact study on the surrounding road network.

SITE TRAFFIC ASSIGNMENT

1. Adjacent street volumes were used to calculate site trip distribution.
    a. The largest portion of the traffic is assumed to be coming from/going to Novi Road followed by 10 Mile Road and Meadowbrook Road.

FUTURE CONDITIONS

1. Operations at the signalized intersections are expected to deteriorate at the following movements:
    a. Eastbound left at 10 Mile and Novi (LOS F in both existing and build conditions). **Westbound through/right is estimated to be LOS E in future conditions deteriorated from LOS D in existing and background conditions** during AM peak hour. However, the LOS E in the future conditions is on the border of LOS D with a net increase in the delay of approx. 1.5 seconds. (Table 8.2.1)
    b. LOS F for 3rd Site Driveway with the **significantly excessive delay of approx. 800 sec NB** and 76 seconds delay SB during PM peak hours (Table 8.5.1). **The existing driveway on the north (Southbound) is estimated to have approx. 34 seconds net increase in the delay due to this development**. However, this existing driveway suggests a low volume (10 cars) during the PM peak hour. (Table 8.5.1)
    c. Movements at Northbound and Southbound approaches at Meadowbrook continue to experience higher delays at LOS E. (Table 8.7.1)
2. Excessive delay at 3rd site driveway will lead ultimately to the driveway not being utilized by the commuters of this proposed development and will end up adding more traffic on other driveways and circulation within the development. This might start a cascade of effects on other driveways also failing especially when all the driveways are on 10 Mile Road.

CONCLUSIONS

1. The study concluded with a list of recommendations that will improve the failing level of service and traffic conditions as per the following:
    - Widen eastbound 10 Mile Road to two through lanes, ending with a right-turn lane at the site's easternmost residential driveway.
    - Widen westbound 10 Mile Road to two through lanes west from the 3rd site driveway to help provide additional capacity for outbound site traffic.
    - Provide a continuous center lane turn lane to serve the 1st, 2nd, and 3rd commercial driveways.

    However, widening at the intersections with tapering it down to the existing cross section should follow the road jurisdiction (RCOC) approval and standards.

2. The study indicates a large number of trips (reduced from the last traffic study) from this proposed development on the surrounding road networks and driveways. The study concluded with a list of significant roadway improvements including the addition of through lanes and a central left turn lane on 10 Mile Road within the study area in support of the neighborhood retail/restaurant. **The commercial part of this project is dependent on these mitigations/improvements being implemented.**

Access: Sight Distance, Right-turn Lane and Left-turn Lane

Accesses will also be reviewed under the site plan review and please refer comments provided in the site plan review. Please provide detailed drawings showing sight distances and right-turn and left-turn lanes as part of the site plan review. The comments here are based on the level of detail provided as part of the Traffic impact study:

- Sight Distance: The traffic study concluded that adequate sight distance for three commercial driveways and a residential driveway. However, the tennis/pickleball court driveway has not been studied and is assumed to have adequate sight distance due to its location. **However, the applicant needs to show the sight distance triangle and details on the plan set for further review and confirmation.**
- Right-tun lane: The traffic study concluded that due to traffic volumes along 10 Mile Road, all driveways qualify for a right-turn deceleration taper according to the RCOC warrant graph. **However, the applicant needs to coordinate with RCOC for geometrical standards and approval for the right-turn taper. And applicant needs to show the right-turn taper details with dimensions and adherence to the applicable standards on the plan set for further review and confirmation.**
- Left-turn lane: The traffic study concluded that projected numbers of left-turns into each of the site driveways during the busier PM peak warrants a center left-turn lane at all three commercial driveways, a left-turn passing lane at the residential driveway. **However, the applicant needs to coordinate with RCOC for geometrical standards and approval for the center left-turn lane and left-turn passing lane. And applicant needs to show the details on the plan set for further review and confirmation.**

Additional comment

Traffic study does not include the assessment of operation when rail-road crossing is closed. However, it is fair to assume that the proximity of the railroad crossing to this development would have a significant impact on the traffic flow and **might block all the driveways on the eastbound due to the queues from the closure of the railroad crossing.**

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

Sincerely,

AECOM

Saumil Shah
Project Manager

Sarah Binkowski, PE, PTOE
Michigan Traffic Engineering Manager

FAÇADE REVIEW

DRN & ASSOCIATES, ARCHITECTS, PC
Phone: (248) 880-6523
E-Mail: dnecci@drnarchitects.com
Web: drnarchitects.com
50850 Applebrooke Dr., Northville, MI 48167

July 16, 2024

City of Novi Planning Department
45175 W. 10 Mile Rd.
Novi, MI 48375-3024

Façade Review Status:
Residential Units – Section 9 Waiver Recommended.
Commercial Buildings – Full Compliance with Façade Ordinance and PRO Enhancement has been provided.

Attn: Ms. Barb McBeth – Director of Community Development

Re: FACADE ORDINANCE REVIEW
Novi-Ten PRO, JZ23-09 Formal PRO Plan (3rd Review)
Façade Region: 1, Zoning District: RA

Dear Ms. McBeth:
The drawings provided by Toll Architecture dated 6/30/2023 for 4 typical residential townhome units have not changed since our prior review. The drawings for the commercial buildings by Siegal Tuomaala Architects dated 6/17/24 have been revised since our prior review.

Residential Unit 1 Howe, Newhaven (Drawings Dated 6/30/23)	Front	Rear	Left	Right	Ordinance Maximum (Minimum)
Brick	34%	**27%**	43%	43%	100% (30% Min)
Horizontal Siding	1%	21%	45%	45%	50% (Note 10)
Asphalt Shingles	**58%**	49%	7%	7%	50% (Note 14)
Wood Trim	7%	3%	5%	5%	15%

Residential Unit 2 Howe, Weatherby (Drawings Dated 6/30/23)	Front	Rear	Left	Right	Ordinance Maximum (Minimum)
Brick	**26%**	**27%**	43%	43%	100% (30% Min)
Horizontal Siding	1%	21%	45%	45%	50% (Note 10)
Vertical Siding	16%	0%	7%	7%	25%
Asphalt Shingles	47%	49%	5%	5%	50% (Note 14)
Wood Trim	10%	3%	5%	5%	15%

Residential Unit 3 Sanders, Newhaven (Drawings Dated 6/30/23)	Front	Rear	Left	Right	Ordinance Maximum (Minimum)
Brick	34%	**27%**	43%	43%	100% (30% Min)
Horizontal Siding	3%	21%	45%	45%	50% (Note 10)
Asphalt Shingles	**56%**	49%	7%	7%	50% (Note 14)
Wood Trim	7%	3%	5%	5%	15%

Residential Unit 4 Sanders, Weatherby (Drawings Dated 6/30/23)	Front	Rear	Left	Right	Ordinance Maximum (Minimum)
Brick	**26%**	**27%**	43%	43%	100% (30% Min)
Horizontal Siding	1%	21%	45%	45%	50% (Note 10)
Vertical Siding	18%	0%	7%	7%	25%
Asphalt Shingles	45%	49%	5%	5%	50% (Note 14)
Wood Trim	10%	3%	5%	5%	15%

Residential Units - Our prior recommendation for a Section 9 Waiver for the deviations highlighted above remains unchanged. As shown above the percentage of Brick is below the minimum amount required by the Ordinance and the percentage of Asphalt Shingles exceeds the maximum amount allowed by the Ordinance on several elevations. In this case the deviations are minor in nature and do not adversely affect the aesthetic quality of the facades. A Section 9 Waiver is therefore recommended for the underage of Brick (3%) and overage of Asphalt Shingles (8%) on the front and rear facades. The precise type of tongue and groove (T&G) and Batten Wood Siding in not clearly indicated on the drawings. It is recommended that a sample board as required by Section 5.15.4.D of the Ordinance and/or a colored rendering be provided to indicate the colors and type of all façade materials.

Commercial Bldg. A & B (Drawings Dated 6/17/24)	North Front	South Rear	East	West	Ordinance Maximum (Minimum)
Brick	45%	83%	72%	72%	100% (30% Min)
C-Brick	0%	12%	12%	12%	25%
EIFS	20%	0%	7%	7%	25%
Cast Stone	18%	0%	7%	7%	50%
Awning	10%	0%	0%	2%	10%
Flat Metal Panel	7%	5%	2%	0%	50%

Commercial Bldg. C & D (Drawings Dated 6/17/24)	North Front	South Rear	East	West	Ordinance Maximum (Minimum)
Brick	45%	71%	73%	73%	100% (30% Min)
C-Brick	0%	24%	12%	12%	25%
EIFS	0%	0%	6%	6%	25%
Cast Stone	45%	0%	7%	7%	50%
Awning	7%	0%	0%	0%	10%
Flat Metal Panel	3%	5%	2%	2%	50%

Commercial Buildings –All facades remain in full compliance with the Façade Ordinance. The drawings indicate "all roof mounted mechanical equipment to be screened". The applicant should specify the material to be used for the roof screens; the screen's material must comply with the Façade Ordinance. A dumpster enclosure detail is not provided. The dumpster enclosure should have Brick to match the primary buildings on 3 sides.

Section 7.13.2 – Planned Rezoning Overlay - The PRO Ordinance requires that the project "accomplishes the integration of the proposed land development project with the characteristics of the project area in such a manner that results in an enhancement of the project area as compared to the existing zoning that would be unlikely to be achieved, or would not be assured, in the absence of the use of a PRO." We believe that the requirements of Section 5.15, the Facde Ordinance, must be exceeded to achieve compliance with this Section. In this case the percentage of Brick and Stone on the commercial units significantly exceed the minimum amount required by the Façade Ordinance. This represents an enhancement that would not otherwise be achieved in the absence of the PRO.

Sincerely,
DRN & Associates, Architects PC

Douglas R. Necci, AIA

FIRE REVIEW

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

July 10, 2024

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

RE: Novi Ten PRO Concept

PRZ23-0001

Project Description:
Build 13 multi-tenant structures and 3 commercial buildings.

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.
- Fire lanes will be designated by the Fire Chief or his designee when it is deemed necessary and shall comply with the Fire Prevention Ordinances adopted by the City of Novi. The location of all "fire lane – no parking" signs are to be shown on the site plans. ***(Fire Prevention Ord.)***
- 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).)***
- All new multi-residential buildings shall be numbered. Each number shall be a minimum 10 inches high, 1 inch wide and be posted at least 15 feet above the ground on the building where readily visible from the street. ***(Fire Prevention Ord.).***
- **Corrected 7/10/24 KSP -** The distribution system in all developments requiring more than eight hundred (800) feet of water main shall have a minimum of two (2) connections to a source of supply and shall be a looped system**.**
- ***(D.C.S. Sec. 11-68(a))***
- The ability to serve at least two thousand (2,000) gallons per minute in single-family detached residential; three thousand (3,000) gallons per school areas; and at least four thousand (4,000) gallons per minute in office, industrial and shopping centers is essential. ***(D.C.S. Sec.11-68(a))***
- Water mains sizes 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)***
- Fire hydrant spacing shall be measured as "hose laying distance" from fire apparatus. Hose laying distance is the distance the fire apparatus travels along improved access routes between hydrants or from a hydrant to a structure.
- **Hydrants shall be spaced approximately three hundred (300) feet apart online in commercial, industrial, and multiple-residential areas.** In cases where the buildings within developments are fully fire suppressed, hydrants shall be no more than five hundred (500) feet apart. The spacing of hydrants around commercial and/or industrial developments shall be considered as individual cases where special circumstances exist upon consultation with the fire chief. ***(D.C.S. Sec. 11-68 (f)(1)c)***
- Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise approved by the code official. ***(International Fire Code 912.2.1)***
- With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be approved. ***(International Fire Code 912.2)***
- Proximity to hydrant: In any building or structure required to be equipped with a fire department connection, the connection shall be located within one hundred (100) feet of a fire hydrant. ***(Fire Prevention Ord. Sec. 15-17 912.2.3)***
- 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.
- **Corrected 7/10/24 KSP -** Water mains and fire hydrants shall be installed prior to construction above the foundation. Note this on all plans.
- Site plan shall provide more than one point of external access to the site. A boulevard entranceway shall not be considered as providing multiple points of access. Multiple access points shall be as remote from one another as is feasible. The requirement for secondary access may be satisfied by access through adjacent property where an easement for such access is provided. **The truck route plan shows the vehicle being able to drive from residential area to business area. The site plan shows separation.**
- Secondary access road for residential development cannot have a temporary topping on the road. Road shall be finished with grass pavers, asphalt, or cement.

- The installation of security gates across a fire apparatus access road shall be approved by the fire chief. Where security gates are installed, they shall have an approved means of emergency operation. The security gates and the emergency operation shall be maintained operational at all times. Electric gate operators, where provided, shall be listed in accordance with UL 325. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200
- 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))*** **Road from "T" turn around to the north in business area, turning to the east this intersection doesn't meet city standards.**

Recommendation:

Approved with Conditions

Sincerely,

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

cc: file

PLANNING COMMISSION MINUTES

FEBRUARY 21, 2024 EXCERPT

PLANNING COMMISSION
MINUTES

CITY OF NOVI
Regular Meeting
February 21, 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 Becker, Member Dismondy, Member Lynch, Chair Pehrson, Member Roney
Absent Excused:	Member Avdoulos, Member Verma
Staff:	Barb McBeth, City Planner; Beth Saarela, City Attorney; Lindsay Bell, Senior Planner; Adam Yako, Plan Review Engineer; Saumil Shah, Traffic Consultant

PLEDGE OF ALLEGIANCE

Chair Pehrson led the meeting attendees in the recitation of the Pledge of Allegiance.

APPROVAL OF AGENDA

Motion made by Member Lynch and seconded by Member Roney to approve the February 21, 2024 Planning Commission Agenda.

VOICE VOTE ON MOTION TO APPROVE THE FEBRUARY 21, 2024 PLANNING COMMISSION AGENDA MOVED BY MEMBER LYNCH AND SECONDED BY MEMBER RONEY. *Motion carried 5-0.*

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 no City Planner report.

CONSENT AGENDA - REMOVALS AND APPROVALS

There were no Consent Agenda – Removals and Approvals.

PUBLIC HEARINGS

1. **NOVI-TEN PRO JZ23-09 WITH REZONING 18.740**

   Public hearing at the request of Novi-Ten Associates for initial submittal and eligibility discussion for a Zoning Map Amendment from Light Industrial (I-1) and Office Service (OS-1) to Low Density Multiple Family (RM-1) and General Business (B-3) with a Planned Rezoning Overlay. The subject site is approximately 34-acres and is located east of Novi Road, south of Ten Mile Road (Section 26). The applicant is proposing to develop a 71-unit multiple-family townhome development on the RM-1 portion, and approximately 35,900 square feet of commercial space on the B-3 portion.

Planner Lindsay Bell relayed the applicant is proposing to rezone about 34 acres south of Ten Mile Road, to the east of Novi Road, utilizing the Planned Rezoning Overlay option. The site is currently vacant and was historically part of the original Erwin Orchard, which operated in Novi from 1920-1983. The Ridgeview of Novi development is to the south, along with the Novi Athletic Club and Novi Ice Arena & Dog Park. The railroad tracks border the eastern property line. North of Ten Mile Road are industrial uses, and commercial uses are to the west.

The current zoning of the property is I-1 Light Industrial on the eastern side, and OS-1 Office Service on the western side. The adjacent parcels on the west are also OS-1. The Ridgeview development to the south is zoned RM-1 with a PRO, while the Athletic Club and Ice Arena area is I-1, as is the area east of the railroad tracks. North of 10 Mile Road is zoned I-2 and I-1.

The Future Land Use Map identifies this property as Community Office on the west and Industrial Research Development Technology on the east. To the south and east is planned for Industrial, north of the site is planned for industrial and heavy industrial, and on the western side is community office.

There is floodplain area associated with Chapman Creek and Walled Lake Branch of the Middle Rouge along the southern property boundary and along the eastern side of the site extending down toward the dog park. The natural features map also indicates extensive wetland area within the floodplain, and regulated woodlands are present in most areas of the site.

The applicant is proposing to utilize the Planned Rezoning Overlay to rezone about 7 acres of the property to B-3 General Business, and about 27 acres to RM-1 Low Density Multiple Family. The initial PRO plan shows a total of 71 attached 2-story townhome units on the site. The RM-1 residential portion is accessed by one entrance off Ten Mile Road, with a secondary emergency access drive to commercial portion of the project. Parking is provided in garages, on garage aprons, and in a few small bays of surface parking for visitors.

For the B-3 commercial portion, the current concept plan shows a total of 35,900 square feet in four separate buildings. Access to the B-3 site would be from three curb cuts on Ten Mile Road – one is the existing shared driveway with Maly Dental office, and the other two are new. The plan notes retail and restaurant uses within the commercial buildings but generally other uses permitted in the B-3 district could be tenants in those spaces. However, the applicant does offer to prohibit certain uses as a condition of the PRO Agreement, including a gas station, auto repair, car wash, marijuana sales, check cashing and pawn shops.

The applicant describes the project as creating a walkable community, with links to the existing paved trail in Ridgeview, which would connect to Nick Lidstrom Drive and to the nature trail behind the Novi Sports Club and dog park area. They also propose a paved path around the proposed townhouses that would be available to the public and two new overlook areas in the marshland area. A park area with seating is proposed between the commercial and residential area, and two pickleball/tennis courts are proposed in the northeast corner of the site, which are proposed to be donated to the City for public use.

Staff notes some concern that the pickleball courts may create a noise disturbance to the closest residential units, and that the associated parking area requires another curb cut on Ten Mile Road. Grading required for this area may also impact the flood zone. Therefore, the applicant may want to reconsider the pickleball courts, and instead provide a more low-impact nature park that would fit with City Council's goal to develop more walkable pocket parks, and even connect to the dog park to the south.

Staff and consultants have identified some issues with the proposed rezoning and PRO Plan. First, the proposed zoning districts indicated do not match the Future Land Use map guidance. Staff has concerns with the proposed residential use's compatibility with the adjacent I-2 Heavy Industrial to the north. However, it is adjacent to similar multiple family communities on the south side, and there are also similar commercial uses in this area to the west.

One of the biggest issues with the proposal is the traffic impacts. The applicant's traffic study notes that a significant increase in the number of vehicle trips are expected. A number of road improvements to Ten Mile could help accommodate this increase, including extending the 5-lane cross-section further east to at least the residential driveway. Also note that the traffic study assumed the commercial development size was 60,000 square feet, while the current proposal for 35,900 square feet could lessen those impacts. Driveway spacing and major drive deviations are also likely to be required with the current proposal.

The Engineering review notes there is capacity for the water and sewer demands for the proposed use in the public utilities, and stormwater detention is to be provided in a single storm sewer detention system on the east side of the site, with controlled outlet into the floodplain to the east.

The proposed landscaping is generally in conformance with the ordinance. The applicant has added screening between the residential and commercial portions of the property and have indicated that the deficiencies in foundation landscaping and greenbelt berm in the commercial portion will be corrected in the site plan submittal stage if this project moves forward. Landscaping waivers for street trees and greenbelt canopy trees along Ten Mile Road are supported by staff due to conflicts with existing underground utilities.

The Façade review notes that the commercial buildings are in full compliance with the Ordinance. For the residential buildings, Section 9 façade waivers would be required for an underage of brick on the rear and some front facades of the townhomes, and an overage of asphalt shingles on some front facades. These waivers are supported as they are minor in nature and do not adversely affect the overall aesthetic quality of the homes.

Wetland impacts have been minimized, with approximately 0.1 acre (or less than 0.9% of the total wetland area) of permanent impact to a few small pockets of wetlands in the upland area. A large portion of the site, 15.87 acres of wetland, woodlands, and floodplain area, is proposed to be protected in a conservation easement to ensure permanent preservation. This could be considered a public benefit.

This initial public hearing is an opportunity for the members of the Planning Commission to hear public comment, and to review and comment on whether the project meets the requirements of eligibility for Planned Rezoning Overlay proposal. Following the Planning Commission public hearing, the project would then go to the City Council for its review and comment on the eligibility.

After this initial round of comments by the public bodies, the applicant may choose to make any changes, additions, or deletions to the proposal based on feedback received. The subsequent submittal would then be reviewed by City staff and consultants, and then the project would be scheduled for another public hearing before the Planning Commission. Following the second public hearing on the formal PRO Plan the Planning Commission would make a recommendation for approval or denial to City Council.

Tonight the Planning Commission is asked to hold the public hearing, and to review and comment on the proposed rezoning. Members may offer feedback for the applicant to consider that would be an enhancement to the project and surrounding area, including suggesting site-specific conditions, revisions to the plans or the deviations requested, and other impressions.

The applicant, Dan Weiss from Novi-10 Associates, along with Scott Hansen from Toll Brothers, architect Lonny Zimmerman, as well as other members of their team, are here representing the project tonight. Staff and our traffic consultant are also available to answer any questions.

Chair Pehrson invited the applicant to address the Planning Commission.

Lonnie Zimmerman, Siegal Tuomaala Architects, relayed property owner Dan Weiss, Scott Hansen with Toll Brothers, Jason Iacoangeli with Toll Brothers, Mike Cool, traffic consultant with AECOM, and Jason Rickard with SKL Engineering are with him tonight.

Originally, about 120 acres were owned by Dan Weiss's family, partially sold off over a period of years. Mr. Weiss' family has been in Novi as residents and businesses owners for years, and he still has a business in Novi. In addition to selling off a lot of his property, Mr. Weiss donated 18 acres to the City for the Ice Arena, Sports Club, and Dog Park. Mr. Weiss' OS-1 and I-1 parcel have been on the market for many years with no interest.

The Novi-10 team looked at the Future Land Use plan, the current zoning, and market conditions. The Future Land Use plan shows these parcels as I-1 and OS-1. The market has changed, and everybody knows that lifestyles have changed since COVID, there is much less demand for office space. We see that represented with this parcel. We've also looked at the industrial aspect and found statistics from 2023 for the City of Novi by CoStar Realty Information Services which show a significant drop in industrial demand in Novi. That set the basis for what is the logical change of direction for the property.

Mr. Zimmerman has a market study which shows that commercial is a very viable option and local commercial, which is the type of use proposed, is going to be a significant and acceptable use for the property. It's basically a family friendly retail type of environment. In the proposed agreement for the PRO the uses will be limited, there will be no gas stations, auto repair, car washes, pawn shops, check cashing or that sort of thing.

The townhouses are a very logical extension of what is there now. To the south is Ridgeview Villas, which was also developed by Toll Brothers, to the southwest are River Oaks and Saddle Creek apartments.

Mr. Zimmerman feels that the proposal complies with the Master Plan even though the zoning doesn't match the Future Land Use plan. In looking at elements in the Master Plan, this is right on target. First is the walkable community as listed in the Master Plan, which is the reason for the trail system. The trail runs all the way from Ten Mile Road, connecting adjacent retail and residential through the site, continuing south all the way to a final connection with the dog park, the Novi Ice Arena, and the Sports Club. The connectivity through this whole area links the new retail with a lot of residential in the area.

Secondly, a conservation easement to preserve wetlands, woodlands, and animal habitats has been designated on 15.87 acres west along the railroad tracks from the dog park up to Ten Mile Road. That's in perpetuity so nothing will be developed there. Just as the Master Plan calls for connectivity, it also calls for environmental stewardship and this is a representation of that.

As was also mentioned, there are two proposed tennis/pickleball courts on Ten Mile Road along with parking spaces being donated to the City and this is an important part of making this a whole usable area for the community.

As far as the traffic is concerned, Mr. Zimmerman has been working with AECOM. Traffic consultant Mike Cool is here. The level of service is not changed by this project. A widening for Ten Mile Road is proposed by adding a center left turn lane, that with the proper tapers, will go all the way across the Ten Mile Road portion of the site including the residential area. The commercial drives will have three lanes, a left turn exit, a right turn exit, and an entry line.

The Novi-10 team has been talking to engineers with the Oakland County Road Commission. The proposed residential entrance, which doesn't align with the driveway across the street, has been approved by the Road Commission as an acceptable situation. The two new drives proposed at the commercial portion do align with the driveways across the street and engineers will be working with the Oakland County Road Commission to firm up design plans for Ten Mile Road to accommodate traffic.

The commercial portion has been reduced to 35,900 square feet from the original proposal of 60,000

square feet to help with the process as well.

Regarding the separation between the RM-1 and the I-2, Mr. Zimmerman displayed renderings produced by Toll Brothers. Scott Hansen relayed that the renderings show the residential area in summer and winter, a view from the entrance that reflects how berms and trees will help screen the first two units, and a view from the units looking out to Ten Mile at first floor level. Mr. Zimmerman added that there is almost 300 feet from the setback line of the I-2 to the setback line of the RM-1, so 120 feet right of way, then 100 feet and 75 feet. The berm at the residential is 6-10 feet high and the evergreens are upsized to be 10-12 feet high.

Mr. Zimmerman stated in conclusion that the proposed residential connects with the Toll Brothers development to the south. They really know residential and wouldn't be building it here if they felt it wasn't going to be a success. It ties in with the commercial and is a good fit for Novi along with the walkable system. It has a very family friendly vibe.

Chair Pehrson opened the Public Hearing and invited members of the audience who wished to participate to approach the podium.

Elena Wayne, 42776 Cardinal Way, relayed that she is new to Novi having recently moved back to the area from Arizona. This proposal is somewhat shocking. There are strip malls already here that are empty, this proposed strip mall is not necessary. Seeing that wetlands and areas that have beautiful mature trees will be destroyed to build more homes that probably aren't necessary is a little shocking as well, and disheartening.

Ms. Wayne moved here to be in an area that is family friendly. She would like to point out that driving around Novi, especially this Ten Mile area, there is strip mall after strip mall. Why do we need another strip mall. Why would we destroy an area to have a strip mall for businesses that could move into a strip mall that's already empty.

Ms. Wayne would also like to point out that although this is being referred to as a walkable area, when the train is going through there is a backup on Ten Mile. What are we accounting for here? Do we really need strip malls? Do we really need more homes? Let's keep Novi family friendly and have a beautiful habitat for animals and trees.

Linda Tyza, 23987 Seminole Court, referred to the floodplain map showing the stripes which are zone AE, a special hazard. Ms. Tyza has a map from 2006, a lot has happened since then. There has been a lot of fill. The map shows there are lines shown going right through houses in Ridgeview which can't be because there is a house there, which proves that it is not an up-to-date map, and that is up to FEMA to correct.

What happens is when an area gets filled in the developer files a LOMA, a letter of map amendment due to the fill process. Around Ridgeview where there is fill, there is a wall with rocks that bring the property up so it is not in the flood zone, except for Ms. Tyza's house. Houses in the flood zone, with these walls around them, have water that runs from west to east. Zooming out a little bit further on the map, farther west has a huge area that's designated a flood zone. Driving around that area you see a lot of standing water.

The water moves from west to east and goes around Ms. Tyza's house. She is located on the far west side. If a flood were to happen and the flood zone needed more area, it could spread out to the trees in the habitant and that wall would stop it from going to the homes. But if was free to expand out further, if Toll Brothers puts that the group of homes in there, the northernmost part of her subdivision there would have a wall and a retainer wall on the other side to make sure that that was not in the flood zone.

Chair Pehrson informed Ms. Tyza her 3 minutes were up and asked her to summarize. She inquired if she could use her husband's 3 minutes. Chair Pehrson replied she could get back in line.
A resident (no name given), on Seminole Court, relayed she lives in Ridgeview of Novi, backing up to where the property in this rezoning area is being discussed. She is very concerned and a little bit frustrated, her comments mirror some of the first comments that were raised. She is happy to be able to connect with the Planning Commission and thanked them for the opportunity.

When the resident purchased her condo, she was told by Toll Brothers that this back area was protected wetlands, and it would never be developed or destroyed. Now she is hearing a different story which is a bit frustrating. She paid a premium for a back lot that would be butting up to this beautiful nature and wetlands area. Now based on this, there's potential that she will be looking at condos, traffic, and commercial property, it is frustrating in that it is really going to create a lack of privacy for her home.

From a Ten Mile perspective, the road is already overwhelmed by the current traffic that we have. The resident understands there are proposed plans in place to put a left-hand turn lane there, which is great for the overwhelming amount of current traffic, but Ten Mile is just not equipped to be able to handle a massive establishment like this. The resident has some very serious concerns about the traffic impact.

To mirror the first comments that were made, the City has so many unoccupied commercial buildings and so many new residential developments, particularly townhomes. It is a little disconcerting that the Commission or the City would entertain adding another one on to the list when we have some really beautiful nature that we can preserve at this time and really allow our city to flourish in other areas.

Tammy Spangler, 42908 Cardinal Way, thanked the Planning Commission for the opportunity for residents to be able to share their opinions and perspectives. In 2017, when she and her husband made plans to purchase a home in the Detroit metro area, they decided on Novi for two reasons. They were looking for a location where there would be woodlands and wetlands and an area with lots of pocket parks and other park areas. They saw the Toll Brothers development at Ridgeview, and decided they liked the area. They purchased a premium lot so they could enjoy the wildlife. Now she is learning that this prized green space, along with the wetlands of the creek basin, are going to be spoiled by this development.

For every inch of concrete or square foot that goes into the new development, it is going to be impacting the drainage and the capacity of that area with storm runoff and flooding. It is going to impact so much and that's a huge concern. They will be cutting down 460+ trees. Sadly, what happens in a lot of cities is that we cut down trees, and then plant ornamental trees that are not even native species to our state, as Ms. Spangler saw from her time on a Planning Commission up north for a bike trail through the city. That is unfortunate because cities throughout the United States are all homogeneous and generic, then the developments all look the same.

While researching, Ms. Spangler found that the City of Novi has a Code of Ordinances and City Charter that includes two ordinances. One focuses specifically on wetlands protection and the other focuses on woodlands protection. The information says the City finds that rapid growth, the spread of development, and increasing demands upon natural resources have had the effect of encroaching upon, despoiling, or eliminating many of the trees and other forms of vegetation. The most important part stated is woodland growth protects public health through the absorption of air pollutants and contamination, through buffering in the reduction of excessive noise, wind, storms and visual screening, and through its cooling effect in the summer months. Woodlands provide for public safety through the prevention of erosion, siltation, and flooding. Trees and woodland growth are an essential component of the general welfare of the city. Protecting woodlands, including trees and other forms of vegetation, of the city for their economic support of local property values when allowed to remain uncleared or unharvested and for their natural beauty, wilderness character of geological, ecological or historical significance.

Ms. Spangler does not have time to share the details of the wetlands ordinance but requested that copies she brought with excerpts from the woodlands and wetlands ordinance be filed with meeting record.

Paula Guhlke, 23884 Seminole Trail, has lived in her home for almost five years. To her right is a pond that freezes in the winter, drains pretty slowly in the summer, but fills back up in the winter, fall and spring. After the last four or five days of rain that we had, it was at least three times as big, and you could hear the water cascading through a trickle. It's not a trickle when that pond empties, you can hear it running from Ms. Guhlke's deck.

When Ms. Guhlke moved in, she had turkeys at her window wall pecking, thinking they had met a new friend. Now there are coyotes, which Ms. Guhlke wouldn't mind if they moved on. There are deer, rabbits, and a mama duck that decided to nest on her deck and who successfully introduced seven more

ducklings to the environment. Looking out at that and enjoying four seasons is wonderful and Ms. Guhlke would hate to lose that. Toll Brothers will do a beautiful job, as they did with Ridgeview. It will be aesthetic, but it's not what Ms. Guhlke wants to look at from her deck all year.

Safety issues are another concern. Ridgeview is a subdivision that is private, with no trespassing posted at both entries. If there is a walkway from Ten Mile all the way through, 24 hours a day, right back by Ms. Guhlke's window wall, she is not sure what can be back there at any time of the day. It will be a straight throughway to get from Ten Mile to wherever and not have to be seen from the outside.

Ms. Guhlke asked the Planning Commission to think about all the aspects and how much residents care about where they live. Developers deserve to develop, and people who own land deserve to sell it, but please consider all aspects.

Karen Chopjian, 23991 Seminole Court, would like to speak about the plans, including building additional strip malls and 70 three-story townhouses by Toll Brothers. To do this, 34 acres would be excavated, including the destruction of nearly 400 trees. This would have a significant impact to her neighborhood as well as the woodlands and wildlife that are presently there.

Looking at the FEMA flood zone map, it looks like they are turning Ridgeview into a watershed. It's an idea that Toll Brothers has now that doesn't need to be here in this location. It looks like original owners were told a perceived myth by Toll brothers that the adjacent land was considered wetlands and not able to be developed. It looks like those who live by the proposed development, after paying a lot premium to back into woods, now will have the builder wipe out the woodlands a few years later. Ms. Chopjian is worried that her property will be devalued.

Charles Bates, 42876 Cardinal Way, was a homeowner in Novi in 1976. He moved around a little bit, but when it came time to retire and get comfortable, he moved back to Novi. Toll Brothers was a great company, they were very well respected. Mr. Bates paid a premium for his lot, which he thought would always look on the wildlife area. He is slowly finding the wildlife leaving. He has water right now behind his house, where it's a floodplain. He sees water every time it rains, every time it snows, that's where the water is going to flow.

Mr. Bates has some big, beautiful trees near him. He did not know turkeys could nest in trees, he thought they were so big that they could only walk on the ground, but they nest in the trees. He has had ducks jump up onto his patio railing, and a deer walk up to his window to stare back at him. It is something that he really loves and appreciates.

One thing that is proposed that drives Mr. Bates crazy is pickleball courts, you don't want them in a suburban area. You hear them bang and bang and bang, other communities have really been up in arms over them. Mr. Bates is not sure why it is part of this proposal to put pickleball courts in.

Mr. Bates has always been in favor of what has been done in Novi, but is not in favor of tearing down trees in his backyard to put in new trees that his grandchildren will have to wait to see a turkey sitting in.

Mark Alafita, 42844 Cardinal Way, stated there are a lot of things on his list that have already been addressed. There is no need for more strip malls. There are concerns about traffic on Ten Mile Road. There are concerns about adhering to the Novi Code of Ordinances relating to woodlands protection. There are big concerns about flooding. Since the new development goes so close to Ridgeview, that water is going to have nowhere else to go. It's going to affect Ridgeview residents as the FEMA maps already show, and as you've already heard, it affects quite a few people.
Mr. Alafita would like to share a story because he thinks it's powerful. By coincidence, the Ridgeview HOA had an annual meeting last week. Residents along the property line that would be bordering this proposed development all relayed the same story that Mr. Alafita had. He remembers it like it was yesterday, sitting with his Toll Brothers Rep expressing concern over what could happen in the adjacent space because he loved the beauty as it is now. The answer he got back was there is no need to worry, that is wetlands. Nothing will be built on that. It is zoned for industrial, but if anything is built, it's going to be further to the front by Ten Mile. It is certainly not going to be coming close to Ridgeview. Mr. Alafita

understands Toll Brothers can say one thing, and then another developer can come in and say what they'd like to do. But when the very developer who told him that is the one who is proposing this, that's when he calls foul play on that.

Mr. Alafita agrees with Mr. Zimmerman's comments about the post COVID environment needs being different. However, we've also learned post COVID that people have really learned to appreciate their woodlands, their water lands, nature, protecting the animals around us, and the green space. Mr. Alafita requests that the Planning Commission reject the proposal on rezoning this area, because if anything were to be developed there, he doesn't know what that would be, but he would rather deal with the devil he doesn't know than the devil he does know.

Linda Tyza, 23987 Seminole Court, relayed she spoke earlier about the two fill areas and the letter of map amendments due to the fill process, already on the Ridgeview side. That is why nobody is in the flood zone, but the same thing will happen on the other side. The people will have a retainer wall, so they won't be in the flood zone. When you look at the flood plain, you can see that the part between the two plans is going to be narrower than it is. You can already see that because the areas to the left are so much wider and bigger, that if we were to have a big storm there could be a bottleneck. When that bottlenecks, it will back up.

Ms. Tyza lives in building #2, lot #6, and when she closed on her home, she was told that her house was in the flood zone, which she did not know. Another letter of map amendments (LOMA) was done, and it came back that her structure is in X500, but the land associated with her is in the flood zone. There is no barrier there, there's no fill, so if there is flooding, it'll just go right between the two houses, Ms. Tyza's and her neighbor's house and the other side.

Rob Fridenberg, 23844 Winnsborough Drive, lives In the Mystic Forest subdivision. His concern is more about the traffic. There have been many times independent of a train coming through that westbound Ten Mile is backed up almost to Busch's during rush hour. Mr. Fridenberg assumes that the Planning Commission has reviewed the traffic study data and the assumptions that were put into it. He inquired if it is possible for residents to review the document as well, to understand how many vehicles are assumed by the residents, what is the impact on traffic during different times of day and also when the train is coming through. He assumes there is data on how long a train typically closes that intersection.

Chris Friedenberg, 23844 Winnsborough Drive, in the Mystic Forest subdivision is further removed from the residents in the Ridgewood sub but feels really bad for them being told that there wasn't going to be development behind them. She would be very upset if that was her house and agrees with everybody who spoke before her regarding traffic and taking down the woodlands.

Ms. Fridenberg understands the developer needs to make a profit, but if there could be something less invasive, with no residential development, that would be best. Or alternately build detached condos, something that's one story. Ms. Fridenberg works with senior citizens, and they can't do stairs. She doesn't know of any single level developments anywhere in Novi. She does not think we need two-story condos, we have enough of them. There are a lot of senior citizens, the population is aging, think about their needs. Ms. Fridenberg thanked the Planning Commission for listening.

Joy Carter, 23951 Seminole Court, is concerned about the type of housing that's being proposed. Typically, three-story homes are bought by people who are trying to rent them, not live in them, so there is often a lot of turnover in those areas. Ms. Carter has a concern about that because the homeowners are absentee owners.
Ms. Carter knows that the developer is purporting the development will be walkable. She has six grandchildren and there is no way she would walk anywhere around Ten Mile with that traffic. No way. She does not know what this walkable idea is, but it doesn't sound like it can be achieved.

Ms. Carter expressed concern that residents are here talking about their concerns, but that minds have already been made up. That is one thing she is unappreciative of if that is the case. She is hoping that this is an open forum where Planning Commissioners are actually listening to the residents in the community.

The flood zone is just another crazy thing where, like the person before said, lines are going through and stopping at homes which Ms. Carter is smack dab in the middle of. She is unappreciative of all the casualness with which this is being approached. It's not about the developer, there is plenty of land. It's not about the opportunity at this site, they would just move forward. It's about the people that have chosen to live here. Ms. Carter has been here for 20 years; she has chosen to live here. She does not want it to become the same place she left, where a lot of people don't live there, with a lot of vacant buildings, it is an eyesore. Ms. Carter asked the Planning Commission to think about that and about their positions of stewardship to make sure to do the right thing and look out for the people that are supporting them.

Beth Mier, 42764 Cardinal Way, wanted to echo what the last two ladies spoke about, the first floor or ranch style homes. Ms. Mier spent a lot of time trying to find a ranch or something with a first-floor bedroom in Novi. Her mother is 83 years old and is moving in with her, so it would be great to find something without three stories where an older person could live.

Ms. Mier relayed she has video of the whole flood zone from the last couple of weeks when we had the big snowstorm, followed by the massive rain. She took it before she received notice of this proposal because it was so beautiful back there and she wanted to show people how great her backyard looked with the stream moving. She can email it to anyone who would like to see it. It shows all the flooding that goes on behind Ridgeview, although she is at the end of the sub where it doesn't affect her as much.

Ms. Mier also has concerns about the walkability. She has a seven year old living with her. She has seen strange people coming out from the woods near the Sports Club and the dog park. When she takes her dog out at 11:00 PM there are people coming out of the woods. It concerns her as to what kind of traffic there might be if there is a walk from Ten Mile all the way to the dog park. Due to concerns about what is going on in the woods at night, Ms. Mier put a camera on her condo.

Ken Mac, 42787 Cardinal Way, already submitted his objection in writing, his wife did as well. He has more of a technical comment or question for Toll Brothers on the renderings. Mr. Mac is confused because the documents he saw at the City indicated three-story townhomes without basements. He has heard both three-story and two-story proposed.

Mr. Mac lives in Ridgeview in two-story villas with basements and was told the proposed residential units will be three-story townhomes, which have more transient residents. As for the other points made, people can't age in place in a three-story home because it's nothing but stairs. Chair Pehrson clarified the renderings shown are two-story. Mr. Mac stated that there was documentation on the website that indicated three stories and asked for accurate renderings to be shown. If the reality is three-story homes, they would tower over the two-story homes that are only about 200 feet apart.

Mr. Mac stated Ridgeview units are quality. Toll Brothers does nice work in terms of stone and brick. The renderings shown a little bit ago, especially from the Ten Mile view, appeared to be nothing but Hardy board siding. It will look pretty bad and cheap from Ten Mile to see siding and no stone or brick. Mr. Mac would like to see more technical details added to the renderings.

Ravi Jasti, 42808 Cardinal Way, has two concerns. First, about four weeks ago, there was a day all the snow melted. Near Mr. Jasti's house there was almost one and half feet of water on the land behind his home flowing on the wetlands. He would welcome anyone anytime they would like to look at that area. If something is constructed on the adjacent parcel and if there is a lot of snow, Mr. Jasti imagines there is a chance it could go to three or four feet, and a chance water will get into his basement.
Mr. Jasti's second concern is about the connecting walkway to Ten Mile Road. If it is connected to the Ridgeview community, it is disturbing the privacy for the Ridgeview residents. There is a chance people will come into the community from Ten Mile Road. A lot of times, Mr. Jasti will see people providing internet, or providing something else such as security service, come and knock on his door to talk about something, so the connecting walkway is going to give access to people to come directly into Ridgeview and is going to be a big concern security wise.

Barbara Vanderhoff, 24323 Hampton Hill Road in Meadowbrook Glens, stated as it currently stands, there are a number of times during the day that it is very difficult to get out on to Ten Mile from where she lives.

The traffic is backed up from Novi Road to Meadowbrook Road. When someone else mentioned Busch's, Ms. Vanderhoff wanted to emphasize that is not an exaggeration, it takes some work to get out of the subdivision.

In addition, a number of years ago, right across from the Meadowbrook Glens entrance and exit onto Ten Mile, new homes were built. They pleasantly overlook the playground at Orchard Hills Elementary School and then come up to what were beautiful wetlands right across Ten Mile from the end of Ms. Vanderhoff's street. It was lovely to leave the subdivision or come home to all the animals and wildlife in the neighboring subdivision. Ms. Vanderhoff had been so proud prior to that to be part of a City that protected its woodlands. The builder agreed to reconfigure the area for animals, birds, and other wildlife. In the past Ms. Vanderhoff saw a doe with her fawn drinking at the pond there, there were always a great number of birds and there were nesting turtles. The homes were built and to this day, there's never been another deer. There hasn't even been another bird return to the small pond that's across from the entrance to her subdivision. It's a huge disappointment. Ms. Vanderhoff hopes the Planning Commission will take into consideration everything that everybody is saying and keep the loveliness of our city.

Saurabh Mall, 23880 Seminole Trail, relayed most of the issues he has have already been covered but wanted to emphasize that he basically moved from Northville to Novi to the Ridgeview community because he liked that there was no adjacent development taking place. He has also lived in many, many communities, east side, north side, all around the Metro area. He has seen what overdevelopment does to a city. It cuts out the city, takes all the things out, and basically the property values go to nothing. Now the question is, with all the things that are happening in Novi with malls and everything else, do we need another development like this? What does it do long term for the city? That is for the Planning Commission to decide.

Limin Chen, 23924 Seminole Trail, agrees with the prior speakers. She was the first resident to purchase a condo in Ridgeview of Novi in 2017. She had just moved to Michigan in 2016 and lived in Novi while they waited for the new Toll Brothers development to be built in this area. She strongly remembers she and her husband confirmed with the sales agents whether any development in the future would be in the backyard of the home they preferred to purchase. The answer was no, there were no future plans to develop that area, it is a conservation area to protect the environment. So, they decided to sign the contract and were the first to move in.

When they first moved in, every morning and night the deer came to Ms. Chen's front door and there were turkeys walking along. But now, almost seven years later, she does not see the turkeys and the deer are coming less and less. She can see the wildlife is disappearing in her area. So, as the gentleman before Ms. Chen asked, what is the long-term plan for Novi? Is it just building and developing more, or do we need more concern for the balance of people and wildlife?

Chris Fridenberg, 23844 Winnsborough, added to her prior statement to say she does not believe Novi needs any more pickleball courts. She recently read online that there is one being added on Meadowbrook by the Novi Senior Center. We just don't need it. Less cement is better. Leave the trees.

Lisa Jacquin, 42795 Cardinal Way, wanted to echo all the comments of her neighbors, but also give her voice to hopefully reject this proposal for a couple reasons. She has lived in Novi for 25 years. She raised her kids here primarily because of the schools, which are top notch in the state, but the broader city honestly could use a little help around city planning. We don't need any more strip malls. We do not need any more fast-food restaurants. Ms. Jacquin is single, and her kids are grown. When she goes out, she heads to Northville, to a community with character. Honestly, as was said earlier, Novi is losing that character. We just don't need any more development and the roads can't handle the population as it is. Again, Ms. Jacquin is echoing most of the sentiment already heard, but wanted to add her voice as well.

Seeing no other audience members who wished to speak, Chair Pehrson asked Member Lynch to read into the record correspondence received. Member Lynch relayed that 18 responses were received, all opposed, and two of the people who sent in a response also spoke this evening. All the objections stated in the responses received were similar to what was expressed in the public hearing.

Chair Pehrson closed the public hearing and turned the matter over to the Planning Commission for consideration.

Member Lynch stated he went out to the Ridgeview subdivision to take a look. He recalls when Ridgeview was approved. He was a little concerned about it since it was an industrial site and next to the dog park and Sports Club. It is really nicely developed; Toll Brothers did a nice job. Member Lynch walked towards the back to see what is there and saw water flowing, like a stream. He did not go all the way back as his hiking days are long gone.

Member Lynch clarified his understanding of current zoning on the site, which is OS-1 and I-1, and that the site includes a fair amount of wetland area. He heard comments that residents were told there would be nothing built on the wetland area and can see that this proposal does not include development in the wetland conservation area.

Since there is no two-way communication with the public during the public hearing portion of the meeting by Commission rules, Member Lynch will try to address some of the questions he heard.

The traffic study is available in the Planning Commission packet on the website if anyone wants to read it. Member Lynch expressed concern with the railroad tracks and traffic, which have been a problem for the past 25 years he's lived here.

The developer mentioned the installation of a center turn lane. Member Lynch drove down Ten Mile for better understanding and inquired to Mr. Zimmerman whether the tennis courts are proposed to be located in the vicinity just west of the railroad tracks near Ten Mile. Mr. Zimmerman confirmed this is correct. Member Lynch initially thought that trying to back out on to Ten Mile from the proposed parking for the courts wasn't a good idea, but saw the way it is set up, granted it wasn't in peak rush hour, that it may work due to the lane the developer is proposing to install. Member Lynch suggested that instead of two proposed tennis courts, that the developer think about proposing four pickleball courts, the parking and some benches when they go before City Council, it would be cheaper. Member Lynch knows the cost since his subdivision decided to install pickleball courts. The public indicated in a survey that they would like to see more pickleball courts in Novi. The City would like to get pickleball courts on this side of the City but ran out of money with Meadowbrook Commons, only four courts were able to be installed there. Mr. Zimmerman responded that the thought was to have two courts that can be multipurpose as two tennis courts or four pickleball courts, but whatever the City wants, they would be happy to do.

Member Lynch inquired what the walking trail would be made of. Mr. Zimmerman responded that the material has not been determined yet, but it will be a hard surface material.

Member Lynch inquired if the residential units are basically the same as Ridgeview. Mr. Hansen responded that they are two-story townhomes, with 2 car front entry garages similar to Ridgeview, but with a different floor plan and elevation from Ridgeview. Ridgeview's product is a villa, so a wider, deeper, bigger unit. This is similar but not the same. Member Lynch inquired as to the target price. Mr. Hansen indicated that pricing is not yet set at this stage, it adjusts a lot, but will be priced based on new comparable construction in the area at the time it is built.
Member Lynch inquired about another proposal Toll Brothers has in conjunction with Singh. Mr. Hansen responded that Toll Brothers currently has another application in with the City for a PRO called Elm Creek. Member Lynch inquired if any consideration has been given to having an elevator option in any of the units. Mr. Hansen responded that Elm Creek does have first floor primary bedrooms but not an elevator option. Member Lynch indicated he was asking the question to try to help when the applicant goes before Council since there is an aging population and there are people that would pay for an elevator.

Member Lynch also suggested that the applicant show City Council a comparison between what could be built with the current I-1 zoning versus the residential proposal in terms of environmental impact and how much of the habitat will be saved. It goes without saying, that just like Ridgeview, it survives the 100-year flood plain with the runoff from the new development going right to the detention basins. Member Lynch suggested that the developer clearly demonstrate that since any time new development comes

in there are a lot of concerns from nearby residents as to how it might affect them. Member Lynch inquired if the one detention basin takes care of the whole site and where the discharge is. Mr. Hansen responded that it does take care of the entire site and discharges on the west side of the railroad tracks.

Relating to the landscape, Member Lynch is always a proponent of not putting money into the tree fund by trying to plant as much as possible back on site. The area has some nice typography. Member Lynch suggested that more trees be considered between the new residential area and Ridgeview to help buffer.

As far as the walking trails are concerned, 40,000 voters want to see a walkable Novi. Member Lynch is not that concerned about the migration from Ten Mile. There are no roads connecting the two subdivisions so there is really only one way in and out of Ridgeview and two ways out for the new proposal. Mr. Hansen clarified that the second new residential access dead ends where it meets the commercial area and will be gated for fire access only.

Member Lynch suggested that the little park on the northwest could probably be a private amenity for the proposed residential area since it is such a small park, he does not see any benefit to the City.

Member Becker inquired through the Chair that the Planning Commission is only providing comments at this point. Chair Pehrson confirmed the Planning Commission is not approving the proposal at this point, only providing comments.

Member Becker thinks that an important point made was that so many residents in Ridgeview we told something by their builder regarding the wetland areas. What we've heard tonight is that no more than 0.1 acre of the wetlands on the total property are going to be impacted by the actual construction. Of the total site, there is a total of 15.87 acres that are going to remain a conservation easement.

We hear a lot about stormwater. Where the townhouses are going to be built now, there is unmanaged stormwater. With a development like this, it infers that stormwater has to be managed. According to where the detention basin is and how that is going to be focused there, Member Becker does not have concerns about the stormwater heading south. It looks like it is going to be managed and taken away from Ridgeview.

Member Becker wanted to relay that the Planning Commissioners have been listening and showed his notes written from all the public comments made tonight and the 18 letters received. They have been listening but won't always agree with the opinions expressed.

Another interesting thing to consider is that Ridgeview would not exist without a PRO. It would be an industrial development since that is what zoning indicated at the time, but now there are lovely villas to live in because the PRO was approved. Change is happening and people don't want 4,000 square foot homes on one acre lots anymore. Our diversity as a community means we need diverse residential options.

Keep in mind that there is a lot of Novi that was Future Land Use planned or zoned for something, and it was changed for a better option. Member Becker looks at this proposal and thinks it is a good use. It is 71 units and is a type of residence that we may find a lot more attractive, and 15.87 acres won't be touched. The alternative is that a developer comes in and puts a huge industrial complex north of Ridgeview because that is what it is currently zoned for, and we could not stop it. This is our chance to consider something that may be a lot more favorable.

Regarding the proposed trail, Member Becker recommends that the developer meet with the Ridgeview HOA and talk about how the walkway could be restructured a little. He sees the concerns about how the walkway funnels people through. Mr. Hansen noted that there is a public sidewalk easement that is built right up to the property line. That was incorporated into Ridgeview Villas and is something dedicated for public use. It runs basically from the property line of Ridgeview out to Nick Lidstrom Drive. That is the only section that is considered public, the rest of the sidewalks in Ridgeview are considered private.

Member Dismondy inquired to clarify that the new development is just connecting walkway into what already exists. Mr. Hansen replied that the easement already exists.

Member Dismondy can totally understand how residents feel disappointed that they were told that nothing would be built behind them and then come to find out there will be. The industrial zoning was approved long ago and would be much more invasive to have to look at through the trees than some hopefully similar type of townhomes, though neither is ideal for the residents of Ridgeview. Member Dismondy would like to make sure that the developer works with the neighbors on reassuring them that drainage will be properly handled, and even though there is a traffic study, make sure it is explained to residents in layman's terms and make sure that the county is endorsing it.

Regarding more strip malls, Member Dismondy agrees there are already a lot in Novi. It makes sense to get the site approved for retail versus office since no one is going to put an office building there. Nobody will put retail there until it is leased. It won't be built and sit vacant since you probably couldn't even get a loan to do that anyway. If tenants want to be there, then the building will be built, so that could be some reassurance for the neighbors.

Member Roney stated it is hard to add much to what fellow Commissioners have already said. One thing he did want to address is that the question before the Planning Commission tonight is whether this proposal is eligible for a PRO. Member Roney thinks it could be, but it is not there yet. Going through the packet there are a lot of details that still need to be resolved.

Member Roney shares concerns on the retail area if it looks like a strip mall, but it doesn't necessarily have to look that way. If it did that would be a no go for Member Roney.

In terms of the pickleball courts, Member Roney loves them, he plays pickleball. The Director of Parks and Rec may have concerns about noise from the courts. Member Roney has had conversations with the Director as to where to put more pickleball courts, that is the biggest thing he deals with is location.

To the west of this property, there is another small parcel. To enhance that conservation easement, maybe add that parcel in as well. It looks to be mostly wetlands; it'd be difficult to develop anyways.

Mr. Hansen added that if you look at the grading plan, the pickleball court was set down about six feet from the top of the pond. Not only are the units on that side of the community walkouts, but then the pickleball courts are down even further. So that wall will help kind of buffer the sound from the pickleball court.

Chair Pehrson stated he agrees with Member Roney, a PRO is the only way this is going to be approved going forward for whatever it is going to be. Whatever its final course, we are not there yet. We don't have all the right information based upon some of the comments from the residents and fellow Commissioners.
Chair Pehrson inquired whether the pickleball courts would be lit to manage the usage of that to only daytime hours. Mr. Zimmerman responded that they would be donated to the City. Chair Pehrson suggested they remain unlit and that additional berm be added in the area to help suppress noise.

Every time a development comes forward with any kind of walking path, there is concern about security. Rather than talk about it in terms of everybody's opinion, Chair Pehrson would like to have the petitioner to look at the walking path in terms of security. Data is needed from the police department to understand other developments that have walking paths through their neighborhoods as to what the increase or decrease was of any kind of security issue.

Relative to the water flow and the water management plan, in addition to the water retention area, there needs to be additional swales or a different plan for the topography between the two developments to assure the folks that are there now that they are not going to be in any additional threat of water flow into that area, and that can be done very easily on whatever plan comes eventually forward to the

Planning Commission.

For both the townhome occupancy rate and the business occupancy rate, Chair Pehrson would like to see what data suggests now relative to where we are in today's time frame, not data from two or three, or four or five, years ago. What are the occupancy rates for both of those businesses? Chair Pehrson doesn't consider the retail area a strip mall. This really seems to be two outbuildings that are going to have multiple tenants. It's not a strip mall like what is at Ten Mile and Meadowbrook Road, but Chair Pehrson would like to see what the occupancy rates really are so that the Planning Commission can make an assessment and have an understanding as to viability of the project. There is a whole other business side that we are not going to get into.

The biggest problem that Chair Pehrson has with the plan right now is the traffic. He does not know if the applicant has ever driven up and down Ten Mile and seen the traffic backed up from Meadowbrook Road all the way to Novi Road. It's not infrequent, it happens multiple times during the week. Add a train in there and that might be something that helps the traffic flow just because people are turning around and they're tired of waiting for the train to go by. Chair Pehrson does not know, even with the applicant's generous offer to add a turn and the deceleration lane, how that's really going to improve that area for the number of traffic trips that are estimated, especially if the added outbuildings in the B-3 area have any kind of drive thru.

We have seen the utter failure of a development that we all agreed to, which is Starbucks at Beck Road and Grand River. The traffic flow for that particular business is ridiculous because it does back up at times on to Beck Road. We have to put some forward thinking into what the potential might be for that kind of drive-through so that we don't end up with anything that's going to include traffic further on to Ten Mile.

When the Planning Commission started looking at this piece of property, way back when, before anything was there before, after maybe Annie's Donuts and the apple orchard and things of that nature, it was going to be a Kroger. We all had heartburn with the Kroger going there just because of the size, the scale, and what it was going to do to the surrounding area. That would have been ten times worse than what this is, but again, we are not at a point where Chair Pehrson would be comfortable at all approving anything relative to the PRO from what we see here. He thinks there is a need to understand some of the comments made, so there are some real hard facts to work with, then incorporate those into the PRO.

This agenda item was discussed, but a motion on the item was not required.

MATTERS FOR CONSIDERATION

1. **JSP22-19 SAKURA NOVI ARTWORK APPROVAL**
   Approval at the request of Sakura Novi, LLC for artwork to be permanently displayed on Building C. The subject property is located north of Grand River Avenue and east of Town Center Drive. A condition of the PRO Agreement for the project was for the artwork proposed for Building C to be approved by the City with site plan approval for Phase 1 but was deferred by the Planning Commission in July.

The Sakura Novi PRO Agreement includes the condition that the "Developer shall include high-quality Japanese-themed artwork as part of the design of Building C, to be approved by the City at the time of site plan approval for Phase 1". The elevations indicated a window area on the south-facing façade of Building C, which faces Grand River, as the location for an "Illuminated Spandrel Glass Art Mural Panel."

On July 27, 2023, the Planning Commission approved an extension of the necessary approval for the artwork piece in order to not delay the construction of the overall project. In approving the extension, the Planning Commission motion included the following conditions:

1. The applicant shall provide a model, drawings and/or high-quality rendering of the proposed artwork before the first Temporary Certificate of Occupancy will be issued for Sakura Novi, and not later than 12 months from the date of Final Stamping Set approval.
2. The artwork will be placed on a Planning Commission agenda for review and approval.

The applicant has opted to present a surface-applied 3D image, or sculpture, as opposed to the

CITY COUNCIL MINUTES

APRIL 8, 2024 EXCERPT

REGULAR MEETING OF THE COUNCIL OF THE CITY OF NOVI
MONDAY, APRIL 8, 2024 AT 7:00 P.M.

Mayor Fischer called the meeting to order at 7:00 P.M.

PLEDGE OF ALLEGIANCE

ROLL CALL: Mayor Fischer, Mayor Pro Tem Casey, Council Members Gurumurthy, Heintz, Smith, Staudt, Thomas

ALSO PRESENT: Victor Cardenas, City Manager
Tom Schultz, City Attorney

APPROVAL OF AGENDA:

CM 24-04-41 **Moved by Heintz, seconded by Casey; MOTION CARRIED: 7-0**

To approve the agenda as amended.

Roll call vote on CM 24-04-41 **Yeas: Casey, Gurumurthy, Heintz, Smith, Staudt, Thomas, Fischer**
Nays: None

PUBLIC HEARINGS: None

PRESENTATIONS:

Mayor Fischer gave the floor to Member Gurumurthy to introduce the Novi Robotics Team. There were three teams from Novi who qualified for the World competition. She said it was a big deal to have three teams advance to the World Championships in Houston, and they are so excited. The three teams are the Novi Robo Titans, Atomic Toads, and Rapid Robots. Each team would be given three minutes to present what they had been doing. After the presentations, all the team members would take a photo with City Council. Mayor Fischer thanked her for the introduction and welcomed the first team to the podium.

The Novi Titans thanked the Council for the opportunity. The team started in 2016 and would be representing Michigan at the Houston World Championships. They are strong supporters of Girls in STEM and have advocated for more support from the Governor and Congresswoman Debbie Dingle. In addition to their competitions, they have connected with the community, mentored other teams, and have given back through community service. They were super excited to show their robot styles. The team described the various parts and functions of their robot and how each piece was used during game play. A driver controls the movements of the chassis to collect pixels. The robot is designed with an intake that has bristles to collect pixels and a wheel and transfer sheet to bring the pixels into the cassette. A boot wheel makes sure that the pixels are in the correct position inside the cassette which is attached to a lift. The lift allows them to place one or two pixels at a desired height on the backdrop. There is a time during the game when they can score extra points. The robot is equipped with a

for ceasefire in Gaza. She asked when would it stop? When is it enough? Please find a way to pass the resolution to cease fire in Gaza and let's all be on the right side.

Virginia Nega, a resident of Meadowbrook Commons, said thank you for getting them the electronic bingo board. They didn't get the swimming pool, but they got the board. Second, she was concerned about senior transportation. How is it going to really affect them? She had questions about how similar the new service would be compared to the existing service. She also mentioned that there is no cost to use the service today, but according to the Novi papers, they would begin paying $2 each way.

Rebecca Paone said she wanted to support the previous speaker in everything she had to say. She also wanted to support Ron Klein and the North Le Bost community in keeping the gate open.

Sara Mashkoor said she lived on 11 Mile Road. A lot had been stated and said about the genocide taking place in Palestine over the last several weeks. She used her time to make a prayer and implore Allah for his help to ease the pain and suffering of the people in Gaza. She asked for Council to pass a ceasefire resolution.

Tammy Spangler-Timm, an HOA board member in Ridgeview of Novi, wanted to speak to item number 4 in the matters for Council action. She shared that she was a retired educator, and while at university, specialized in environmental sciences. She had concerns about the proposed development for the property near Novi Road and 10 Mile. When she and her husband purchased a home in the Villas, they were misinformed. They were told that the wetlands along the Chapman Creek area down into the ravine would never be developed because they were protected wetlands. They liked being so close to nature right out their back door. They now feel disenchanted to learn about what is going to be developed and the very narrow band of green space that will remain. She said that she would like to see the ordinances protecting woodlands and wetlands be upheld.

The next speaker wanted to echo the last speaker and hoped to preserve the wetlands. She also said that her family was relatively new to Novi. She expressed her disappointment that many of the Council members had not taken a public stance on the situation in Gaza. She wanted reassurance that all Council members represent every Novi resident, not just certain groups. She encouraged Council to stand up and use their voices to make a difference.

Mark Alafita said that like Ms. Spangler-Timm, he lived in the Ridgeview of Novi area. He said that during the February planning commission meeting, they had around 17 written comments and 17 verbal comment made regarding the Toll Brothers proposal to rezone the 10 Mile area. He addressed some of the concerns these letters and speakers brought forth including flooding, concerns for the wetlands and wildlife, privacy issues. He spoke about the ecosystems and the animal communities that would be forced out, as well as those that would stay such as skunks and vermin. He recognized that something would

happen with that land, but he asked for a modified plan that would bring less harm to the wetlands, wildlife, and continued to offer a sustainable environment.

Kazi Afzal commented on the number of trees that had been cut down in the five years that he had lived in Novi. He asked that no more trees be removed. He then spoke about the situation in Gaza and how some people are taking a stand against the violence. He asked Council to find a way to stand up for what is right and call for ceasefire support.

Firdaus Maldar of Westminster Circle said that she and many other Novi residents had been there week after week trying to raise awareness of what is happening in Gaza. She said that she had thought that Council was unaware of the war, but now felt like the had chosen to ignore what was happening. She asked for justice, a ceasefire, and for peace.

Karyn Chopjian of 23991 Seminole Ct., said that as a resident in Ridgeview, she stood behind her neighbors who had spoken about the proposed Toll Brothers development.

The next speaker said that he hadn't planned on speaking, but wanted to say that It looked like City Council didn't care about what the people had been saying about Gaza. He knew that Council listened, but he thought it was selective. He didn't understand why the members couldn't make a statement about the situation in a personal capacity. He said that Council was the first door that residents could knock on, the next level up were not reachable.

Annette Primo-Mac of 42787 Cardinal Way in Ridgeview said she strongly opposed the rezoning by Toll Brothers. She appreciated that modifications had been made since the planning commission meeting but felt that the development was too high density. She opposed the placement of restaurants next to residential areas due to rodents, trash, and air pollution. She thought that the addition of pickleball courts was a carrot dangling to the City to push this development through. She thought that while it is fun to play, no one wanted these courts in their backyard. Her last comment was regarding the addition of lookout areas, which she felt would cause more mess and work for residents to clean up the litter.

Ken Mac, also of 42787 Cardinal Way echoed the concerns of his neighbors in Ridgeview. He asked Council to review the packet materials that stated that the rezoning did not align with the City's future land use plan. He felt that Toll Brothers was waffling on their plans, changing the number of units and not providing certain data points for those concerned parties.

CONSENT AGENDA REMOVALS AND APPROVALS:
Member Heintz asked to remove item E.
Mamber Smith asked to remove item G.

CM 24-04-42 **Moved by Casey, seconded by Smith; MOTION CARRIED: 7-0**

To approve the Consent Agenda as amended.

Committee to formulate a Request for Proposals to secure the services of a professional project management company to evaluate the viability of those recommendations and propose next steps for further City Council consideration.

Roll call vote on CM 24-04-45 **Yeas: Staudt, Thomas, Fischer, Casey, Gurumurthy, Heintz, Smith**
Nays: None

Mayor Fischer called for a brief break to reconvene at 9:30 pm.

4. **Initial review of Planned Rezoning Overlay (PRO) eligibility of the request of Novi-Ten Associates, for JZ23-09 Novi Ten PRO for a Zoning Map Amendment from Light Industrial (I-1) and Office Service (OS-1) to Low Density Multiple Family (RM-1) and General Business (B-3) with a Planned Rezoning Overlay. The subject site is approximately 34-acres and is located east of Novi Road, south of Ten Mile Road (Section 26). The applicant is proposing to develop a 71-unit multiple-family townhome development on the RM-1 portion, and approximately 35,900 square feet of commercial space on the B-3 portion. Under the PRO Ordinance, this initial review by City Council is an opportunity to review and comment on the eligibility of the proposal and offer feedback.**

City Manager Cardenas said the proposed housing for this proposal were 71 attached single-family owner-occupied units accompanying four buildings of commercial, close to 36,000 square feet. The developer at that point had included pickleball courts, public trails, and wetland overlooks as their public benefit, much like similar proposed developments. That was the initial input for council to weigh in. Staff from planning and engineering divisions were there to answer any questions. He believed the developer was also there to address City Council. The developer approached the podium to make a presentation.

Lonnie Zimmerman of Siegal/Tuomaala Associates Architects said that he was there with representatives from Toll Brothers, Scott Hanson, Jason Iko and from SKL engineers Jason Rickers. Dan Weiss, the owner of Novi 10 was called out of town on emergency, so Mr. Zimmerman would be representing him. Novi 10 and Toll Brothers had used the master plan goals for the project. As they could see on the screen, the left-hand side was the existing zoning with the OS-1 in light blue and the large purple area representing the I-1. It was 34 acres of land. What generated the whole change that they were proposing was that there had been a change to lifestyle, the master plan, and the existing zoning. They felt they didn't match up with what was happening in the City of Novi. Changing lifestyles, COVID, less office space, demand for industry in Novi. CoStar Realty Information Service in 2023 showed a 35% drop in industrial leasing. Conversely, their market study showed a demand for an additional 344,000 square feet of commercial space within the next three years. That established the nature of the zoning change that they were requesting. He said they could see in the right-hand picture that it had the commercial use B-3 in the dark orange and the RM-1 multiple family was the beige color on the right

had side. The overall site plan and more detail of some of the surrounding was shown. The 71 units of new townhouses proposed on a dark green background. The orange, again, were the four buildings of commercial and to the right-hand side and wrapping around the new residential was the lighter green area. That represented all areas to be zoned R-1 and to receive a conservation easement. No development now or ever in that area. The red areas, the trail areas, a lot of that was existing sidewalk, but they intended on adding to the trail network. It was mentioned earlier by one of the residents that they were proposing, if they looked opposite in the lower area, they would see two lookout areas over the wetland areas that were being preserved. They wanted to add those areas to it. He showed an enlargement of the B-3 area. What they had done with the B-3 area was written into the agreement that there would be a limitation on the uses there. They would not permit auto repair uses or car wash, pawn shop, check cashing. The goal was to make it a local commercial area. It would be restaurants, local retail. They would only allow one drive through. If they could see the left-hand side, the furthest from the residential, that would be where a potential drive through restaurant would occur. He then showed a typical elevation of one of the retail buildings, it was primarily brick. It had been reviewed by the façade reviewer and it complied totally with the Novi ordinance. He next showed an enlargement of the residential site plan with yellow or ochre color buildings, the 71 buildings and the trail that they were proposing along the south wrapping around to a little park on the left-hand side. Towards the right-hand side as it went up, they would be donating land to either be a pocket park of pickleball courts. They had already been told that the Parks department prefers probably a pocket park rather than pickleball courts, but it would be donated by the developer and they were open to whatever the city preferred at that point. He also wanted to mention, because it had been brought up earlier and was brought up by the planning staff, the fact that there was industrial across the street, across 10 Mile Road. From the closest building of the townhouses to the industrial building was over 300 feet. Between the residential and 10 Mile Road were six- to ten-foot-high berms, heavily landscaped. He didn't want to say that it isolated, but it separated from not only the industrial but more from the hustle bustle of 10 Mile Road as much as possible. They could also see wrapping around the townhouses heavy landscaping separating it from the proposed new commercial. He showed some rendering views of the new proposed townhouses by Toll Brothers. The next slide dealt with some of the traffic that had been discussed. They knew that there was a lot of traffic on 10 Mile Road, and they had been working with aecom, the traffic consultant for Novi, and would be working with the Oakland County Road Commission. As of then, what they were proposing at the developer's expense was adding a center left turn lane and adding an eastbound and westbound additional lane, which were all indicated with arrows on the drawing. That would help the traffic situation along that stretch of 10 Mile Road. He then spoke briefly about the green area. He had mentioned that they had a conservation easement that they were proposing. On the screen, they could see in the center of the image along the railroad tracks and then wrapping around, that was their property. There was additional property also owned by the same owner to the left that had wetlands. Then it also connected on the lower right to Orchard Hills West Park. They had a continuous green belt that connected all the way across the entire area. He then spoke about removing trees. He understood that any development would have to have trees removed. The next slide showed a picture of the existing zoning

and the potential development within that zoning. What they could see was the large industrial building on the right-hand side could potentially, by zoning ordinance, could be 40 feet high. The office on the left-hand side could be 30 feet high. In theory, if it were developed per existing zoning ordinance, have a mass of building that was along 10 Mile Road and just north of the existing Ridgeview Villa Condos. He said he would ask the existing Ridgeview residents, who were rightly concerned about the surrounding property, to think about if the existing zoning persisted, what the potential for development was there. Likewise, he wanted to talk about trees. They knew that there would be trees removed there, there were no two ways about. What they were adding though, with their development, they were adding over 600 new trees and on top of that, they were adding over 500 trees to the tree fund. They were doing their best to emphasize replacing as many trees as possible. Moving back to the proposed development, the yellow arrows showed the existing sidewalk system and the new proposed trail. The new trail connected on the upper right to either a pocket park or pickleball courts donated by Novi 10 and wrapped around to the North of the existing wetland that would be retained and attached to a proposed pocket park on the left side of the U there. A lot of what they could see was existing sidewalk system, but they wanted to augment that with the proposed lookouts. He showed arrows on the right-hand side with the lookouts to add to the existing system so people could enjoy the wetland. Again, to emphasize again, that wetland would be a conservation easement so it would never be developed as anything other than wetland. Another thing that had been mentioned at the planning commission meeting was drainage issues. He thought with the development, they could deal with any drainage issues that would impact them better than if it were just left undeveloped. There would be planned catch basins. In the new development they had the detention pond going in the upper right-hand corner just to the left of the trail. That would help with the drainage situation there. In conclusion, he said they were going to incorporate as much of what the planning commission and, of course, what City Council asked them to do as far as putting into the plan or taking out of the plan as much as they could. The idea was that they wanted to do a development that added to the City of Novi. The owner of Novi 10, Dan Weiss, had a lot of development in Novi. He had been a resident of the city and he recognized it was in his best interest because he knew it would not be the last time he would be in front of City Council. He wanted to do a development that everyone could be proud of, it would satisfy them, satisfy the residents, and serve the community. With that being said, that was all he had to say. He didn't know if Toll Brothers had anything to add, but they were willing to answer any questions. They did not have anything to add, but would standby for questions.

Mayor Fischer reminded everyone that they were not making specific motions that evening. It was an opportunity for them to comment on the proposal, ask questions of the petitioner. After that meeting, it would go through the typical planning process. He asked City Attorney Schultz to highlight the next steps after they provided their comments so everyone was aware. Mr. Schultz said that after their comments, questions, and indications to the developer, it would start the typical process. It would go to the Planning Commission, they would hold a public hearing and get more information. There might be changes to the plan, but it would be the more recognizable development recommended by the planning commission. Ultimately it would be approved by the City

Council in the two-step PRO process, they would decide whether or not they were interested in what the planning commission had reviewed and recommended. Maybe there would be an agreement drafted, but the new part of the process where they got early input is what they were doing that evening. Mayor Fischer then turned it over to City Council for questions.

Member Staudt wanted to start out with their friends at Toll Brothers. He asked if there was a representative there. Scott Hanson approached the podium. Member Staudt said they had received numerous emails saying that Toll Brothers charged a premium for lots and promised landowners that the property would never be developed. They had heard from enough people to where it caused some concern. What was Toll Brothers response to this? Mr. Hanson said that ultimately on the sales floor, they could only speak to the property that they owned. When Ridgeview was sold, they had the ability to say that the property that Ridgeview owned was part of the conservation easement. Part of the wetland could never be developed. They did not have the ability to project future unassociated land. They were not associated with the Novi 10 land at that time. He did not know what had been said on the sales floor at that time when those units were sold. The clear direction, and it was typical to not comment on parcels that were not part of the property they controlled. Member Staudt asked if they sold properties with a premium for views of the woodlands and wetlands behind. Mr. Hanson said yes, that was typical. Any house that backed up to woodlands or wetlands were higher premium units. Member Staudt said that looking at the design there, they had homes backing up to those Ridgeview homes now. He wouldn't call that premium if he had set it up. He said they could talk about all the berms, take it work what it was worth, it was his opinion at that point. He was not making any value judgements to anything, but they had some residents who felt that they had been misled. He was asking questions that they had posed to Council, and they wanted to know. He wanted to ask why they didn't build this whole development at one time? Here they were coming back 01 years later and now they wanted to finish this off. It would have been so much easier if they had done the whole thing at one time and integrated the whole thing together because then nobody could complain about them building back up because it would already be there. Mr. Hanson said that he totally agreed. He wasn't involved at the time, but he didn't think it had been an opportunity to do the whole project at once. He said obviously they worked with Dan on the first one, it just wasn't in his plan to sell this parcel at that time. Member Staudt said he was incredibly disappointed Dan wasn't there because as the property owner, he had been in front of Council in the past and he had been in front of Council for that piece of property at least twice in the past. One of the reasons they declined it while he was on was that they wanted to build a Kroger there, which would have not been very favorable to the first development, but it wasn't there yet, so it wouldn't have mattered. It would have been built after the Kroger was built. But Council turned it down and they turned it down primarily because of the designated B-3 commercial that he was asking for at that time. It was extremely similar to what was being asked for right there. They had 3-B buildings that were being asked for with no idea of what would go into any of them. When he declined it the first time, he thought the Kroger was great. He thought that was too big an ask. In that situation, he wasn't sure that its not too big of an ask for the second time. He said that it was not a four-lane road where 10 Mile Road was.

It was a road that had very limited ability to get in and out. If one went to the Speedway gas station there, it was very difficult to turn to go back towards the East. He wanted to give them a few things that he personally didn't love. One was the pickleball courts. Wrong place, not this part of the community. Secondly, pathways through one development into another, even though they developed both of them, those folks didn't want pathways. They had already gotten that message for years in the community. They didn't want pathways built from new developments into existing developments. It might be a really nice conceptual thing, but it wasn't something that folks there had really liked. He was really supportive of the amount of space they were talking about making permanent conservation easement. But to him, the only way he would ever support it personally would be those homes that were on the South side of the property that were backing up to a sidewalk that they were proposing which was right next to a stream. It was too much density in that area. He said they should have bought it and built it then because they wouldn't be dealing with people that had already built there. He said they deal with a lot fo developments built next to existing developments, but seldom do they get to have developments build next to developments by the same builder knowing that they sold these properties and now they are putting new homes right next to them. Those were his big factors. He said all of that was fixable. Less units was fixable. Getting rid of the sidewalk was fixable. Pocket parks, he liked the idea. Trailways along the railroad tracks, that was fine as long as they were not going into the backyards of current residents. As he stood then, he would be hard pressed, but he didn't know what they were going to do about the 3-B businesses. No chance that he would support a drive through there. Not ever going to happen. They faced residents all the time who had restaurants behind their houses and it was not a good thing. It wasn't an acceptable use. If they agreed to those three, he didn't want spec buildings. He wanted to know that would go there. The multi-use stuff that was being thrown out there was the way architects and planners wanted to do things. It wasn't something he liked. He said they had his opinion and the great thing about it was they had the opportunity to go back, rethink it out, listening to them and the residents and come back with an alternative. He said they couldn't tell them to change things. They couldn't tell them to come back, not come back. It was completely up to them. They could just tell them what they thought was acceptable in the long haul. Those were his comments.

Mayor Pro Tem Casey said she would give the gentlemen a breather for a minute if they wanted. She said that when they had developments that came in front of them, she wanted to take the opportunity as often as she could to make general comments. They were not specific to them at all which is why she gave them a chance to take a seat. She wanted to make a couple comments about how she was looking at developments that were starting to come into the City. The first she was looking for developments that were for owners, not for rentals. She was keeping an eye on the percentage of rental units that they were starting to see some into the city. She wanted to put that out there while she had the microphone for a minute, not on their development at all, just to make that point. Secondly, for any developers who were watching at 10 o'clock at night. She was definitely looking for more opportunities to get first floor living in unit coming into the city. They had heard from the Older Adult Needs Committee multiple times that they have people in the city who want to downsize. They don't want to leave Novi; they were

not ready to live in senior living facilities yet. They don't have a lot of places that have first floor living. With all that being said, stealing the floor for just that moment to make those comments. She would come back to the gentlemen now and talk specifically about what they were seeing. The previous speaker said a lot of what she was going to comment on, but she would still comment on much of it. Some of the big issues there were the traffic on 10 Mile. What she would want to see, as part of the development plan, she would like to see construction timing for the changes on 10 Mile correspond to the construction timing of the buildings going on. What she would not be happy with was if they had the development finish and then the road work on 10 Mile was three to five years down the road. That didn't help them if they were adding 71 units and about 134 residents according to the proposal. Not quite a full two residents per unit math there. She would want to see the timing of improvements on 10 mile. She drove down 10 mile that day at five o'clock. It was painful. She did that purposely because she wanted to see what the road traffic was at that time. It was painful. She would be very interested in seeing the timing of that road construction. She knew that they were partnering with RCOC and that was a lot of work, but it was on her mind as something that was critical. She was also concerned, she loved the idea of an extended center lane, but then she was worried about getting bottlenecked towards the railroad. She just wanted to put those thoughts on the record. As the previous speaker said, she was not telling them what to do, just sharing her thoughts with them. She had significant concerns, she wasn't an ecologist or anybody who knew a whole lot about floodplains, but they had experts on staff. She knew there would be permits required, but she had real concerns about a development going in on wetland that would then have a lot of impermeable surface and butting that up against wetlands. She was concerned about the amount of water and how that runoff was going to work. She wanted them to understand that she would be asking a lot of questions when it came back to Council about how that would be managed and what level of confidence they had in making sure they were protecting the residents in Ridgeview. Whatever that looked like, they were the experts. She trusted staff to help make those determinations, but she wanted them to know that she had her eye on a couple other things as well. She mentioned the feedback from residents about the woods behind, but she wouldn't address that because the previous speaker had. She would say that if they had seen some of the other developments that had come in front of them, the points that she always kept an eye on were the amount of screening between new residences going in and abutting existing residences. She had looked for things and put requirements into previous developments several years ago that required 18-foot-tall trees. Her point was to make sure that they were putting as much screening between residents as they possibly could. She was not telling them to put in 18-foot-tall trees, that was an example, but understand that would be a critical focus of hers to make sure that they were buffering with as much space as possible between the new units going in which were two story. She said that they were not going super tall, but between the new units and the existing units, they would have to beat their ordinance requirements for screening and opacity. She looked to City Planner McBeth to keep her honest on if it was 80% opacity in winter and 90% in the summer. They had to meet that already, but she would be looking for density on top of opacity. She said she had concerns about the screening going in on 10 Mile. She understood that they had underground utilities they were concerned about. She didn't know how those would

change if the road got extended or widened, but she would be interested to see what they do additionally on 10 Mile to do some screening. She said that she agreed that pickleball was probably not the best choice for there. They had a Council goal for a pocket park, that was more passive. She understood that they had a playground in the west side of the development. She wanted to know what was driving the request for the zooming to be B-3 instead of B-2? Was it the drive through? Mr. Zimmerman said one of the reasons they went to it, although it would probably have to be reconsidered now, was because B-3 permitted a drive through and B-2 did not. If the drive-thru was eliminated, in all likelihood they could go to the B-2, but they wouldn't be able to start with B-2 and then ask for a drive-thru that was not permitted in the ordinance. Member Casey thanked him for the clarification. Mr. Zimmerman asked to make one other clarification on the whole thing with B-3. They had eliminated some potential uses that would have otherwise been permitted in a B-3 to really kind of focus on local commercial. It was sort of incongruous when he said B-3 and local commercial, he understood that. But that was the thought process in the whole thing. Member Casey thanked him for the clarification. She asked if the project were to remain B-3, she agreed with the previous speaker in that she wasn't open or interested in a drive-thru and would have a handful of other exclusions including fueling stations, mini lubes, hotels, nurseries, no drive-thru tattoo parlors. There was a longer list of principal uses in B-3 that she would also expect to see excluded there. Her last question was if the lookouts in the project proceed, whose responsibility would it become to maintain those lookouts? She heard feedback about trash being in that space, and it had been a bit since she had been behind the Novi Athletic Club and into that space. Who would have the responsibility once the development was in, should the lookout still exist, to maintain that area? City Manager Cardenas said that it would be the property owners if it were not part of the pocket park dedicated to the City. SO that would be the property owner's responsibility and the property owners being the HOA or whatever would come in from Toll Brothers.

Member Smith said that he would not repeat any of the previous comments. He agreed with most of them. He thought there were some definite benefits. The maintenance of a conservation easement was a very good thing, especially for that are of the Rouge headwaters that they needed to preserve. There was talk about more efficient construction, about EV charging. Those were good things that he would like to see. He had more of a general comment for developers listening at that time of night, including a provision for solar panels to give the owners options for that or geothermal heat pumps. Anything they could do to increase efficiency. He thought the mention of good windows and good insulation, at this point he thought was assumed. He said he disagreed with not connecting the trails up, especially if the business commercial area gave people something to walk to, he thought people would appreciate that. He said he hadn't been on Council very long, but that was one of the things he had walkways watched. Initially when a new path went in, there was a lot of resistance to it because it was different. It will bring more people in, but then a few years later, he would see a lot of people using it and it seemed to be well accepted. One of the questions that planning commission had for staff was if there was an increase of crime or anything with a trail going through. Their example was ITC trail which cut behind a lot of houses and didn't seem to have any increase. He liked the idea of the greenway going all the way through to Meadowbrook.

He mentioned the wetland to the west of it that went to Novi Road, He asked what would happen to that if it was owned by the same owner? There was no plan on that.

Member Thomas said that Member Smith had mentioned the idea of connecting the paths. She thought that although there could be some resistance, connecting the paths was a good thing. It looked like that would give the ability for them to get down to the overpass. She wasn't sure how they would walk down to the overpass without connected areas. To be able to walk past that green space, she loved all of the green space in it. That bothered her, and what really made her crazy, was the idea of charging lot premiums to people to buy homes on other property that they were going to rip out what they paid the premium for. She didn't see how they could sell lot premiums for lots that they didn't own and had no guarantee that they would stay in whatever condition it was in when the person bought the home. She recognized that currently there was a housing shortage, a housing crisis. Novi was fairly expensive. She said that she knew that they need places where people can move, but they needed to respect the neighbors who are there. She loved the green spaces, she loved the pocket parks. She would be concerned about traffic potentially, maybe the number of units. She would also not be in favor of a drive-thru in that area. She liked the idea of being able to walk to a store or being able to walk to a restaurant, not a fast-food restaurant, but having that walkability without having to get in a car and drive everywhere. Her most important part was the residents who lived in the other property. She thought it was very important that they listen to the concerns of the people who were there. They make sure that they are protecting them and their ability to maintain nice homes that they live in. She did love the fact that it would five them some extra ability to have the pathway and the surety at least on the one side with the easement that it would not be developed. That would be a place where it made sense to have a lot premium because it could not be developed because there was an easement. She would want to make sure that they had that buffer area between the different residents. She would continue to listen to resident feedback on the matter as it moved forward. She hoped that they were spending as much time as they could listening to the feedback of the people who already lived there. It baffled her how they could charge a lot premium and then tear out what they had paid the premium for to build new houses. She agreed with a lot of the stuff Member Casey spoke about, she said she was always on top of it and always did her homework. She loved that she mentioned first floor living because they were hearing so much about that from the seniors from the senior committee and she wanted to make sure that there was enough buffer space and screening between residents and developments.

Member Heintz wanted to start out with the positives. He wouldn't restate everything that had been said already, but he liked the general comments about energy efficiency, having EV outlets or different things that could be done with the houses. To piggyback on the premiums to have a connection with nature, he asked them to consider if that was something that would be important for those prospective individuals who might want to buy a home in the proposed development areas. If nature was truly a premium to all those individuals whether it be current or future owners. He thought it might take further assessment to look at the proposed plan to see if moving things around or reducing the number of houses could be a wonderful concept. Simply listening to the residents that

had spoken about how awesome it was to have that connection to nature and to have that balance of how many houses and how much nature they could have squeezed into one spot. He was not an expert in development at all and would be interested to learn more about the negative impact development had on drainage. He understood there were ways they could construct retention ponds, but in his mind, nature did a great job at doing what it did and if they removed too much of it, then add impermeable surfaces or other things that have the likelihood of causing problems, because that water had to go somewhere. Lastly, to connect everything together, he thought it was important for them all to think of themselves as stewards of the area and being on the upper end of the Rouge River that connected to all the different waterways. They want to make sure that they were not just there to develop the land, but to care for it. Being mindful of how that land would be developed and how it could impact not only those individuals living there, but everyone and all things downstream of that too. One last note. It had been mentioned that there were 600 trees that were going to be replaced, that was in relation to the number of trees that were going to be replacement credits. From what he saw, it said there were 277 planned site replacement plantings. He wasn't sure if the numbers had changed at all. Mr. Zimmerman said that if they added up all the replacement trees, it would come to about 500 trees. They were not all in the same area on the pages, they could be seen at different spots.

Member Gurumurthy said that she dropped her kid to the athletic club and went walking through the tails and discovered the dog park. She had never been there before, She shared it with her friends who never knew about it, too. She could totally relate to what residents had said in terms of nature. She would request that instead of the 71 units, if there was an opportunity to look at lesser density and keep that space between Ridgeview and the newer development as much as possible in terms of woods. She wanted to make that request. She said in terms of traffic, she used 10 Mile almost every day. She saw that there was only one entrance to the complex and a secondary emergency access. Everything was related to traffic there, and it would only increase. If there was an opportunity to consider another entrance to reduce the traffic. She agreed with Member Casey on the timing. She wanted to ask if they had already started some discussions with RCOC, because the timing never aligned and that was a key thing they would want to see. Mr. Hanson said that they had met with the road commissions already, very preliminarily, but ultimately it would be the City engineering department and their process for getting building permits and starting development would boil down to having all those permits in place before they even put a shovel to the ground to clear trees. All of those road improvement would be concurrent with the development of the site whether it was commercial or residential. That was a city requirement. Member Gurumurthy also had flooding as a concern. It was not at all clear to her how flooding would be taken care of. They should see those details very clearly, at least when it came back. She also looked at the sidewalks and was questioning if it aligned with the active mobility plan. Was there some relation or alignment? She would request that they looked at that to see how it all integrated.

Mayor Fischer had a couple comments to add. First question, as far as phasing the commercial versus the residential, what did they anticipate? Mr., Hanson said he could

speak to the residential. They would want to start as soon as possible. As soon as they were through the process, through the engineering and permitting process, they would want to start immediately. They sell and then build, so that process ran a little bit slower typically. That would be their timeframe. It would be one phase of development. Mr. Zimmerman said that, according to Mr. Weiss, it would all be one phase, including both residential and commercial. Mayor Fischer said that he would want to see all of that done concurrently. He wanted to mention a couple of things. He knew it was redundant, but the whole point of this was to get an idea of how each of them were on a couple of those items. He was very concerned about the B-3 use as well. The drive-thru was a non-starter for him as well. He liked some of the other ideas to restrict those uses. He thought that there needed to be a pretty good effort in making sure that any of those uses had a local kind of feel to them. Local shopping experience if you will. He agreed to the pickleball moving to more of a pocket park. He said that he would continue to watch the traffic and RCOC discussions. The thought that would be very telling and important. If they were to go forward, he thought there were some comments about lowering density and removing some of the units to the south of the project. He thought that would be kind of an interesting concept. A lot of what he talked about when fitting in developments near other ones was the similar kind of units as well. He would continue to watch whether it was the façade, the size, the density. If it varied very much from what was already there in Ridgeview, he would not be in support of that. So if the density went higher than Ridgeview or if the units were much higher. A couple of things that he was happy with, impressed with. One was the conservation easement. He said they had been looking at that property for many years wondering what would end up going in there and what would happen to a lot of it. They were looking at conserving about half of the property. He wouldn't talk to the promise of lot premiums because that was an issue between two private enterprises that had nothing to do with the City, so he wouldn't comment on that. He would say that the efforts to create that conservation easement was a good thing in his mind. The more that could be done with that, the better. The last thing he wanted to say about the sidewalks was that he liked the idea of connecting. He didn't know it that was the right connection. He thought that it was one of those things that if they got down the road too far and it was developed, that they might regret that they didn't do something. There were concerns about how it traversed right through another development that they had built. If they had just been one big development, it would have been a heck of a lot smarter. He thought that they had received a lot of feedback from the seven of them on the likes and dislikes and hopefully they could take that and so with it what they would.

Member Staudt said he had one more question because he listened to all the great ideas. One thing that he looked at in the drawings was the concrete pad from one side of the property to the other on the residential or on the commercial It was all concrete along 10 Mile Road. It was parking lots. He said come on. They knew, couldn't they think of something more than contiguous parking lots all the way down? Just giving some input on it as there was a lot of concrete there.

Member Smith said one thing he forgot to mention was that it would be useful to see a rendering of what it would look like from the backyards of the people that lived in

Ridgeview now. It was hard for him to visualize what that would look like. Yardages and tree heights were hard to see, but a picture would be great.

CONSENT AGENDA REMOVALS:
E. Approval of the adoption of a resolution designating the City of Novi as a Bee City USA affiliate and affirming commitments to conserve native pollinators.

Member Heintz said that overall, he thought it was a great idea, but he wanted to see if there was any more specificity for the different resolution pieces that were in there, he thought it was very vague as to what they were doing with that. Was it a plan looking at increasing habitat space for bees or reducing pesticide usage or anything like that? With the Bee City applications, it was a yearly thing and they would look to see if they wanted to do it again, what had they done the previous year to renew it if they were interested in doing that. He asked if there was more specificity that could be given either now or in the coming times as to what resources or what actions would be taken to promote this Bee City status? City Manager Cardenas said that this was an initiative from the Beautification Commission. They were looking to get more involved and this was an endeavor that they had been looking at for a couple of years. In terms of the actual specific activities, they were looking at and evaluating a bunch of activities. Oddly enough, they had a very excited and experienced beekeeper that was on the fire department staff, and he had met with them. He had spoken to the beautification in terms of creating some hives in buildings and on rooftops. It was looking at the habitats they had in their gardens and properties and some other possible hives they could install around the facilities. That was why it was a little more broad right now as they dig into it. These are volunteers that will be looking at getting more involved and proposing some ideas with the staff's assistance in terms of how they can meet the demands of the Bee City program. Member Heintz said that it overall seemed like a great concept. If it passed, he would be looking to get updates to see what happened.

CM 24-04-46 Moved by Heintz, seconded by Smith: MOTION CARRIED: 7-0

Approval of the adoption of a resolution designating the City of Novi as a Bee City USA affiliate and affirming commitments to conserve native pollinators.

Roll call vote on CM 24-04-46

Yeas: Thomas, Fischer, Casey, Gurumurthy, Heintz, Smith, Staudt
Nays: None

G. Approval of the 2024 Suburban Mobility Authority for Regional Transportation (SMART) Municipal Credit Fund Contract and Resolution for the Older Adult Transportation Program in the amount of $62,149.

Member Smith said he was just looking for clarification. He said that they were applying to receive $62,149 from SMART used to support the Older Adult Services Transportation. There was mention of transferring money to People's Express (PEX). The money that they

PLANNING COMMISSION MINUTES

EXCERPT 10/30/2024

PLANNING COMMISSION
MINUTES

CITY OF NOVI
Regular Meeting
October 30, 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 Becker, Member Dismondy, Member Lynch, Chair Pehrson, Member Roney
Absent Excused:	Member Avdoulos, Member Verma
Staff:	Barbara McBeth, City Planner; Beth Saarela, City Attorney; Lindsay Bell, Senior Planner; Dan Commer, Planner; Humna Anjum, Plan Review Engineer; Rick Meader, Landscape Architect; Saumil Shah, Traffic Consultant; Jason DeMoss, Environmental Consultant

PLEDGE OF ALLEGIANCE

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

APPROVAL OF AGENDA

Motion made by Member Lynch and seconded by Member Becker to approve the October 30, 2024 Planning Commission Agenda.

VOICE VOTE ON MOTION TO APPROVE THE OCTOBER 30, 2024 PLANNING COMMISSION AGENDA MOVED BY MEMBER LYNCH AND SECONDED BY MEMBER BECKER. *Motion carried 5-0.*

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 no City Planner Report.

CONSENT AGENDA - REMOVALS AND APPROVALS

1. **JSP17-37 ARMENIAN CULTURAL CENTER**

   Approval of the request of Zeimet Wozniak & Associates, on behalf of the Armenian Community Center of Greater Detroit, for the one-year extension of the Final Site Plan and Special Land Use approval. The subject property is located on the north side of Twelve Mile Road, east of

of deviations and why they were there. A multitude of them are those that have been granted to other locations relative to the density.

Relative to density, this project was previously at 1,000 units under RM-2. The team takes pride in studying what has been going on in a community and redesigned a product that is less dense. The genesis of what they are trying to do is make a multi-generational community where one village was multi-family. The point is well taken, the Planning Commission wants to see what is being done across the street. What the team is trying to do here though is create something totally unique for Novi where there is multi-generational low-density apartment living in the Grove community. The project was previously at over 12 units per acre, so they have brought that down. Mr. Shapiro would like the Planning Commission to keep an open mind as the Ivanhoe team proceeds to the goal of having a diverse attainable community for future Novi residents.

Mr. Shapiro believes Ivanhoe has a creative multi-generational unique development. He and his team appreciate the comments and are going to digest what was discussed this evening. They look forward to moving ahead with the project. He invites the Planning Commission to reach out if they have any thoughts in the interim.

This agenda item was discussed, but a motion on the item was not required.

2. **JZ23-09 NOVI-TEN PRO WITH REZONING 18.740**
   Public hearing at the request of Novi-Ten Associates for Planning Commission's recommendation to City Council for a Zoning Map Amendment from Light Industrial and Office Service to Low Density Multiple Family and Community Business with a Planned Rezoning Overlay. The subject site is approximately 34-acres and is located east of Novi Road, south of Ten Mile Road (Section 26). The applicant is proposing to develop a 71-unit multiple-family townhome development on the RM-1 portion, and approximately 35,900 square feet of commercial space on the B-2 portion.

Senior Planner Bell stated the applicant is proposing to rezone about 34 acres utilizing the Planned Rezoning Overlay option. The site is currently vacant and was historically part of the original Erwin Orchard along with the area to the south. The Ridgeview of Novi development is now to the south, along with the Novi Athletic Club and Novi Ice Arena & Dog Park. The railroad tracks border the eastern property line. North of Ten Mile Road are industrial uses, and commercial uses are to the west.

The current zoning of the property is I-1 Light Industrial on the eastern side, and OS-1 Office Service on the western side. The adjacent parcels on the west are also OS-1. The Ridgeview development to the south is zoned RM-1 with a PRO, while the Athletic Club and ice area are I-1, as is the area east of the railroad tracks. North of Ten Mile is zoned I-2 and I-1.

The Future Land Use Map identifies this property as Community Office on the west and Industrial Research Development Technology on the east. To the south and east is planned for Industrial, north of the site is planned for industrial and heavy industrial, and on the western side is community office.

There is a floodplain area associated with Chapman Creek and Walled Lake Branch of the Middle Rouge along the southern property boundary and along the eastern side of the site extending down toward the dog park. The natural features map also indicates extensive wetland area within the floodplain, and regulated woodlands are present in most areas of the site.

The applicant is proposing to utilize the Planned Rezoning Overlay to rezone about 7 acres of the property to B-2 Community Business, and about 27 acres to RM-1 Low Density Multiple Family. The PRO plan shows a total of 71 attached 2-story townhome units on the site. The RM-1 residential portion is accessed by one entrance off Ten Mile Road, with a secondary emergency access drive to the commercial portion of the

project. Parking is provided in garages, on the garage aprons, and a few small bays of surface parking.

During the initial review of this project the commercial area was proposed for B-3 General Business, but the applicant heard the feedback given and has revised the request to B-2 which is more in line with community-scale retail and removed the drive-through restaurant. For the B-2 portion, the current concept plan shows a total of 35,900 square feet in four separate buildings. Access to the commercial site would be from three curb cuts on Ten Mile Road – one is the existing shared driveway with Maly Dental office, and the other two are new. The plan notes retail and restaurant uses within the commercial buildings – but generally other uses permitted in the B-2 district could be tenants in those spaces. However, the applicant does offer to prohibit certain uses as a condition of the PRO Agreement, including Hotel/Motel, Gas Station, Marijuana sales, Check Cashing, and Pawn Shop. Marijuana sales are not permitted in the City of Novi. By changing to the B-2 District, Automobile repair/service/maintenance uses and car washes would not be permitted.

The applicant describes the project as creating a walkable community, with linkages to the existing paved public access path in Ridgeview Villas, which would connect to Nick Lindstrom Drive and to the nature trail behind the Novi Athletic Club and dog park area. They also propose a paved path around the proposed townhouses that would be available to the public, and two new overlook areas behind the Athletic Club.

The trail connection is consistent with the Ridgeview PRO Agreement, which offered as a public benefit the construction of a pathway for public use from Nick Lidstrom Drive to the north property line to provide for this future connection. This is also shown in the Ridgeview Master Deed, and a Pathway Easement was granted to the City for this segment in 2016.

A park area with seating is proposed between the commercial and residential area, and in place of the pickleball/tennis courts that were previously proposed in the northeast corner of the site, there is now a "trailhead" area which is proposed to be donated to the City for public use. Currently there are no amenities proposed for that area and the size of the area to be dedicated is undetermined, which will need to be clarified for the PRO Agreement.

Staff and consultants have identified some issues with the proposed rezoning and PRO Plan. First, the zoning districts indicated do not match the Future Land Use map guidance. Staff has concerns about the proposed residential use compatibility with the adjacent I-2 General Industrial to the north. However, the RM-1 category does correspond to the adjacent Ridgeview development to the south, which was also previously zoned Light Industrial and Office Service. They are also providing a landscaped berm to help screen the homes from the industrial uses to the north. There are also commercial uses in this area to the west that would be contiguous with the B-2 area.

The revised Traffic study notes that the change of uses will result in a modest increase in traffic on the local road network compared to likely development under the current zoning. The revisions to the study considered the commercial area decreasing in size from 60,000 sf to about 36,000 sf. The anticipated daily trips are just under 3,000 for the proposed uses, whereas the potential uses under the existing zoning is approximately 2,500 trips (16% increase). However, the proposed mix of uses is estimated to generate approximately 35% fewer morning peak hour trips compared to potential development under the existing zoning, and about 1% fewer afternoon peak hour trips. The applicant indicates that they intend to complete the following improvements identified in the study to mitigate the traffic impacts on Ten Mile when the commercial portion of the project is developed:

- Widen eastbound side to two through lanes, ending with a right-turn deceleration lane at the site's easternmost residential driveway.
- Widen westbound side to two through lanes west from the 3rd site driveway to help provide

additional capacity for outbound site traffic.
- Extend the center left-turn lane from where it currently ends at Catherine Industrial Road to service all commercial driveways.

The applicant will need to coordinate improvements with the Road Commission for Oakland County as Ten Mile Road is under its jurisdiction.

Driveway spacing and major drive deviations are also likely to be required, but the applicant states the Road Commission for Oakland County has given preliminary approval of the driveway locations.

Engineering notes there is capacity for the water and sewer demands for the proposed use in the public utilities, and stormwater detention is to be provided in a single storm sewer detention system on the east side of the site, with controlled outlet into the floodplain to the east. An image was shown reflecting the areas of stormwater collection that would be directed to the basin. The City engineers review all proposed developments to ensure that the stormwater systems are properly designed to meet all standards to account for 100-year flood conditions.

The proposed landscaping is generally in conformance with the ordinance. The applicant has added screening between the residential and commercial portions of the property, and the deficiencies in foundation landscaping and greenbelt berm in the commercial portion will be corrected in the site plan submittal. Landscaping waivers for street trees and greenbelt canopy trees along Ten Mile Road are supported by staff due to conflicts with existing underground utilities.

Façade review notes that the commercial buildings are in full compliance with the ordinance, and actually exceed the requirement for brick material, which could be considered an enhancement to the area. For the residential buildings, Section 9 façade waivers would be required for an underage of brick on the rear and some front facades, and an overage of asphalt shingles on some front facades. These waivers are supported as they are minor in nature and do not adversely affect the aesthetic quality.

Wetland impacts have been minimized, with only 0.1 acre, less than 1% of the total wetland area present, of impact to a few small pockets of wetlands in the upland area. A large portion of the site, 15.87 acres of wetland, woodlands, and floodplain area, is proposed to be protected in a conservation easement to ensure permanent preservation (the area in green on this slide). This could be considered a benefit to the public.

The PRO request includes conditions that are more limiting than we could otherwise require of a developer, including:
- A 15.87-acre area of woodland and wetland to be protected in a Conservation Easement
- The publicly accessible pathway and trailhead area previously mentioned
- Exceeding the open space requirements
- The residential units will be set back a minimum of 100 feet from the south property line, which is greater than the required 75 feet
- Limitations on building height
- Limitations on residential density
- Greater than required building setbacks for the commercial buildings
- Use restrictions for commercial buildings
- See the draft motion sheet for a full list of proposed conditions and deviations requested

Tonight, the Planning Commission is asked to hold the public hearing, and to make a recommendation to City Council on the PRO Plan. Following the Planning Commission public hearing, the project would then go to City Council for its determination of approval.
The applicant Dan Weiss from Novi-10 Associates, along with Scott Hansen from Toll Brothers, architect

Lonny Zimmerman, as well as other members of their team, are here representing the project tonight. Staff and our traffic and environmental consultants are also available to answer any questions.

Chair Pehrson invited the applicant to address the Planning Commission.

Lonny Zimmerman, architect with Siegal Toumaala Associates, introduced Dan Weiss, the developer and longtime property owner in Novi; Scott Hansen and Jason Iacoangeli with Toll Brothers; and Jason Emerine with SKL Engineers. Ms. Bell did a complete job describing the project. It has been presented to the Planning Commission on prior occasion. The team has made some improvements since the last time they were here. They tried to follow the goals in the Master Plan – walkability, connectivity, supporting local retail, creating open space, and environmental stewardship.

This 34-acre site has been owned by Dan Weiss for over 35 years. There have been past plans to develop it. This has now taken the form of what Mr. Zimmerman believes is a really workable, successful plan. The current zoning is I-1 and OS-1, both of which have low demand right now and replaced it with B-2 zoning for retail and RM-1 zoning for the townhomes. Previously the site could have had up to a 291,000 square foot building. There isn't really an office market these days, but there is a market for retail and townhouses.

The retail center is proposed at 35,900 square feet, with the limited uses Ms. Bell indicated. Architecturally it is a little more unique. It has a 20-foot plaza in front of the buildings, with planters and landscaping that create more of a plaza feel than just a walkway in front of the store fronts.

Regarding walkability, the whole concept is to be able to walk around the residential areas and that connects to the new proposed pocket park on the northeast corner near Ten Mile. The pickleball courts in this area were eliminated given concerns with noise issues. The pocket park would be donated to the City of Novi. There is a connector path to Ridgeview Villas that was built into the PRO agreement for that development. The Novi-Ten team is flexible in terms of the walking trail shown, it would be a very good connecting trail to let people look at the wetlands along the railroad tracks. There is a 100-foot-wide wetland area the connect just to the south of the new trail system and separates Ridgeview Villas from this development. There is a lot of natural area to be seen.

Mr. Zimmerman believes that this connectivity, which is called for in the Master Plan, and the walkability is something that adds to the development. The retail area was changed to B-2 to orient it more towards the local retail rather than the general business of the B-3 which was part of the previous plan. That was a good suggestion that came from the Planning Commission when the project was previously presented.

Environmental stewardship is very important. Almost 16 acres are to be put into the conservation easement so in perpetuity this will be kept in a natural form. Two lookouts proposed down towards the southern end will allow views into this natural area.

Jason Iacoangeli stated he is a certified planner with Toll Brothers. He and Scott Hansen had the opportunity over the summer months to meet on a couple of occasions with the neighbors at Ridgeview to discuss the plan and what could be done to make it better work for the Ridgeview residents. Their major concern was pedestrians coming through the neighborhood through the existing easement. Some discussion was had to change the material type of the pathway from a hard surface to a soft surface, like a crushed limestone that you would find in a nature preserve to be able to better preserve trees that are in that horseshoe around the new residential development. It is much easier to place a pathway of that kind in and around trees as opposed to using something harder like asphalt or concrete.

Another consideration was some of the residents preferred to just eliminate that U-shaped trail and just have the connection to the commercial. If they had to have a pathway, it would just be directly to the commercial center and run sort of straight down, eliminating the area that goes behind the buildings to

what would be a pocket park because the thought was residents that are currently there now don't want to see people walking through the woods behind their homes. That point was well taken and the way it was left was to have the Planning Commission consider the scope and breadth of the walkability around the new development.

Looking at this piece in its entirety, not only the Novi-Ten development being proposed, but with what is already there, this development is the perfect fit. The proposed residential complements the residential that currently exists to the south. They both have consistent zoning, and then it introduces neighborhood level lower impact commercial that can be walkable for all the residents.

Mr. Iacoangeli and Mr. Hansen met with the Ridgeview residents twice and did listen to their concerns. Stepping down on the commercial to the B-2 zoning eliminates the drive-thrus, which was a big concern for the Ridgeview neighbors. They wanted more pedestrian scale commercial that would be more of a destination place for people who might walk.

Mr. Zimmerman added the I-2 zoning, approximately 295 feet across Ten Mile, has been screened from the proposed entry to the Novi-Ten development with very dense evergreens. This was a concern raised in being able to market the units. The traffic concerns were addressed by widening Ten Mile, paid for as part of this project. It is a benefit as well.

Chair Pehrson opened the public hearing and invited members of the audience who wished to speak to approach the podium.

Tammy Spangler-Timm, 42908 Cardinal Way, stated she would like to thank the City leaders for this opportunity to provide feedback tonight. She has multiple concerns about the development adjacent to Ridgeview, but wanted to start with a positive approach by showing a map she created that proposes an alternate route that still achieves the purposes of the walkable pathway. The positives are that this route would keep the trail in the high visibility areas instead of down through the wetlands and woodlands. It would still provide access to the community resources down here, the dog park, and the gym. It would not increase the risk exposure for Ridgeview residents. The connector pathway does exist right now. Ms. Spangler-Timm showed a photograph of how close that pathway comes to about eight Ridgeview homes, it is within one to two feet of some of those homes. Those people could be on their back patios barbecuing and they are going to have a parade of people walking by their decks. Ms. Spangler-Timm is not sure if there's any other situation like that in the City of Novi.

The Ridgeview community is very dense, they are not like Chase Farms or Turtle Creek. They don't have a lot of green space for screening, for buffers, for noise, for visuals. There are areas within Ridgeview that are like a parking lot, there are multiple driveways, the sidewalks are close to the homes. There are pods within here where three and four homes are using the same driveway and to have pedestrians walking through there would be a very hazardous situation. Ms. Spangler-Timm also has concerns about the connector pathway and whether it should it be kept there. People could just wander. There's no guarantee they're not going to come into Ridgeview and walk around through the development. Ridgeview is private property by Michigan law. It's very generous of Mr. Weiss to have donated the property, but technically that is a swamp wetland that could never be developed anyway.

Ms. Spangler-Timm spoke with Cindy Ross at Friends of the Rouge. She was involved in a study of Chapman Creek. Chapman Creek is 2.5 miles long, so it's not just the little stretch by Ridgeview. Whatever happens upstream is going to impact things downstream. Ms. Spanger-Timm has a photo of some flooding that occurred during the storm on August 28th this past summer. That is classified by SEMCOG, and the Michigan Extension Service as a rare and vulnerable wetland, now they're maintaining it's 100 feet wide. Ms. Spangler-Timm stated that to put a trail through there a two-way pedestrian pathway must be 10 to

12 feet wide, and two feet are needed on either side for stability and drainage. So, you're really cutting a wide swath of trees, vegetation, and destroying the wildlife habitat.

If the trail Ms. Spangler-Timm proposed on her map were to go in, it could follow along the beautiful plaza pathway that the applicant is proposing that is now even wider. There are 420 apartments in the River Oaks development, and the current pathway proposed opens it up for them to also enter the Ridgeview community.

John Linxwiler, 23778 Seminole Trail, stated his comments are going to specifically address the proposed public nature trail, which consists of the connector pathway between Ridgeview and the proposed development and the cut through berms to the River Oaks West Apartments.

Ridgeview of Novi is a privately owned community. Through their HOA fees Ridgeview residents pay to have their streets and sidewalks maintained and for snow removal. Ridgeview had their streets repaved two years ago and HOA fees paid for that. The City of Novi does not incur these expenses. Ridgeview residents also through their monthly HOA fees pay for the insurance on their property.

Mr. Linxwiler is concerned that the Planning Commission could consider granting public access points into the privately owned Ridgeview community. If someone uses one of these public access points to come into the Ridgeview property and they are injured and sue, will the City of Novi indemnify Ridgeview residents? If a child comes onto the Ridgeview property through one of these public access points and they drown in one of the two ponds, who's going to be responsible? Ridgeview general liability costs are certain to increase due to nothing they have done. Due to the increased foot and pedestrian traffic and the bicycle traffic that's going to come through our neighborhood, who's going to pay for that increased cost? Ridgeview residents will. Mr. Linxwiler requested the public access points be eliminated by not connecting the pathway through the Novi-Ten development to Ridgeview. It would be an open invitation to access a private community, which increases liability, exposure, and cost to Ridgeview residents, none of which the City of Novi would be assuming.

Mr. Linxwiler supports a fully walkable community, but Ridgeview is privately owned. The City of Novi should never have allowed Toll Brothers to build a privately owned community if the intention now is to create public access points into Ridgeview that it's residents pay for and maintain, it's not fair. He would like to support Ms. Spangler-Timm's proposal to build a pathway west to Novi Road and connect it with a better sidewalk down Novi to and down to the Novi Sports Club. There is a sidewalk that exists already between Ridgeview and the Novi Sports Club that would be an automatic tie in with this, and that would satisfy the walkable community needs, and it would satisfy Ridgeview needs as well.

Elena Wayne, 42776 Cardinal Way, stated she wants to address a few concerns and one of them is safety. She moved back to Novi in February and was so happy to move into Ridgeview, it is a beautiful Toll Brothers community. However, Ms. Wayne is sure Mr. Zimmerman would agree that he wouldn't want people walking through his backyard or people approaching his front door. In the past month and a half, Ms. Wayne has had Novi police in her neighborhood twice, once using a drone, looking for somebody in the woods. Safety is a big concern. Ms. Wayne is sure anyone would agree that having people wandering in their neighborhood is quite concerning. Mental health issues are quite concerning, and she has had an influx of people with mental health issues in her neighborhood.

Another concern Ms. Wayne has is regarding the new development proposed at Twelve Mile and Meadowbrook, with two-story and three-story homes. Novi is not addressing the need for one-story home development, and yet more two-story homes are being proposed with retail. Going along Novi Road for a mile or two there is retail, a lot of restaurants, so why the need for more retail? There are empty retail spaces all over in a five-mile radius of Ms. Wayne. She does not think more retail is needed.

Ms. Wayne continued she is not opposed to having something built, but what concerns her is extra traffic coming in for retail. That means people coming into the adjacent development, walking after dinner, walking the nature trail, walking in her backyard and that's concerning. She asked if City Council will be hiring extra police officers to patrol. Her concerns are her safety, her family's safety, and her community's safety. She asks the Planning Commission to consider all these points and to think about her community, and the wildlife. There is a lot of talk about preserving wetlands and Ms. Wayne is concerned that Novi is turning into another concrete jungle and that is not what she wants for Novi.

Greg Wayne, 42776 Cardinal Way, stated as a longtime resident of Novi and a recent resident of Ridgeview Villas, he has been keenly interested in the proposal to develop the Novi-Ten property. He firmly believes it should be rejected in its entirety. The property was part of a larger parcel that was purchased a long time ago by the Weiss family and over the years, they've divided it up and turned a profit from it. Mr. Wayne thinks the parcel should remain undeveloped in perpetuity. It's a haven for wildlife that contributes to the remaining natural beauty of Novi, and, most importantly, it serves as a floodplain for the surrounding area. He finds it somewhat absurd to think that we can modify this based on 100-year government flood maps. We have all seen what's been going on in the environment around the world and the increasing number of extreme weather effects we've witnessed.

In addition to the natural features and barrier provides, building on this parcel adds to an already untenable traffic situation on Ten Mile Road. There has been talk about trying to widen it, but it can only be widened in certain areas and certainly not across the railroad tracks. Anyone who has driven down Ten Mile Road knows what that's like at rush hour.

Mr. Wayne can't comprehend why anyone would want to live directly off this major thoroughfare and right next to the train tracks with the railroad crossing which the trains signal every time they go through. The noise and vibration from the trains, let alone from the paint manufacturing plant to the east of this proposed subdivision, make this site undesirable. Surely there must be more appropriate areas available within city boundaries to build on.

Mr. Wayne appreciates the conservation easement being proposed. However, that portion of land is really unbuildable as it exists today. He does not see any reason to not consider a conservation easement for the entire property. Other municipalities have used their budget to purchase land. Mr. Wayne proposes this would be a potential win-win situation, where the City or County retains control of the property while providing financial benefit to the Weiss family who have indeed supported Novi all these years. He is not speaking as a member of the Ridgeview HOA, but perhaps there is an opportunity for the HOA to raise funds to help offset this cost to the city.

Mr. Wayne acknowledged the dedication of City leaders. Their work directly contributes to the quality of life for Novi residents, and this is where Mr. Wayne has chosen to live for the past 30 years.

Mr. Wayne urges the Planning Commission to uphold and fulfill previous mandates to preserve and protect valuable woodlands and wetlands within the boundaries of Novi. He knows recently Novi was classified as a Tree City USA. It seems absurd to him that on one hand we are a Tree City USA, and on the other hand, going to destroy these natural wetlands and woodlands. We need to continue to have the foresight and vision to prevent the overdevelopment of properties and help avoid the destruction of these unique and valuable land features that have been disappearing, one small tract at a time.

Joy Carter, 23951 Seminole Court, stated she will stress what has already been talked about, which is the walkability. She believes it is an obvious mistake to continue to build the connecting pathway. This needs to be revisited. She would like the Planning Commissioners to imagine their children in their own yard and then have other people coming into their yard that they did not expect. That is what the homes across the street from Ms. Carter will experience. It is not safe, it doesn't feel good at all, and no one would

expect to have anyone walking into their home or on their property at any time of the night. You would greet them with something different than a smile or a question.

Ms. Carter would like the Planning Commission to reconsider the plan that's being proposed. Let's not try to achieve walkability for the City of Novi at the expense of the Ridgeview Community.

Ellen Linxwiler, 23778 Seminole Trail, stated she moved to Novi from out of state about 4 ½ years ago after hearing that Novi was a great place to live. She was attracted to Ridgeview partly because it is a private community. Taking away the private sidewalks by allowing others to come in creates some issues. First, the driveways are very short. There is not much space from when you back out of the garage and are on the sidewalk, so you're constantly having to look out for pedestrians and kids on bikes, scooters, and dogs. Adding non-Ridgeview residents just creates more exposure issues.

She continued that the private yards are small. She does not need non-Ridgeview residents walking or riding bikes on her grass, causing damage to her grass and landscaping. The sprinkler heads are right by the sidewalk and can be easily damaged if walked on or run over by a bike. There are downspout grates in the small front yards that can also be easily damaged. Residents don't need dogs running through their landscaping and people not picking up after their dogs because that happens. Who is supposed to pay for damages incurred?

Ms. Linxwiler stated there is one pond right among the condos. Non-resident kids have had to be chased away from playing around it. She does not want non-Ridgeview residents wandering too close to the pond, or the cost of added exposure. She feels a sense of safety living in her private neighborhood. She fears an increase in crime if non-Ridgeview residents are allowed to freely walk on her private sidewalks and streets. Residents who live there take pride in the neighborhood, and allowing non-Ridgeview residents to walk freely in the neighborhood increases exposure and takes away from the privately owned community.

Steven Emmenecker, 23912 Seminole Trail, stated he lives in Ridgeview and has been a Novi resident for 35 years. He was one of the founding members of Saint James Church. He agrees with what previous speakers have said. He thinks the walkway can be rerouted to not come through Ridgeview property. He is one of the residents who literally lives on that walkway. His deck could only be seven feet because it would be over hanging the walkway. Ridgeview residents walk that pathway, and when he is out barbecuing or doing things he enjoys seeing them. He knows them and loves talking to them. He loves that Ridgeview residents use the pathway but does not want people he doesn't know or has no clue of who they are using it. That is not right. He's concerned about security, about dogs. The people in the River Oaks Apartments walk through Ridgeview all the time. They shouldn't be there. On top of that, if you put a trail head in, what does that invite?

There are ducks behind Mr. Emmenecker's home, as well as turkeys, coyotes, deer, osprey, grey herons, possums, and weasels. He doesn't want to see that habitat destroyed. That's why he moved there. He paid a premium for his lot. He was told by Toll Brothers that the reason they put a bench at the end of the path facing the woods was because that was the end of the trail. It would never continue any further. He stated in the fall the trees drop their leaves, and he will be able to see the new homes. He does not want the trail connection. He prefers to not have the adjacent development but doesn't know if that's practical.

In Mr. Emmenecker's opinion there is no need for restaurants. People aren't going to walk up there. There is already empty commercial down by the CVS, the whole strip on Novi Road is empty.

Larry Haddock, 23976 Seminole Court, said he would just like to outline seven points that he feels are the most important in his objection to the development as it is recommended.

First, many residents paid a significant premium for a condo backing up to the woodlands and were told by Toll Brothers that this land wouldn't be developed due to its sensitive environmental status and it's not fair or proper to change it now.

Secondly, there would be increased traffic congestion on Ten Mile and Novi Road. There are constant long backups because of excessive vehicles, the train track crossing, school buses, etc. Adding 71 townhomes and commercial retail buildings in the same area is a bad idea.

Third, the proposed walkable community pathway goes directly through Ridgeview private property, resulting in diminished privacy, safety, and HOA maintenance and cost issues and disruption of the quiet ambiance of the community. The pathway should be routed around, not through Ridgeview.

Fourth, the destruction of woods and wetlands will increase flooding possibilities. Ridgeview is already located at the designated flood plan. Where's the water going to go?

Fifth is the loss of natural features and wildlife habitat, removal of trees and vegetation that filter noise and provide a visual screen.

Sixth, Novi has two ordinances that address the protection and preservation of Woodlands and Wetlands within the City that need to be upheld.

Lastly, Mr. Haddock asks the Planning Commission to please have the foresight and vision to prevent the over development of properties in Novi and halt the destruction of our unique and valuable land features.

Karen Chopjian, 23991 Seminole Court, stated she sent in a response form with nine objections which she would not restate. She wanted to back the opinions of her neighbors because she sees a turnover in the neighborhood. People are selling their homes, and new people are coming in. She doesn't like it and doesn't want to see her neighbors leave. She concluded she also doesn't want any flooding42787.

Ken Mac, 42787 Cardinal Way, apologized in advance for the redundancy, but hopefully it helps the Planning Commission formulate its feedback and its questions. He showed a picture of Ten Mile representing the 3:00 PM to 6:00 PM window, without a train crossing. During rush hour going east or west, it's madness. It backs up. It gets dangerous back into the Novi intersection. The 71 units that Toll Brothers propose is likely to make ROI numbers. Perhaps they could consider making those numbers by lowering the density and cutting out some of the unnecessary costs. In Mr. Mac's opinion, the u-shaped pathway and the two proposed lookouts could be eliminated along with other cost-cutting measures.

He continued pathways are quite destructive to the natural wildlife and to the watershed area. It really wipes out the swaths of trees, the brush, and the barrier. What is extremely concerning is connecting an existing path close to the Ridgeway condos and the new path would decimate some wildlife habitat. It would negatively impact the wetlands and the watershed. There is a lookout behind that pond. Mr. Mac showed a photo taken behind the Novi Athletic Club showing a 20 to 30 foot drop off there. He spoke to Toll Brothers about this when he did his walk through but wonders why this is even there. It's serving a purpose to channel flood water out of the pond and overflow water, but it's dangerous for a child, or a biker, or a stroller to have a lookout here.

Mr. Mac questioned who will maintain the maintenance of the paths and the lookouts, and who is responsible for the liability. If it doesn't get maintained, and if there is a problem, the finger pointing begins. He urged the Planning Commission to strongly to consider reducing the density from 71 units to a lower number, to eliminate the pathway, the lookouts, and the horseshoe between the proposed development and the Ridgeview development, and to save trees and brush. It will help keep a natural barrier, save

costs, and eliminate liability. The Ridgeview community pays about $1,000,000 of tax property to the city per year and is an important stakeholder.

Seeing no one else, Chair Pehrson requested Member Lynch read the correspondence received. There was a petition with 57 signatures and 17 letters were received, with some duplication, all from Ridgeview residents.

Chair Pehrson closed the public hearing and turned the matter over to the Planning Commission for consideration.

Member Lynch stated that he thought getting rid of the pickleball and putting a trailhead in that location was a good idea. The Novi Sports Club is nearby, and they have pickleball. He also thought it was a good idea to reduce the intensity of the business district.

He stated the subject site is a difficult piece of property to develop. To compare density, he looked at what is being proposed to what's existing in Novi, not only at Ridgeview, but at another industrial site that was rezoned residential, Villas at Stonebrook. He saw 71 units proposed on 27 acres for Novi-Ten, that comes out to about a 2.6 unit per acre, yet in the motion sheet it references a 4.5 dwelling units per acre.

Senior Planner Bell stated it depends on how you consider the area that is being rezoned to RM-1, and whether you look at the entire area that's being rezoned to RM-1, including the whole area on the east side, which includes the area that's going to be in the conservation easement. Theoretically, the density could be based on all the RM-1 area, or just the area that is being built on. That's the difference in the numbers.

Member Lynch stated it looks like Ridgeview is at about 4.7 dwellings per acre. Novi-Ten is about 4.5 dwellings per acre. Stonebrook is about little over 4 units per acre. These are difficult sites when rezoning from industrial to residential. The pathway was something that got his attention. Member Lynch lives next to a pathway too. It's next to a lake and he worries about that.

Member Lynch confirmed the path will be crushed limestone and stated that is good and eliminates the bike traffic. He inquired if the conservation easement would extend the entire length between the two properties.

The applicant clarified the conservation easement would not include the west park area on the right.

Member Lynch stated the densities between the proposed residential and Ridgeview are about the same, the units from the renderings that he saw are substantially similar, there are not a lot of deviations that are unreasonable. He agrees that with the industrial to the north, there is a road in between so that means less issue with compatibility. He stated he didn't have a problem getting rid of the berm. He inquired about the deviation to exceed the required 3,000 CCT.

Senior Planner Bell stated that CCT is color correlated temperature. It's the temperature of the light measured in Kelvin. The recent text amendment now requires light fixtures to be 3,000 Kelvin and the applicant is proposing 4,000 Kelvin.

Member Lynch stated removing the landscape berm on the east side is no issue. The trees don't make sense on Ten Mile. These are minor deviations in landscaping. Wetlands had an improvement. Woodlands will have a permit. And as far as the facade, there are very few deviations. In Member Becker's opinion the density is the same as Ridgeview. The units are substantially similar. He likes the layout. It's a beautiful piece of property. With the railroad tracks on Ten Mile, Member Lynch does not think the traffic issue will be solved.

Regarding the pathway, Member Lynch will let one of his colleagues that is more familiar with the Walkable Novi plan comment, but going from concrete to the limestone fines would be more beneficial for the wetland areas. It would also significantly reduce bike traffic. He does not believe that people will be coming from all over just to see the railroad tracks and the wetland areas. Member Lynch is in support of the proposal.

Member Becker stated as opposed to the earlier project where the Planning Commission was asked to consider a PRO rezoning request, this proposal is in fact compatible with the surrounding area. It forms a transition that goes from offices that are on the south side of Ten Mile to the east to the new designated B-2 commercial buildings, and then to residential.

Across the railroad tracks on the north side of Ten Mile is residential, and to the south of the proposed Novi-Ten project is residential, so this is a much more fitting PRO rezoning request to consider.

Member Becker stated as a reminder that for just about everybody who lives anywhere in Novi, there were existing trees, wetlands, and things that had to be disturbed to build the houses that we all live in. A rezoning request with the PRO was approved for Ridgeview Villas. This is exactly what the Planning Commission is considering for the Novi-Ten proposal, so it seems that it would be a natural thing to do, since it was already done once in this immediate area.

However, the City also gave the right to the Ridgeview developer and the expectation to the people moving to Ridgeview that they would have control of the access to their neighborhood, both vehicular and otherwise. Whether it somehow got baked into the earlier agreement for Ridgeview or not, it seems totally illogical to come back at this point and say let's route traffic from someplace else through your neighborhood.

Member Becker thinks Ridgeview residents have every right to restrict access since they are a private development. For the Planning Commission to approve or to say that it's OK to run that pathway from the new proposed development through the Ridgeview development, and not on the edge of it, it is not proper to even consider at this point.

He recommends the applicant take the sidewalk down Novi Road to Lidstrom Drive as was suggested earlier. It's not that far out of the way and it respects what has already been established. The 71 units proposed in return for designating 16 acres as easement is going to benefit everybody in Ridgeview in that it will never be developed. Member Becker is in support, with the exception that the connector pathway be taken out.

Member Dismondy stated he agreed with Member Becker. He thinks the proposal is compatible with surrounding development. He doesn't understand the genesis of the walkway and having it go through the adjacent neighborhood.

Member Roney stated he looks at this in four different ways, four different parts. He likes the conservation easement, that's always something we like to see in the city. He thinks the development of the townhomes is good and overall it's a good fit.

Member Roney asked Senior Planner Bell for clarification of the pathway in the Ridgeview PRO and if it was intended for attachment at some point.

Senior Planner Bell stated that she believes so. The PRO document says extending it to the property line to connect to future development.

Member Roney stated that it may not mean they have to connect to it, but that was the intent if it is in the PRO agreement for the Ridgeview property.

Engineer Humna Anjum stated there's also a public sidewalk easement on that pathway right now within Ridgeview, which takes that S curve through the Ridgeview property. Member Roney stated he believes that was mentioned in the prior Planning Commission presentation of this project and stated that's still something that needs to be debated in his opinion.

He appreciates the plaza concept though there weren't any renderings to see how it would look different, he really doesn't want to see another strip mall. He cannot be in favor of this proposal today if the retail there is going to look like a strip mall.

Chair Pehrson thanked the applicant and asked if there has been any consideration to reroute the path as suggested.

Dan Weiss stated that he was not sure how this got buried in a small print but had 4 brief things to say. The first one will accommodate what you just said that they had said in writing, in prior comments, and at prior meetings that to accommodate everybody here is well, the city is used to weighing public benefits versus private individuals and we think that accommodations are often on the table and we placed them there. We said we could accommodate and ignore the fact that these fine people when they bought, they knew this connection was there. We can accommodate by ignoring that.

Mr. Weiss continued to say they could remove the trail connection. Furthermore, that whole South Walkway, the South part, that's between the two complexes. If they don't even want to see people walk there, that can be deleted. Papers that we submitted to the City said we leave that to the city and their final site plan approval through the Planning Commission and Council. Those connections can be removed.

The other piece of it that goes from 10 Mile Road along the railroad tracks that gives a public benefit to overlook the marshland and in no way impacts the residents to the South. If you guys want to keep that there seems like there would be a public benefit to that, but seems to me that we're glad to accommodate and you know it seems like they would rather residences be there instead of a 290,000 square foot industrial building.

Chair Pehrson thanked the applicant and stated the question had been answered.

Chair Pehrson stated that relative to the PRO that exists is there the ability in the language that would be created for this PRO to acknowledge that connection point and eliminate it?

Attorney Beth Saarela stated that there is a public pathways agreement in the PRO that would need a closer look to see what the process would be to terminate the public path.

Member Becker added that when the residents of Ridgewiew purchased their homes the connector pathway was there, and the subject site was zoned for I-1 Light Industrial.

Chair Pehrson suggested that the City attorney look at the PRO to see if that small path can be avoided as part of this plan. Legally, if there's already something in play that can't be taken away we will be stuck with it. Otherwise, I'd like to see that it be removed just from the standpoint of not having intrusion into the current development.

Attorney Beth Saarela stated that there may need to be a PRO amendment to the PRO which would be a significant process. There would be somebody coming in and proposing to amend the PRO plan to

eliminate a pathway connection and vacate a pathway easement which would have to go to City Council. So potentially we're looking at a process that would require them to come in for a whole process like this where they come to you for a recommendation to amend their PRO plan to eliminate the public pathway connection. The Planning Commission would make a recommendation to City Council to take that into consideration. She advised she would have to take a look at whether there was any provision in the PRO agreement or what minor amendments might have been considered in that agreement.

Chair Pehrson stated that whatever we recommend is still at the jurisdiction of the City Council to make their final recommendation one way or the other.

Attorney Beth Saarela advised an additional condition to the current motion be added for City Council consideration to modify or eliminate the proposed pathway connection to the Ridgeview subdivision.

Motion to approve JZ23-09 Novi Ten Pro was made by Member Lynch and seconded by Member Becker.

In the matter of JZ23-09 Novi-Ten PRO, with Zoning Map Amendment 18.740 motion to recommend approval to City Council to rezone the subject property from Light Industrial (I-1) and Office Service (OS-1) to Low Density Multiple Family (RM-1) and Community Business (B-2) with a Planned Rezoning Overlay Concept Plan.

A. The recommendation includes the following ordinance deviations for consideration by the City Council, for the reasons noted:

1. **Building Orientation *(Sec. 3.8.2.D): Deviation for proposed residential buildings to not be configured 45 degrees to the property lines since most of the buildings are not on any main road and they front to a substantial irregular shaped 20-acre wetland nature area of a minimum 200 feet wide separation across from Toll's existing multifamily Ridgeview project.***
2. **Side and Rear Setbacks *(Sec 3.1.7.D and Sec 3.6.2.B): Deviation to reduce the side setback from 75 feet to 25 feet along the north property line for two residential buildings abutting the proposed commercial area (B-2), since screening is proposed between the residential and commercial uses.***
3. **Distance between Buildings *(Sec 3.8.2.H): Deviation to reduce the building separation distance from the calculated formula (resulting in 31-32.72 feet required) to a distance of 30 feet between all buildings.* This deviation of less than 3 feet is considered minor and enables the layout of this project to fit within the available space while minimizing wetland and woodland impacts.**
4. **Parking along Major Drives *(Sec. 5.10): Deviation to allow for 8 perpendicular parking spaces on a major drive, since the spaces provide for visitor parking.***
5. **Major Drive Radius *(Sec. 5.10):* Deviation from the ordinance requirement for a minimum centerline radius of 100 feet, to allow the 85-foot radius shown at the western curve. The reduced radius does not impede the fire truck access route, and may serve to slow traffic speeds, creating a safer roadway.**
6. **Landscape Berms (Section 5.5.3.A.ii): *A Zoning Ordinance deviation is requested to not provide a 10 to 15-foot-high landscape berm on a proposed RM-1 district adjacent to an I-1 district.* The berm would be unnecessary in this case as the adjacent I-1 area is east of the existing natural features and the railroad tracks and would likely result in greater wetland and woodland impacts, as well as fill in the floodplain.**
7. **Right-of-Way Landscaping (Section 5.5.3.B.ii): *A deviation for the lack the required street trees and berm along 10 Mile Road due to underground utilities.* The required trees are to be provided elsewhere. This deviation is supported due to the utility conflicts.**
8. **Adjacent to Public Rights-of-Way – Berm/Wall (Zoning Sec. 5.5.3.B.ii, iii)*:* The required 3-foot-tall berm is not proposed, however an alternative brick screening wall 3-feet in height is proposed.**
9. **Building Foundation Landscaping *(*Zoning Sec 5.5.3.D): None of the commercial**

buildings meet the requirements for building foundation landscaping along the front side and allow the planter landscaping to count toward foundation requirements. However, Buildings A, C and D are only slightly deficient, so the waiver is supported. The applicant states Building B landscaping will be increased to lessen the deviation or eliminate it.

10. **Section 9 Waiver (Section 5.15): Proposed elevations for residential buildings have an underage of minimum required brick on all rear and some front facades (26-27% proposed, 30% minimum required) and an overage of Asphalt shingles (56% front side, 50% maximum allowed). As the deviations are minor and do not adversely affect the aesthetic quality of the facades, the waiver is supported.**
11. **Opposite-Side Driveway Spacing Waiver (Code of Ordinances, 11.216.d.1.d & e.): The Design and Construction Standards indicate a minimum of 150 feet is required between a new driveway and an existing "downstream" driveway. The proposed driveways are 105 feet and 118 feet. *The applicant indicates they have RCOC approval of the proposed driveway locations, however the City would also need to approve a waiver from its standards.***
12. **Color Spectrum Management (Sec. 5.7.3.F): A recent amendment to the Zoning Ordinance has a requirement that light fixtures shall not have a Correlated Color Temperature (CCT) greater than 3000 Kelvin (K). The photometric sheets show light fixtures measuring 4000K, *since the level still represents a warm tone that is pleasing to the eye rather than a cool or unnaturally bright light.***

B. If the City Council approves the rezoning, the Planning Commission recommends the following conditions be made part of the PRO Agreement:

1. ***The complete east portion adjacent to the railroad tracks and the south 50-foot-wide strip along the wetland of the proposed PRO (15.87 acres of the 27.07 RM-1 rezoning) being retained as a natural area with a conservation easement to preserve its existing marshland and wildlife. This natural area, with wetlands, wraps around the PRO and includes on the west end a proposed new 0.4-acre park/playground located between the proposed residential and retail sites. The proposed trail system, with its overlooks near the Novi Athletic Club is to be a usable and accessible community resource."* This is a benefit to both residents and the environment to have additional natural resources preserved in perpetuity.**
2. ***"To help achieve walkability and connectivity of the entire area, a trail system is being added which consists of new crushed limestone paths, overlooks, and existing sidewalks. This walkway system provides connectivity between surrounding existing residential areas and new proposed PRO residential area with all the marshland nature areas, the proposed pocket park, the Novi Athletic Club, Ice Arena, and Dog Park, and with the new proposed local (retail) along Ten Mile Road. The retail consists of the new proposed retail and restaurant areas, and the existing Walgreen's and dental office. New walkways and bike paths wind through the natural area, overlook 15.87 acre wildlife area and connect this PRO development to the recreation areas: The $3.2 million dollars worth of Novi 10 land previously donated to the city, initiated by Novi request (18 acres of land): For the Novi Arena Facility and the Novi Dog Park."* This is a benefit as future residents as well as the general public will have access to a pleasant area for walking that connects various community amenities. The City would prefer the pathway to be concrete rather than crushed limestone. Subject to the Planning Commission's recommendation to the City Council for consideration to modify or eliminate the proposed pathway connection to the Ridgeview subdivision.**
3. ***"Two pocket parks are added: One added at the trail head on 10 Mile Road at the north end of the new conservation area. The second is on the west end of the trail townhouses to include playground equipment."* This is a benefit as future residents as well as the general public will have access to the pocket parks and trails. The applicant states the trailhead area will be dedicated to the City. It remains unclear if they will be providing amenities and responsible for maintaining it. There are no details currently provided. If this is to be a benefit, the size and details of the benefit will need to be**

clarified and be included in the PRO Agreement.

4. *"A planted plaza over 20 feet deep, with benches and other amenities is proposed to be continuous along the storefronts of the new local retail area including a variety of planter sizes and types with a variety of trees and flowers."* This goes beyond what the ordinance requires and is considered an enhancement of the project area that could be used by any customers of the retail area.
5. *Proposed use restrictions not permitting certain automotive and other business uses in the proposed B-2 commercial zoning (Sec. 3.1.12.B & C) are to be part of the PRO. Not permitted uses are:*
    a. *Vehicle Oriented Uses: gas/fueling station,*
    b. *Other excluded uses: Check cashing, Pawn shop, Hotel/motel (Marijuana sales already not permitted in the City of Novi will also be excluded by the PRO documents in case the city's law is changed to allow it in the future.)*

    This is an enhancement of the property as the City can be assured that the future tenants of the property will not include certain less desirable uses, and is more restrictive than the ordinance requires.
6. *EV Charging Stations will be located at each of the commercial buildings (8 indicated in total). Outlets for 240-volt EV chargers will be provided in each townhouse garage.* This is an amenity that goes beyond what the ordinance requires.
7. *The amount of open space provided for the RM-1 townhouses exceeds ordinance requirements.* This is a benefit as future residents as well as the general public will have access to the trails and trailhead area.
8. *Commercial Building Setbacks:*
    a. *Front: 40 feet required….101 feet provided*
    b. *Rear: 30 feet required….74 feet provided*
    c. *Side: 30 feet required…..88 feet provided*
9. *Residential Building Heights* will be limited to 29 feet, which is more limiting than the 35 feet permitted. This is a benefit as the buildings will be less obtrusive than the 35-feet otherwise permitted.
10. *Commercial Building height will be limited to* 23 feet, which is more limiting than the 30 feet permitted. This is a benefit as the buildings will be lower profile than the 30-feet otherwise permitted.
11. *Maximum Residential Lot Coverage* of *25% is permitted, 14% is proposed.* This is a benefit as more permeable surface will be preserved, which allows stormwater to permeate, and more green space is available.
12. The development standards of the RM-1 District require a minimum rear yard setback of 75 feet. The applicant proposes a greater setback of 100 feet minimum along the south side. This benefits the neighborhood to the south as buildings are further away than the ordinance requires, with less of the existing trees to be cleared.
13. *In the RM-1 District, a development of 3-bedroom units can have up to 5.4 dwelling units per acre. This development proposes 4.5 dwelling units per acre.* This is 17% more limiting than otherwise permitted in the district.
14. *As noted in the façade review, the commercial buildings significantly exceed the 30% minimum requirement for brick on nearly all elevations. This represents an enhancement of the project area beyond what the ordinance requires.*
15. The applicant states they will off-set their impacts on 10 Mile Road by constructing the following improvements:
    a. *Widen eastbound 10 Mile Road to two through lanes, ending with a right-turn deceleration lane at the site's easternmost residential driveway.*
    b. *Widen westbound 10 Mile Road to two through lanes west from the 3rd site driveway to help provide additional capacity for outbound site traffic.*
    c. *Extend the center left-turn lane along 10 Mile Road from where it currently ends at Catherine Industrial Road to service all commercial driveways.*

    As noted in the Engineering Review letter, these improvements may require the acquisition of Right of Way on the north side of 10 Mile Road, and the approval of those property owners, as well as the approval of the design by the RCOC.

C. This motion is made because the proposed zoning districts are a reasonable alternative to the OS-1 and I-1 Districts and fulfills the intent of the Master Plan for Land Use, and because:

1. **The plan results in the preservation of a large area of woodland, wetland, and floodplain, which benefits the overall environment and community members,**
2. **The development supports various goals of the 2016 Master Plan for Land Use, including:**
   a. **Provide residential developments that support healthy lifestyles. Ensure the provision of neighborhood open space within residential developments.**
   b. **Safe housing and neighborhoods. Enhance the City of Novi's identity as an attractive community in which to live by maintaining structurally safe and attractive housing choices and safe neighborhoods.**
   c. **Maintain existing housing stock and related infrastructure.**
   d. **Provide a wide range of housing options. Attract new residents to the City by providing a full range of quality housing opportunities that meet the housing needs of all demographic groups including but not limited to singles, couples, first time home buyers, families and the elderly.**
   e. **Maintain quality architecture and design throughout the City.**
   f. **Protect and maintain the City's woodlands, wetlands, water features, and open space.**
   g. **Increase recreational opportunities in the City.**
   h. **Provide and maintain adequate transportation facilities for the City's needs. Address vehicular and non-motorized transportation facilities.**
   i. **Ensure compatibility between residential and non-residential developments.**
3. **The detriments to the City from the commercial and multiple family development as proposed are mitigated through the preservation of woodland and wetland areas, and the proposed improvements to 10 Mile Road. The conditions proposed would result in an overall enhancement of the area that may not be achieved in the absence of the PRO Agreement.**

ROLL CALL VOTE ON MOTION TO RECOMMEND APPROVAL OF JZ23-09 NOVI-TEN PRO, WITH ZONING MAP AMENDMENT 18.740 TO CITY COUNCIL TO REZONE THE SUBJECT PROPERTY FRO LIGHT INDUSTRIAL (I-1) AND OFFICE SERVICE (OS-1) TO LOW DENSITY MULTIPLE FAMILY (RM-1) AND COMMUNITY BUSINESS (B-2) WITH A PLANNED REZONING OVERLAY CONCEPT PLAN. ***Motion carried 4-1 (Roney).***

3. **JSP23-33 SHEETZ**

   Public hearing at the request of Skilken Gold for Preliminary Site Plan, Wetland Permit, Woodland Permit, and Stormwater Management Plan. The subject property is zoned B-3 General Business and is located in Section 13, west of Haggerty Road and south of Twelve Mile Road. The applicant is proposing to demolish the existing gas station on the site to redevelop with a new gas station/convenience store.

Senior Planner Bell stated the site is located on the southwest corner Haggerty Road and Twelve Mile Road in Section 13. The site currently operates as a BP gas station. The Shelter Bay Animal hospital is to the west, a medical office building to the north, and an undeveloped parcel to the south. Across Haggerty Road, in the City of Farmington Hills, is an office building.

The site is zoned B-3 General Business, and the surrounding area is zoned OST (Office Service) and B-3 (General Business). To the east in Farmington Hills is zoned for Office Research. The Future Land Use map indicates Community Commercial for the subject property and those to the west. The rest of the surrounding area is planned for Office Research Development and Technology. The subject property has regulated wetlands and woodlands along the south side of the property, which are connected to a larger system of off-site forested wetlands.

As indicated on the site plan, the applicant is proposing to demolish the existing BP gas station redevelop

APPLICANT RESPONSE LETTERS

12-10-24

To: City Council City of Novi

Novi 10 Associates PRO Rezoning Along Ten Mile Rd., East of Novi Rad:
Accommodations from Novi10 as approved by Planning Commission

This memo is to confirm key items and what was said on the record at the October 30, 2024 Planning Commission meeting which resulted in approval vote in favor of the project. The project has many benefits for the whole community, and extra concession was made for the Ridgeview Villa neighbors. The concessions include improving the land for the Novi-10 PRO adjacent to them from Industrial to residential use, which removes the likelihood of 291,000 Square foot manufacturing factory from becoming a neighbor to Ridgeview. An industrial use would have less trees, less open space and far more parking. And we hereby now confirm, as shown on the accompanying drawing, our ONE promised significant reduction of public access across Ridgeview by eliminating the originally proposed trail connection from 10 Mile road and the new proposed townhouses to Ridgeview Villa, deleted as a favor to Ridgeview residents. This can be incorporated into the final PRO contract.

As we indicated to the Planning Commission and the Ridgeview Villa residents:
When any resident bought at Ridgeview it was clearly visible that there are public sidewalks including one across one section of the existing Ridgeview neighborhood with its overview of the wetland, and river and connecting to the neighboring land on the north side, which is the subject of this rezoning. And while it is posted for Ridgeview residents not to walk and trespass northward, the public access possibility to Ridgeview from the north there was always quite visible. And although some residents have indicated that Toll Brothers may (allegedly) have promised that the neighboring land north of Ridgeview along Ten Mile road would be staying vacant forever, Toll Brothers at no time owned that land to be able to commit anything binding.

Yet, while this is not owed, and we feel there is clear good public benefit to have the connection for this extra nature trial connection (public walkway) all the way from Ten Mile Road, we agreed to eliminate that one connection to Ridgeview Villas from the north. And the attached drawing shows that one deletion. And this can also be confirmed in final Contract and site plan approval by the City.

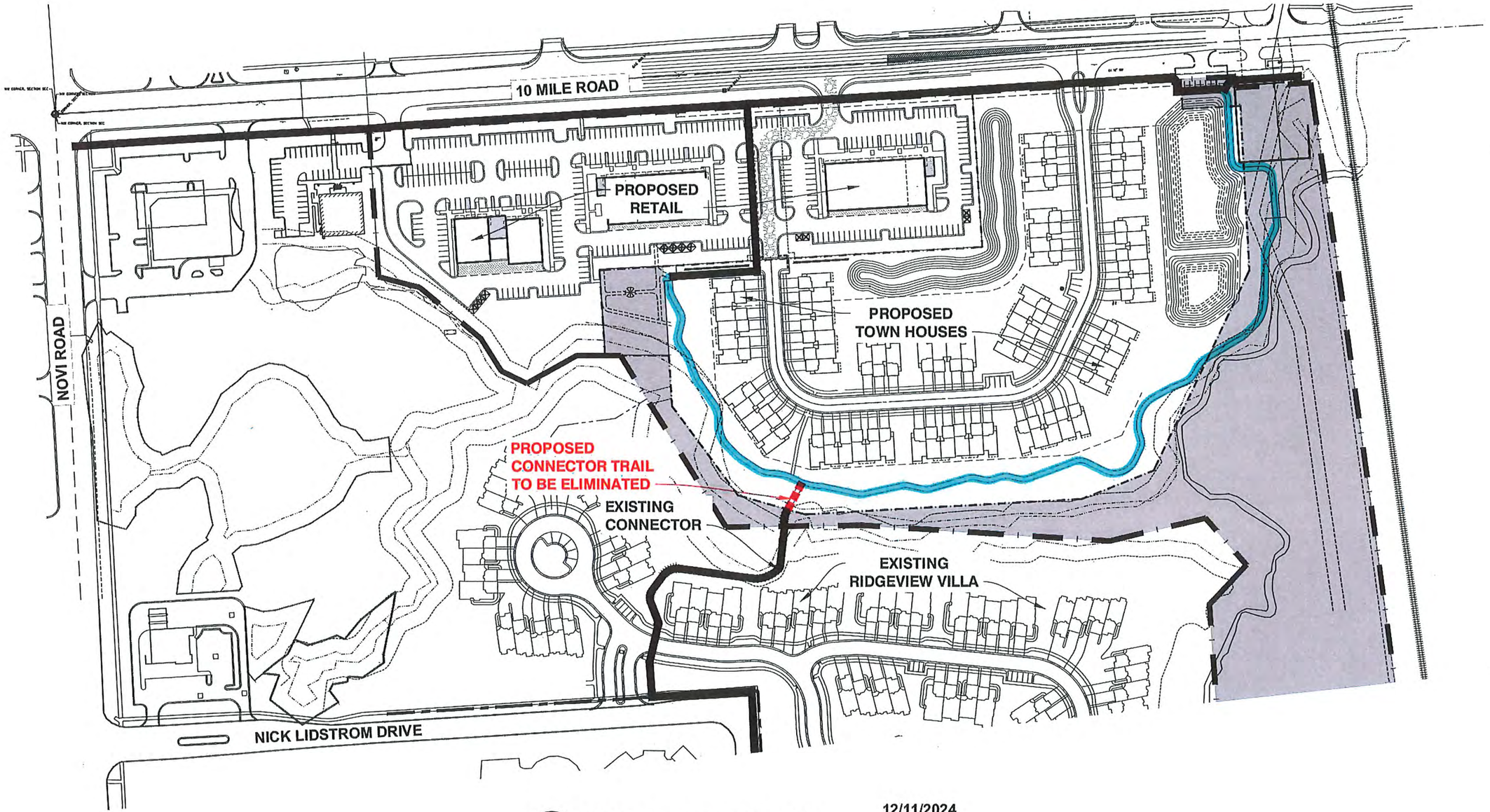
Please note: Once that **new public access from the north by 10 mile road**, is deleted as was agreed and shown, there is no plan to implement that or delete the other, long existing Public walkway coming up from the south (Lidstrom drive public sidewalk area), which is already in place on the one section of Ridgeview Villas. This was agreed by the City planners and benefits the regional community, and was in place when residents purchased, and allows strollers coming to the pond and river viewing area from the south. This was agreed to and set up by the city years ago in prior PRO Contract.

Overall, as indicated, this one agreed deletion is clearly a “gift “(not owed), concession to those residents, placing their private interests above the public on this one topic, and

we hope they appreciate that and will maintain withdrawal of their complaints as was indicated in the public hearing and by the HOA President would occur based on that one item alone. And this created an amicable approval by all, and is part of what resulted in the Planning Commission's positive vote.

Thank you for your consideration,

Dan Weiss , Novi Ten Associates



12/11/2024

NORTH

NOVI -10 PRO TRAIL PLAN

PROPOSED NATURE TRAIL

SIEGAL/TUOMAALA ASSOCIATES ARCHITECTS AND PLANNERS INC.
29200 northwestern hwy suite 160 southfield, mi 48034 p•248•352•0099 f•248•352•0088 www.sta-architects.com

October 21, 2024
Ms. Lindsay Bell, AICP
Community development- Planning Division
City of Novi
45175 Ten Mile Rd.
Novi, MI 48375

Re: Novi-10 PRO JZ23-09 Reviews- Received Sept. 18, 2024

Dear Ms. Bell,

This is the response letter to the September 16, 2024 review letter for the 8-09-2024 submission for the Novi-10 PRO. Responses to items indicated in the review letter requiring a response are as follows:

REVIEW COMMWENTS

Item 1. Supporting Documentation
- a. c. Rezoning Traffic Study: The applicant has been communicating and coordinating with the RCOC for its input. No objections have been expressed regarding the widening plan for 10 Mile Rd.

Item 5. Adjacent Industrial Uses
- a. The I-2 industrial zoning district is located on the north side of Ten Mile Road and has a 120 ft. right-of-way and a 100 foot I-2 setback requirement. Although the current uses in this district are generally not heavy industry, it is recognized that it may be heavy industry in the future. The proposed townhouses setback is 75 feet from the south right-of-way line, totaling a 295 foot minimum separation between I-2 and RM-1 buildings with 10 Mile Road between them and a 6 to 10 foot high berm along most of the RM-1 right-of way, planted with 10 ft. to 12 ft. high evergreens. This dense landscaping and berms will mitigate the visual and acoustical effects of the industrial area to the north and the traffic on Ten Mile Road.

Item 6. Usable Open Space:
- a. Staff prefer a concrete path to another material. A hard surface such as concrete or asphalt would be acceptable.

Item 8. Non-motorized access:
- a. The applicant will maintain the trail in the easement that is not in the public ROW.
- b. If River Oaks West agrees to a connection to the trail system easements will be obtained if possible,

2016 MASTER PLAN FOR LAND USE: GOALS AND OBJECTIVES

Item 2. General Goal: Community Identity:
- a. A Section 9 Waiver will be obtained for the townhouses (Recommended by façade review)

Item 3. General Goal: Environmental Stewardship
- a. b. Details and amenities for the west park area will be provided during the site plan approval phase.

b. c.. The applicant will consider recommended sustainable, energy efficient design for the project.

Item 5. General Goal: Economic Development / Community Identity

a. This development of townhouses and retail / restaurant areas provides uses that are in demand in Novi as well as connectivity to surrounding residential and community recreation facilities. It creates a cohesive identity for this area that is an enhancement to the city of Novi.
Item 5. a above discusses the separation from the I-2 zoning on the north side of 10 Mile Road, and how the 295 ft. distance, berms, and heavy landscaping, and how they create a buffer to insure there is no incompatibility.

MAJOR CONDITIONS OF PLANNED REZONING OVERLAY AGREEMENT (Benefits)

Item 14. 10 Mile Road Improvements:

a. Acquisition of right-of-way on 10 Mile Road will not be necessary. The RCOC has agreed to reduce the driveway turning radius to 25 feet, which keeps the complete driveway in the existing right-of-way.

ORDINANCE DEVIATIONS

Item 9. Building Foundation Landscaping:

a. As indicated in the previous response letter (dated August 9, 2024) Building B will have the foundation landscape increased to comply for the site plan approval submission.

Item 11. Opposite Side Driveway Spacing Waiver

a. A driveway spacing deviation request for the city to match the approval received from the RCOC will be added.

IDENTIFYING BENEFITS TO PUBLIC RESULTING FROM REZONING AND THE PROPOSED DEVIATIONS.

Item 2. Any off-site easements required will be applied for.

Item. 15 The boundaries for the proposed pocket park on 10 Mile Road will be clarified during the site plan approval phase.

Item 5: Applicant will propose a legal document to dedicate the right-of-way to the city.

NEXT STEP: PLANNING COMMISSION PUBLIC HEARING

This paragraph in the city's review inadvertently indicated the proposed commercial portion as B-3 (General Business). The applicant previously changed the commercial rezoning to B-2 (Community Business). The Planner has indicated that this was an error and will be corrected.

END

October 21, 2024
Ms. Lindsay Bell, AICP
Project JZ23-09 Response Letter- Sept. 18, 2024
Page 3

Please contact us with any questions.

Sincerely,

Lonny S. Zimmerman, AIA, NCARB
President
SIEGAL TUOMAALA ASSOCIATES
ARCHITECTS AND PLANNERS INC.

cc. Daniel Weiss, Jason Iacoangeli, AICP, Scott Hansen, PE, Jason Rickard, PE, Emma O'Dwyer, Cheryl Chapman-Cowan

August 09, 2024
Ms. Lindsay Bell, AICP
Community development- Planning Division
City of Novi
45175 Ten Mile Rd.
Novi, MI 48375

Re: Novi-10 PRO JZ23-09 Reviews- Received July 19,2024

Dear Ms. Bell,

This is a response letter that will answer the review items for the unapproved items (Planning and Traffic) of our June 17, 2024 submittal for eligibility. Responses have also been added for the approved areas as shown below. No drawing revisions are included now, but drawings will be updated for the review comments in the approved and unapproved areas for the submission during the site plan approval phase.

Note that the previous June 17, 2024 submission addressed some of the comments made by the Planning Commission and the City Council.

As well as this response letter, we have included an updated **Narrative (Including Benefits & Deviations)**, which now expands the deviations to include recommended deviations that would be supported for landscape.

PLANNING REVIEW COMMENTS

The following are responses to the February 21, 2024 Planning Commission public hearing minutes and the April 8, 2024 City Council meeting minutes

PLANNING COMMISSION

- *The proximity of the railroad tracks crossing 10 Mile Road just east of this site poses some concerns. When the train passes through, or sometimes stops on the tracks, traffic on 10 Mile Road can get very backed up. Additional traffic in this area could make that worse.*

  This statement holds true for either the proposed development, the site as currently zoned, or any other potential future development on the site or in the area that might generate traffic along 10 Mile Road. In comparison to the potential traffic generated for this site by the current OS-1 and I-1 zoning, the Novi-10 PRO will generate 35% fewer morning peak trips and 1% fewer afternoon peak trips, as indicated in the previously submitted Traffic Study.

- *The applicant should provide clear depictions of what could be developed under the current I-1 District, to show what development might occur if the rezoning is not approved.*

As previously indicated, there is a low demand for office and industrial space compared with the demand for retail and multi-family residential uses. Previously submitted Drawing Sheet P-2, indicates the maximum office development in the existing OS-1 zoned area and the maximum industrial building in the I-1 zoned area.

- *The applicant should clearly show how stormwater detention system will work to alleviate concerns residents raised regarding flooding. Additional swales*

The proposed stormwater management system follows the updated Oakland County Standards which are more restrictive than the old City of Novi Standards which Ridgeview of Novi was designed. This PRO directs all storm water to one detention basin which outlets further downstream than the exiting drainage pattern. This diversion of runoff will help minimize flooding along the north side of the Ridgeview property where the floodplain is closest to the existing buildings. The Stormwater Management Plan is shown on the previously submitted Engineering Drawing Sheet 2.

- *More woodland replacement credits could be planted on-site to provide more screening between the residents to the south.*

This PRO proposes the maximum amount of woodland replacement trees that the space allows south of our proposed buildings to provide maximum screening to the south.

- *The proposal has a very small amount of wetland impact (0.1 acre) and a large amount of wetland (15.87 acres) is planned to be permanently protected in a conservation easement.*

Agreed

- *The residential use being proposed next to the Ridgeview development would be better in the long run to have compatible zoning rather than an industrial use adjacent to residential.*

The Novi-10 PRO accomplishes this.

- *There were questions about the existing public sidewalk easement that was granted as a public amenity when the Ridgeview PRO was approved, and it could be a nice amenity to be able to walk to the Novi Athletic Club or the dog park or up to the businesses along 10 Mile Road. However, signage might be needed to distinguish the private sidewalks from the public portion in Ridgeview*

If signage is requested, it will be provided.

- *The proximity of the proposed pickleball courts to residents caused concerns. They tend to make a lot of noise and should be located a good distance away from homes.*

The plans submitted on June 17, 2024 (shown on PRO Plan sheet P.3 and Engineering sheet 6A) have eliminated the pickleball courts and substituted a pocket park at this location which will eliminate the bouncing ball and racket noise.

- *The commercial area should not be another strip mall, and the project should be designed to avoid it looking like one. The individual buildings are laid out in a manner different from a strip retail center.*

The proposed retail/ restaurant development is composed of four (4) buildings with significant landscaping and is designed to not be another standard strip mall. It will have a 23 foot deep plaza in front of all the buildings, as well as patios at the proposed restaurants. As indicated in the staff review (page 19) "The planters and benches at the storefronts could be an attractive amenity which isn't found in many retail developments in Novi." This plaza is designed to make the shopping experience enjoyable with clusters of seating, a variety of different sized planters, trash containers and bike racks. This is shown on previously submitted Drawing Sheet P.5. This also shows a three foot high brick wall is to be installed along the edge of the parking to separate the parking more from the 10 Mile Road traffic.

- *Data should be provided related to whether trails in proximity to neighborhoods lead to an increase in crime, as many residents were suggesting.*

Specific Crime Statistics for the City as it relates to local pathways is best addressed by the City of Novi Police Department. In the City of Novi crime on pathways and trails does not appear to be a significant issue compared to overall crime rates based on review of the public reports found on the CLEMIS (Court and Law Enforcement Management Information System) Public Crime Search website. CLEMIS is a police information network that provides for daily entry of police data which generates statistical reports and geographic reference of crime for most of Southeast Michigan.

- *The applicant should provide data on the occupancy rate of townhomes and retail/restaurant businesses that might occupy the commercial buildings so they can make their decisions based on the expected viability of the development. The data that has been provided up to now is rather dated.*

Current market analysis on townhomes in the City of Novi show that 109 units have sold in the last twelve months. The average unit that was sold was approximately twenty-two years of age. As of July 31, 2024 only seven (7) townhome units were for listed for sale on the MLS in Novi. As of that date townhomes sell within about 26 days of being listed for sale.

An August 6, 2024 commercial market study update letter from The Chesapeake Group, who did the original 2022 market study for the commercial portion is attached after this response letter. The update indicates that the positive retail market for this area shown in the July 2022 Market Feasibility Analysis remains the same.

- *Given the concerns about traffic in this area, there are serious concerns about the drive-thru restaurant proposed, and whether there was enough consideration to ensure traffic from that use would back up onto 10 Mile.*

The drive-thru has been eliminated, as shown on the June 17, 2024 submission.

CITY COUNCIL

- *The pickleball courts do not seem to be right for this location, and perhaps the applicant should consider a pocket park for that area instead.*

As suggested by the City Council, the plans submitted on June 17,2024 have eliminated the pickleball courts and substituted a pocket park instead. This is shown on Drawing Sheet P.3 and Engineering Sheet 6A.

- *Pathways connecting two neighborhoods have been a point of resistance for residents for a long time, and the trail behind the homes on the south side would likely receive complaints from the owners of those units. Maybe if they had been developed at the same time that JZ23-09 NOVI TEN PRO with ZMA 18.740 July 18, 2024 Formal PRO Plan Review Page 4 would have worked. Other members thought the trail connection would be seen as a positive given time.*

We believe that the trail system which overlooks almost 16 acres of natural marshland is a benefit to the entire community. Using sidewalks and the proposed trail it creates a walkable interconnection between the retail areas and pocket park on 10 Mile Road and the athletic club, ice arena and dog park to the south.
The portion of the trail from the new pocket park running south of the new townhouses will have a line of trees separating it from the new townhouses. South of the trail will be Chapman Creek and its surrounding wetlands.
Nature trails have consistently been mentioned in Novi public surveys including ones recently conducted for Novi's 5 year Parks Master Plan.
The proposed connector from the trail system through to Ridgeview Villas joins all of this into one trail system. This is shown on the June 17, 2024 previous submission Drawing Sheets P.0, P.1, P.3 and P.4.
However, if there is a preference by Planning Commission or City Council to eliminate the connector, the developer is willing to do so.

- *Developments for owners are preferable over those for renters.*

The townhouses will be for sale.

- *Homes that provide first-floor living opportunities are needed in the city, as is heard repeatedly in the Older Adult Needs Committee*

The proposed Townhomes do not provide for first floor primary bedrooms.

- *To accommodate the anticipated traffic demand, there should be coordination between construction of the traffic improvements on 10 Mile at the same time as the development construction. You wouldn't want new residents living there before those improvements are finished.*

It is anticipated that the 10 Mile Road widening and the townhouses will begin construction simultaneously.

- *Given the area is adjacent to the floodplain, the applicant should make it very clear how the stormwater management system is going to mitigate any risk of flooding to the downstream occupants.*

As indicated above:
The proposed stormwater management system follows the updated Oakland County Standards which are more restrictive than the old City of Novi Standards which Ridgeview of Novi was designed. This PRO directs all storm water to one detention basin which outlets further downstream than the exiting drainage pattern. This diversion of runoff will help minimize flooding along the north side of the Ridgeview property where the floodplain is closest to the existing buildings. The Stormwater Management Plan is shown on the previously submitted Engineering Drawing Sheet 2.

- *Screening between the residential development to the south was a concern, and the applicant should show how the existing and proposed trees would provide a buffer between the developments. A rendering showing the perspective from the Ridgeview site would be helpful.* • *Screening along 10 Mile was also mentioned as a concern.*

This PRO proposes the maximum amount of woodland replacement trees that the space allows south of our proposed buildings to provide maximum screening to the south.

- *The preservation of the wetland/floodplain area was seen as a positive, especially since this area is part of the headwaters of the Rouge River.*

Agreed

- *Energy efficiency, including solar panels or geothermal heating options, good windows and insulation, etc. should all be taken into consideration in the building of these projects.*

Energy efficiency is a goal for both the residential and the commercial portion of the development, including insulated glass, high R- value insulation, and high efficiency heating and cooling systems.

- *The applicant should consider reducing the number of units to reduce the impact on the existing residential development and preserve more open space. The housing should also be similar to the housing to the south.*

With the 71 units provided, the residential open space provided, as verified by the Planning department, is 2.47 acres. This is 6.5 times the ordinance requirement and provides a natural area buffer to the existing residential units. Open space is shown on the June 17, 2024 drawings, Engineering Sheet 9.
The townhouse design incorporates the design features of the housing to the south.

- *The development of the residential and commercial portions of the project should be completed concurrently.*

The development of the residential and commercial portions of the project is planned to occur at the same time, but specific timing is subject to the final engineering and permitting process.

- *There was concern about the drive-thru restaurant use shown on the plans, which doesn't seem appropriate for this area. The applicant was asked to consider B-2 uses only, and also restrict certain uses that are not appropriate.*

As requested, the June 17, 2024 submission has eliminated the drive-thru restaurant. This is shown on Drawing Sheet P.5.
Certain allowable B-2 uses in the zoning ordinance will not be permitted, including hotels, motels, pawn shops, check cashing, marijuana sales. This is indicated in the Narrative.

- *Along the 10 Mile Road frontage, there appears to be a lot of parking lot area and it would be more interesting to see the buildings closer to the road or something more creative.*

As indicated above:
The proposed retail/ restaurant development is composed of four (4) buildings with significant landscaping and is designed to not be another standard strip mall. It will have a 23 foot deep plaza in front of all the buildings, as well as patios at the proposed restaurants. As indicated in the staff review (page 19) "The planters and benches at the storefronts could be an attractive amenity which isn't found in many retail developments in Novi." This plaza is designed to make the shopping experience enjoyable with clusters of seating, a variety of different sized planters, trash containers and bike racks. This is shown on previously submitted Drawing Sheet P.5. This also shows a three foot high brick wall is to be installed along the edge of the parking to separate the parking more from the 10 Mile Road traffic.

End of Planning Commission and City Council Responses

PLANNING REVIEW CHART RESPONSES

The items indicated in the Planning Review Chart pages 1 thru 17 as not meeting code have been listed as deviations in the June 17, 2024 submission or will be added.

Page 7- (Sec. 3.1.8.D & Sec. 3.6.2) Residential setback deviations are requested in documents.

Page. 9- (Sec. 3.8.2.D) Building orientation variance requested in documents.
(Sec. 3.8.2.H) Request for deviation for variance of 1 – 3 feet is shown on Engineering Drawing 6A, Deviation note 6; but will be added to the deviations listed in the narrative for coordination.

Page 11- (Sec. 5.10) On street perpendicular parking deviation is requested in documents.

Page 12- (Sec. 5.10) Minimum centerline deviation is requested in documents.

Page 13- Non-Motorized Plan: The 8 foot wide crushed limestone trail runs from the new pocket park on 10 Mile Road (which will be donated to the city of Novi), in a "U" shape and connects to the new pocket park on the west side (owned by the HOA).as shown on the drawings. It also connects to the existing townhouses to the south and is in a 12 foot public easement. This path will be constructed and maintained by the new HOA.

Page 13- Legal descriptions of the proposed parcels are shown on Engineering Drawing 2.

Page 14- (City Code 28.3) Signage will be submitted with the Preliminary Site Plan Approval Phase.

Page 15- (Sec. 5.7.2.A.iii) Commercial lighting was shown on the June 17, 2024 submission set.
(Sec. 5.7.2.A.ii) Hours of lighting operation will be included with the Site Plan Approval phase.

Page 16- (Sec. 5.7.3.F) The light Color Spectrum Management- lighting will be revised from 4000K to 3000K in the Preliminary Site Plan Approval Phase.

JULY 18, 2024 ENGINEERING REVIEW. (RECOMMENDED FOR APPROVAL)

All items listed will be addressed at site plan approval as indicated in the review.

JULY 15, 2024 LANDSCAPE REVIEW RESPONSES

All items indicated in the Landscape review comments requiring corrections will be indicated on the site plan approval drawings, except for the deviations indicated in the review as supported by staff. These supported deviations have been added to the deviations listed in the narrative. (Deviations 12 – 14).

JULY 16, 2024 WETLAND AND WOODLAND REVIEW (RECOMMENDED FOR APPROVAL)

- All required permits, inspections, fees, etc. will be complied with.

JULY 15, 2024 and AUGUST 02, 2024 AECOM TRAFFIC REVIEW RESPONSES

The August 02, 2024 AECOM review indicated APPROVAL WITH THE MITIGATIONS/ IMPROVEMENTS:

- The sight Distance triangle will be indicated on the site plan approval submission.
- Engineers are working with RCOC to coordinate and design standards for Right -turn lane and Left-turn lane.

The July 15, 2024 AECOM traffic review chart indicated items that required addressing. Below is a listing of the item numbers and the responses as generated by the engineer.

Item No:

1. We will reduce the driveway radii to 25' for local streets.
2. We will include the length of island.
4. The gate location is labeled on Sheet 6A.
6b. We will verify with the City that a deviation will not be required.
7. We will include labels for all proposed striping.
9. We will update R-28-I sidewalk ramp detail with R-28-K.
15a. We will provide radii dimension for islands in commercial phase.
15b. We will provide radii dimension for islands in commercial phase.
20. We will include 6" curb for all non-adjacent parking locations.
24a. We will add 2 bicycle parking spaces for each retail building.
24b. For the residential bicycle parking we will consider breaking the 8 bays into 2-4 bayes.
24d. We will include rack detail for commercial phase.
24e. We will follow 18.301 for revised standard layout details.
26. We will update R-28-I sidewalk ramp detail with R-28-K. We will include location of ramps for van accessible spaces.
32. We will provide with future submittal.
33. We will provide with future submittal.
34. We will provide with future submittal.
35. We will provide with future submittal.
36. We will provide with future submittal.
37. We will provide with future submittal.
38. We will provide with future submittal.
39. We will provide with future submittal.
40. We will provide with future submittal.
41. We will rotate symbol to meet standard.
42. We will provide with future submittal.

JULY 16, 2024 FAÇADE REVIEW: (RECOMMENDED FOR APPROVAL)

Residential-

- A Section 9 façade waiver will be requested (recommended for approval by the review.
- As requested, a sample board will be submitted. This will be done during Site Plan Approval.

Commercial-

- No roof screens are anticipated since the buildings have high parapets to conceal the roof units. I any roof screens are required their material will be in compliance with the façade ordinance.
- A brick dumpster enclosure note will be added to the site plan drawings and a detail added.

JULY 10, 2024 FIRE DEPARTMENT REVIEW (RECOMMENDED FOR APPROVAL)

- All items will be shown on the site plan approval drawings
- The one correction required to one drive for fire truck turning radius will be shown on the site plan approval submission.

END

Please contact us with any questions.

Sincerely,

Lonny S. Zimmerman, AIA, NCARB
President
SIEGAL TUOMAALA ASSOCIATES
ARCHITECTS AND PLANNERS INC.

RIDGEVIEW OF NOVI DOCUMENTS

PRO Agreement – Excerpt
Master Deed Exhibit B – Excerpt
Pathway Easement

RIDGEVIEW OF NOVI DOCUMENTS

PLANNED REZONING OVERLAY (PRO) AGREEMENT
NOVI TEN TOWNHOMES

AGREEMENT, by and among Toll II MI Limited Partnership, a Michigan Limited Partnership, whose address is 28004 Center Oaks Ct. Suite 200, Wixom, MI 48393 (referred to as "**Developer**"); Novi Ten Associates, L.L.C., a Michigan limited liability company, whose address is 400 Renaissance Center, Suite 2170, Detroit, Michigan 48243 ("**Owner**"); and the City of Novi, 45175 West Ten Mile Road, Novi, MI 48375-3024 ("**City**").

RECITATIONS:

I. Owner is the owner and Developer is the developer, of two vacant parcels totaling approximately 20 gross acres (with final acreage determined in accordance with the PSA as hereinafter defined) located south of Novi Road and East of Novi Road along Nick Lidstrom Drive, herein known as the "Land" or the "Development" described on **Exhibit A**, attached and incorporated herein. Owner and Developer are hereinafter referred to as "Applicants."

II. For purposes of improving and using the Land for a 93-unit owner occupied attached condominium development, Applicants have petitioned the City for an amendment of the Zoning Ordinance, as amended, so as to reclassify the Land from I-1 Light Industrial and OS-1, Office Service, to RM-1, Low-Density Multiple-Family. The I-1/OS-1 classification shall be referred to as the "**Existing Classification**" and RM-1 shall be referred to as the "**Proposed Classification**."

III. The Proposed Classification would provide the Applicants with certain material development options not available under the Existing Classification, and would be a distinct and material benefit and advantage to the Applicants.

IV. The City has reviewed and approved the Applicants proposed petition to amend the zoning district classification of the Land from the Existing Classification to the Proposed Classification under the terms of the Planned Rezoning Overlay (PRO) provisions of the City's Zoning Ordinance and has reviewed the Applicants' proposed PRO Plan, including conceptual renderings of unit styles and materials, attached hereto and incorporated herein as **Exhibit B** (the "PRO Plan"), which is a conceptual or illustrative plan for the potential development of the Land under the Proposed Classification, and not an approval to construct the

proposed improvements as shown. The City has further reviewed the proposed PRO conditions offered or accepted by the Applicants.

V. In proposing the Proposed Classification to the City, Applicants have expressed as a firm and unalterable intent that Applicants will develop and use the Land in conformance with the following undertakings by Applicants, as well as the following forbearances by the Applicants (each and every one of such undertakings and forbearances shall together be referred to as the "Undertakings"):

A. Applicants shall develop and use the Land solely for a 93-unit high-quality, owner occupied, attached residential condominium project, in accordance with the PRO Plan, including but not limited to the architectural rendering made a part hereof. Applicants shall forbear from developing and/or using the Land in any manner other than as authorized and/or limited by this Agreement.

B. Applicants shall develop the Land in accordance with all applicable laws and regulations, and with all applicable ordinances, including all applicable setback requirements of the Zoning Ordinance with respect to the Proposed Classification, except as expressly authorized herein or as shown on the PRO Plan. The PRO Plan is acknowledged by both the City and Applicants to be a conceptual plan for the purpose of depicting the general area contemplated for development. Some deviations from the provisions of the City's ordinances, rules, or regulations that are depicted in the PRO Plan are approved by virtue of this Agreement; however, except as to such specific deviations enumerated herein, the Applicants right to develop the 93-unit attached condominium under the requirements of the Proposed Classification shall be subject to and in accordance with all applications, reviews, approvals, permits, and authorizations required under applicable laws, ordinances, and regulations, including, but not limited to, site plan approval, storm water management plan approval, woodlands and wetlands permits, façade approval, landscape approval, and engineering plan approval, except as expressly provided in this Agreement.

C. In addition to any other ordinance requirements, Applicants shall comply with all applicable ordinances for storm water and soil erosion requirements and measures throughout the site during the design and construction phases, and subsequent use, of the development contemplated in the Proposed Classification.

D. Applicants shall provide the following Public Benefits/Public Improvements in connection with the development of the Land:

1. Residences that exceed the minimum architectural standards of the City and are similar, in the City's determination, to those conceptual architectural renderings in the PRO Plan attached as Exhibit B.

2. Construction of a pathway for public use through the Development from Nick Lidstrom Drive to the north property line for connection to the future development of the non-residential property to the north in the location and to the standards shown in the PRO Plan attached as **Exhibit B**. Pathway easements in a form acceptable to the City, shall be provided to the City for dedication for public use of the pathways. The pathways will thereafter be repaired and replaced by the City, as determined by the City. Winter maintenance consisting of snow and ice removal shall be completed in accordance with applicable City ordinances, as the may be amended from time to time, as determined by the City. The pathway easements shall be offered to the City for dedication by the Owner prior to the issuance of any building permits (except for the model) for the Development. The pathway easements shall be non-exclusive and shall permit the fee title owner of the easement property to make use of the property that is not inconsistent with use as a public pathway. The Applicants may construct and/or install underground improvements to the property, including utilities and/or similar improvements, which improvements do not interfere with use, operation, maintenance, repair and replacement of the pathways in the pathway easement areas shown on the PRO Plan;

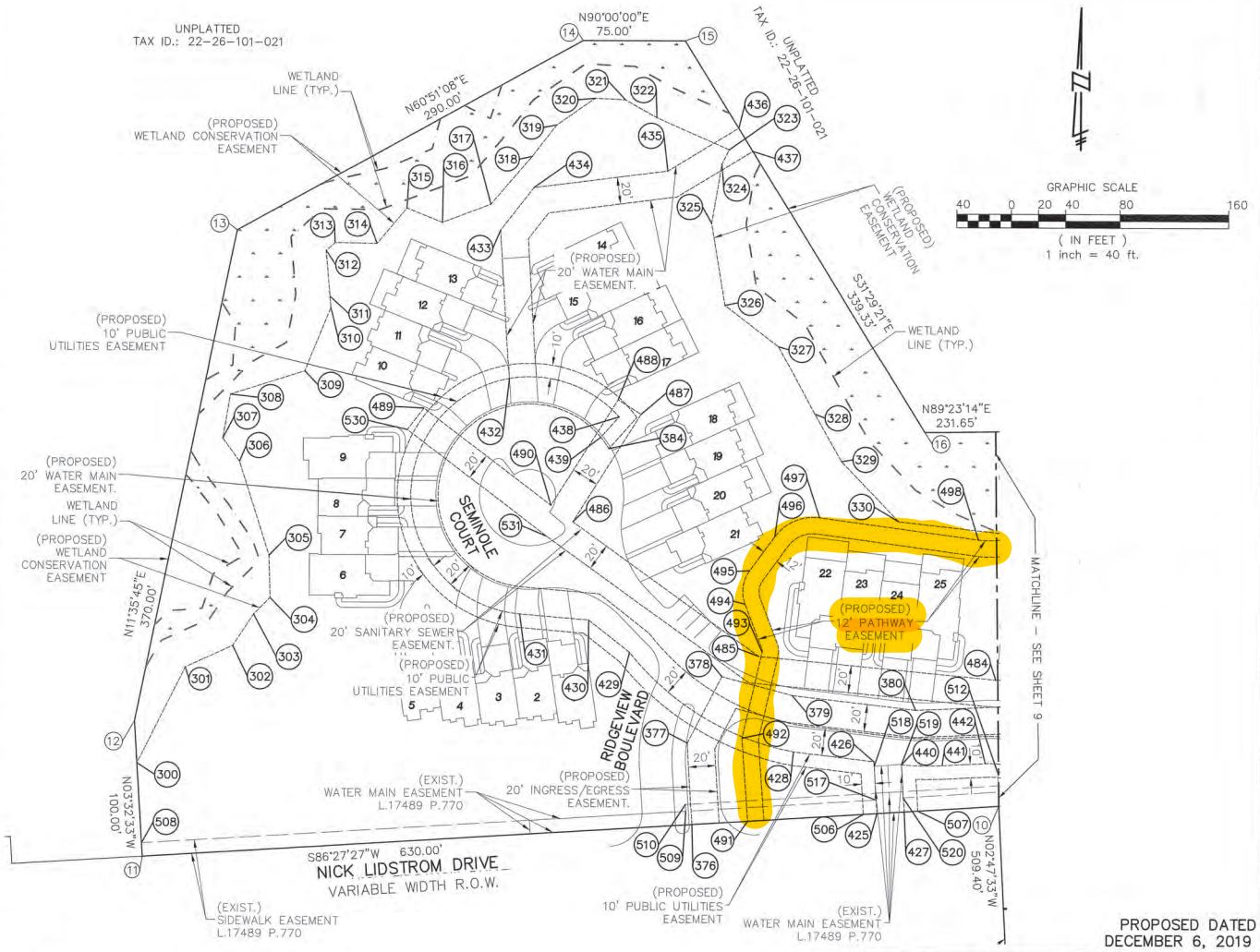
3. Construction of an off-site pathway for public use to the Novi Dog Park commencing from the site's southeast corner along the rear property line of Novi Sport's Club and a connection to the existing pathway along Nick Lidstrom Drive, in the location and to the standards shown in the PRO Plan attached as **Exhibit B;**

4. Installation of pedestrian directional signage along the pathways set forth above, which the City and Applicants acknowledge shall include signage identifying the pathway in four (4) locations, including 2 signs along the north and 2 signs on the south, as follows:

> Weiss Nature Trail: Dedicated by the Dan and Michelle Weiss family in honor of these various lands donated by them, and honoring their father Albert Weiss and their love and promotion of natural habitats and to foster

POINT TABLE		
POINT #	NORTHING	EASTING
10	4028.5162	6190.1932
11	3989.5892	5561.3970
12	4089.3981	5555.2181
13	4451.8463	5629.5905
14	4593.0948	5882.8668
15	4593.0948	5957.8668
16	4303.7342	6135.1120
300	4058.4902	5557.1315
301	4129.2818	5592.3826
302	4145.1725	5627.2449
303	4168.4916	5642.4361
304	4180.7633	5654.5302
305	4211.8279	5653.6707
306	4280.9002	5631.7747
307	4297.9100	5619.4653
308	4330.3807	5624.9352
309	4347.6844	5679.6187
310	4394.7348	5698.7487
311	4403.0351	5698.0133
312	4436.8221	5695.0197
313	4442.6157	5701.4694
314	4442.1632	5732.0248
315	4468.3859	5753.9716
316	4457.7943	5780.0216
317	4471.3772	5815.5279
318	4507.1671	5845.7973
319	4530.5621	5863.7665
320	4550.3604	5891.9566
321	4549.2619	5914.0605
322	4536.1142	5937.2028
323	4512.5279	5990.5463
324	4501.7890	5985.2122
325	4457.7226	5977.8551
326	4397.2404	5988.0087
327	4366.8148	6027.6438
328	4317.1113	6054.2646
329	4282.0429	6073.9337
330	4237.8696	6116.1040
376	4014.5612	5964.7755
377	4074.5026	5961.0647
378	4123.4984	5986.4647
379	4109.6559	6038.1373
380	4099.0409	6128.8953
384	4291.1253	5902.8878
425	4022.9819	6100.7970

POINT TABLE		
POINT #	NORTHING	EASTING
426	4061.0919	6098.4377
427	4024.2177	6120.7588
428	4068.1834	6039.1901
429	4141.1187	5918.5629
430	4164.9007	5888.4646
431	4169.1632	5837.6999
432	4342.4957	5829.6663
433	4452.2132	5822.8567
434	4483.9295	5847.2957
435	4496.6543	5945.4871
436	4528.4809	5997.4455
437	4511.4261	6007.8922
438	4314.5375	5910.3855
439	4299.4907	5896.9510
440	4058.8435	6118.6152
441	4058.3685	6148.6152
442	4059.9086	6180.1897
484	4121.4291	6187.6851
485	4138.4228	6013.5375
486	4237.1512	5876.6297
487	4316.5163	5926.5555
488	4327.1657	5909.6266
489	4320.5029	5766.9172
490	4249.1178	5860.5293
491	4017.0953	6005.7097
492	4078.1535	6001.2994
493	4141.6731	6015.9400
494	4177.0376	6003.3136
495	4201.6117	6006.6882
496	4226.6633	6025.0970
497	4240.6141	6058.0512
498	4224.6243	6174.7740
506	4022.3640	6090.8161
507	4024.8356	6130.7397
508	3999.5700	5560.7791
509	4024.3004	5960.2538
510	4029.2945	5960.0102
512	4053.5038	6189.2547
517	4032.9458	6099.9179
518	4057.9161	6098.6999
519	4059.1519	6118.6617
520	4034.6010	6119.8592
530	4304.5994	5754.7897
531	4226.4977	5857.2096



PROPOSED DATED
DECEMBER 6, 2019

NOTE:

THE ROADS AND STRUCTURES RELATED TO THE ROADS AS SHOWN ON THIS PLAN AND WHICH SERVE UNITS 1 THROUGH 93 "MUST BE BUILT".

THE LOCATIONS OF BUILDINGS AND DRIVEWAYS ON UNITS 1 THROUGH 93 ARE SUBJECT TO CHANGE. THE ACTUAL LOCATION OF THE BUILDINGS AND DRIVEWAYS WILL BE SHOWN ON THE AS-BUILT DRAWINGS.

ALL OF THE UNITS AND COMMON ELEMENTS ARE DESIGNATED AS "CONVERTIBLE AREAS", SUBJECT TO CONVERSION PURSUANT TO ARTICLE XI OF THE MASTER DEED.

(1) DENOTES COORDINATE POINT NUMBER.

1 INDICATES A UNIT NUMBER.

ALL UNITS ARE PROPOSED.

SEE SHEET 11 FOR UTILITY PLAN.

RIDGEVIEW OF NOVI

EASEMENT PLAN - UNITS 1-25

JASON M. EMERINE
ENGINEER NO. 54218

STATE OF MICHIGAN
JASON M. EMERINE
ENGINEER
NO. 54218
REGISTERED PROFESSIONAL ENGINEER

SEIBER, KEAST ENGINEERING, L.L.C.
CONSULTING ENGINEERS
100 MAINCENTRE • SUITE 10 • NORTHVILLE, MICHIGAN • 48167
PHONE: 248.308.3331 EMAIL: INFO@SEIBERKEAST.COM

ESE Land Planning Engineering Land Surveying
ESE CONSULTANTS, INC.
28004 CENTER OAKS COURT, SUITE 200
WIXOM, MI 48393
PHONE: 248.446.5103

13-038XB-10

SHEET 10 OF 48

P:\13-038 NOVI 16 TOWNHOMES - TOLL\DWG\10TH AMENDMENT\13-038B-EP.DWG

LIBER 49574 PAGE 400
$46.00 MISC RECORDING
$4.00 REMONUMENTATION
07/13/2016 09:40:49 AM RECEIPT# 77903
PAID RECORDED - Oakland County, MI
Lisa Brown, Clerk/Register of Deeds

RECEIVED
OAKLAND COUNTY
REGISTER OF DEEDS
2016 JUN -7 PM 3:57

CHECKING COMPLETED
AT REGISTER OF DEEDS
JUN 08 2016
Register of Deeds
Oakland County, MI

PATHWAY EASEMENT

Pursuant to this Pathway Easement Agreement (the "PEA"), **NOVI TEN ASSOCIATES LLC**, a Michigan limited liability company ("**N-10**"), with an address at 400 Renaissance Center, Suite 2170, Detroit, MI 48243, Attn: Dan Weiss, for and in consideration of One ($1.00) Dollar, receipt and sufficiency of which is hereby acknowledged, hereby grants and conveys to the **CITY OF NOVI**, a Michigan Municipal Corporation ("**City**"), whose address is 45175 West Ten Mile Road, Novi, Michigan 48375, being exempt pursuant to MCLA 207.505(a), and MCLA 207.526 (a), a permanent, non-exclusive easement (the "Easement") for a public non-motorized pathway over across and through the pathways described on Exhibit B attached hereto ("**Pathways**").

BACKGROUND

The Parties (together with Toll II MI Limited Partnership, a Michigan limited partnership, whose address is 28004 Center Oaks Ct., Suite 200, Wixom, MI 48393 ("**Developer**")) have executed and delivered a **PLANNED REZONING OVERLAY (PRO) AGREEMENT** recorded August 19, 2015, in Liber 48514 Page 617 Oakland County Records, and re-recorded November 14, 2015, in Liber 48766 Page 1 Oakland County Records ("**PRO**"), which pertains to the development by Developer (the "Development") of certain land in Section 1, T.1N., R.8E., City of Novi, Oakland County, State of Michigan, more particularly described on Exhibit A attached hereto (the "**Premises**").

The Pathways are located within the Premises.

The Premises abut certain property which is owned by N-10 which is described on Exhibit C attached hereto ("N-10 Land").

The PRO sets forth certain terms and conditions regarding the construction of improvements on the Development. The terms and conditions set forth in the PRO require the construction of the Pathways for public use through the Development and the dedication for public use of the Pathways.

N-10 is executing and delivering this PEA in partial satisfaction of the terms of the PRO.

This PEA and the Easement are exempt from transfer taxes under MCL 207.505(a) and MCL 207.526(a) as the consideration is less than $100.00.

TC13-50012

11
47

OK - LB
as per date
of doc

#2

1. N-10 does hereby dedicate to the City the Easement on the terms and conditions set forth herein. The Pathways will be repaired and replaced by the City, as determined by the City. Winter maintenance consisting of snow and ice removal shall be completed in accordance with applicable City ordinances, as the same may be amended from time to time, as determined by the City. The Easement shall be non-exclusive and shall permit the fee title owner of the Easement property to make use of the Easement property that is not inconsistent with use as a public pathway.

2. Subject to the City's approval, the Developer shall install, and the City shall allow and maintain, directional signage at each of the four (4) end points of the Pathways, which signage will be approximately 20 inches by 30 inches, designed, fabricated and installed in the usual quality consistent with other park signs installed in parks in the City, and containing the following dedication statement:

"Weiss Nature Trail: Dedicated by Dan and Michelle Weiss family in honor of these various lands donated by them and honoring father Albert Weiss, and all their love and promotion of natural habitats, and fostering further acts of charitable community benefit, performed by all, sized however big or small."

Such signage may include typical nature habitat descriptive language or graphics showing Michigan vegetation, ducks, turtles, birds, and other information.

3. This instrument shall run with the land first described above and shall be binding upon and inure to the benefit of the City, and their respective heirs, representatives, successors and assigns.

4. This instrument shall be binding and inure to the benefit of the parties hereto, their heirs, representatives, successors and assigns.

5. This PEA shall be recorded in the Office of Records for Oakland County, Michigan before the conveyance of the Premises by N-10 to the Developer.

6. This PEA shall be interpreted and enforced in accordance with the laws of the State of Michigan.

7. In the event the City does not accept the Pathways, or if after acceptance, the City abandons the Pathways, then:

I. the Pathways will no longer be "public access" Pathways, but instead will be reserved solely for the use and benefit of (and this instrument will be deemed amended to be consistent with such reservation) both (1) the owners and occupants of the N-10 Land, (2) the Developer, the owner or the successor owner of the Premises, and (3) the homeowner or condominium association operating the Premises ("HOA"); and

II. said Developer, owner or successor owner of the Premises and said HOA (following thirty (30) days written notice of either the City's rejection of

acceptance of dedication of the Pathways or the City's abandonment thereafter of the Pathways) shall have the same responsibilities for maintenance which applied to the City as hereinabove stated, provided, however, that (A) under no circumstances will the Developer, such successor owner or the HOA be responsible for winter maintenance (including snow plowing or ice removal), and (B) N-10 expressly acknowledges that upon formation of an HOA for the Development and assumption by the HOA of the obligations hereunder, Developer, owner and successor owner of the Premises shall have no further responsibilities for maintenance under this PEA, it being agreed that the HOA shall be solely responsible for the same.

Abandonment by the City may only be accomplished by the City taking affirmative action to abandon the easement rights in accordance with then applicable statutes and ordinances and including, without limit, adopting and recording required resolutions or ordinances, if any.

8. Injunctive Relief. In the event of a breach or attempted or threatened breach of any obligation of this PEA by either party, then in such event, the other party hereto shall be entitled (as its sole remedy) forthwith to full and adequate relief by specifically enforcing the terms of this PEA. As a condition precedent to the institution of such action, the aggrieved party shall give written notice of default to the defaulting party and the defaulting party shall have thirty (30) days to cure such default after receipt of such written notice.

Signature Page to Pathway Easement

Dated this 9th day of May, 2016.

NOVI TEN ASSOCIATES, L.L.C.,
a Michigan limited liability company

By: Daniel Weiss
Name: Daniel S. Weiss
Title: Manager

STATE OF MICHIGAN)
) SS
COUNTY OF OAKLAND)

The foregoing instrument was acknowledged before me this 9th day of MAY, 2016, by Daniel S. Weiss, the Manager of Novi Ten Associates, limited liability company, on its behalf.

JEANETTE L. COOK
Notary Public, State of Michigan, County of Oakland
My Commission Expires July 15, 2019
Acting in the County of OAKLAND

Jeanette L. Cook
Notary Public

_____ County, Michigan

My Commission Expires:

Drafted by:
Beth Saarela
Johnson, Rosati, Schultz & Joppich
27555 Executive Drive, Suite 250
Farmington Hills, MI 48331

When recorded return to:
Maryanne Cornelius
City of Novi
City Clerk
45175 W. Ten Mile Road.
Novi, MI 48375

EXHIBIT A

"RIDGEVIEW VILLAS"

LEGAL DESCRIPTION
SUBJECT PROPERTY

COMMENCING AT THE NORTHWEST CORNER OF SECTION 26, T.1N, R.8E., CITY OF NOVI, OAKLAND COUNTY, MICHIGAN; THENCE N86°27'27"E 2123.10 FEET ALONG THE CENTERLINE OF TEN MILE ROAD; THENCE S07°58'33"E 2072.30 FEET; THENCE S86°56'27"W 355.53 FEET; THENCE N35°58'56"W 279.43 FEET; THENCE N03°03'33"W 269.20 FEET TO THE POINT OF BEGINNING; THENCE S86°56'27"W 658.95 FEET; THENCE N02°47'33"W 509.40 FEET; THENCE S86°27'27" W 630.00 FEET; THENCE N03°32'33"W 100.00 FEET; THENCE N11°35"45"E 370.00 FEET; THENCE N60°51'08"E 290.00 FEET; THENCE N90°00'00"E 75.00 FEET; THENCE S31°29'21"E 339.33 FEET; THENCE N89°23'14"E 231.65 FEET; THENCE S86°22'13"E 420.86 FEET; THENCE N76°46"23"E 167.10 FEET; THENCE S41°34'10"E 105.00 FEET; THENCE S43°34'07"W 91.51 FEET; THENCE S04°10'41"E 519.60 FEET; THENCE S42°47'02"W 133.85 FEET; THENCE S86°56'27"W 30.00 FEET TO THE POINT OF BEGINNING, CONTAINING 20.09 ACRES OF LAND, MORE OR LESS, AND BEING SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY.

Tax I.D. No. 22-26-101-025 (FR 019 ~021)

Exhibit B

Pathways

EXHIBIT B
1 of 5

RIDGEVIEW VILLAS OF NOVI

LEGAL DESCRIPTION
EASEMENT FOR PATHWAY

An Easement for Pathway, located in a Part of the Northwest 1/4 of Section 26, Town 1 North, Range 8 East, City of Novi, Oakland County, Michigan; being more particularly described as commencing at the Northwest corner of said Section 26; thence South 02°47'33" East, 817.88 feet along the West line of said Section 26 and the centerline of Novi Road; thence North 86°54'46" East, 290.16 feet; thence South 02°47'44" East, 202.00 feet; thence North 86°54'46" East, 125.19 feet; thence South 03°05'14" East, 20.07 feet; thence North 86°27'27" East, 541.14 feet, for a POINT OF BEGINNING "A"; thence North 04°07'53" West, 61.22 feet; thence North 12°58'46" East, 65.19 feet; thence 2.35 feet along a curve to the left, said curve having a radius of 4.00 feet, a central angle of 33°39'02" and a chord bearing and distance of North 03°50'45" West, 2.32 feet; thence North 20°40'17" West, 35.33 feet; thence 25.86 feet along a curve to the right, said curve having a radius of 26.00 feet, a central angle of 56°58'52" and a chord bearing and distance of North 07°49'09" East, 24.80 feet; thence North 36°18'35" East, 31.09 feet; thence 37.56 feet along a curve to the right, said curve having a radius of 35.00 feet, a central angle of 61°29'26" and a chord bearing and distance of North 67°03'18" East, 35.79 feet; thence South 82°11'59" East, 117.81 feet; thence 42.86 feet along a curve to the left, said curve having a radius of 65.00 feet, a central angle of 37°47'03" and a chord bearing and distance of North 78°54'30" East, 42.09 feet; thence 12.15 feet along a curve to the left, said curve having a radius of 13.00 feet, a central angle of 53°33'09" and a chord bearing and distance of North 33°14'24" East, 11.71 feet; thence North 06°27'50" East, 62.62 feet; thence North 89°23'14" East, 12.09 feet; thence South 06°27'50" West, 64.11 feet; thence 23.37 feet along a curve to the right, said curve having a radius of 25.00 feet, a central angle of 53°33'09" and a chord bearing and distance of South 33°14'24" West, 22.53 feet; thence 50.78 feet along a curve to the right, said curve having a radius of 77.00 feet, a central angle of 37°47'03" and a chord bearing and distance of South 78°54'30" West, 49.86 feet; thence North 82°11'59" West, 117.81 feet; thence 24.68 feet along a curve to the left, said curve having a radius of 23.00 feet, a central angle of 61°29'26" and a chord bearing and distance of South 67°03'18" West, 23.52 feet; thence South 36°18'35" West, 31.09 feet; thence 13.92 feet along a curve to the left, said curve having a radius of 14.00 feet, a central angle of 56°58'52"and a chord bearing and distance of South 07°49'09" West, 13.36 feet; thence South 20°40'17" East, 35.33 feet; thence 9.40 feet along a curve to the right, said curve having a radius of 16.00 feet, a central angle of 33°39'02" and a chord bearing and distance of South 03°50'45" East, 9.26 feet; thence South 12°58'46" West, 63.38 feet; thence South 04°07'53" East, 59.54 feet, for a reference POINT "A"; thence South 86°27'27" West, 12.00 feet, to the Point of Beginning "A".

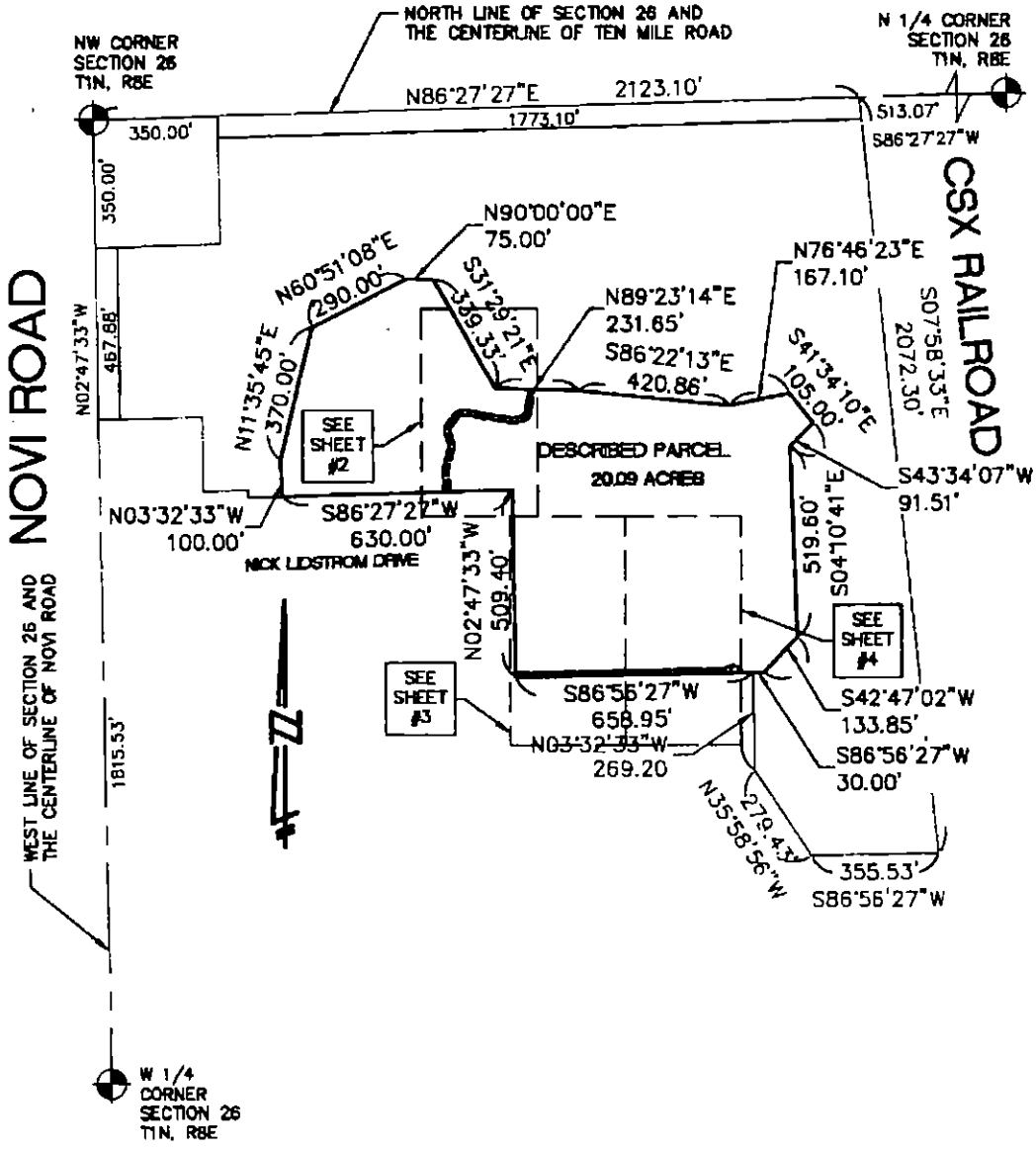
And also, commencing at said reference POINT "A"; thence North 86°27'27" East, 172.84 feet; thence South 02°47'33" East, 498.40 feet, for a POINT OF BEGINNING "B"; thence North 86°56'27" East, 578.75 feet; thence 11.82 feet along a curve to the left, said curve having a radius of 19.15 feet, a central angle of 35°21'44" and a chord bearing and distance of North 69°11'43" East, 11.63 feet; thence 40.66 feet along a curve to the right, said curve having a radius of 25.12 feet, a central angle of 92°43'29" and a chord bearing and distance of South 81°39'34" East, 36.37 feet; thence South 39°28'52" East, 9.14 feet; thence South 86°56'27" West, 630.95 feet; thence North 02°47'33" West, 11.00 feet, to the Point of Beginning "B". All of the above containing 0.299 Acres.

Pt of 22-26-101-025 (FR 019 & 021)

EXHIBIT B

2 of 5

10 MILE ROAD



GRAPHIC SCALE
400 0 200 400
(IN FEET)
1 INCH = 400 FEET

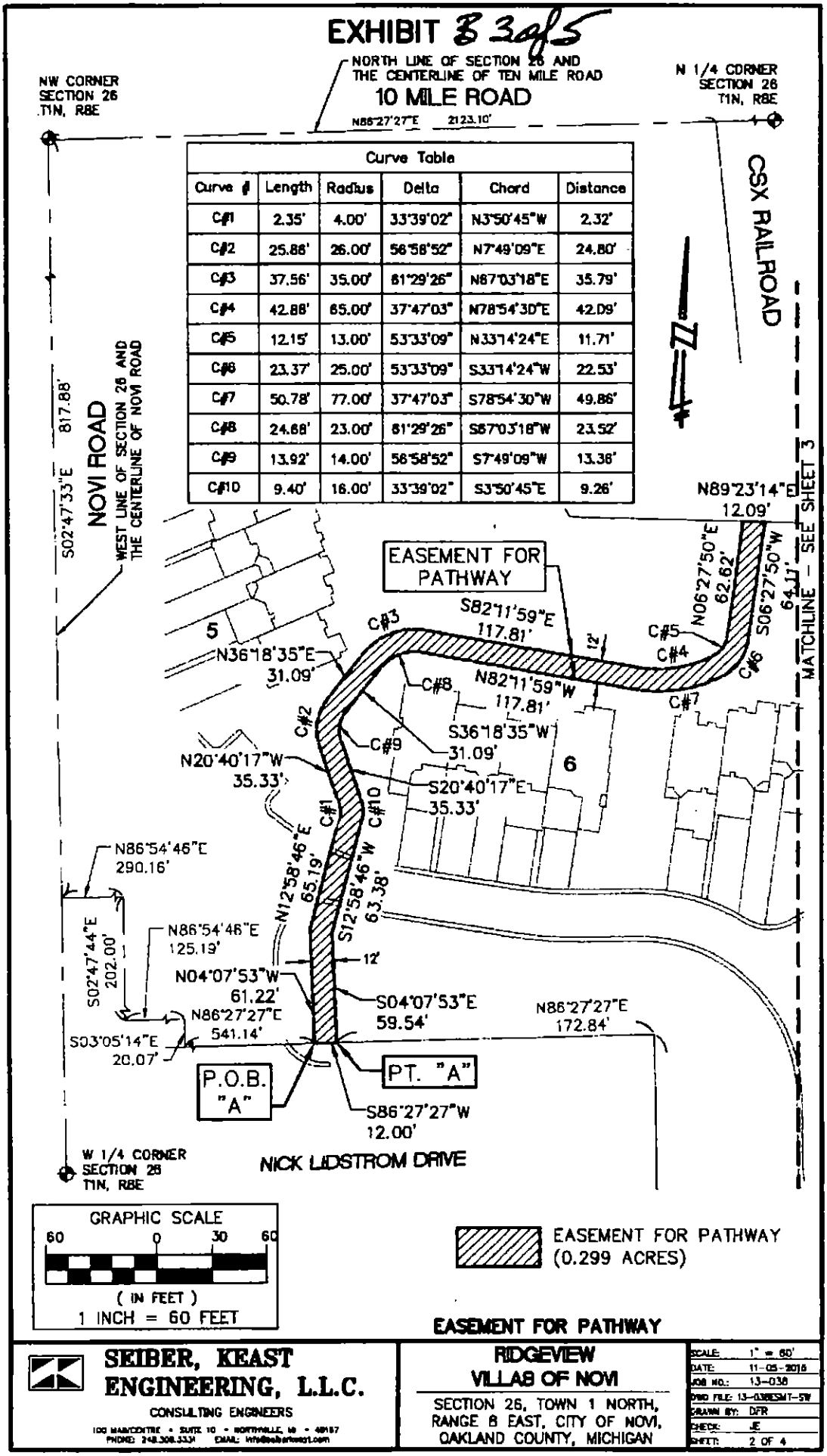
SUBJECT PROPERTY & SHEET INDEX
EASEMENT FOR PATHWAY

SEIBER, KEAST ENGINEERING, L.L.C.
CONSULTING ENGINEERS
100 MAIN CENTRE • SUITE 10 • NORTHVILLE, MI • 48167
PHONE: 248.308.3331 EMAIL: info@seiberkeast.com

RIDGEVIEW VILLAS OF NOVI
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SCALE:	1" = 400'
DATE:	11-05-2015
JOB NO.:	13-038
DWG FILE:	13-038SM1-SW
DRAWN BY:	DFR
CHECK:	JE
SHEET:	1 OF 4

EXHIBIT B 3 of 5



EASEMENT FOR PATHWAY

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100 MAIN CENTRE • SUITE 10 • NORTHVILLE, MI • 48167
PHONE: 248.308.3331 EMAIL: info@seiberkeast.com

RIDGEVIEW VILLAS OF NOVI
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SCALE:	1" = 60'
DATE:	11-05-2015
JOB NO.:	13-036
DWG FILE:	13-036ESMT-5W
DRAWN BY:	DFR
CHECK:	JE
SHEET:	2 OF 4

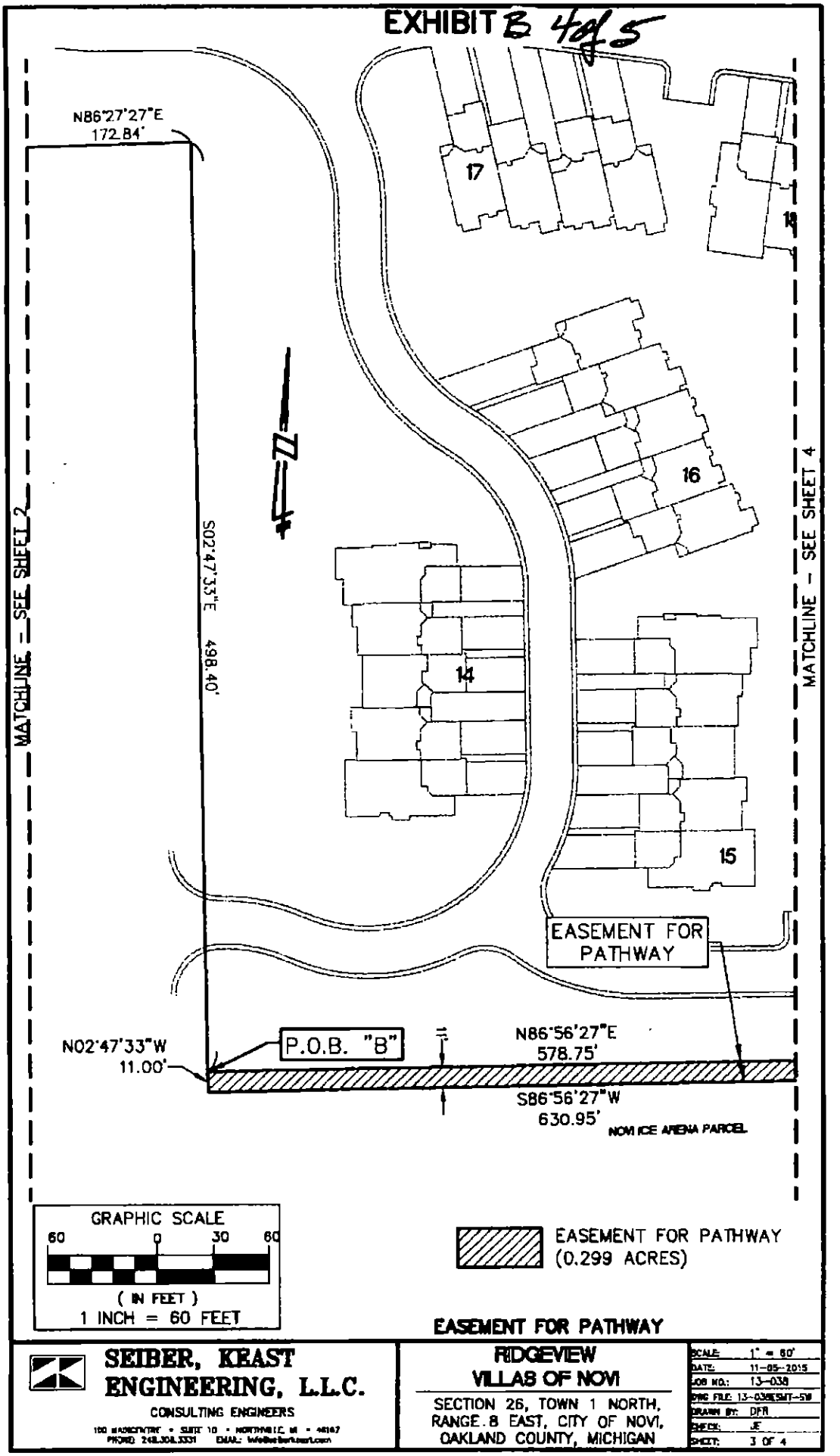
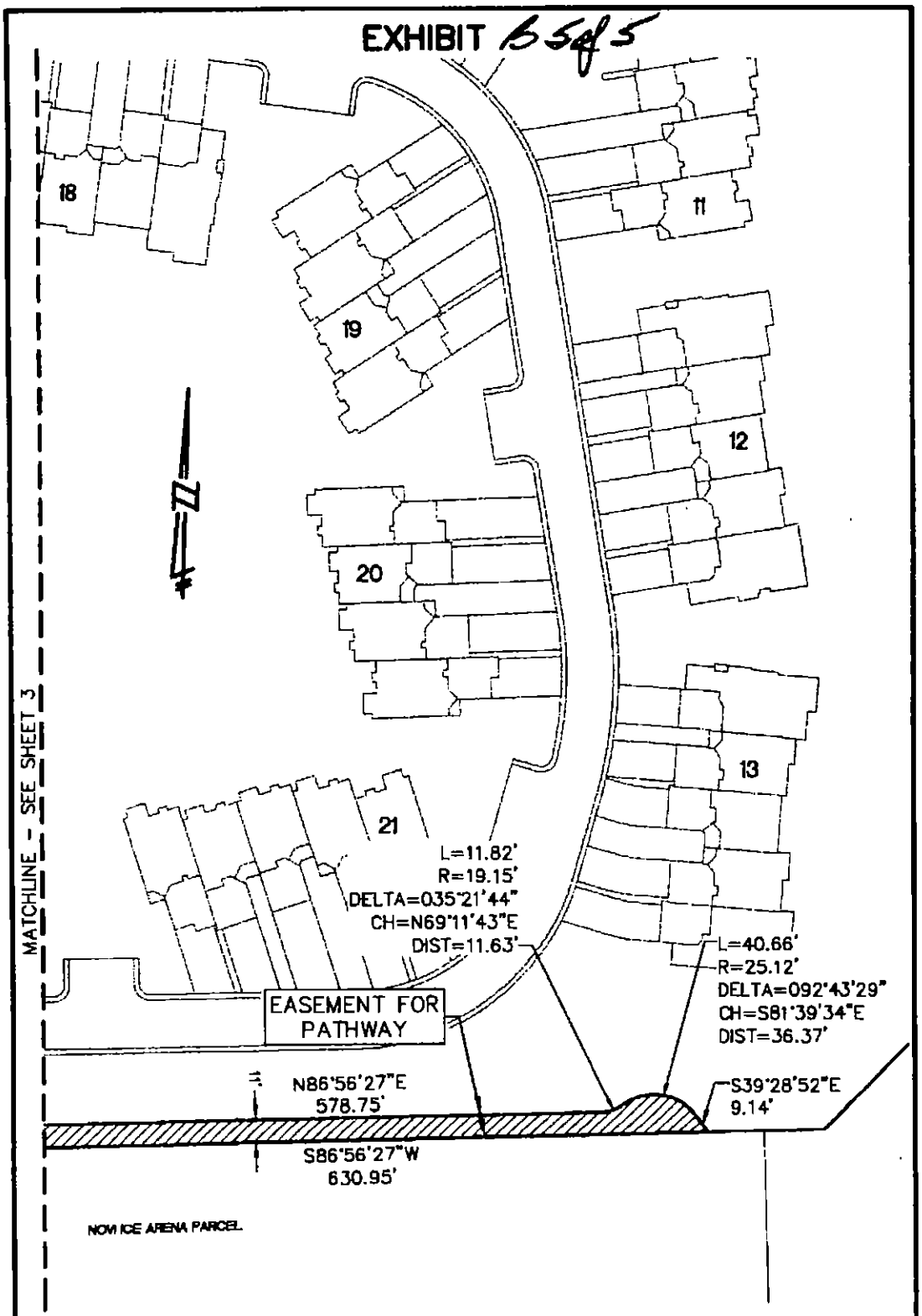

EXHIBIT B 4 of 5
N86°27'27"E
172.84'
S02°47'33"E 498.40'
MATCHLINE – SEE SHEET 2
MATCHLINE – SEE SHEET 4
17
16
14
15
EASEMENT FOR PATHWAY
P.O.B. "B"
N02°47'33"W
11.00'
N86°56'27"E
578.75'
S86°56'27"W
630.95'
NOVI ICE ARENA PARCEL
GRAPHIC SCALE
60 0 30 60
(IN FEET)
1 INCH = 60 FEET
EASEMENT FOR PATHWAY
(0.299 ACRES)
EASEMENT FOR PATHWAY
SEIBER, KEAST ENGINEERING, L.L.C.
CONSULTING ENGINEERS
RIDGEVIEW VILLAS OF NOVI
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN
SCALE: 1" = 60'
DATE: 11-05-2015
JOB NO.: 13-038
DWG FILE: 13-038ESMT-SW
DRAWN BY: DFR
CHECK: JE
SHEET: 3 OF 4

EXHIBIT B 5 of 5



EASEMENT FOR PATHWAY

SEIBER, KEAST ENGINEERING, L.L.C.
CONSULTING ENGINEERS
100 MAINCENTRE • SUITE 10 • NORTHVILLE, MI • 48167
PHONE: 248.308.3331 EMAIL: info@seibereast.com

RIDGEVIEW VILLAS OF NOVI
SECTION 26, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SCALE:	1" = 60'
DATE:	11-05-2015
JOB NO.:	13-038
CAD FILE:	13-038ESMT-SW
DRAWN BY:	DFR
CHECK:	JE
SHEET:	4 OF 4

EXHIBIT C

PARCEL TAX ID: 22-26-~~101-019~~ 101 024 CFR 019

LEGAL DESCRIPTION
SUBJECT PROPERTY

A part of the Northwest 1/4 of Section 26, Town 1 North, Range 8 East, City of Novi, Oakland County, Michigan; more particularly described as commencing at the Northwest Corner of said Section 26; thence North 86°27'27" East, 1061.55 feet, along the North line of said Section 26 and the centerline of Ten Mile Road, for a POINT OF BEGINNING; thence continuing North 86°27'27" East, 1061.55 feet, along the North line of said Section 26 and the centerline of said Ten Mile Road; thence South 07°58'33" East, 2072.30 feet; thence South 86°56'27" West, 355.53 feet; thence North 35°58'56" West, 279.43 feet; thence North 03°03'33" West, 269.20 feet; thence North 86°56'27" East, 30.00 feet; thence North 42°47'02" East, 133.85 feet; thence North 04°10'41" West, 519.60 feet; thence North 43°34'07" East, 91.51 feet; thence North 41°34'10" West, 105.00 feet; thence South 76°46'23" West, 167.10 feet; thence North 86°22'13" West, 420.86 feet; thence South 89°23'14" West, 231.65 feet; thence North 31°29'21" West, 80.31 feet; thence North 02°47'25" West, 694.19 feet, to the Point of Beginning. All of the above containing 30.66 Acres. All of the above being subject to easements, restrictions and right of ways of record. All of the above being subject to the rights of the public in Ten Mile Road.

EXHIBIT C cont.

PARCEL TAX ID: 22-26-101-~~021~~ 023 (FR 021)

LEGAL DESCRIPTION
SUBJECT PROPERTY

A part of the Northwest 1/4 of Section 26, Town 1 North, Range 8 East, City of Novi, Oakland County, Michigan; more particularly described as commencing at the Northwest Corner of said Section 26; thence North 86°27'27" East, 350.00 feet, along the North line of said Section 26 and the centerline of Ten Mile Road; thence South 02°47'51" East, 60.00 feet, to a point on the southerly right-of-way line of said Ten Mile Road, for a POINT OF BEGINNING; thence North 86°27'27" East, 711.55 feet, along the southerly right-of-way line of said Ten Mile Road; thence South 02°47'25" East, 634.19 feet; thence North 31°29'21" West, 259.03 feet; thence Due West, 75.00 feet; thence South 60°51'08" West, 290.00 feet; thence South 11°35'45" West, 370.00 feet; thence South 03°32'33" East, 100.00 feet; thence South 86°27'27" West, 95.98 feet; thence North 03°05'14" West, 20.07 feet; thence South 86°54'46" West, 125.19 feet; thence North 02°47'44" West, 202.00 feet; thence South 86°54'46" West, 230.16 feet, to a point on the easterly right-of-way line of Novi Road; thence North 02°47'51" West, 468.36 feet, along the easterly right-of-way line of said Novi Road; thence North 86°27'27" East, 289.99 feet; thence North 02°47'51" West, 290.00 feet, to the Point of Beginning. All of the above containing 13.42 Acres. All of the above being subject to easements, restrictions and right of ways of record. All of the above being subject to the rights of the public in Ten Mile Road and Novi Road.

TRAFFIC IMPACT STUDY

Updated Traffic Impact Study
Novi / Ten PRO Project

Novi, Michigan

(Version 03, March 11, 2024)

Prepared For:

Novi Ten Associates
400 Renaissance Center – Suite 2170
Detroit, Michigan 49243

Prepared By:

Midwestern Consulting
3815 Plaza Drive
Ann Arbor, Michigan 48108

MIDWESTERN™
CONSULTING

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- ITE Trip Generation Information
- Signal Timing Plans
- HCM Output

This traffic impact study has been prepared by:

Michael R. Cool

Michael R. Cool, P.E.
Midwestern Consulting
Project Manager
License No: 6201050420

1.0 Executive Summary

The proposed Novi-Ten PRO development, which consists of 35,900 SF of neighborhood retail/restaurant space, 71 townhouse residential units, and two tennis/pickleball courts is located on the south side of 10 Mile Road between Novi Road and the Railroad tracks.

The proposed development will not have a significant traffic impact on the overall level of service at the major intersections of 10 Mile Road with Novi Road and with Meadowbrook Road. The level of service at Novi Road and 10 Mile Road is currently a D and will remain a D during both morning and afternoon peak hours for all scenarios. The level of service at 10 Mile Road and Meadowbrook Road is currently a C during the morning peak hour and a D during the afternoon peak hour and the level of service does not change in the background and forecast scenarios.

The client has prepared a parallel plan with light industrial and office space under the existing zoning, which is currently OS-1 and I-1, which would generate 314 new trips to the area in the morning peak hour, and 289 trips during the afternoon peak hour. In comparison, the proposed PRO plan only generates 204 morning and 285 afternoon trips, which is 35% less morning peak hour trips and 1% less afternoon peak hour trips than if the site were developed under the existing zoning.

When the commercial portion of the site is developed, this study recommends the following modifications to 10 Mile Road, which are already illustrated on the January 2nd 2024 submitted site plan, to accommodate traffic at the proposed site driveways:

- In lieu of separate right-turn deceleration lanes at each driveway, widen eastbound 10 Mile Road to two-through lanes ending at a right-turn deceleration lane at the residential driveway.
- Extend the center left-turn lane along 10 Mile Road from where it currently ends at Catherine Industrial to service all commercial driveways.
- Widen westbound 10 Mile Road to two through lanes west from the 3rd commercial site driveway to help improve capacity for the commercial driveways.

2.0 Introduction

A development consisting of 71 townhouse residential units (low rise) and approximately 35,900 SF of neighborhood retail is planned for a site located on the south side of 10 Mile Road between Novi Road and the railroad tracks. Two public tennis courts (or 4 pickleball courts) are planned for the northeast corner of the site which will have its own driveway for those users. The development is a PRO plan and the site would need to be rezoned from its existing mix of I-1 and OS-1. A concept plan for the site indicates that there may be a total five driveways that access the site from 10 Mile Road, one of which is already exists and currently provides access to a small business located at 43025 10 Mile Road.

This traffic study will focus on the site traffic impacts on the study area of this project which includes the major intersections of 10 Mile Road with Novi Road and Meadowbrook Road as well as the five proposed site driveways and the relevant commercial driveways on the north side of 10 Mile Road, such as Catherine Industrial, the driveway pair near the 3rd commercial site driveway, the Tremar driveway, and the western Wrenchers' driveway (now Big City Dance Center or BCDC) down near the railroad.

3.0 Area Description & Site Plan

3.1 Proposed Site Location and Surroundings

The Novi/Ten site is located on the south side of 10 Mile Road, east of Novi Road, west of the railroad crossing (and Meadowbrook Road. The site is surrounded by residential areas to the south, east, and further west beyond Novi Road. To the north of the site are light industrial type uses and a small amount of commercial to the west.



3.2 Existing Zoning

The site is currently zoned for OS-1 and I-1 for which there is a parallel plan with 54,000 SF of office space, and 291,200 SF of light industrial space, allowable under the current zoning. The trip generation for this parallel plan is included later in the report.

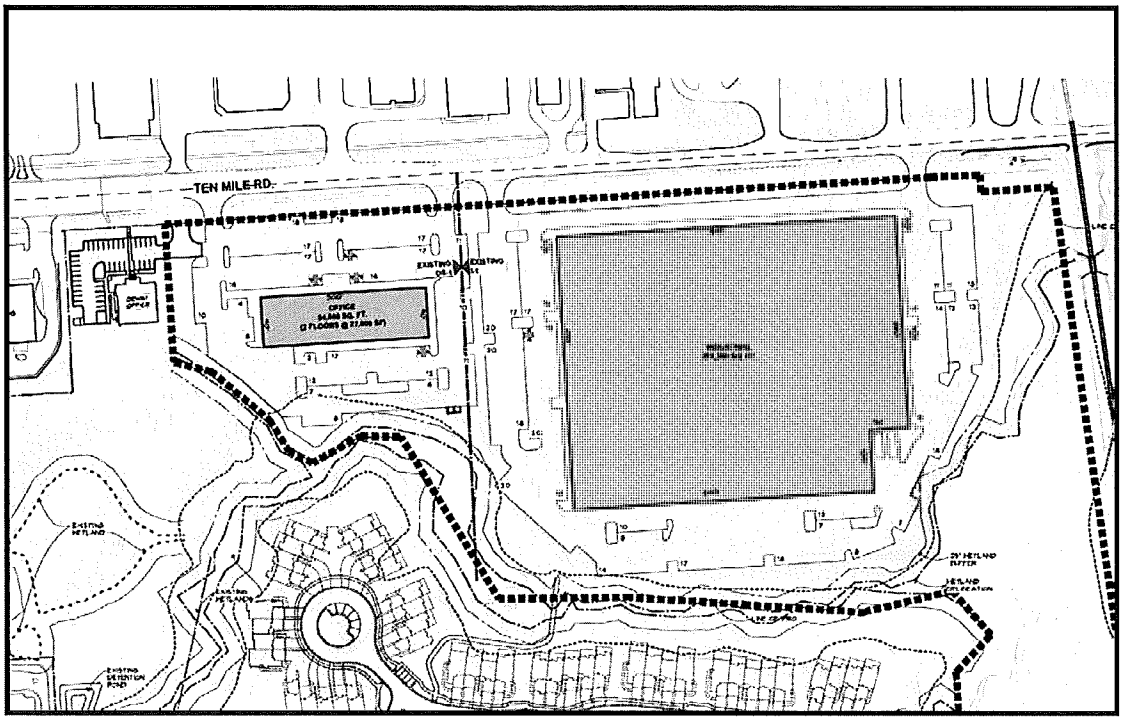


Figure 3.2.1 - OS-1 and I-1 Parallel Plan

3.3 Proposed Zoning and Site Plan

The proposed development is a PRO project with 71 townhouse residential units and a total of 35,900 SF of commercial space. A portion of the commercial space, 9,200 SF, is assumed to be high-turnover restaurant. A small parking lot in the northeast corner of the site will provide access to the users of two proposed tennis courts (or four pickleball courts).

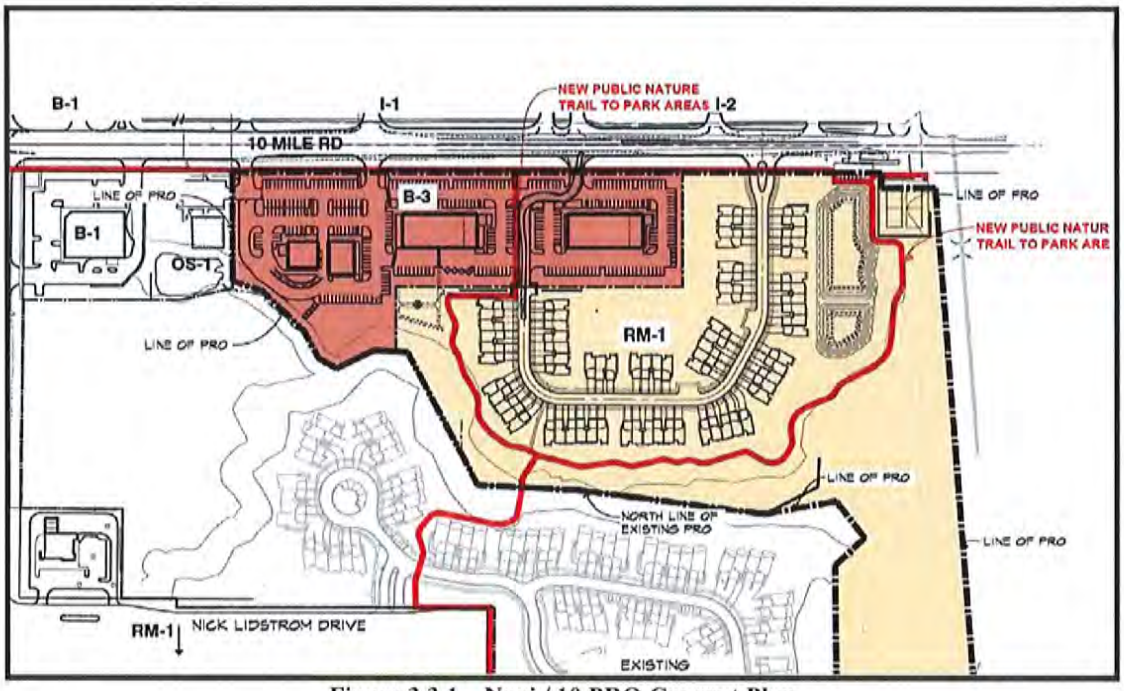


Figure 3.3.1 – Novi / 10 PRO Concept Plan

3.4 Project Scope and Study Intersections

The intersections, numbered from west to east, that are considered within the traffic influence area of this development and that are analyzed in this traffic study are as follows:

- Major Intersections
  - 10 Mile Road & Novi Road
  - 10 Mile Road & Meadowbrook Road
- Site Driveways (5 shown in concept plan)
  - 10 Mile Road & Shared 1st Commercial Driveway
  - 10 Mile Road & Catherine Industrial Drive / 2nd Commercial Driveway
  - 10 Mile Road & 3rd Commercial Driveway / Double Driveways
  - 10 Mile Road & 4th Proposed Residential Driveway
  - 10 Mile Road & Pickleball / Tennis Driveway
- Other Relevant Driveways
  - 10 Mile Road & Tremar's Driveway
  - 10 Mile Road & Wrenchers' Driveway (now BCDC)

Both Novi Road and 10 Mile Roads are under the jurisdiction of the Road Commission for Oakland County and are classified as other principal arterials.

Novi Road, at 10 Mile Road, is five-lanes wide with a speed limit of 45 MPH. The intersection is controlled with a traffic signal that includes permitted/protected style left-turn phasing in either direction.

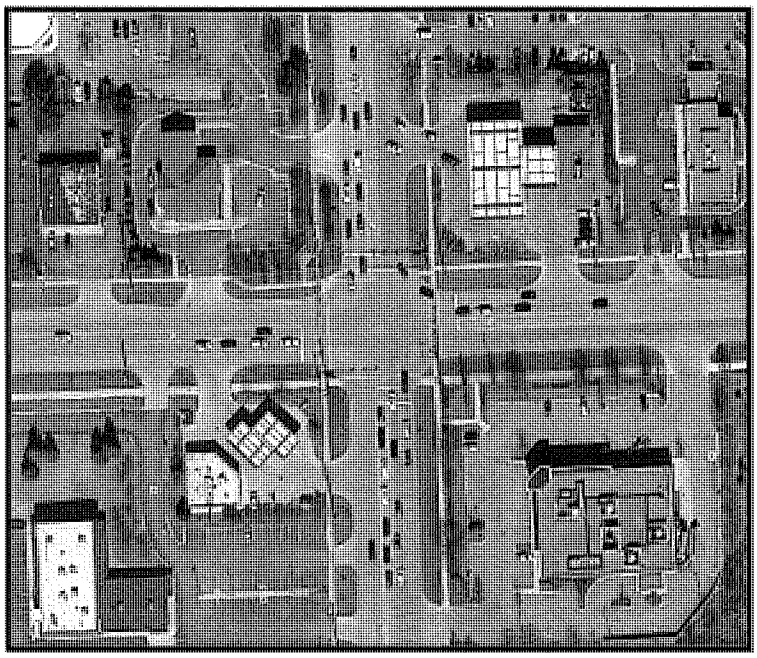


Figure 3.4.1 – 10 Mile Road & Novi Road

10 Mile Road is five-lanes wide near the intersection with Novi Road, however it narrows down to three-lanes just east of Catherine Industrial Drive, and narrows again down to two-lanes wide, with deceleration lanes for a few businesses on the north side of the road and one left-turn passing lane at the Tremar Driveway. East of the railroad tracks, 10 Mile Road eventually widens back to a four-lane and then a five-lane cross section as it approaches Meadowbrook Road. The speed limit on 10 Mile Road is 45 MPH.

Meadowbrook Road is a City of Novi roadway and classified as a minor arterial. At its intersection with 10 Mile Road, Meadowbrook Road is 4 lanes wide, with a separate left-turn, through-lane, and right-turn lane on the northbound and southbound approaches. The speed limit on Meadowbrook Road is 40 MPH to the north, and 30 MPH to the south.



Figure 3.4.2 – 10 Mile Road & Meadowbrook Road

The 1st commercial site driveway (1002) will share access with a dental business at an existing driveway which is aligned across from another business on the north side of 10 Mile Road. The 2nd commercial site driveway (1003) is located directly across from Catherine Industrial Drive.



Figure 3.4.3 – Driveways at 1002 and 1003.

The other two driveways are approximately located at the red arrows illustrated in Figure 3.4.4. The 3rd commercial driveway will also serve as the emergency access route for the residential portion of the site. The 4th driveway will only serve the residential portion of the site and will not carry any commercial traffic. The proposed pickleball/tennis court driveway only provides parking access to the users of those courts and is located just west of the guard rail near the railroad tracks.



Figure 3.4.4 – 3rd (Commercial), 4th (Residential) Driveway, and 5th Tennis/Pickleball lot driveway.

4.0 Data Collection & Existing Traffic Volumes

4.1 Twenty-Four Hour Traffic Volumes

Historical 24-hr volume data for this traffic study have been acquired from the Southeast Michigan Council of Governments (SEMCOG) traffic count database (TCDS). The traffic cameras at Novi Road and Meadowbrook Road have accumulated a significant data set of the yearly AADT's for each intersection's approach which is summarized in Tables 4.1.1 and 4.1.2.

Table 4.1.1 – 24-Hr AADT Volumes at 10 Mile Road & Novi Road

Year	EB	WB	NB	SB	Total
2022*	**9793**	**8282**	**9695**	**10552**	**38322**
2019	8355	7391	9890	10385	36021
2018	7765	7697	10045	10608	36115
2017	8445	7859	10532	10698	37534
2016	9456	8118	10328	10800	38702
2015	9746	8376	10487	11010	39619
2014	9308	7754	9645	10131	36838
2013	9864	8568	10178	10532	39142
2012	9825	8687	9844	10232	38588
2010	9543	8468	9655	9569	37235

Table 4.1.2 – 24-Hr AADT Volumes at 10 Mile Road & Meadowbrook Road

Year	EB	WB	NB	SB	Total
2022	7687	7488	3645	4706	23526
2019	7620	8223	3586	5016	24445
2018	7321	8135	3867	4820	24143
2017	8359	7707	4082	4456	24604
2016	10938	7162	3762	4182	26044
2015	7340	8032	4151	4755	24278
2014	7102	7508	4106	4329	23045

*The 2022 entries are a quick estimate based on our 13 hour traffic count at the intersections, factored by 1.225 to bring the 13 hour count to a 24 hour count. The factor was derived from a February 27th 2018 traffic count at 10 Mile/Novi using the same 13 hours relative to its 24 hour volume. The 2018 count summary is included in the Appendix.

4.2 Turning Movement Counts

Video cameras were installed at each of the study intersections in order to record the various turning movements that occurred between the hours of 6:00 AM-7:00 PM on March 16th, 2022. The video files were uploaded to www.spacksolutions.com 's counting service, then downloaded and processed. The intersections are listed below:

- 1001 – 10 Mile Road and Novi Road
- 1002 – 10 Mile Road and Shared Driveway
- 1003 – 10 Mile Road and Catherine Industrial Drive
- 1004 – 10 Mile Road and existing driveway pair across from 3rd site driveway.
    - Counts at this location were limited to just 7-9 AM, 4-6 PM.
- 1006 – 10 Mile Road & Tremar's Driveway
- 1008 – 10 Mile Road & Wrenchers' Driveway (BCDC)
- 1009 – 10 Mile Road & Meadowbrook Road

These morning and afternoon peak hour counts include all personal vehicles, commercial truck traffic, pedestrians, and bicycle traffic. A summary of these turning movement counts is included in the Appendix.

Figure 4.2.1 shows the existing morning and afternoon peak hour traffic volumes.

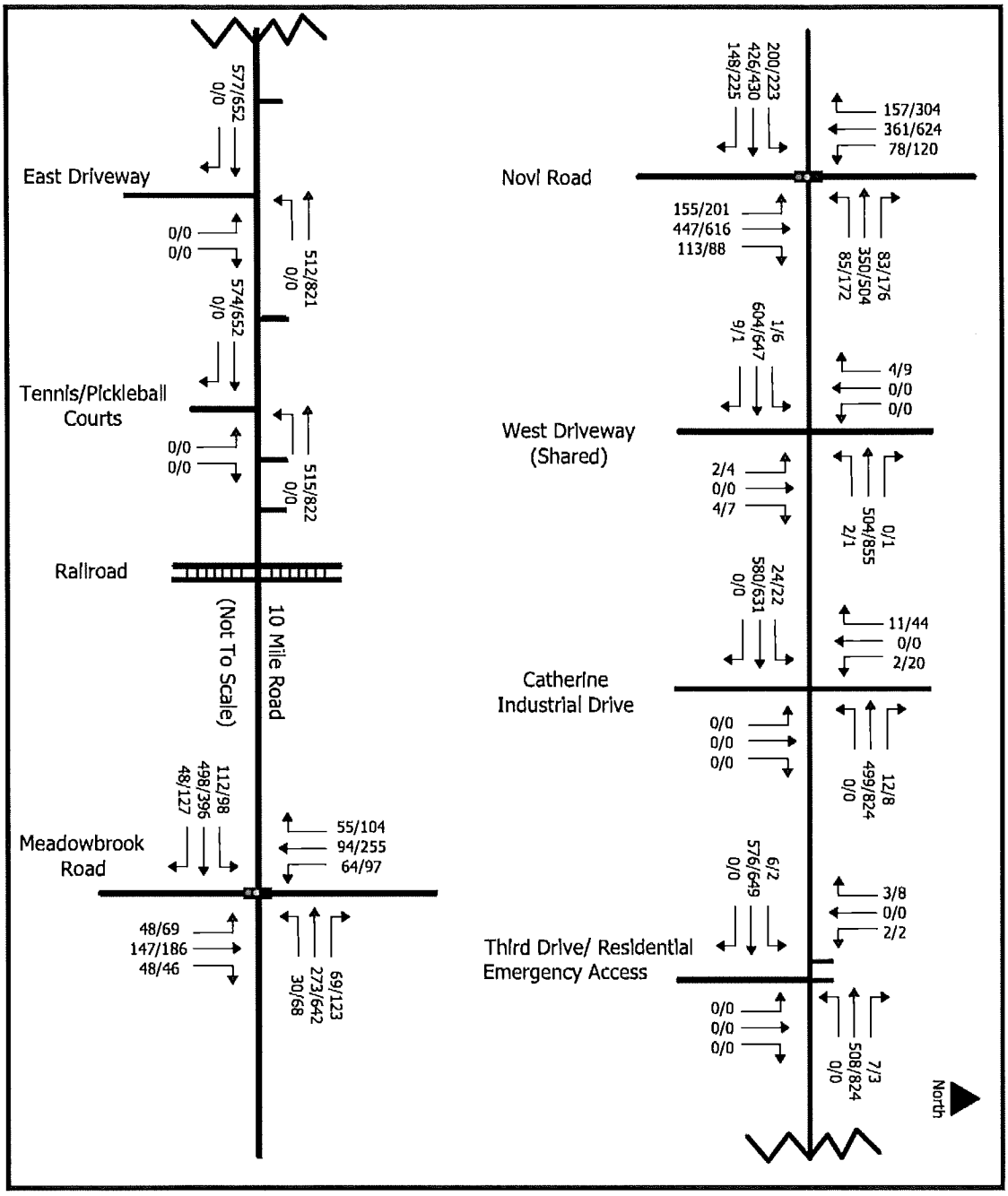


Figure 4.2.1 – Existing Morning/Afternoon Peak Hour Volumes

5.0 Background Growth

Typically traffic volumes may grow over time due to development in the surrounding area. The existing traffic volumes are increased by a background growth rate to estimate the background traffic conditions that will be present when the proposed site has reached its build-out.

Based on the historical AADT data contained in Tables 4.1.1-2, traffic volumes in the area have been in a slight decline, even when ignoring all of 2020 and 2021 due to the effects of COVID, and even excluding the current 2022 count.

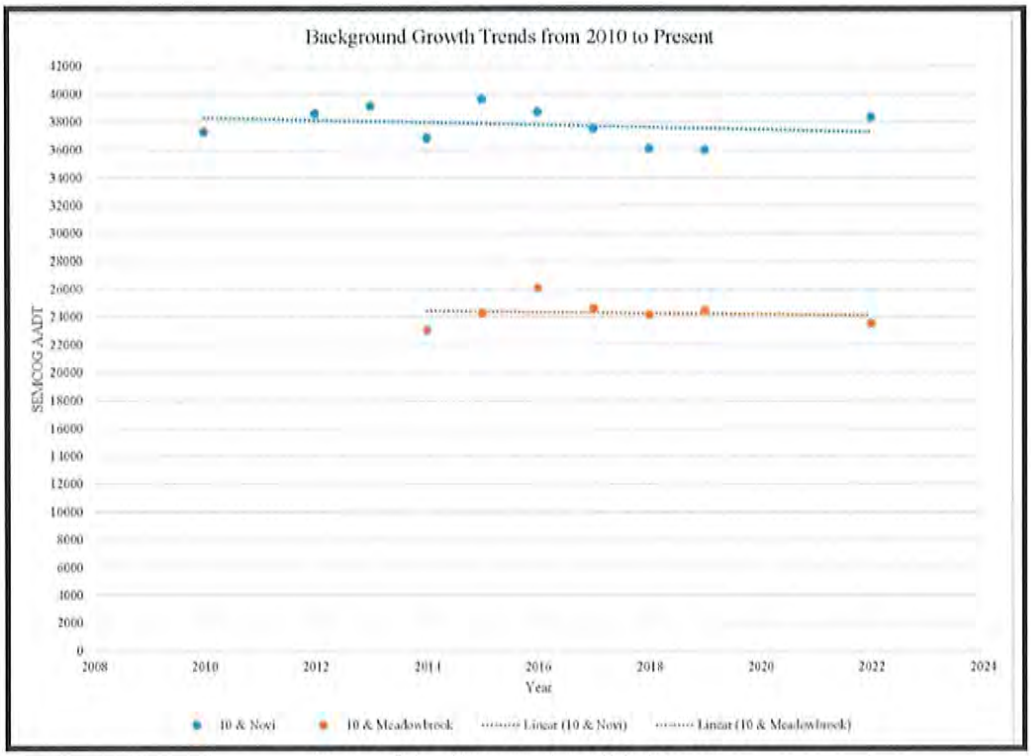


Figure 5.1 – Historical AADT Trends

Despite the downward trend in traffic volumes, this study will conservatively assume a background growth rate of 0.2% / year for five years to estimate the traffic conditions that might be present at buildout of the site. That growth estimate was based on a comparison of the 2022 counts with a 2018 traffic count, which is attached in the Appendix.

Figure 5.2 shows the background volumes for the morning and afternoon peak hours.

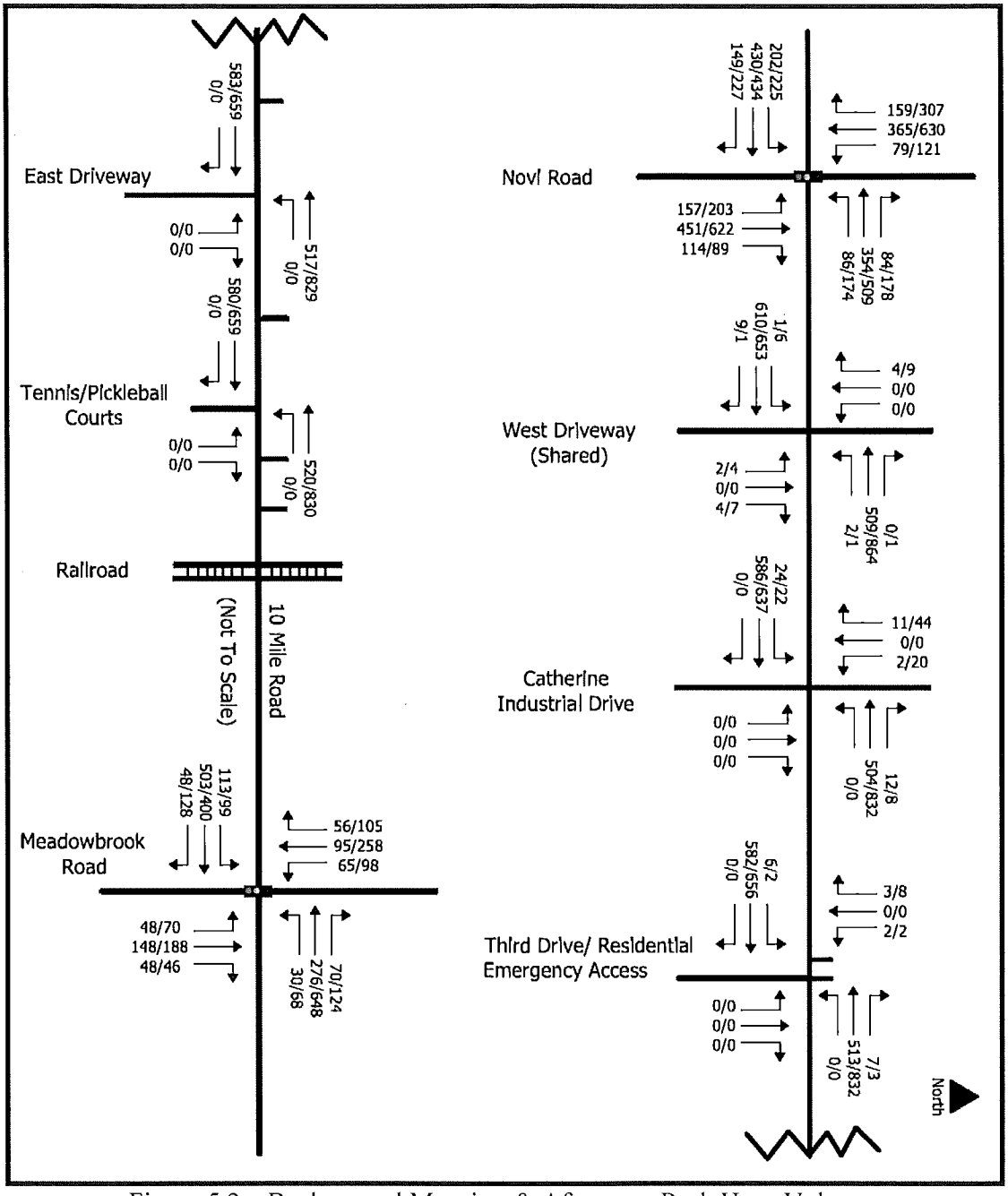


Figure 5.2 – Background Morning & Afternoon Peak Hour Volumes

6.0 Trip Generation

6.1 Methodology

Trip generation for this traffic study is based upon the rates and equations contained in the Institute of Transportation Engineer's (ITE) **Trip Generation Manual**, 11th Edition. The **Trip Generation Manual** is a publication that contains a wealth of traffic data on a wide variety of land uses that fall within the categories of residential, lodging, recreational, institutional, industrial, medical, office, retail, and services. The **Trip Generation Manual** is typically used if no local data for a specific land use is readily available.

6.2 Trip Generation Summary – Proposed Development

Since the future use of the retail/restaurant portion of the site is unknown at this time, this traffic study assumes that the site will generate traffic based on the ITE land use categories High Turnover Restaurant (9,200 SF) and Strip Retail Plaza (26,700 SF). The residential portion of the site is assumed to generate traffic according to the land use category Multifamily Low Rise (71 units). The category Tennis Courts was used for the two (2) tennis/pickleball courts. The trip generation for the proposed development is summarized in Table 6.2.1.

Table 6.2.1 Trip Generation – Proposed Development

	ITE	Size	Weekday	Morning Peak Hour			Afternoon Peak Hour		
Land Use	Code	SF/Units	24-Hr	Enter	Exit	Total	Enter	Exit	Total
Base Vehicular Trips									
Strip Retail Plaza	822	26,700	1454	38	25	63	88	88	176
HT Restaurant	932	9,200	986	48	40	88	51	32	83
Multi Family LR	220	71	530	11	34	45	32	19	51
Tennis Courts	490	2	61	4	4	8	4	4	8
Trips present at site driveways			2970	101	103	204	175	143	318
Applied Pass By Reduction (High Turnover Restaurant Only, PM Peak Hour)									
Pass by Rate	43%			0	0	0	-20	-13	-33
Net New Trips to Area				101	103	204	155	130	285

The ITE Trip Generation Manual 11th edition web app has pass-by data for the High Turnover Restaurant Category, but no data on the Strip Retail Category. The pass-by data covers 12 restaurant sites of various sizes. The average pass-by rate for those restaurants was 43% in the afternoon peak hour. Therefore this study assumes that 43% of the restaurant traffic at this development will come from existing traffic on 10 Mile Road and not add new trips to the area during the afternoon peak hour.

6.3 Trip Generation Summary – Parallel Plan

The client has estimated that a total of 345,200 square feet of office and light industrial space could be built on this site if developed under the existing I-1 and OS-1 zoning instead of the proposed PRO plan. Comparing the findings in tables 6.2.1 and 6.3.1, the proposed PRO development should generate about 35% less trips to the area during the morning peak hour and 1% less trips to the area during the afternoon peak hour.

Table 6.3.1 - Parallel I-1 & OS-1 Plan

	ITE	Size	Weekday	Morning Peak Hour			Afternoon Peak Hour		
Land Use	Code	SF/Units	24-Hr	Enter	Exit	Total	Enter	Exit	Total
Office	710	54000	679	87	12	99	17	83	100
Light Industrial	110	291200	1418	189	26	215	26	163	189
		345200	2097	276	38	314	43	246	289

7.0 Trip Distribution

Trip Distribution for both the proposed development and the other background developments are based upon the existing traffic patterns in the area. The uses within the retail portion of the site are expected to service the local neighborhoods and isn't expected to draw any significant amounts of traffic from outside of the local area such as from traffic on the I-96 freeway.

However, comments raised by the City's Traffic consultant and the RCOC, indicated that they believed more traffic may come to/from the north on Novi Road than what was previously assumed in our preliminary methodology memorandum which was based on existing travel patterns. Therefore, an additional 4% percent of the site's traffic is assigned to and from the north on Novi Road, pulling 2% each from the west on 10 Mile Road and from the south on Novi Road. The percentages are shown below in Table 7.1.

Table 7.1 – Trip Distribution – Novi/Ten Development (New Trips)

In From / Out To	%	AMIN	%	PMIN		%	AMOUT	%	PMOUT
North on Novi Road	24%	24	28%	43		27%	28	27%	35
South on Novi Road	23%	23	18%	28		17%	18	21%	27
West on 10 Mile Road	25%	25	18%	28		19%	20	21%	27
East on 10 Mile Road	13%	13	19%	29		20%	21	12%	16
North on Meadowbrook	7%	7	10%	16		11%	11	9%	12
South on Meadowbrook	8%	9	7%	11		6%	5	10%	13
	100%	101	100%	155		100%	103	100%	130

Pass by trips are taken from existing traffic on 10 Mile Road during the afternoon peak hour with an assumed 55% westbound / 45% eastbound split. Westbound pass-by trips that enter the site are assumed to exit the site to the west, and vice versa for eastbound traffic. Pass by traffic is only assigned to the three commercial driveways.

Figures 7.1 and 7.2 show the generated traffic volumes for the morning and afternoon peak hours and Figure 7.3 shows the forecast traffic volumes for the morning and afternoon peak hours which is the summation of the background and generated traffic volumes.

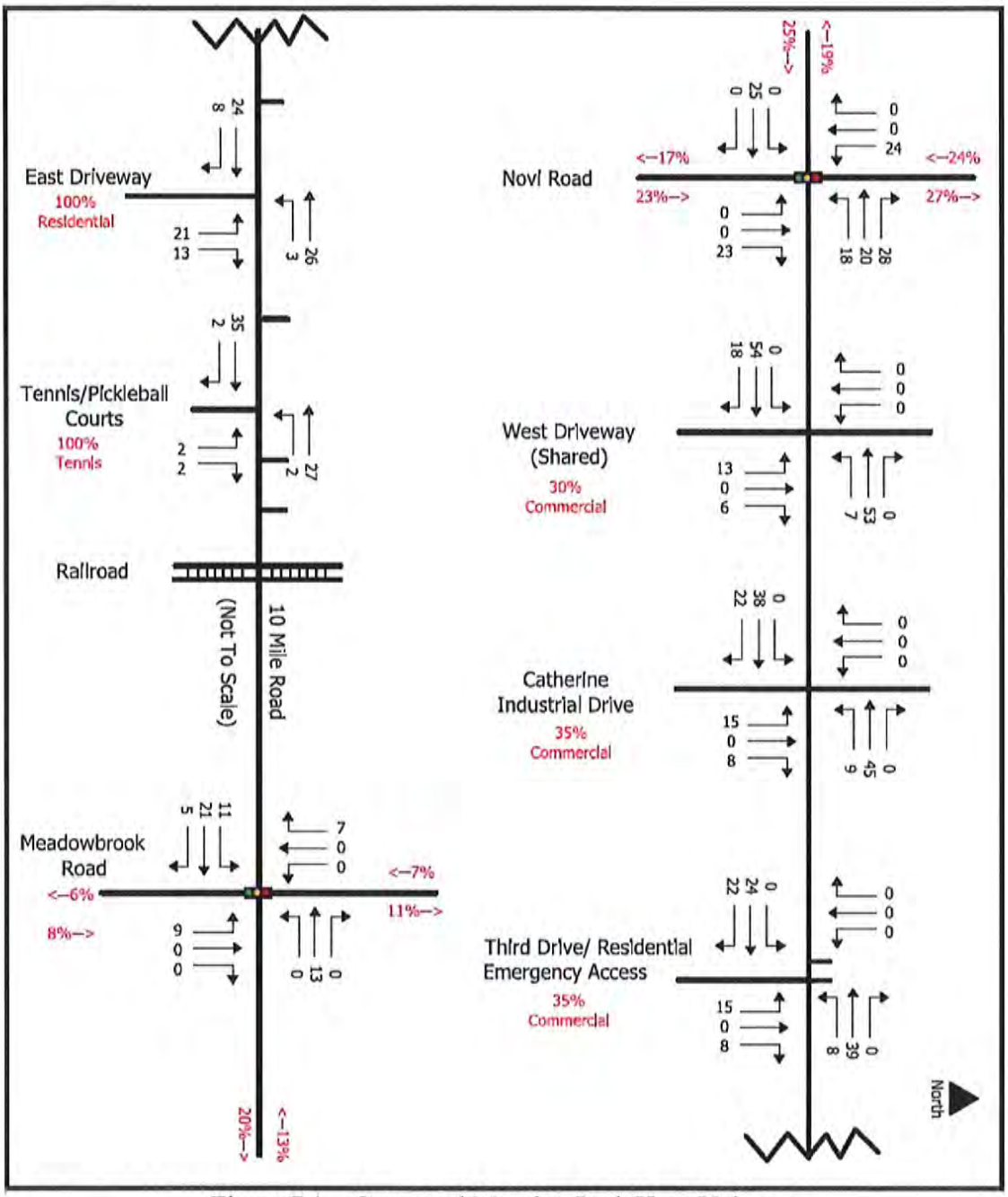


Figure 7.1 – Generated Morning Peak Hour Volumes

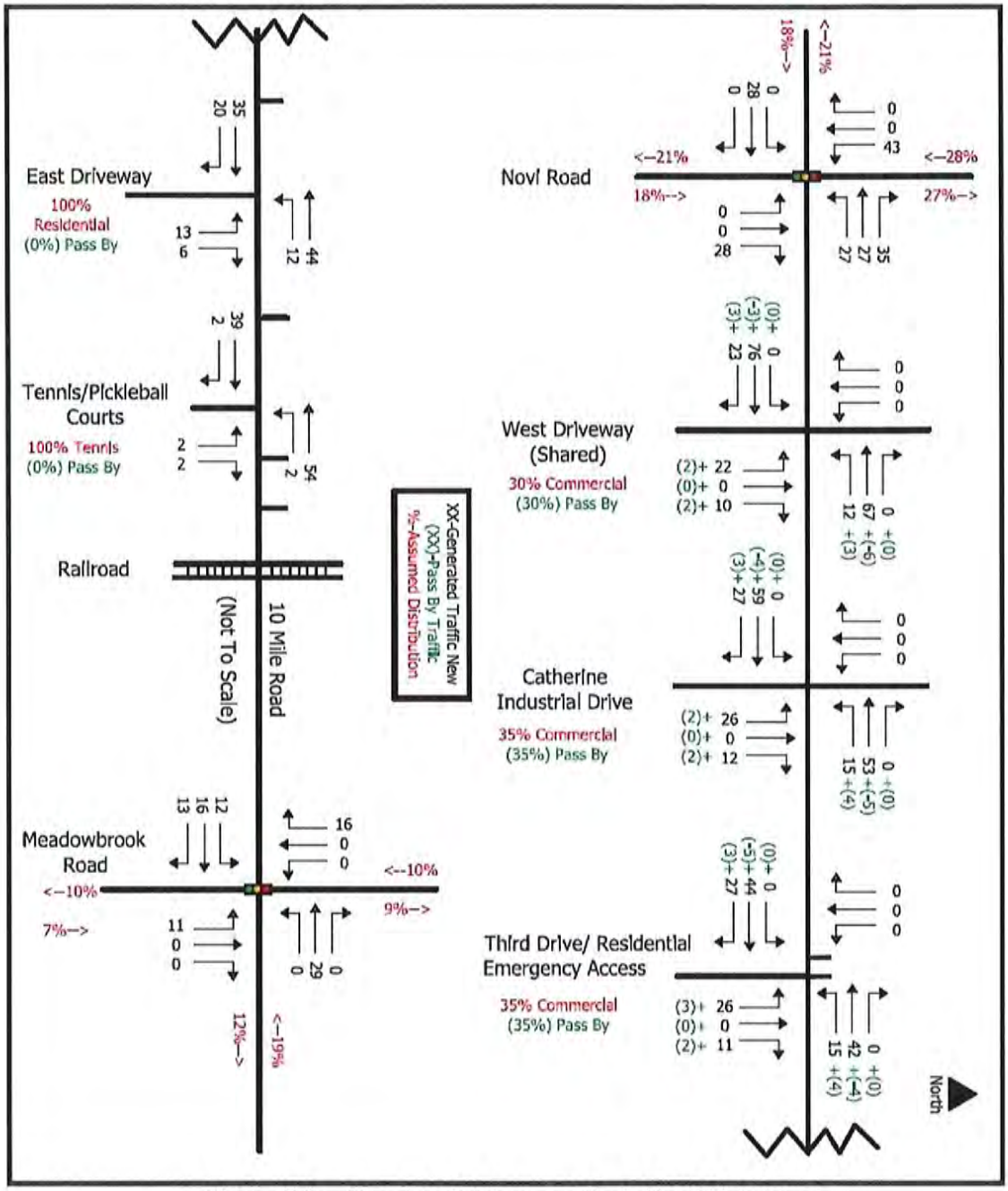


Figure 7.2 – Generated Afternoon Peak Hour Volumes

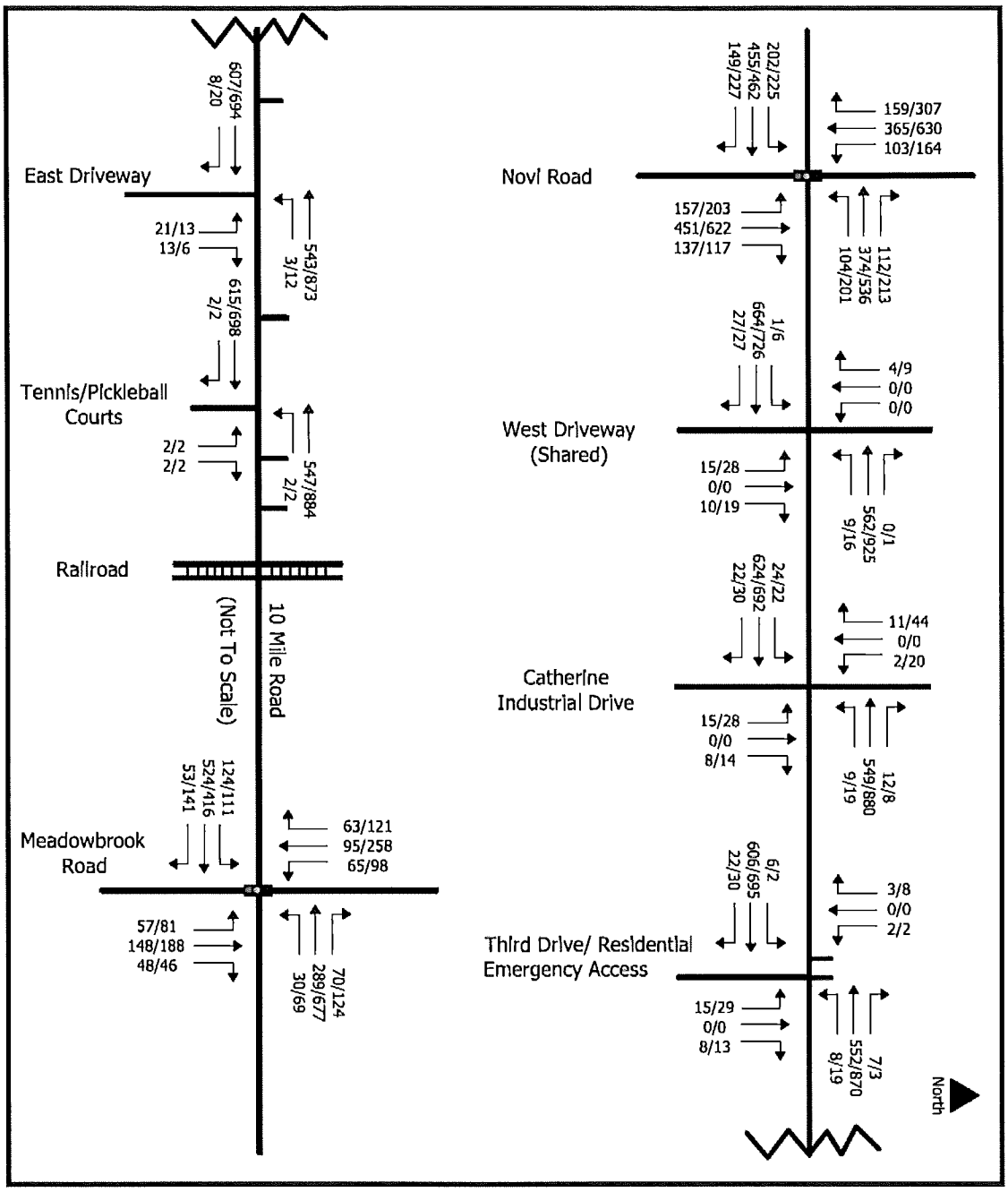


Figure 7.3 – Forecast Morning and Afternoon Peak Hour Volumes

8.0 Capacity Analysis

8.1 Methodology and Analysis Tools

Capacity analysis for this traffic study utilizes the Synchro/SimTraffic (Version 11) program to create a traffic model of the existing, background growth (if needed), and forecast traffic scenarios. Synchro provides the **Highway Capacity Manual**'s (HCM) level of service for each study intersection, while the SimTraffic model provides an alternative and sometimes more realistic analysis of traffic conditions and impacts where queuing at intersections may impact other driveways, or delays for other turning movements at the same or other nearby intersections.

Neither analysis method is perfect as the equations within the **Highway Capacity Manual** may result in unrealistically long delays at busy unsignalized intersections. Sometimes the vehicle behavior within the SimTraffic model does not always match reality, such as where human drivers would more easily change lanes to avoid a blockage, or instances where more drivers in reality "sneak" through an intersection at the end of a signal phase to turn left.

Synchro - HCM Level-of-service (LOS)

The Highway Capacity Manual assigns the following level-of-service grades to the ranges of control delay in seconds for unsignalized and signalized intersections. Generally LOS D is considered the limit of acceptable delay, although there are many situations where providing road improvements needed to improve a failing intersection LOS grade may be realistically unattainable for a sole developer or even undesirable to a community:

Table 8.1 – Highway Capacity Manual
Level of Service Delay Ranges and Grades

Unsignalized Level-of-service Grades						
Delay (sec.)	0-10	10-15	15-25	25-35	35-50	50+
LOS	A	B	C	D	E	F

Signalized Level-of-service Grades						
Delay (sec.)	0-10	10-20	20-35	35-55	55-80	80+
LOS	A	B	C	D	E	F

The HCM Level of Service grades for each scenario and study intersection is the basis upon which improvements are recommended in this traffic impact study. Any turning movement with a HCM level of service E or F is highlighted and improvements are recommended to mitigate those poor level of service grades.

8.2 Capacity Analysis: Intersection 1001 - 10 Mile Road & Novi Road

Table 8.2.1 shows the capacity analysis results for the 10 Mile Road and Novi Road intersection for the morning and afternoon peak hours of the day. Background growth and the proposed development traffic is not anticipated to significantly impact the average LOS of the intersection, which is currently a D and will remain a D.

Table 8.2.1 – Capacity Analysis – 10 Mile Road & Novi Road

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB Novi Road			SB Novi Road			Int.
AM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	200	426	148	85	350	83	155	447	113	78	361	157	2603
Background Vol.	202	430	149	86	354	84	157	451	114	79	365	159	2630
Generated Vol.	0	25	0	18	20	28	0	0	23	24	0	0	138
Forecast Vol.	202	455	149	104	374	112	157	451	137	103	365	159	2768
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	48.9	46.2	46.7	36.7	53.9	54.6	19.3	24.3	24.4	18.9	25.3	25.5	36.5
Background Delay	49.6	46.2	46.7	36.5	54.0	54.7	19.5	24.6	24.7	19.1	25.6	25.8	36.7
Forecast Delay	49.0	45.7	46.1	35.0	55.4	56.2	21.0	27.8	27.9	20.7	27.4	27.6	38.1
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	-0.6	-0.5	-0.6	-1.5	1.4	1.5	1.5	3.2	3.2	1.6	1.8	1.8	1.4
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	D	D	D	D	D	D	B	C	C	B	C	C	D
Background LOS	D	D	D	D	D	D	B	C	C	B	C	C	D
Forecast LOS	D	D	D	C	**E**	**E**	C	C	C	C	C	C	D

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB Novi Road			SB Novi Road			Int.
PM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	223	430	225	172	504	176	201	616	88	120	624	304	3683
Background Vol.	225	434	227	174	509	178	203	622	89	121	630	307	3719
Generated Vol.	0	28	0	27	27	35	0	0	28	43	0	0	188
Forecast Vol.	225	462	227	201	536	213	203	622	117	164	630	307	3907
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	87.0	45.1	45.7	43.5	49.0	49.6	32.5	29.3	29.3	22.4	38.0	38.3	42.4
Background Delay	90.6	45.0	45.6	43.9	49.1	49.6	34.1	29.7	29.7	22.6	38.7	39.1	43.0
Forecast Delay	90.9	42.8	43.2	53.2	49.5	50.0	39.4	34.6	34.7	25.0	42.6	43.1	45.2
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.3	-2.2	-2.4	9.3	0.4	0.4	5.3	4.9	5.0	2.4	3.9	4.0	2.2
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	**F**	D	D	D	D	D	C	C	C	C	D	D	D
Background LOS	**F**	D	D	D	D	D	C	C	C	C	D	D	D
Forecast LOS	**F**	D	D	D	D	D	D	C	C	C	D	D	D

8.3 Capacity Analysis: Intersection 1002 - 10 Mile Road & Shared 1st Driveway

Table 8.3.1 shows the capacity analysis results for the 1st site driveway, located on the western end of the site, if no improvements are made to the intersection.

Table 8.3.1 – Capacity Analysis – 10 Mile Road & Shared 1st Driveway

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB 1st Driveway			SB Driveway			Int.
AM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	1	604	9	2	504	0	2	0	4	0	0	4	1130
Background Vol.	1	610	9	2	509	0	2	0	4	0	0	4	1141
Generated Vol.	0	54	18	7	53	0	13	0	6	0	0	0	151
Forecast Vol.	1	664	27	9	562	0	15	0	10	0	0	4	1292
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	9.1	0.0	0.0	9.1	0.0	0.0	11.3	11.3	11.3	11.0	11.0	11.0	0.1
Background Delay	9.2	0.0	0.0	9.1	0.0	0.0	11.3	11.3	11.3	11.1	11.1	11.1	0.1
Forecast Delay	9.4	0.0	0.0	9.5	0.0	0.0	12.6	12.6	12.6	11.4	11.4	11.4	0.4
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.2	0.0	0.0	0.4	0.0	0.0	1.3	1.3	1.3	0.3	0.3	0.3	0.3
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	A	A	A	A	A	A	B	B	B	B	B	B	A
Background LOS	A	A	A	A	A	A	B	B	B	B	B	B	A
Forecast LOS	A	A	A	A	A	A	B	B	B	B	B	B	A

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB 1st Driveway			SB Driveway			Int.
PM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	6	647	1	1	855	1	4	0	7	0	0	9	1531
Background Vol.	6	653	1	1	864	1	4	0	7	0	0	9	1546
Generated Vol.	0	73	26	15	61	0	24	0	12	0	0	0	211
Forecast Vol.	6	726	27	16	925	1	28	0	19	0	0	9	1757
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	9.9	0.0	0.0	9.4	0.0	0.0	12.1	12.1	12.1	11.7	11.7	11.7	0.3
Background Delay	9.9	0.0	0.0	9.4	0.0	0.0	12.1	12.1	12.1	11.8	11.8	11.8	0.3
Forecast Delay	10.2	0.0	0.0	12.1	0.0	0.0	14.4	14.4	14.4	12.1	12.1	12.1	0.8
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.3	0.0	0.0	2.7	0.0	0.0	2.3	2.3	2.3	0.3	0.3	0.3	0.5
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	A	A	A	A	A	A	B	B	B	B	B	B	A
Background LOS	A	A	A	A	A	A	B	B	B	B	B	B	A
Forecast LOS	B	A	A	B	A	A	B	B	B	B	B	B	A

8.4 Capacity Analysis: Intersection 1003 - 10 Mile Road & Catherine / 2nd Driveway

Table 8.4.1 shows the capacity analysis results for the intersection of 10 Mile Road and Catherine/2nd Site Driveway assuming no improvements are made to the intersection.

Table 8.4.1 – Capacity Analysis – 10 Mile Road & Catherine / 2nd Driveway

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB 2nd Driveway			SB Catherine Industrial			Int.
AM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	24	580	0	0	499	12	0	0	0	2	0	11	1128
Background Vol.	24	586	0	0	504	12	0	0	0	2	0	11	1139
Generated Vol.	0	38	22	9	45	0	15	0	8	0	0	0	137
Forecast Vol.	24	624	22	9	549	12	15	0	8	2	0	11	1276
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	12.0	12.0	0.3
Background Delay	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.9	11.9	11.9	0.3
Forecast Delay	9.6	0.0	0.0	9.3	0.0	0.0	12.2	12.2	12.2	12.8	12.8	12.8	0.5
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.2	0.0	0.0	9.3	0.0	0.0	12.2	12.2	12.2	0.9	0.9	0.9	0.2
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	A	A	A	A	A	A	A	A	A	B	B	B	A
Background LOS	A	A	A	A	A	A	A	A	A	B	B	B	A
Forecast LOS	A	A	A	A	A	A	B	B	B	B	B	B	A

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB 2nd Driveway			SB Catherine Industrial			Int.
PM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	22	631	0	0	824	8	0	0	0	20	0	44	1549
Background Vol.	22	637	0	0	832	8	0	0	0	20	0	44	1563
Generated Vol.	0	55	30	19	48	0	28	0	14	0	0	0	194
Forecast Vol.	22	692	30	19	880	8	28	0	14	20	0	44	1757
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.3	16.3	16.3	1.0
Background Delay	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	16.7	16.7	1.0
Forecast Delay	10.1	0.0	0.0	9.8	0.0	0.0	14.1	14.1	14.1	20.4	20.4	20.4	1.5
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.2	0.0	0.0	9.8	0.0	0.0	14.1	14.1	14.1	3.7	3.7	3.7	0.5
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	A	A	A	A	A	A	A	A	A	C	C	C	A
Background LOS	A	A	A	A	A	A	A	A	A	C	C	C	A
Forecast LOS	B	A	A	A	A	A	B	B	B	C	C	C	A

8.5 Capacity Analysis: Intersection 1004 - 10 Mile Road & 3rd Driveway

Table 8.5.1 shows the capacity analysis results for the intersection of 10 Mile Road and the 3rd site driveway assuming no improvements at this intersection. Eastbound and westbound 10 Mile Road is a single thru lane at this driveway which has a dramatic effect on the unsignalized LOS for the northbound and southbound approaches to the intersection.

Table 8.5.1 – Capacity Analysis – 10 Mile Road & 3rd Driveway

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB 3rd Driveway			Double Driveway			Int.
AM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	6	576	0	0	508	7	0	0	0	2	0	3	1102
Background Vol.	6	582	0	0	513	7	0	0	0	2	0	3	1113
Generated Vol.	0	24	22	8	39	0	15	0	8	0	0	0	116
Forecast Vol.	6	606	22	8	552	7	15	0	8	2	0	3	1229
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.8	32.8	32.8	0.2
Background Delay	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.4	33.4	33.4	0.2
Forecast Delay	9.5	0.0	0.0	9.5	0.0	0.0	97.8	97.8	97.8	48.0	48.0	48.0	1.9
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.2	0.0	0.0	9.5	0.0	0.0	97.8	97.8	97.8	14.6	14.6	14.6	1.7
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	A	A	A	A	A	A	A	A	A	D	D	D	A
Background LOS	A	A	A	A	A	A	A	A	A	D	D	D	A
Forecast LOS	A	A	A	A	A	A	F	F	F	E	E	E	A

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB 3rd Driveway			Double Driveway			Int.
PM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	2	649	0	0	824	3	0	0	0	2	0	8	1488
Background Vol.	2	656	0	0	832	3	0	0	0	2	0	8	1503
Generated Vol.	0	39	30	19	38	0	29	0	13	0	0	0	168
Forecast Vol.	2	695	30	19	870	3	29	0	13	2	0	8	1671
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.8	39.8	39.8	0.4
Background Delay	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.9	41.9	41.9	0.4
Forecast Delay	9.9	0.0	0.0	10.3	0.0	0.0	817.8	817.8	817.8	75.7	75.7	75.7	21.0
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.2	0.0	0.0	10.3	0.0	0.0	817.8	817.8	817.8	33.8	33.8	33.8	20.6
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	A	A	A	A	A	A	A	A	A	E	E	E	A
Background LOS	A	A	A	A	A	A	A	A	A	E	E	E	A
Forecast LOS	A	A	A	B	A	A	F	F	F	F	F	F	C

8.6 Capacity Analysis: Intersection 1007 - 10 Mile Road & Residential Driveway

Table 8.6.1 shows the capacity analysis results for the intersection of 10 Mile Road and the Residential Site Driveway.

Table 8.6.1 – Capacity Analysis – 10 Mile Road & Residential Driveway

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB Residential Drive			(None)			Int.
AM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	0	577	0	0	512	0	0	0	0	0	0	0	1089
Background Vol.	0	583	0	0	517	0	0	0	0	0	0	0	1100
Generated Vol.	0	24	8	3	26	0	21	0	13	0	0	0	95
Forecast Vol.	0	607	8	3	543	0	21	0	13	0	0	0	1195
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Background Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forecast Delay	0.0	0.0	0.0	9.1	0.0	0.0	11.8	0.0	11.2	0.0	0.0	0.0	0.3
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.0	0.0	0.0	9.1	0.0	0.0	11.8	0.0	11.2	0.0	0.0	0.0	0.3
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
Background LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
Forecast LOS	A	A	A	A	A	A	B	A	B	A	A	A	A

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB Residential Drive			(None)			Int.
PM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	0	652	0	0	821	0	0	0	0	0	0	0	1473
Background Vol.	0	659	0	0	829	0	0	0	0	0	0	0	1488
Generated Vol.	0	35	20	12	44	0	13	0	6	0	0	0	130
Forecast Vol.	0	694	20	12	873	0	13	0	6	0	0	0	1618
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Background Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forecast Delay	0.0	0.0	0.0	9.7	0.2	0.0	30.4	0.0	14.9	0.0	0.0	0.0	0.4
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.0	0.0	0.0	9.7	0.2	0.0	30.4	0.0	14.9	0.0	0.0	0.0	0.4
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
Background LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
Forecast LOS	A	A	A	A	A	A	D	A	B	A	A	A	A

8.7 Capacity Analysis: Intersection 1009 - 10 Mile Road & Meadowbrook Road

Table 8.7.1 shows the capacity analysis result for the intersection of 10 Mile Road and Meadowbrook Road. Overall, the proposed development isn't expected to significantly impact the intersections of 10 Mile Road and Meadowbrook Road. The intersection's level of service isn't expected to change from a C during the morning peak hour and a D during the afternoon peak hour.

Table 8.7.1 – Capacity Analysis – 10 Mile Road & Meadowbrook Road

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB Meadowbrook			SB Meadowbrook			Int.
AM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	112	498	48	30	273	69	48	147	48	64	94	55	1486
Background Vol.	113	503	48	30	276	70	48	148	48	65	95	56	1500
Generated Vol.	11	21	5	0	13	0	9	0	0	0	0	7	66
Forecast Vol.	124	524	53	30	289	70	57	148	48	65	95	63	1566
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	13.3	26.6	26.6	14.8	24.2	24.3	50.6	57.8	49.0	58.7	58.7	55.1	34.6
Background Delay	13.5	26.7	26.7	14.9	24.2	24.4	50.6	57.8	48.9	58.8	58.8	55.2	34.6
Forecast Delay	13.9	27.0	27.0	15.3	24.4	24.5	50.9	57.8	48.9	58.8	58.9	56.2	34.7
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.4	0.3	0.3	0.4	0.2	0.1	0.3	0.0	0.0	0.0	0.1	1.0	0.1
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	B	C	C	B	C	C	D	**E**	D	**E**	**E**	**E**	C
Background LOS	B	C	C	B	C	C	D	**E**	D	**E**	**E**	**E**	C
Forecast LOS	B	C	C	B	C	C	D	**E**	D	**E**	**E**	**E**	C

Scenario	EB 10 Mile Road			WB 10 Mile Road			NB Meadowbrook			SB Meadowbrook			Int.
PM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	98	396	127	68	642	123	69	186	46	97	255	104	2211
Background Vol.	99	400	128	69	648	124	70	188	46	98	258	105	2233
Generated Vol.	12	16	13	0	29	0	11	0	0	0	0	16	97
Forecast Vol.	111	416	141	69	677	124	81	188	46	98	258	121	2330
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	26.3	34.1	34.3	19.4	39.4	39.5	58.6	55.7	47.1	51.6	54.0	45.5	41.7
Background Delay	26.8	34.2	34.4	19.7	39.7	39.7	58.7	55.7	47.0	51.6	53.9	45.3	41.8
Forecast Delay	28.5	34.8	35.1	20.4	40.6	40.7	60.4	55.7	47.0	51.5	53.8	46.0	42.4
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	1.7	0.6	0.7	0.7	0.9	1.0	1.7	0.0	0.0	-0.1	-0.1	0.7	0.6
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	C	C	C	B	D	D	**E**	**E**	D	D	D	D	D
Background LOS	C	C	C	B	D	D	**E**	**E**	D	D	D	D	D
Forecast LOS	C	C	D	C	D	D	**E**	**E**	D	D	D	D	D

8.8 Capacity Analysis: Intersection 1010 - 10 Mile Road & Tennis/Pickleball Lot

Table 8.8.1 shows the capacity analysis result for the intersection of 10 Mile Road and the small tennis/pickleball parking lot.

Scenario	EB 10 Mile Road			WB 10 Mile Road			Tennis Driveway			(None)			Int.
AM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	0	574	0	0	515	0	0	0	0	0	0	0	1089
Background Vol.	0	580	0	0	520	0	0	0	0	0	0	0	1100
Generated Vol.	0	35	2	2	27	0	2	0	2	0	0	0	70
Forecast Vol.	0	615	2	2	547	0	2	0	2	0	0	0	1170
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Background Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forecast Delay	0.0	0.0	0.0	9.1	0.0	0.0	23.5	0.0	23.5	0.0	0.0	0.0	0.1
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.0	0.0	0.0	9.1	0.0	0.0	23.5	0.0	23.5	0.0	0.0	0.0	0.1
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
Background LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
Forecast LOS	A	A	A	A	A	A	C	A	C	A	A	A	A

Scenario	EB 10 Mile Road			WB 10 Mile Road			Tennis Driveway			(None)			Int.
PM Peak Hour	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
Existing, Background, Generated, and Forecast Traffic Volumes													
Existing Vol.	0	652	0	0	822	0	0	0	0	0	0	0	1474
Background Vol.	0	659	0	0	830	0	0	0	0	0	0	0	1489
Generated Vol.	0	39	2	2	54	0	2	0	2	0	0	0	101
Forecast Vol.	0	698	2	2	884	0	2	0	2	0	0	0	1590
Existing, Background, and Forecast Highway Capacity Manual (HCM) average delay (seconds)													
Existing Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Background Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forecast Delay	0.0	0.0	0.0	9.5	0.0	0.0	29.9	0.0	29.9	0.0	0.0	0.0	0.1
Traffic Impact = Change in Average Delay from Background to Forecast													
Traffic Impact	0.0	0.0	0.0	9.5	0.0	0.0	29.9	0.0	29.9	0.0	0.0	0.0	0.1
Highway Capacity Manual (HCM) Level of Service Grades (LOS)													
Existing LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
Background LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
Forecast LOS	A	A	A	A	A	A	D	A	D	A	A	A	A

9.0 Site Access & Circulation

Driveway Spacing and Access Management

The PUD plan shows 5 driveways along 10 Mile Road which are located as follows:

- 1st Driveway, aligned from existing commercial driveway
- 2nd Driveway, aligned from Catherine Industrial Drive
- 3rd Driveway, aligned across from a pair of commercial driveways
- Residential Driveway, positioned roughly 120' between the Tremar Driveway and the western Wrencher's driveway (BCDC)
- Tennis/Pickleball driveway positioned between the BCDC driveways

Per the RCOC (200') and Novi spacing standards (150' upstream, 200' downstream), the residential driveway does not meet the standard spacing requirements, however we understand that the RCOC has tentatively agreed (by emails) that the residential driveway can remain in its proposed location provided that a right-turn deceleration lane and left-turn passing lane is provided as shown on the concept site plan.

The proposed tennis/pickleball court driveway is positioned between the BCDC commercial driveways across 10 Mile Road and also does not meet the spacing standards with only about 65' to the eastern driveway to and 95' to the western driveway. The tennis courts driveway is not expected to carry a significant amount of daily or peak hour traffic.

All other site driveways are aligned across from driveways on the north side of 10 Mile Road.

The 3rd site driveway will also serve as the emergency access route for the residential portion of the development.

Sight Distance

The recommended intersection sight distance for a 45 MPH Road per RCOC standards is 500' for a 2-3 lane roadway and 530' for a 4-5 lane roadway. The three commercial driveways and residential driveway were found to have adequate sight distance. The tennis/pickleball court driveway is expected (not measured by Midwestern Consulting for this version of the traffic impact study) to have adequate sight distance given that it is positioned further away from the crest of the hill to the west than the residential driveway and is near the bottom of a valley with a rise to the west and a rise to the east.

Right-Turn Lanes

According to the RCOC "Permit Rules, Specifications and Guidelines" publication, developers are strongly encouraged to consider the safety benefits of a right-turn deceleration lane. The RCOC provides a right-turn warrant graph to help identify when a right-turn deceleration lane and taper is warranted. Notes in the RCOC geometric guide states that a taper or lane may or may not be required along a 5 Lane road, boulevards, or curbed roads based on traffic engineering requirements.

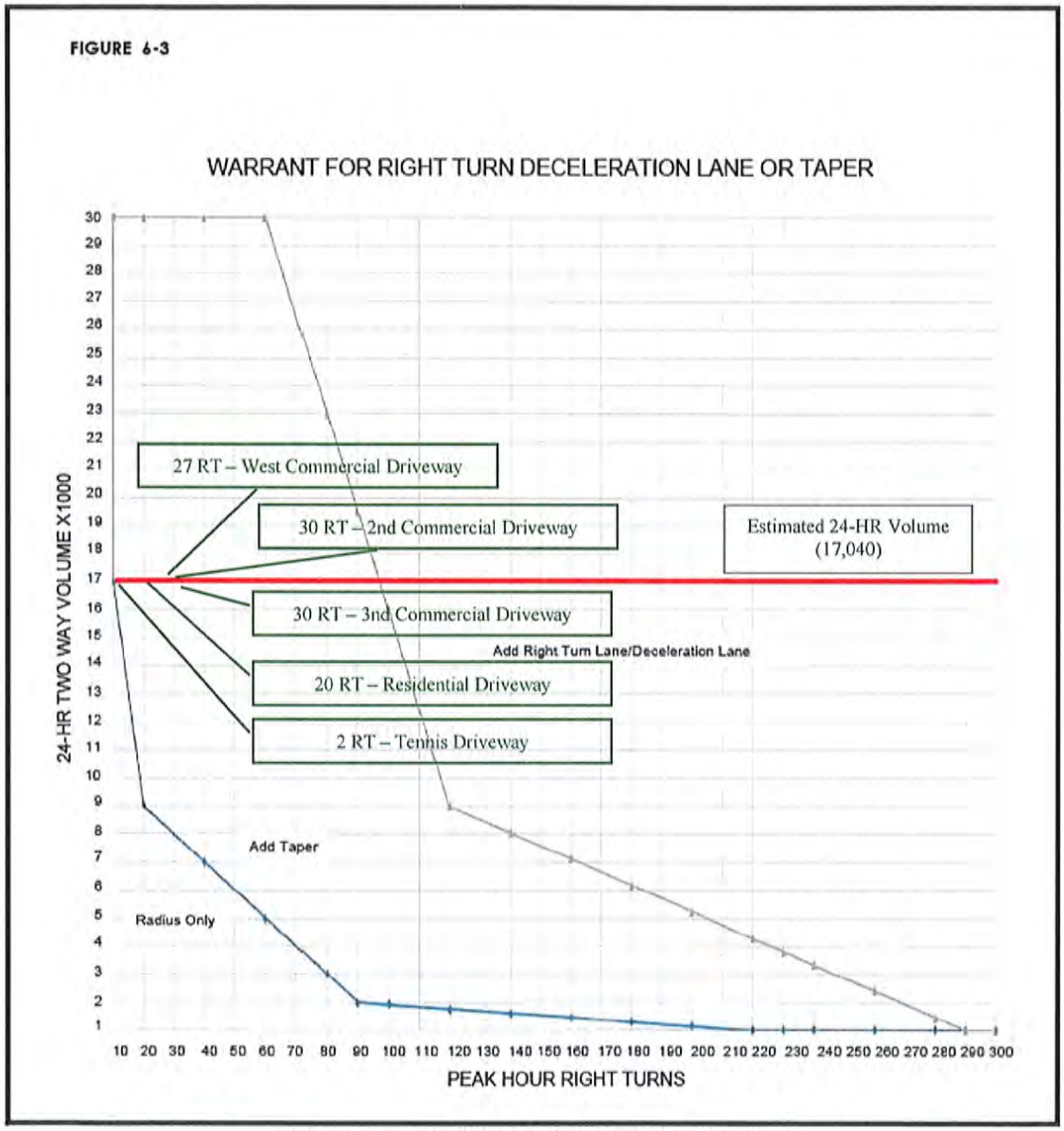


Figure 9.1 – RCOC Right Turn Warrant Graph

Due to the traffic volumes along 10 Mile Road and right-turns into the site driveways, all driveways qualify for a right-turn deceleration taper according to the RCOC warrant graph. The western commercial driveway is located in the 5 lane section of 10 Mile Road, while the remaining four driveways all are located where there is only a single eastbound lane on 10 Mile Road.

Left-Turn Lanes

Similarly, a passing lane or center-left turn lane should be installed at a driveway when warranted per the following graph.

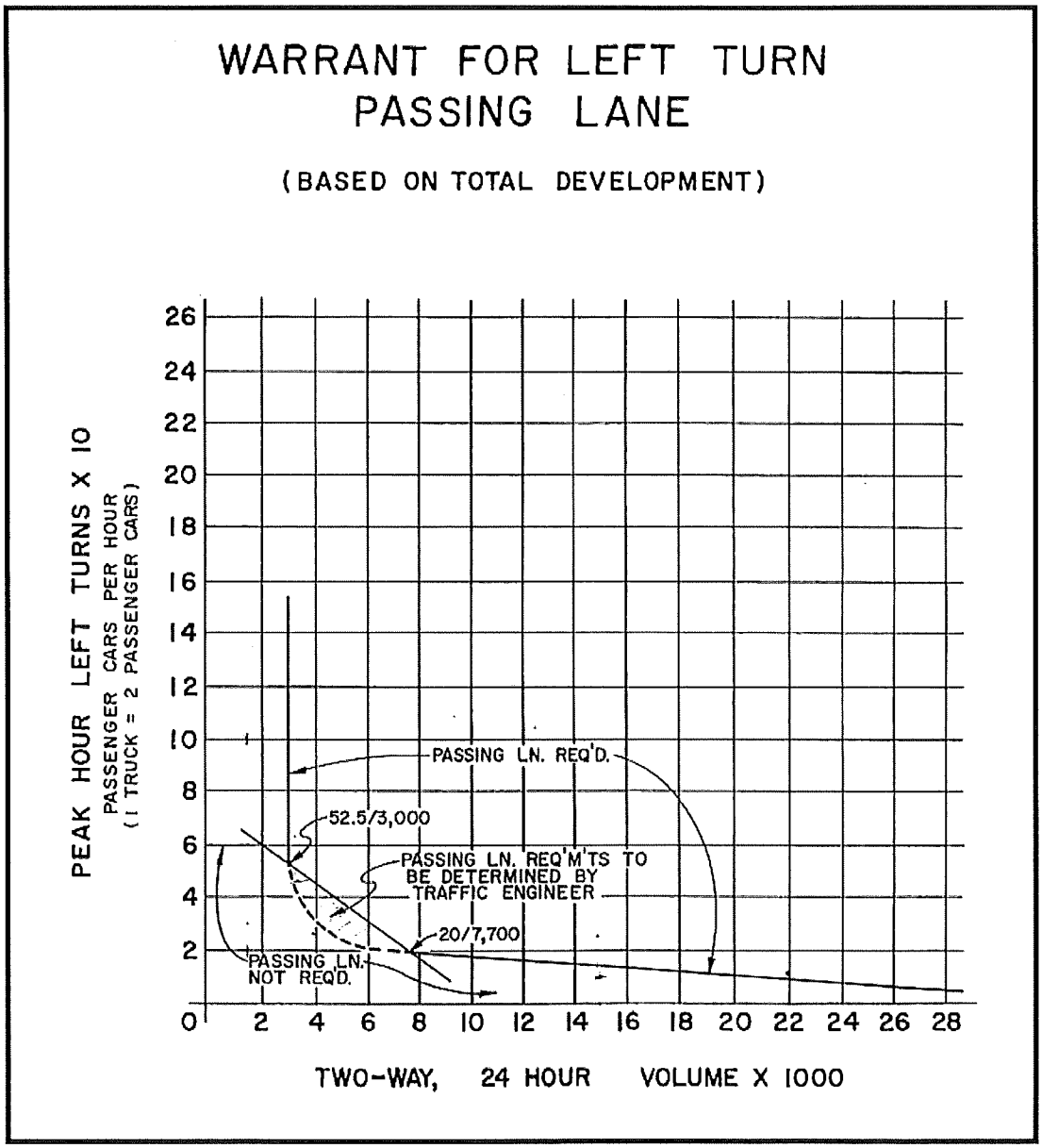


Figure 9.2 – RCOC Left-Turn Warrant Graph

Our 2022 counts at the Tremar and Wrencher's Driveways (now BCDC) near the eastern end of the site indicated that there were about 13,000 vehicles in a 13-hour window from 6:00 AM to 7:00 PM. Based on a 2018 count at 10 Mile Road and Novi Road, the ratio of the same 13 hours versus the full 24-hours creates a factor of about 1.225. Therefore, it is reasonable to assume that the current 24-hour volume at this eastern end of the site is about 16,000 (15,925 rounded up). Conservatively assuming, with no reductions for pass-by traffic, that 35% of the proposed 2970 weekday trips will travel to and from the east on 10 Mile Road, then the forecast traffic volumes would be around 1,040 trips higher or around 17,040 vehicles per day near the eastern end of the site. Therefore, about 15 left-turns into a driveway would justify a center left turn lane.

The projected number of left-turns into each of the site driveways during the busier PM peak hour is 16, 19, 19, 12, and 2 from west to east. Therefore all three commercial driveways warrant a center left-turn lane. The RCOC has indicated that a left-turn passing lane should be provided at the residential driveway in lieu of realignment and a center left-turn lane, as shown on the site plan.

No deceleration/acceleration taper is shown on the PUD at the Tennis driveway. There is an existing guard rail just east of that proposed driveway, and the stop bar for the two-lane wide railroad crossing is located about 200' to the east. Given the geometry on the north side of the street, left-turn passing maneuvers will be likely be done within the right-turn deceleration lane section for the BCDC driveway.

Conceptual Recommendations
When the conceptual neighborhood retail portion of the site is developed, the following improvements may be needed:

- Widen eastbound 10 Mile Road to two through lanes, ending with a right-turn lane at the site's easternmost residential driveway.
- Widen westbound 10 Mile Road to two through lanes west from the 3rd site driveway to help provide additional capacity for outbound site traffic.
- Provide a continuous center lane turn lane to serve the 1st, 2nd and 3rd commercial driveways.

The following table briefly summarizes the average delays for outbound left turning and right-turning traffic, and the corresponding queues for outbound traffic at each of the site driveways if all of the recommendations are implemented.

Table 9.1 Forecast conditions at the site driveways if mitigated.

	Mitigated Forecast AM				Mitigated Forecast PM			
Intersection	Vol L/R	Delay L/R	LOS	Q95%	Vol L/R	Delay L/R	LOS	Q95%
1002 - 1st Driveway	15/10	12.6	B	0.3	28/19	14.4	B	0.6
1003 - 2nd Driveway	15/8	17.9	C	0.3	28/14	24.0	C	0.7
1004 - 3rd Driveway	15/8	16	C	0.2	29/13	19.9	C	0.6
1007 - Residential Drive	21/13	11.8/11.2	B/B	0.1/0.1	13/6	30.4/14.9	D/B	0.3/0.1
1010-Tennis Driveway	2/2	23.5	C	0.1	2/2	29.9	D	0.1

10.0 Historical Crash Data

The Michigan Traffic Crash Facts (www.michigantrafficcrashfacts.org) website database has crash data at the intersections of 10 Mile Road with Novi Road, Catherine Industrial, and Meadowbrook Road. According to SEMCOG's database the ranking of the Novi, Catherine, and Meadowbrook intersections are 11th, 93rd, and 27th, respectively in comparison with crashes at other Novi intersections in the last 5 years.

The intersection of 10 Mile Road and Novi Road has about 18.8 crashes per year based on crash data from 2011 to 2020. Out of those 188 crashes, 2 involved serious injury, 12 involved minor injury, 30 had possible injury, and the remaining 144 crashes involved property damage only.

Table 10.1 – Crash History (2011-2020) - 10 Mile Road and Novi Road

Crash Year	Head-On	Head-On - Left Turn	Angle	Rear-End	Rear-End - Left T	Rear-End - Right T	Sideswipe - Same Direction	Sideswipe - Opposite Direction	Backing	Other/Unknown	Other	Total
2011	0	2	2	5	0	0	1	0	0	1	0	11
2012	0	3	4	6	0	0	1	2	0	1	0	17
2013	0	1	4	8	1	0	1	0	0	1	0	16
2014	0	2	7	10	0	1	6	0	0	0	0	26
2015	0	2	6	3	0	0	1	0	0	3	0	15
2016	0	2	7	10	0	0	2	0	0	0	2	23
2017	0	1	9	13	0	0	2	1	0	0	1	27
2018	0	1	9	7	0	0	3	0	1	0	2	23
2019	1	1	5	12	0	0	3	0	1	0	0	23
2020	0	0	2	3	0	0	1	0	0	0	1	7
Totals	**1**	**15**	**55**	**77**	**1**	**1**	**21**	**3**	**2**	**6**	**6**	**188**

Worst Injury	Head-On	Head-On - Left Turn	Angle	Rear-End	Rear-End - Left	Rear-End - Right	Sideswipe - Same	Sideswipe - Opposite	Backing	Other/Unknown	Other	Total
Suspected Serious Injury (A)	0	1	0	1	0	0	0	0	0	0	0	2
Suspected Minor Injury (B)	1	2	5	2	0	0	0	0	0	2	0	12
Possible Injury (C)	0	3	7	14	1	0	1	0	0	2	2	30
No Injury (O)	0	9	43	60	0	1	20	3	2	2	4	144
Total Crash Count	**1**	**15**	**55**	**77**	**1**	**1**	**21**	**3**	**2**	**6**	**6**	**188**

The intersection of 10 Mile Road and Catherine Industrial has about 1.1 crashes per year based on crash data from 2011 to 2020. Out of those 11 crashes, 1 involved minor injury, 2 had possible injury, and the remaining 8 crashes involved property damage only.

Table 10.2 – Crash History (2011-2020) - 10 Mile Road and Catherine Industrial

Crash Year	Head-On - Left Turn	Angle	Rear-End	Rear-End - Right Turn	Sideswipe - Same Direction	Other	Total
2012	0	1	0	0	0	0	1
2013	0	1	0	1	0	0	2
2014	0	0	0	0	1	0	1
2018	0	1	2	0	0	0	3
2019	1	2	0	0	0	1	4
Totals	**1**	**5**	**2**	**1**	**1**	**1**	**11**

Worst Injury in Crash	Head-On - Left Turn	Angle	Rear-End	Rear-End - Right Turn	Sideswipe - Same Direction	Other	Total
Suspected Minor Injury (B)	1	0	0	0	0	0	1
Possible Injury (C)	0	2	0	0	0	0	2
No Injury (O)	0	3	2	1	1	1	8
Totals	**1**	**5**	**2**	**1**	**1**	**1**	**11**

The intersection of 10 Mile Road and Meadowbrook has about 8.4 crashes per year based on crash data from 2011 to 2020. Out of those 84 crashes, 1 involved serious injury, 5 involved minor injury, 12 had possible injury, and the remaining 66 crashes involved property damage only.

Table 10.3 – Crash History (2011-2020) - 10 Mile Road and Meadowbrook Road

Crash Year	Single Motor Vehicle	Head-On - Left Turn	Angle	Rear-End	Sideswipe - Same Direction	Backing	Other/Un known	Total
2011	0	2	3	4	1	0	1	11
2012	0	0	3	4	0	0	1	8
2013	0	0	4	1	0	0	0	5
2014	0	0	0	1	1	0	2	4
2015	1	1	1	3	0	0	0	6
2016	0	1	3	5	2	1	0	12
2017	0	1	3	9	2	0	0	15
2018	0	1	6	3	0	0	0	10
2019	1	1	1	4	1	0	0	8
2020	1	0	2	2	0	0	0	5
Total Crash Count	**3**	**7**	**26**	**36**	**7**	**1**	**4**	**84**

Worst Injury in Crash	Single Motor Vehicle	Head-On - Left Turn	Angle	Rear-End	Sideswipe - Same Direction	Backing	Other/Un known	Total
Suspected Serious Injury (A)	0	0	1	0	0	0	0	1
Suspected Minor Injury (B)	0	0	3	0	0	0	2	5
Possible Injury (C)	2	0	6	4	0	0	0	12
No Injury (O)	1	7	16	32	7	1	2	66
Total Crash Count	**3**	**7**	**26**	**36**	**7**	**1**	**4**	**84**

11.0 Summary

The proposed Novi-Ten PRO development, which consists of 35,900 SF of neighborhood retail/restaurant space, 71 townhouse residential units, and two tennis/pickleball courts is located on the south side of 10 Mile Road between Novi Road and the Railroad tracks.

The proposed development will not have a significant traffic impact on the overall level of service at the major intersections of 10 Mile Road with Novi Road and with Meadowbrook Road. The level of service at Novi Road and 10 Mile Road is currently a D and will remain a D during both morning and afternoon peak hours for all scenarios. The level of service at 10 Mile Road and Meadowbrook Road is currently a C during the morning peak hour and a D during the afternoon peak hour and the level of service does not change in the background and forecast scenarios.

The client has prepared a parallel plan with light industrial and office space under the existing zoning, which is currently OS-1 and I-1, which would generate 314 new trips to the area in the morning peak hour, and 289 trips during the afternoon peak hour. In comparison, the proposed PRO plan only generates 204 morning and 285 afternoon trips, which is 35% less morning peak hour trips and 1% less afternoon peak hour trips than if the site were developed under the existing zoning.

When the commercial portion of the site is developed, this study recommends the following modifications to 10 Mile Road, which are already illustrated on the January 2nd 2024 submitted site plan, to accommodate traffic at the proposed site driveways:

- In lieu of separate right-turn deceleration lanes at each driveway, widen eastbound 10 Mile Road to two-through lanes ending at a right-turn deceleration lane at the residential driveway.
- Extend the center left-turn lane along 10 Mile Road from where it currently ends at Catherine Industrial to service all commercial driveways.
- Widen westbound 10 Mile Road to two through lanes west from the 3rd commercial site driveway to help improve capacity for the commercial driveways.

Appendix

Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Novi Road
Weather:

File Name : TMC_1001_10 Mile & Novi_Mar-16-2022
Site Code : 1001
Start Date : 3/16/2022
Page No : 1

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				Novi Road Northbound				Novi Road Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
*** BREAK ***																	
06:00 AM	12	23	4	0	11	10	11	1	2	27	6	0	3	18	5	0	133
06:15 AM	24	25	7	0	11	15	9	0	3	35	2	0	5	29	10	0	175
06:30 AM	16	43	6	0	9	25	9	0	6	33	10	0	9	34	13	0	213
06:45 AM	34	57	16	0	5	51	3	0	6	56	16	0	14	52	8	0	318
Total	86	148	33	0	36	101	32	1	17	151	34	0	31	133	36	0	839
07:00 AM	34	53	12	0	11	58	12	0	22	64	12	0	11	49	26	0	364
07:15 AM	50	92	31	0	6	56	9	0	29	69	20	0	14	80	28	0	484
07:30 AM	59	103	30	0	14	89	19	0	32	98	26	0	10	82	43	0	605
07:45 AM	44	96	50	0	25	133	29	0	62	127	33	0	24	96	56	0	775
Total	187	344	123	0	56	336	69	0	145	358	91	0	59	307	153	0	2228
08:00 AM	59	108	42	0	26	78	15	0	29	106	23	0	21	95	27	1	630
08:15 AM	38	119	26	0	20	50	20	0	32	116	31	0	23	88	31	0	594
08:30 AM	51	111	17	0	20	62	14	0	24	96	24	0	25	59	26	0	529
08:45 AM	50	138	44	0	11	71	26	0	34	112	42	0	17	102	43	0	690
Total	198	476	129	0	77	261	75	0	119	430	120	0	86	344	127	1	2443
09:00 AM	68	100	32	0	24	72	24	1	21	69	26	0	18	71	32	0	558
09:15 AM	39	83	21	0	20	47	18	0	16	99	27	0	17	62	33	0	482
09:30 AM	43	83	27	0	15	61	25	0	19	76	19	0	18	62	24	0	472
09:45 AM	45	70	14	0	22	61	32	0	21	100	19	0	26	79	40	0	529
Total	195	336	94	0	81	241	99	1	77	344	91	0	79	274	129	0	2041
10:00 AM	39	54	17	1	17	51	38	0	16	66	20	0	21	71	33	1	445
10:15 AM	37	55	15	0	20	60	28	0	15	101	16	0	25	67	22	0	461
10:30 AM	34	73	11	0	15	54	30	0	17	76	12	0	14	76	25	0	437
10:45 AM	35	56	13	0	21	53	21	0	27	83	15	0	25	83	36	0	468
Total	145	238	56	1	73	218	117	0	75	326	63	0	85	297	116	1	1811
11:00 AM	46	58	14	0	25	58	32	0	14	78	14	0	19	48	43	0	449
11:15 AM	50	63	19	0	21	54	32	0	18	113	19	0	21	104	29	0	543
11:30 AM	49	76	17	0	22	53	30	0	14	115	27	0	27	80	34	0	544
11:45 AM	44	75	29	0	30	64	35	0	17	111	12	0	28	95	44	0	584
Total	189	272	79	0	98	229	129	0	63	417	72	0	95	327	150	0	2120
12:00 PM	60	74	22	0	25	78	40	0	25	114	20	0	24	80	55	0	617
12:15 PM	52	47	17	0	30	68	41	0	18	129	26	0	29	90	60	0	607
12:30 PM	57	83	14	0	27	73	33	0	17	95	20	0	23	93	58	0	593
12:45 PM	54	66	12	0	31	80	30	0	20	106	20	0	30	108	47	0	604
Total	223	270	65	0	113	299	144	0	80	444	86	0	106	371	220	0	2421
01:00 PM	48	54	14	0	36	63	41	0	17	104	20	0	35	100	42	0	574
01:15 PM	49	52	18	0	27	64	26	0	18	105	27	0	36	101	43	0	566
01:30 PM	43	53	23	0	21	79	31	0	23	93	16	0	20	84	59	0	545
01:45 PM	49	50	25	0	32	72	24	1	26	118	16	0	34	109	52	0	608
Total	189	209	80	0	116	278	122	1	84	420	79	0	125	394	196	0	2293
02:00 PM	44	70	17	0	16	88	37	0	20	98	22	0	33	90	53	0	588
02:15 PM	40	63	29	0	20	77	19	0	35	108	23	0	36	90	52	1	593
02:30 PM	42	98	37	1	24	102	34	0	31	108	24	0	35	95	66	0	697
02:45 PM	61	113	55	0	26	77	34	0	44	111	34	0	26	121	57	0	759
Total	187	344	138	1	86	344	124	0	130	425	103	0	130	396	228	1	2637
03:00 PM	67	98	50	0	38	93	49	0	20	123	24	0	40	116	39	0	757
03:15 PM	51	90	33	0	30	80	29	0	35	133	26	0	24	145	64	0	740
03:30 PM	55	111	35	0	29	101	47	2	29	127	13	0	24	103	58	2	736

Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Novi Road
Weather:

File Name : TMC_1001_10 Mile & Novi_Mar-16-2022
Site Code : 1001
Start Date : 3/16/2022

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				Novi Road Northbound				Novi Road Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:45 PM	65	63	37	0	25	91	35	0	39	159	28	0	29	123	74	0	768
Total	238	362	155	0	122	365	160	2	123	542	91	0	117	487	235	2	3001
04:00 PM	63	76	39	0	37	118	38	1	35	158	22	0	33	122	52	1	795
04:15 PM	55	75	51	0	28	93	28	0	31	144	16	1	40	136	74	0	772
04:30 PM	58	91	56	0	51	129	40	0	34	146	21	2	23	112	78	0	841
04:45 PM	57	92	46	0	43	127	37	0	38	136	34	0	29	149	69	2	859
Total	233	334	192	0	159	467	143	1	138	584	93	3	125	519	273	3	3267
05:00 PM	52	103	54	0	39	142	48	0	49	159	22	0	23	159	83	0	933
05:15 PM	56	124	59	1	34	114	34	0	51	164	20	0	42	148	70	2	919
05:30 PM	54	104	66	0	65	139	42	0	43	136	22	0	27	159	66	0	923
05:45 PM	61	99	46	0	34	109	52	0	58	157	24	0	28	158	85	1	912
Total	223	430	225	1	172	504	176	0	201	616	88	0	120	624	304	3	3687
06:00 PM	61	104	42	1	41	122	31	3	48	144	26	1	22	117	70	2	835
06:15 PM	52	70	39	1	20	93	29	3	32	125	22	0	36	124	88	0	734
06:30 PM	55	82	42	0	28	97	30	0	36	119	15	0	33	116	88	0	741
06:45 PM	41	52	40	0	37	96	32	0	47	125	22	0	35	140	107	0	774
Total	209	308	163	2	126	408	122	6	163	513	85	1	126	497	353	2	3084
** PEAK ***																	
Grand Total	2502	4071	1532	5	1315	4051	1512	12	1415	5570	1096	4	1284	4970	2520	13	31872
Apprch %	30.9	50.2	18.9	0.1	19.1	58.8	21.9	0.2	17.5	68.9	13.6	0	14.6	56.6	28.7	0.1	
Total %	7.9	12.8	4.8	0	4.1	12.7	4.7	0	4.4	17.5	3.4	0	4	15.6	7.9	0	
Cars & Peds	2477	4016	1502	5	1298	3987	1476	9	1391	5442	1082	3	1263	4867	2485	9	31312
% Cars & Peds	99	98.6	98	100	98.7	98.4	97.6	75	98.3	97.7	98.7	75	98.4	97.9	98.6	69.2	98.2
H.V. & Bikes	25	55	30	0	17	64	36	3	24	128	14	1	21	103	35	4	560
% H.V. & Bikes	1	1.4	2	0	1.3	1.6	2.4	25	1.7	2.3	1.3	25	1.6	2.1	1.4	30.8	1.8
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

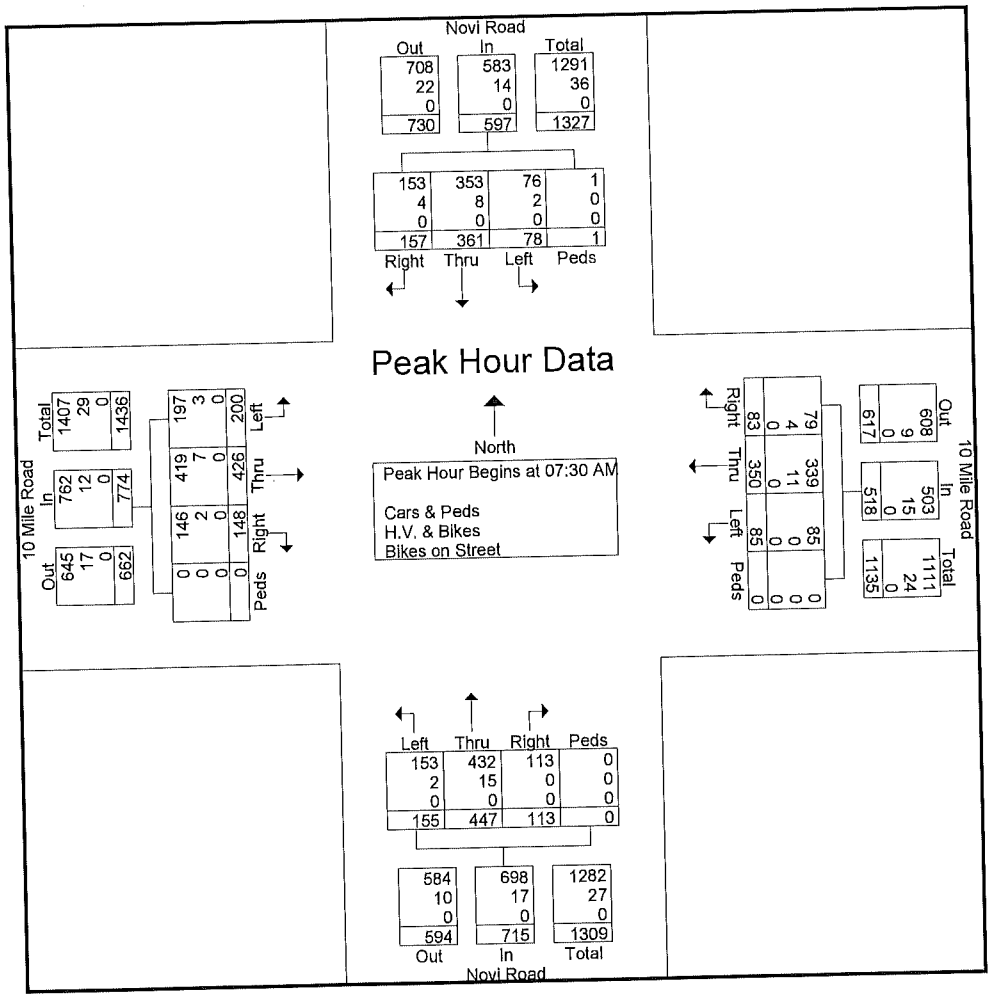
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Novi Road
Weather:

File Name : TMC_1001_10 Mile & Novi_Mar-16-2022
Site Code : 1001
Start Date : 3/16/2022
Page No : 3

	10 Mile Road Eastbound					10 Mile Road Westbound					Novi Road Northbound					Novi Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	59	103	30	0	192	14	89	19	0	122	32	98	26	0	156	10	82	43	0	135	605
07:45 AM	44	96	50	0	190	25	133	29	0	187	62	127	33	0	222	24	96	56	0	176	775
08:00 AM	59	108	42	0	209	26	78	15	0	119	29	106	23	0	158	21	95	27	1	144	630
08:15 AM	38	119	26	0	183	20	50	20	0	90	32	116	31	0	179	23	88	31	0	142	594
Total Volume	200	426	148	0	774	85	350	83	0	518	155	447	113	0	715	78	361	157	1	597	2604
% App. Total	25.8	55	19.1	0		16.4	67.6	16	0		21.7	62.5	15.8	0		13.1	60.5	26.3	0.2		
PHF	.847	.895	.740	.000	.926	.817	.658	.716	.000	.693	.625	.880	.856	.000	.805	.813	.940	.701	.250	.848	.840
Cars & Peds	197	419	146	0	762	85	339	79	0	503	153	432	113	0	698	76	353	153	1	583	2546
% Cars & Peds	98.5	98.4	98.6	0	98.4	100	96.9	95.2	0	97.1	98.7	96.6	100	0	97.6	97.4	97.8	97.5	100	97.7	97.8
H.V. & Bikes	3	7	2	0	12	0	11	4	0	15	2	15	0	0	17	2	8	4	0	14	58
% H.V. & Bikes	1.5	1.6	1.4	0	1.6	0	3.1	4.8	0	2.9	1.3	3.4	0	0	2.4	2.6	2.2	2.5	0	2.3	2.2
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



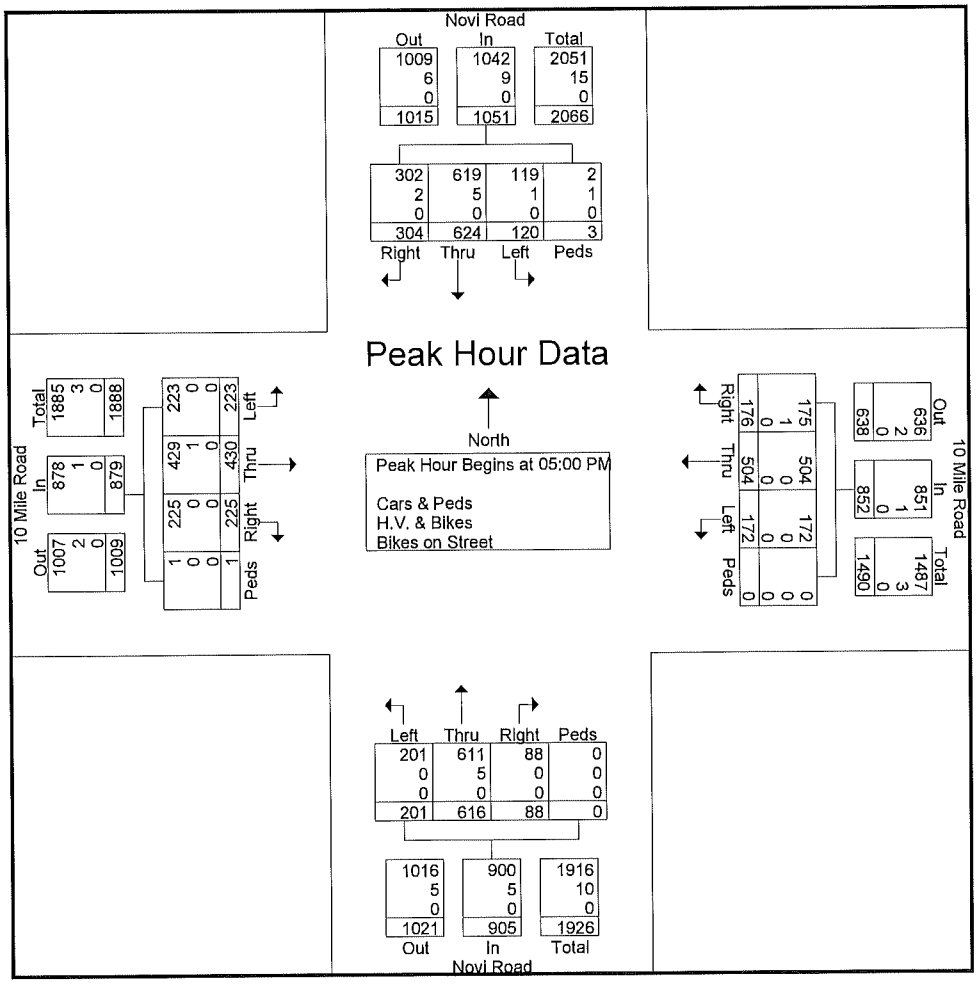
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Novi Road
Weather:

File Name : TMC_1001_10 Mile & Novi_Mar-16-2022
Site Code : 1001
Start Date : 3/16/2022
Page No : 4

	10 Mile Road Eastbound					10 Mile Road Westbound					Novi Road Northbound					Novi Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	52	103	54	0	209	39	142	48	0	229	49	159	22	0	230	23	159	83	0	265	933
05:15 PM	56	124	59	1	240	34	114	34	0	182	51	164	20	0	235	42	148	70	2	262	919
05:30 PM	54	104	66	0	224	65	139	42	0	246	43	136	22	0	201	27	159	66	0	252	923
05:45 PM	61	99	46	0	206	34	109	52	0	195	58	157	24	0	239	28	158	85	1	272	912
Total Volume	223	430	225	1	879	172	504	176	0	852	201	616	88	0	905	120	624	304	3	1051	3687
% App. Total	25.4	48.9	25.6	0.1		20.2	59.2	20.7	0		22.2	68.1	9.7	0		11.4	59.4	28.9	0.3		
PHF	.914	.867	.852	.250	.916	.662	.887	.846	.000	.866	.866	.939	.917	.000	.947	.714	.981	.894	.375	.966	.988
Cars & Peds	223	429	225	1	878	172	504	175	0	851	201	611	88	0	900	119	619	302	2	1042	3671
% Cars & Peds	100	99.8	100	100	99.9	100	100	99.4	0	99.9	100	99.2	100	0	99.4	99.2	99.2	99.3	66.7	99.1	99.6
H.V. & Bikes	0	1	0	0	1	0	0	1	0	1	0	5	0	0	5	1	5	2	1	9	16
% H.V. & Bikes	0	0.2	0	0	0.1	0	0	0.6	0	0.1	0	0.8	0	0	0.6	0.8	0.8	0.7	33.3	0.9	0.4
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Shared Driveway
Weather:

File Name : TMC_1002_10 Mile & Shared_Mar-16-2022
Site Code : 1002
Start Date : 3/16/2022
Page No : 1

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				Shared Driveway Northbound				Existing Driveway Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
*** BREAK ***																	
06:00 AM	1	33	0	0	0	33	1	0	0	0	0	0	0	0	0	0	68
06:15 AM	0	33	1	0	1	25	0	0	0	0	0	0	0	0	0	0	60
06:30 AM	2	63	0	0	0	44	0	0	0	0	0	0	0	0	0	0	109
06:45 AM	3	79	2	0	0	57	1	0	0	0	0	0	0	0	0	0	142
Total	6	208	3	0	1	159	2	0	0	0	0	0	0	0	0	0	379
07:00 AM	3	80	1	0	0	75	1	0	0	0	0	0	0	0	0	0	160
07:15 AM	0	126	2	0	0	70	0	0	0	0	0	0	0	0	0	0	198
07:30 AM	1	136	2	0	0	120	0	0	0	0	0	0	0	0	1	2	262
07:45 AM	0	144	6	0	2	182	0	0	1	0	2	0	0	0	1	1	339
Total	4	486	11	0	2	447	1	0	1	0	2	0	0	0	2	3	959
08:00 AM	0	151	0	0	0	105	0	0	1	0	2	0	0	0	0	0	259
08:15 AM	0	173	1	0	0	97	0	0	0	0	0	0	0	0	2	0	273
08:30 AM	1	155	1	0	0	83	0	0	0	0	1	1	0	0	2	1	245
08:45 AM	2	207	3	0	2	106	0	0	0	0	0	0	0	0	3	0	323
Total	3	686	5	0	2	391	0	0	1	0	3	1	0	0	7	1	1100
09:00 AM	0	143	1	0	1	112	1	1	0	0	1	1	0	0	2	0	263
09:15 AM	1	129	1	0	0	92	0	0	0	0	0	0	0	0	2	0	225
09:30 AM	1	121	1	0	1	92	1	0	1	0	1	0	0	0	0	0	219
09:45 AM	0	117	1	0	0	113	0	0	0	0	0	0	0	0	1	1	233
Total	2	510	4	0	2	409	2	1	1	0	2	1	0	0	5	1	940
10:00 AM	2	90	1	0	0	101	0	0	0	0	0	0	0	0	1	0	195
10:15 AM	0	94	1	0	0	111	0	0	1	0	0	0	0	0	0	0	207
10:30 AM	1	99	1	0	0	89	0	0	1	0	0	0	0	0	0	0	191
10:45 AM	0	99	2	0	1	91	0	0	1	0	1	0	0	0	0	1	196
Total	3	382	5	0	1	392	0	0	3	0	1	0	0	0	1	1	789
11:00 AM	1	89	1	0	1	107	0	0	1	0	2	0	0	0	0	0	202
11:15 AM	1	112	0	0	1	107	1	0	2	0	1	0	1	0	2	0	228
11:30 AM	0	127	2	0	0	99	1	0	0	0	1	0	1	0	2	0	233
11:45 AM	0	120	3	0	0	144	1	0	0	0	0	0	0	0	1	0	269
Total	2	448	6	0	2	457	3	0	3	0	4	0	2	0	5	0	932
12:00 PM	1	118	0	0	0	135	1	0	1	0	1	0	0	0	1	1	259
12:15 PM	1	100	0	0	0	146	0	0	1	0	0	0	2	0	1	0	251
12:30 PM	1	128	1	0	0	123	1	0	1	0	0	0	0	0	0	1	256
12:45 PM	1	125	0	0	1	148	1	0	2	0	1	0	0	0	1	2	282
Total	4	471	1	0	1	552	3	0	5	0	2	0	2	0	3	4	1048
01:00 PM	1	115	0	0	1	123	0	0	5	0	1	0	0	0	1	0	247
01:15 PM	0	117	2	0	0	127	1	1	1	0	0	1	0	0	1	0	251
01:30 PM	0	94	0	0	0	116	2	0	0	0	0	0	2	0	0	2	216
01:45 PM	0	99	3	0	1	136	0	0	0	0	0	0	1	0	1	2	243
Total	1	425	5	0	2	502	3	1	6	0	1	1	3	0	3	4	957
02:00 PM	0	126	2	0	0	133	0	1	1	0	0	1	0	0	0	1	265
02:15 PM	2	116	1	0	0	128	0	0	0	0	0	0	0	0	1	2	250
02:30 PM	1	160	0	0	1	148	0	0	1	0	0	0	0	0	2	1	314
02:45 PM	1	169	2	0	0	136	0	0	3	0	0	0	0	0	1	2	314
Total	4	571	5	0	1	545	0	1	5	0	0	1	0	0	4	6	1143
03:00 PM	0	146	0	0	1	165	1	0	1	0	0	0	0	0	0	0	314
03:15 PM	0	151	1	0	1	155	0	0	1	0	2	0	0	0	0	1	312
03:30 PM	2	144	0	0	0	156	0	0	1	0	1	0	0	0	1	2	307

Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Shared Driveway
Weather:

File Name : TMC_1002_10 Mile & Shared_Mar-16-2022
Site Code : 1002
Start Date : 3/16/2022
Page No : 2

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				Shared Driveway Northbound				Existing Driveway Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:45 PM	0	121	1	0	0	162	1	0	4	0	0	0	0	0	2	2	293
Total	2	562	2	0	2	638	2	0	7	0	3	0	0	0	3	5	1226
04:00 PM	0	129	2	0	1	177	0	0	1	0	3	0	0	0	0	4	317
04:15 PM	1	134	0	0	0	156	0	0	0	0	0	0	0	0	1	0	292
04:30 PM	1	133	0	0	0	212	0	0	0	0	0	0	0	0	2	3	351
04:45 PM	0	162	0	0	1	218	0	0	2	0	2	0	0	0	0	1	386
Total	2	558	2	0	2	763	0	0	3	0	5	0	0	0	3	8	1346
05:00 PM	2	141	1	0	0	219	0	0	2	0	5	0	0	0	3	4	377
05:15 PM	1	190	0	0	0	206	1	0	0	0	0	0	0	0	4	4	406
05:30 PM	3	154	0	0	0	212	0	0	0	0	0	0	0	0	2	3	374
05:45 PM	0	146	0	0	0	190	0	0	0	0	0	0	0	0	0	1	337
Total	6	631	1	0	0	827	1	0	2	0	5	0	0	0	9	12	1494
06:00 PM	0	146	0	0	0	171	0	0	0	0	0	0	0	0	0	6	323
06:15 PM	2	135	0	0	0	141	0	0	0	0	0	0	0	0	2	3	283
06:30 PM	2	134	0	1	0	138	0	0	0	0	0	0	0	0	1	2	278
06:45 PM	0	107	0	0	0	179	0	0	0	0	0	0	0	0	1	0	287
Total	4	522	0	1	0	629	0	0	0	0	0	0	0	0	4	11	1171
** PEAK ***																	
Grand Total	43	6460	50	1	18	6711	17	3	37	0	28	4	7	0	49	56	13484
Apprch %	0.7	98.6	0.8	0	0.3	99.4	0.3	0	53.6	0	40.6	5.8	6.2	0	43.8	50	
Total %	0.3	47.9	0.4	0	0.1	49.8	0.1	0	0.3	0	0.2	0	0.1	0	0.4	0.4	
Cars & Peds	41	6370	50	0	18	6609	17	3	37	0	28	3	7	0	47	39	13269
% Cars & Peds	95.3	98.6	100	0	100	98.5	100	100	100	0	100	75	100	0	95.9	69.6	98.4
H.V. & Bikes	2	89	0	1	0	102	0	0	0	0	0	1	0	0	2	17	214
% H.V. & Bikes	4.7	1.4	0	100	0	1.5	0	0	0	0	0	25	0	0	4.1	30.4	1.6
Bikes on Street	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Shared Driveway
Weather:

File Name : TMC_1002_10 Mile & Shared_Mar-16-2022
Site Code : 1002
Start Date : 3/16/2022
Page No : 3

	10 Mile Road Eastbound					10 Mile Road Westbound					Shared Driveway Northbound					Existing Driveway Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	1	136	2	0	139	0	120	0	0	120	0	0	0	0	0	0	0	1	2	3	262
07:45 AM	0	144	6	0	150	2	182	0	0	184	1	0	2	0	3	0	0	1	1	2	339
08:00 AM	0	151	0	0	151	0	105	0	0	105	1	0	2	0	3	0	0	0	0	0	259
08:15 AM	0	173	1	0	174	0	97	0	0	97	0	0	0	0	0	0	0	2	0	2	273
Total Volume	1	604	9	0	614	2	504	0	0	506	2	0	4	0	6	0	0	4	3	7	1133
% App. Total	0.2	98.4	1.5	0		0.4	99.6	0	0		33.3	0	66.7	0		0	0	57.1	42.9		
PHF	.250	.873	.375	.000	.882	.250	.692	.000	.000	.688	.500	.000	.500	.000	.500	.000	.000	.500	.375	.583	.836
Cars & Peds	1	593	9	0	603	2	492	0	0	494	2	0	4	0	6	0	0	4	2	6	1109
% Cars & Peds	100	98.2	100	0	98.2	100	97.6	0	0	97.6	100	0	100	0	100	0	0	100	66.7	85.7	97.9
H.V. & Bikes	0	10	0	0	10	0	12	0	0	12	0	0	0	0	0	0	0	0	1	1	23
% H.V. & Bikes	0	1.7	0	0	1.6	0	2.4	0	0	2.4	0	0	0	0	0	0	0	0	33.3	14.3	2.0
Bikes on Street	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Bikes on Street	0	0.2	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1

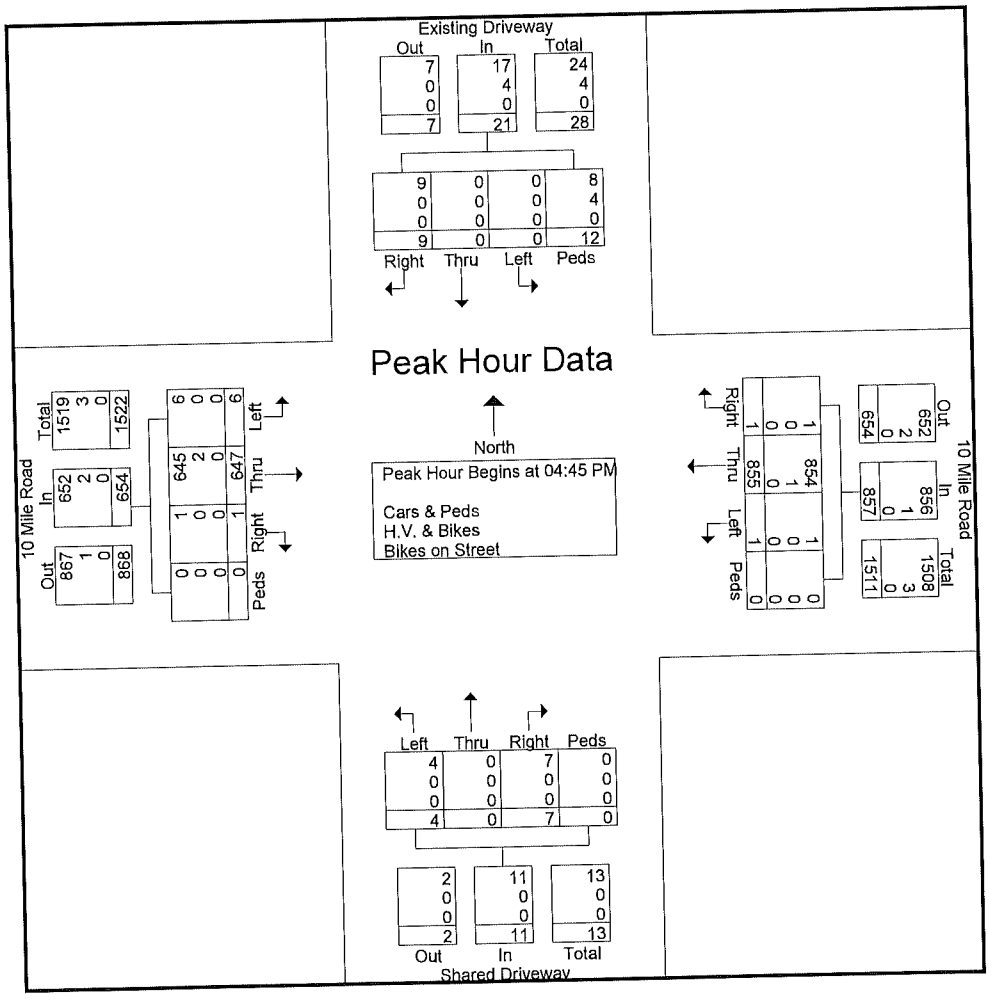
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Shared Driveway
Weather:

File Name : TMC_1002_10 Mile & Shared_Mar-16-2022
Site Code : 1002
Start Date : 3/16/2022
Page No : 4

	10 Mile Road Eastbound					10 Mile Road Westbound					Shared Driveway Northbound					Existing Driveway Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	162	0	0	162	1	218	0	0	219	2	0	2	0	4	0	0	0	1	1	386
05:00 PM	2	141	1	0	144	0	219	0	0	219	2	0	5	0	7	0	0	3	4	7	377
05:15 PM	1	190	0	0	191	0	206	1	0	207	0	0	0	0	0	0	0	4	4	8	406
05:30 PM	3	154	0	0	157	0	212	0	0	212	0	0	0	0	0	0	0	2	3	5	374
Total Volume	6	647	1	0	654	1	855	1	0	857	4	0	7	0	11	0	0	9	12	21	1543
% App. Total	0.9	98.9	0.2	0		0.1	99.8	0.1	0		36.4	0	63.6	0		0	0	42.9	57.1		
PHF	.500	.851	.250	.000	.856	.250	.976	.250	.000	.978	.500	.000	.350	.000	.393	.000	.000	.563	.750	.656	.950
Cars & Peds	6	645	1	0	652	1	854	1	0	856	4	0	7	0	11	0	0	9	8	17	1536
% Cars & Peds	100	99.7	100	0	99.7	100	99.9	100	0	99.9	100	0	100	0	100	0	0	100	66.7	81.0	99.5
H.V. & Bikes	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	4	4	7
% H.V. & Bikes	0	0.3	0	0	0.3	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	33.3	19.0	0.5
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Catherine
Weather:

File Name : TMC_1003_10 Mile & Catherine_Mar-16-2022
Site Code : 1003
Start Date : 3/16/2022
Page No : 1

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				Site Driveway #2 Northbound				Catherine Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
*** BREAK ***																	
06:00 AM	0	34	0	0	0	34	0	0	0	0	0	0	0	0	0	0	68
06:15 AM	1	32	0	0	0	28	1	0	0	0	0	0	0	0	0	0	62
06:30 AM	2	60	0	0	0	45	0	0	0	0	0	0	0	0	0	0	107
06:45 AM	5	73	0	0	0	56	9	0	0	0	0	0	1	0	1	0	145
Total	8	199	0	0	0	163	10	0	0	0	0	0	1	0	1	0	382
07:00 AM	1	80	0	0	0	78	4	0	0	0	0	0	3	0	1	0	167
07:15 AM	8	117	0	0	0	72	1	0	0	0	0	0	1	0	3	0	202
07:30 AM	5	129	0	0	0	118	1	0	0	0	0	0	0	0	2	2	257
07:45 AM	2	144	0	0	0	185	2	0	0	0	0	0	0	0	4	1	338
Total	16	470	0	0	0	453	8	0	0	0	0	0	4	0	10	3	964
08:00 AM	9	140	0	0	0	104	7	0	0	0	0	0	2	0	2	0	264
08:15 AM	8	167	0	0	0	92	2	0	0	0	0	0	0	0	3	0	272
08:30 AM	9	142	0	0	0	81	4	0	0	0	0	0	3	0	2	2	243
08:45 AM	5	202	0	0	0	108	0	0	0	0	0	0	2	0	0	0	317
Total	31	651	0	0	0	385	13	0	0	0	0	0	7	0	7	2	1096
09:00 AM	7	135	0	0	0	109	6	0	0	0	0	0	0	0	5	1	263
09:15 AM	6	125	0	0	0	87	4	0	0	0	0	0	0	0	5	0	227
09:30 AM	8	112	0	0	0	95	2	0	0	0	0	0	2	0	4	0	223
09:45 AM	9	108	0	0	0	108	2	0	0	0	0	0	0	0	2	1	230
Total	30	480	0	0	0	399	14	0	0	0	0	0	2	0	16	2	943
10:00 AM	5	85	0	0	0	95	5	0	0	0	0	0	1	0	8	1	200
10:15 AM	7	86	0	0	0	111	1	0	0	0	0	0	2	0	1	0	208
10:30 AM	0	96	0	0	0	89	3	0	0	0	0	0	1	0	2	0	191
10:45 AM	8	91	0	0	0	88	4	0	0	0	0	0	0	0	5	1	197
Total	20	358	0	0	0	383	13	0	0	0	0	0	4	0	16	2	796
11:00 AM	2	88	0	0	0	106	3	0	0	0	0	0	2	0	3	0	204
11:15 AM	3	110	0	0	0	103	4	0	0	0	0	0	1	0	5	0	226
11:30 AM	9	115	0	0	0	99	2	0	0	0	0	0	1	0	3	1	230
11:45 AM	4	120	0	0	0	139	1	0	0	0	0	0	5	0	5	0	274
Total	18	433	0	0	0	447	10	0	0	0	0	0	9	0	16	1	934
12:00 PM	2	116	0	0	0	131	6	0	0	0	0	0	1	0	8	1	265
12:15 PM	3	98	0	0	0	135	2	0	0	0	0	0	3	0	9	0	250
12:30 PM	3	124	0	0	0	123	9	0	0	0	0	0	4	0	2	0	265
12:45 PM	2	125	0	0	0	148	2	0	0	0	0	0	2	0	3	2	284
Total	10	463	0	0	0	537	19	0	0	0	0	0	10	0	22	3	1064
01:00 PM	4	112	0	0	0	119	3	0	0	0	0	0	2	0	5	0	245
01:15 PM	6	111	0	0	0	122	5	0	0	0	0	0	3	0	4	1	252
01:30 PM	3	93	0	0	0	115	4	0	0	0	0	0	3	0	8	0	226
01:45 PM	2	98	0	0	0	134	2	0	0	0	0	0	2	0	2	2	242
Total	15	414	0	0	0	490	14	0	0	0	0	0	10	0	19	3	965
02:00 PM	4	122	0	0	0	124	0	0	0	0	0	0	3	0	7	2	262
02:15 PM	0	114	0	0	0	125	1	0	0	0	0	0	5	0	6	2	253
02:30 PM	5	155	0	0	0	147	2	0	0	0	0	0	3	0	3	1	316
02:45 PM	5	153	0	0	0	127	3	0	0	0	0	0	3	0	6	2	299
Total	14	544	0	0	0	523	6	0	0	0	0	0	14	0	22	7	1130
03:00 PM	8	145	0	0	0	161	2	0	0	0	0	0	3	0	15	0	334
03:15 PM	4	148	0	0	0	146	4	0	0	0	0	0	5	0	9	1	317
03:30 PM	3	143	0	0	0	147	7	0	0	0	0	0	2	0	16	2	320

Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Catherine
Weather:

File Name : TMC_1003_10 Mile & Catherine_Mar-16-2022
Site Code : 1003
Start Date : 3/16/2022
Page No : 2

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				Site Driveway #2 Northbound				Catherine Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:45 PM	7	113	0	0	0	154	4	0	0	0	0	0	5	0	6	3	292
Total	22	549	0	0	0	608	17	0	0	0	0	0	15	0	46	6	1263
04:00 PM	5	126	0	0	0	164	3	0	0	0	0	0	2	0	12	3	315
04:15 PM	5	124	0	0	0	153	4	0	0	0	0	0	3	0	7	0	296
04:30 PM	4	127	0	0	0	206	3	0	0	0	0	0	0	0	9	3	352
04:45 PM	11	155	0	0	0	214	2	0	0	0	0	0	6	0	8	1	397
Total	25	532	0	0	0	737	12	0	0	0	0	0	11	0	36	7	1360
05:00 PM	4	140	0	0	0	205	2	0	0	0	0	0	5	0	17	5	378
05:15 PM	3	187	0	0	0	205	4	0	0	0	0	0	2	0	7	4	412
05:30 PM	4	149	0	0	0	200	0	0	0	0	0	0	7	0	12	2	374
05:45 PM	8	138	0	0	0	180	1	0	0	0	0	0	0	0	12	2	341
Total	19	614	0	0	0	790	7	0	0	0	0	0	14	0	48	13	1505
06:00 PM	2	141	0	0	0	164	1	0	0	0	0	0	3	0	7	7	325
06:15 PM	0	136	0	0	0	141	0	0	0	0	0	0	1	0	1	1	280
06:30 PM	3	129	0	0	0	136	1	0	0	0	0	0	1	0	3	4	277
06:45 PM	1	108	0	0	0	173	1	0	0	0	0	0	2	0	4	0	289
Total	6	514	0	0	0	614	3	0	0	0	0	0	7	0	15	12	1171
** EAK ***																	
Grand Total	234	6221	0	0	0	6529	146	0	0	0	0	0	108	0	274	61	13573
Apprch %	3.6	96.4	0	0	0	97.8	2.2	0	0	0	0	0	24.4	0	61.9	13.8	
Total %	1.7	45.8	0	0	0	48.1	1.1	0	0	0	0	0	0.8	0	2	0.4	
Cars & Peds	226	6134	0	0	0	6426	145	0	0	0	0	0	106	0	266	46	13349
% Cars & Peds	96.6	98.6	0	0	0	98.4	99.3	0	0	0	0	0	98.1	0	97.1	75.4	98.3
H.V. & Bikes	8	87	0	0	0	102	1	0	0	0	0	0	2	0	8	15	223
% H.V. & Bikes	3.4	1.4	0	0	0	1.6	0.7	0	0	0	0	0	1.9	0	2.9	24.6	1.6
Bikes on Street	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

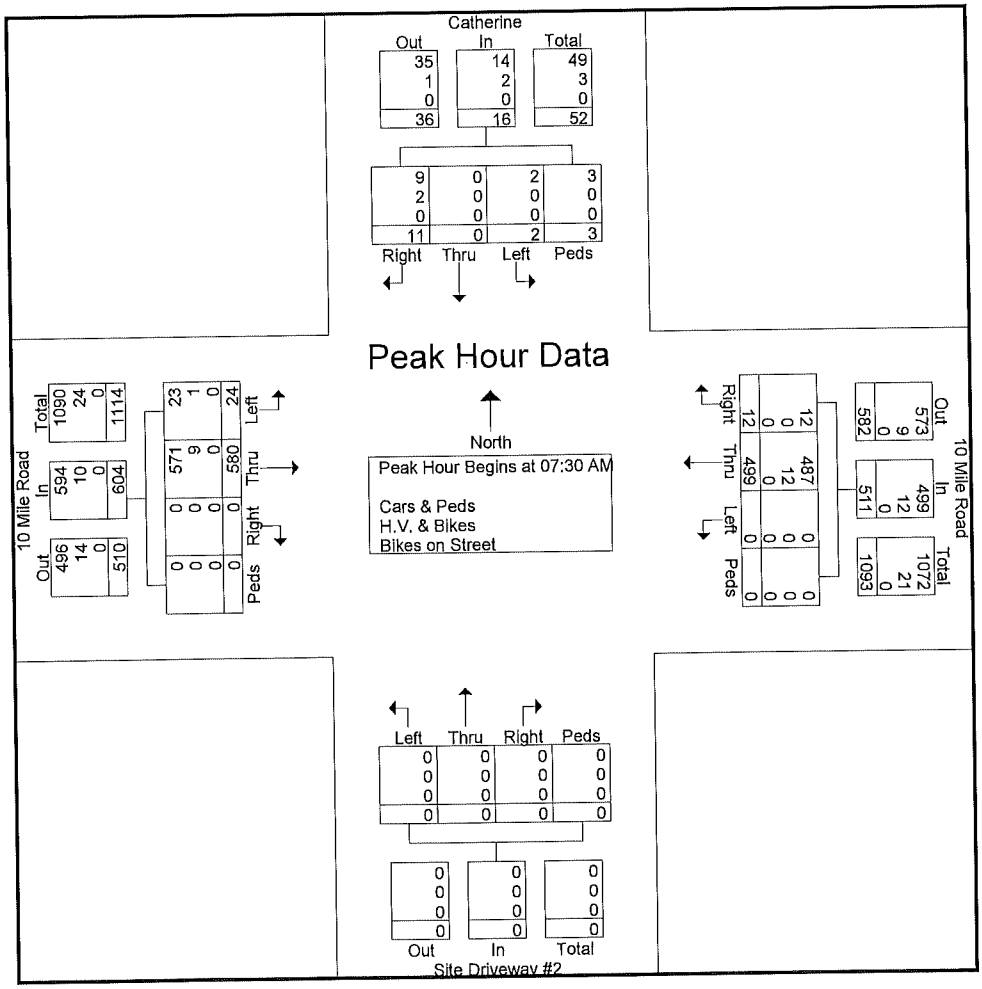
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Catherine
Weather:

File Name : TMC_1003_10 Mile & Catherine_Mar-16-2022
Site Code : 1003
Start Date : 3/16/2022
Page No : 3

	10 Mile Road Eastbound					10 Mile Road Westbound					Site Driveway #2 Northbound					Catherine Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	5	129	0	0	134	0	118	1	0	119	0	0	0	0	0	0	0	2	2	4	257
07:45 AM	2	144	0	0	146	0	185	2	0	187	0	0	0	0	0	0	0	4	1	5	338
08:00 AM	9	140	0	0	149	0	104	7	0	111	0	0	0	0	0	2	0	2	0	4	264
08:15 AM	8	167	0	0	175	0	92	2	0	94	0	0	0	0	0	0	0	3	0	3	272
Total Volume	24	580	0	0	604	0	499	12	0	511	0	0	0	0	0	2	0	11	3	16	1131
% App. Total	4	96	0	0		0	97.7	2.3	0		0	0	0	0		12.5	0	68.8	18.8		
PHF	.667	.868	.000	.000	.863	.000	.674	.429	.000	.683	.000	.000	.000	.000	.000	.250	.000	.688	.375	.800	.837
Cars & Peds	23	571	0	0	594	0	487	12	0	499	0	0	0	0	0	2	0	9	3	14	1107
% Cars & Peds	95.8	98.4	0	0	98.3	0	97.6	100	0	97.7	0	0	0	0	0	100	0	81.8	100	87.5	97.9
H.V. & Bikes	1	9	0	0	10	0	12	0	0	12	0	0	0	0	0	0	0	2	0	2	24
% H.V. & Bikes	4.2	1.6	0	0	1.7	0	2.4	0	0	2.3	0	0	0	0	0	0	0	18.2	0	12.5	2.1
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



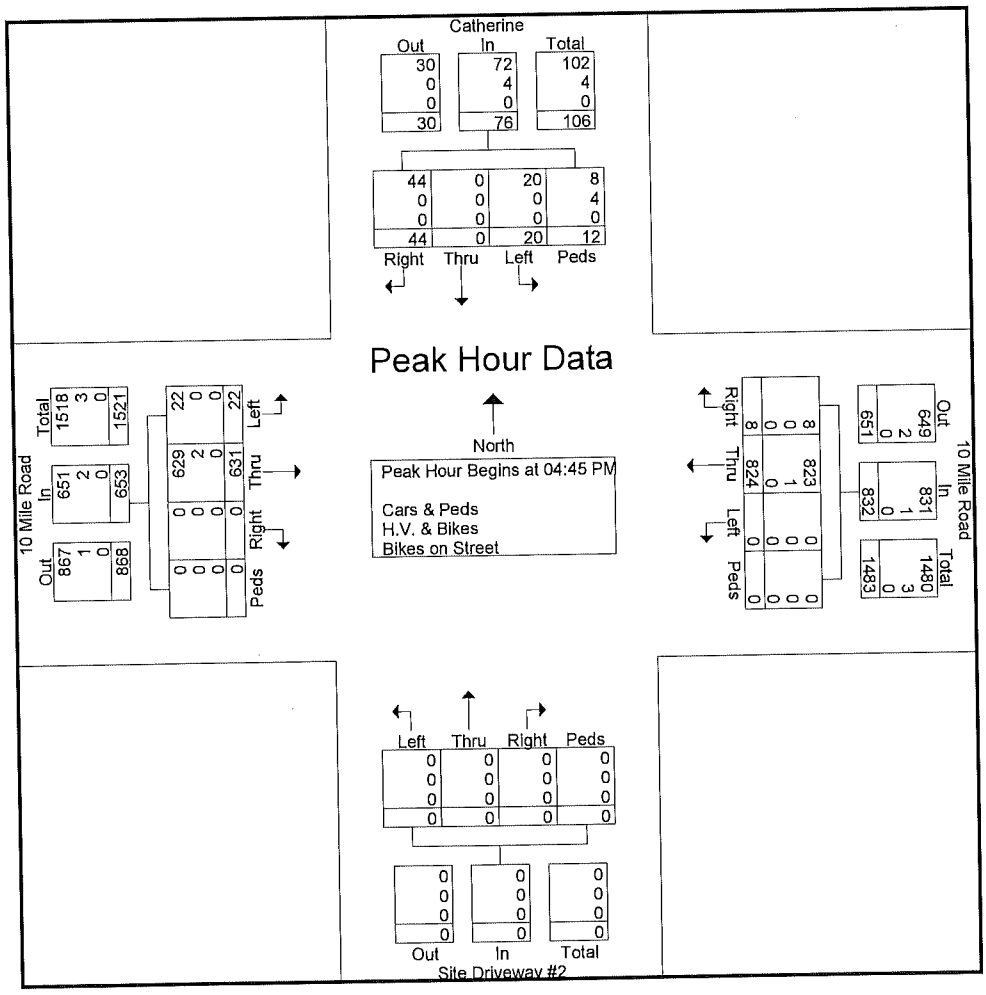
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Catherine
Weather:

File Name : TMC_1003_10 Mile & Catherine_Mar-16-2022
Site Code : 1003
Start Date : 3/16/2022
Page No : 4

	10 Mile Road Eastbound					10 Mile Road Westbound					Site Driveway #2 Northbound					Catherine Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	11	155	0	0	166	0	214	2	0	216	0	0	0	0	0	6	0	8	1	15	397
05:00 PM	4	140	0	0	144	0	205	2	0	207	0	0	0	0	0	5	0	17	5	27	378
05:15 PM	3	187	0	0	190	0	205	4	0	209	0	0	0	0	0	2	0	7	4	13	412
05:30 PM	4	149	0	0	153	0	200	0	0	200	0	0	0	0	0	7	0	12	2	21	374
Total Volume	22	631	0	0	653	0	824	8	0	832	0	0	0	0	0	20	0	44	12	76	1561
% App. Total	3.4	96.6	0	0		0	99	1	0		0	0	0	0		26.3	0	57.9	15.8		
PHF	.500	.844	.000	.000	.859	.000	.963	.500	.000	.963	.000	.000	.000	.000	.000	.714	.000	.647	.600	.704	.947
Cars & Peds	22	629	0	0	651	0	823	8	0	831	0	0	0	0	0	20	0	44	8	72	1554
% Cars & Peds	100	99.7	0	0	99.7	0	99.9	100	0	99.9	0	0	0	0	0	100	0	100	66.7	94.7	99.6
H.V. & Bikes	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	4	4	7
% H.V. & Bikes	0	0.3	0	0	0.3	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	33.3	5.3	0.4
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: 42900-42916 Driveways
Weather:

File Name : TMC_1004_10 Mile & DD_Mar-16-2022
Site Code : 1004
Start Date : 3/16/2022
Page No : 1

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				Site Driveway #3 Northbound				42900-42916 Driveways Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
*** BREAK ***																	
07:00 AM	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
07:15 AM	1	0	0	0	0	0	4	0	0	0	0	0	2	0	0	2	9
07:30 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	1	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	4
Total	6	0	0	0	0	0	7	0	0	0	0	0	2	0	3	4	22
08:00 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
08:15 AM	1	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	7
08:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Total	3	0	0	0	0	0	4	0	0	0	0	0	0	0	5	0	12
*** BREAK ***																	
04:00 PM	2	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	5
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	3
04:45 PM	1	0	0	0	0	0	3	0	0	0	0	0	0	0	2	1	7
Total	3	0	0	0	0	0	4	0	0	0	0	0	1	0	6	3	17
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	4	10
05:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	5
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3
05:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3
Total	2	0	0	0	0	0	0	0	0	0	0	0	1	0	7	11	21
*** BREAK ***																	
Grand Total	14	0	0	0	0	0	15	0	0	0	0	0	4	0	21	18	72
Apprch %	100	0	0	0	0	0	100	0	0	0	0	0	9.3	0	48.8	41.9	
Total %	19.4	0	0	0	0	0	20.8	0	0	0	0	0	5.6	0	29.2	25	
Cars & Peds	13	0	0	0	0	0	15	0	0	0	0	0	4	0	21	11	64
% Cars & Peds	92.9	0	0	0	0	0	100	0	0	0	0	0	100	0	100	61.1	88.9
H.V. & Bikes	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	8
% H.V. & Bikes	7.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38.9	11.1
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

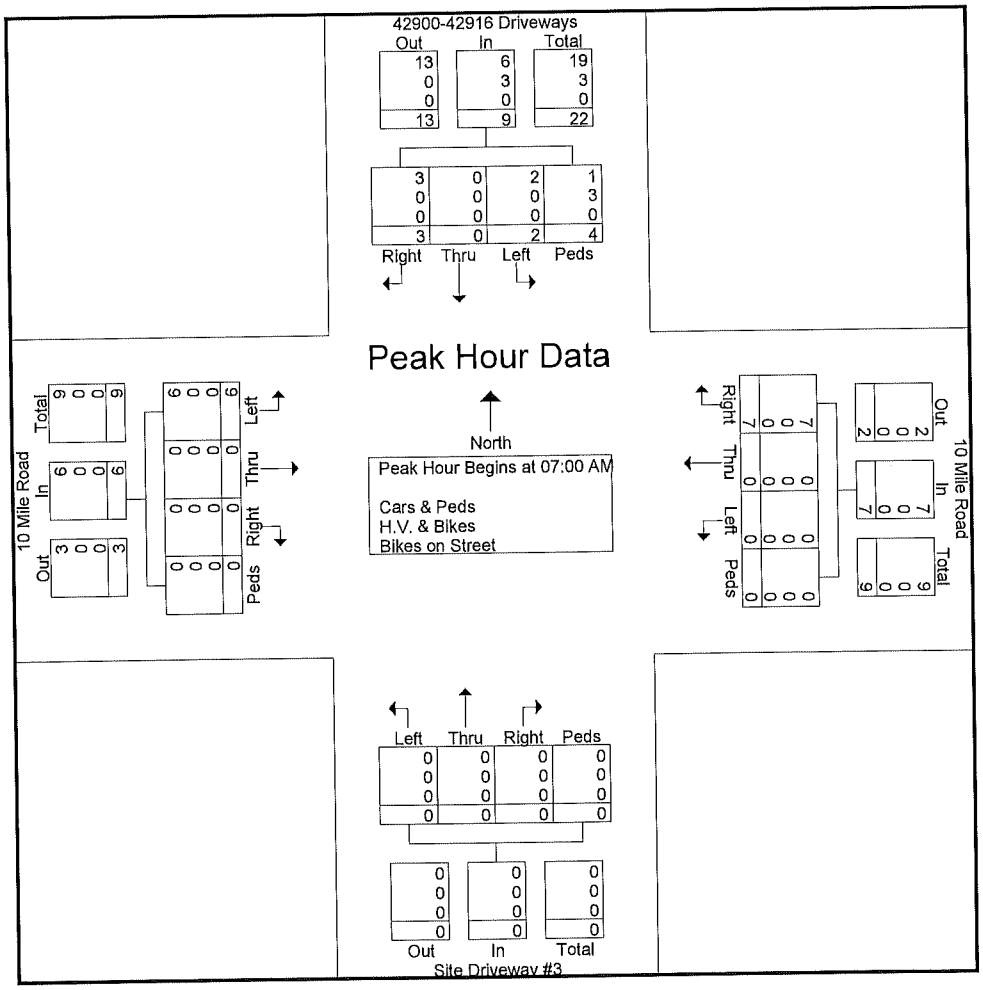
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: 42900-42916 Driveways
Weather:

File Name : TMC_1004_10 Mile & DD_Mar-16-2022
Site Code : 1004
Start Date : 3/16/2022
Page No : 2

	10 Mile Road Eastbound					10 Mile Road Westbound					Site Driveway #3 Northbound					42900-42916 Driveways Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
07:15 AM	1	0	0	0	1	0	0	4	0	4	0	0	0	0	0	2	0	0	2	4	9
07:30 AM	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	1	1	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	4	4
Total Volume	6	0	0	0	6	0	0	7	0	7	0	0	0	0	0	2	0	3	4	9	22
% App. Total	100	0	0	0		0	0	100	0		0	0	0	0		22.2	0	33.3	44.4		
PHF	.300	.000	.000	.000	.300	.000	.000	.438	.000	.438	.000	.000	.000	.000	.000	.250	.000	.250	.500	.563	.611
Cars & Peds	6	0	0	0	6	0	0	7	0	7	0	0	0	0	0	2	0	3	1	6	19
% Cars & Peds	100	0	0	0	100	0	0	100	0	100	0	0	0	0	0	100	0	100	25.0	66.7	86.4
H.V. & Bikes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3
% H.V. & Bikes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75.0	33.3	13.6
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



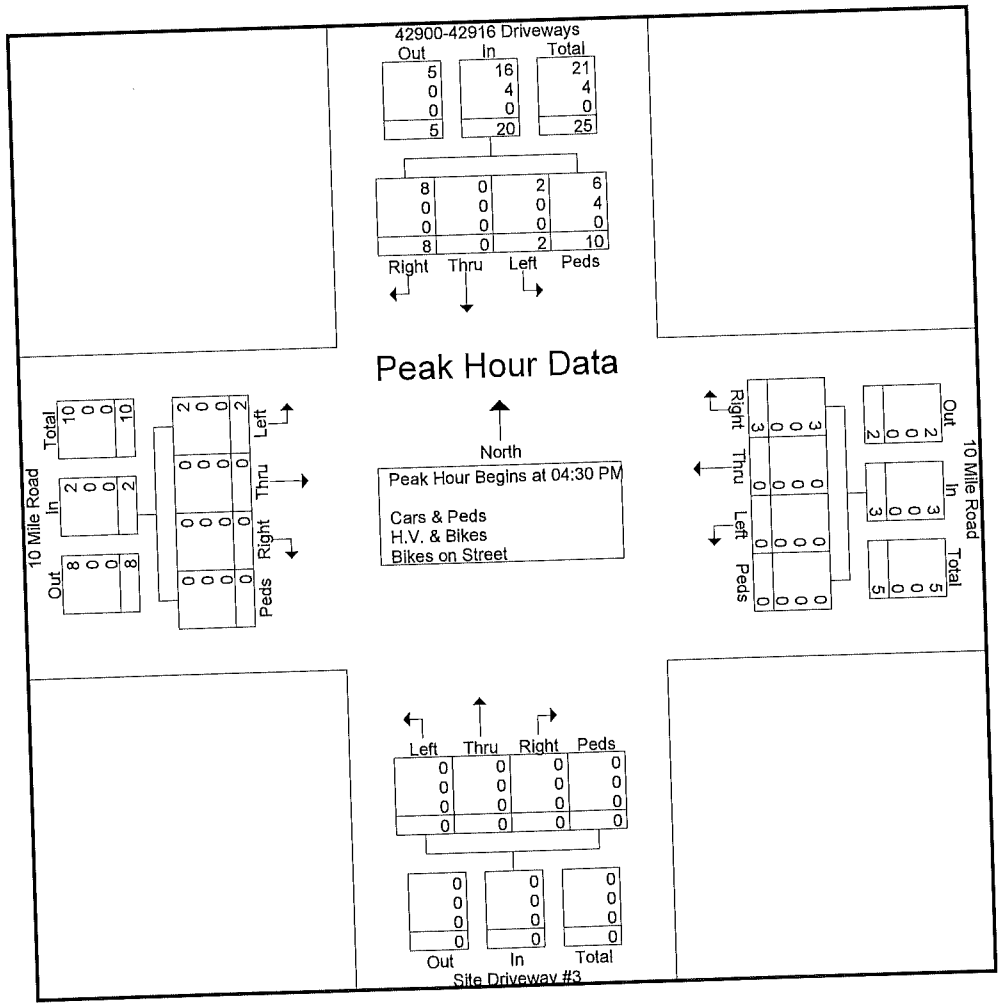
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: 42900-42916 Driveways
Weather:

File Name : TMC_1004_10 Mile & DD_Mar-16-2022
Site Code : 1004
Start Date : 3/16/2022
Page No : 3

	10 Mile Road Eastbound					10 Mile Road Westbound					Site Driveway #3 Northbound					42900-42916 Driveways Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	3	3
04:45 PM	1	0	0	0	1	0	0	3	0	3	0	0	0	0	0	0	0	2	1	3	7
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	4	10	10
05:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	5
Total Volume	2	0	0	0	2	0	0	3	0	3	0	0	0	0	0	2	0	8	10	20	25
% App. Total	100	0	0	0		0	0	100	0		0	0	0	0		10	0	40	50		
PHF	.500	.000	.000	.000	.500	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.400	.625	.500	.625
Cars & Peds	2	0	0	0	2	0	0	3	0	3	0	0	0	0	0	2	0	8	6	16	21
% Cars & Peds	100	0	0	0	100	0	0	100	0	100	0	0	0	0	0	100	0	100	60.0	80.0	84.0
H.V. & Bikes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
% H.V. & Bikes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40.0	20.0	16.0
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Tremar
Weather:

File Name : TMC_1006_10 Mile & Tremar_Mar-16-2022
Site Code : 1006
Start Date : 3/16/2022
Page No : 1

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				None Northbound				Tremar Driveway Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
*** BREAK ***																	
06:00 AM	0	35	0	0	0	34	0	0	0	0	0	0	0	0	0	0	69
06:15 AM	0	31	0	0	0	28	0	0	0	0	0	0	0	0	0	0	59
06:30 AM	0	58	0	0	0	47	0	0	0	0	0	0	0	0	0	0	105
06:45 AM	0	70	0	0	0	67	0	0	0	0	0	0	0	0	0	0	137
Total	0	194	0	0	0	176	0	0	0	0	0	0	0	0	0	0	370
07:00 AM	0	79	0	0	0	81	0	0	0	0	0	0	0	0	0	0	160
07:15 AM	0	120	0	0	0	73	2	0	0	0	0	0	0	0	0	0	195
07:30 AM	1	122	0	0	0	120	3	0	0	0	0	0	0	0	1	1	248
07:45 AM	0	151	0	0	0	189	0	0	0	0	0	0	0	0	0	1	341
Total	1	472	0	0	0	463	5	0	0	0	0	0	0	0	1	2	944
08:00 AM	0	135	0	0	0	111	1	0	0	0	0	0	0	0	0	0	247
08:15 AM	1	169	0	0	0	88	0	0	0	0	0	0	0	0	1	0	259
08:30 AM	1	143	0	0	0	85	2	0	0	0	0	0	1	0	0	2	234
08:45 AM	0	210	0	0	0	110	0	0	0	0	0	0	0	0	0	0	320
Total	2	657	0	0	0	394	3	0	0	0	0	0	1	0	1	2	1060
09:00 AM	1	127	0	0	0	115	0	0	0	0	0	0	0	0	1	1	245
09:15 AM	0	128	0	0	0	89	0	0	0	0	0	0	0	0	0	0	217
09:30 AM	2	108	0	0	0	96	0	0	0	0	0	0	0	0	0	0	206
09:45 AM	1	116	0	0	0	109	0	0	0	0	0	0	1	0	1	1	229
Total	4	479	0	0	0	409	0	0	0	0	0	0	1	0	2	2	897
10:00 AM	0	83	0	0	0	98	0	0	0	0	0	0	0	0	0	2	183
10:15 AM	0	90	0	0	0	111	1	0	0	0	0	0	0	0	0	1	203
10:30 AM	0	95	0	0	0	92	0	0	0	0	0	0	0	0	1	0	188
10:45 AM	0	97	0	0	0	92	0	0	0	0	0	0	0	0	0	1	190
Total	0	365	0	0	0	393	1	0	0	0	0	0	0	0	1	4	764
11:00 AM	0	86	0	0	0	110	2	0	0	0	0	0	0	0	2	0	200
11:15 AM	0	114	0	0	0	105	0	0	0	0	0	0	1	0	0	0	220
11:30 AM	0	110	0	0	0	101	1	0	0	0	0	0	0	0	0	1	213
11:45 AM	1	130	0	0	0	136	0	0	0	0	0	0	0	0	1	0	268
Total	1	440	0	0	0	452	3	0	0	0	0	0	1	0	3	1	901
12:00 PM	0	111	0	0	0	135	1	0	0	0	0	0	0	0	0	1	248
12:15 PM	0	104	0	0	0	131	0	0	0	0	0	0	0	0	0	0	235
12:30 PM	0	124	0	0	0	133	0	0	0	0	0	0	0	0	1	0	258
12:45 PM	1	130	0	0	0	147	0	0	0	0	0	0	1	0	0	2	281
Total	1	469	0	0	0	546	1	0	0	0	0	0	1	0	1	3	1022
01:00 PM	1	107	0	0	0	121	0	0	0	0	0	0	0	0	1	0	230
01:15 PM	0	120	0	0	0	123	1	0	0	0	0	0	0	0	0	1	245
01:30 PM	0	93	0	0	0	122	0	0	0	0	0	0	0	0	0	0	215
01:45 PM	0	100	0	0	0	129	0	0	0	0	0	0	0	0	2	3	234
Total	1	420	0	0	0	495	1	0	0	0	0	0	0	0	3	4	924
02:00 PM	0	119	0	0	0	126	0	0	0	0	0	0	0	0	0	0	245
02:15 PM	1	124	0	0	0	121	0	0	0	0	0	0	1	0	0	2	249
02:30 PM	0	155	0	0	0	153	0	0	0	0	0	0	0	0	0	1	309
02:45 PM	2	137	0	0	0	122	0	0	0	0	0	0	1	0	1	2	265
Total	3	535	0	0	0	522	0	0	0	0	0	0	2	0	1	5	1068
3:00 PM	0	163	0	0	0	163	0	0	0	0	0	0	0	0	0	0	326
03:15 PM	0	158	0	0	0	148	1	0	0	0	0	0	1	0	0	1	309
03:30 PM	1	137	0	0	0	153	0	0	0	0	0	0	0	0	1	2	294

Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Tremar
Weather:

File Name : TMC_1006_10 Mile & Tremar_Mar-16-2022
Site Code : 1006
Start Date : 3/16/2022
Page No : 2

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				None Northbound				Tremar Driveway Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:45 PM	0	121	0	0	0	153	0	0	0	0	0	0	0	0	0	5	279
Total	1	579	0	0	0	617	1	0	0	0	0	0	1	0	1	8	1208
04:00 PM	1	129	0	0	0	166	0	0	0	0	0	0	0	0	0	3	299
04:15 PM	0	131	0	0	0	155	0	0	0	0	0	0	0	0	1	1	288
04:30 PM	1	122	0	0	0	211	0	0	0	0	0	0	3	0	1	1	339
04:45 PM	0	164	0	0	0	213	0	0	0	0	0	0	1	0	0	1	379
Total	2	546	0	0	0	745	0	0	0	0	0	0	4	0	2	6	1305
05:00 PM	0	142	0	0	0	201	0	0	0	0	0	0	1	0	1	2	347
05:15 PM	0	194	0	0	0	206	0	0	0	0	0	0	0	0	1	4	405
05:30 PM	0	150	0	0	0	201	0	0	0	0	0	0	0	0	1	2	354
05:45 PM	0	143	0	0	0	179	0	0	0	0	0	0	1	0	0	2	325
Total	0	629	0	0	0	787	0	0	0	0	0	0	2	0	3	10	1431
06:00 PM	0	142	0	0	0	163	0	0	0	0	0	0	0	0	0	6	311
06:15 PM	0	137	0	0	0	142	0	0	0	0	0	0	0	0	0	0	279
06:30 PM	0	127	0	0	0	138	0	0	0	0	0	0	0	0	0	2	267
06:45 PM	0	115	0	0	0	172	0	0	0	0	0	0	0	0	0	0	287
Total	0	521	0	0	0	615	0	0	0	0	0	0	0	0	0	8	1144
** PEAK ***																	
Grand Total	16	6306	0	0	0	6614	15	0	0	0	0	0	13	0	19	55	13038
Apprch %	0.3	99.7	0	0	0	99.8	0.2	0	0	0	0	0	14.9	0	21.8	63.2	
Total %	0.1	48.4	0	0	0	50.7	0.1	0	0	0	0	0	0.1	0	0.1	0.4	
Cars & Peds	15	6221	0	0	0	6513	14	0	0	0	0	0	13	0	16	39	12831
% Cars & Peds	93.8	98.7	0	0	0	98.5	93.3	0	0	0	0	0	100	0	84.2	70.9	98.4
H.V. & Bikes	1	85	0	0	0	100	1	0	0	0	0	0	0	0	3	16	206
% H.V. & Bikes	6.2	1.3	0	0	0	1.5	6.7	0	0	0	0	0	0	0	15.8	29.1	1.6
Bikes on Street	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

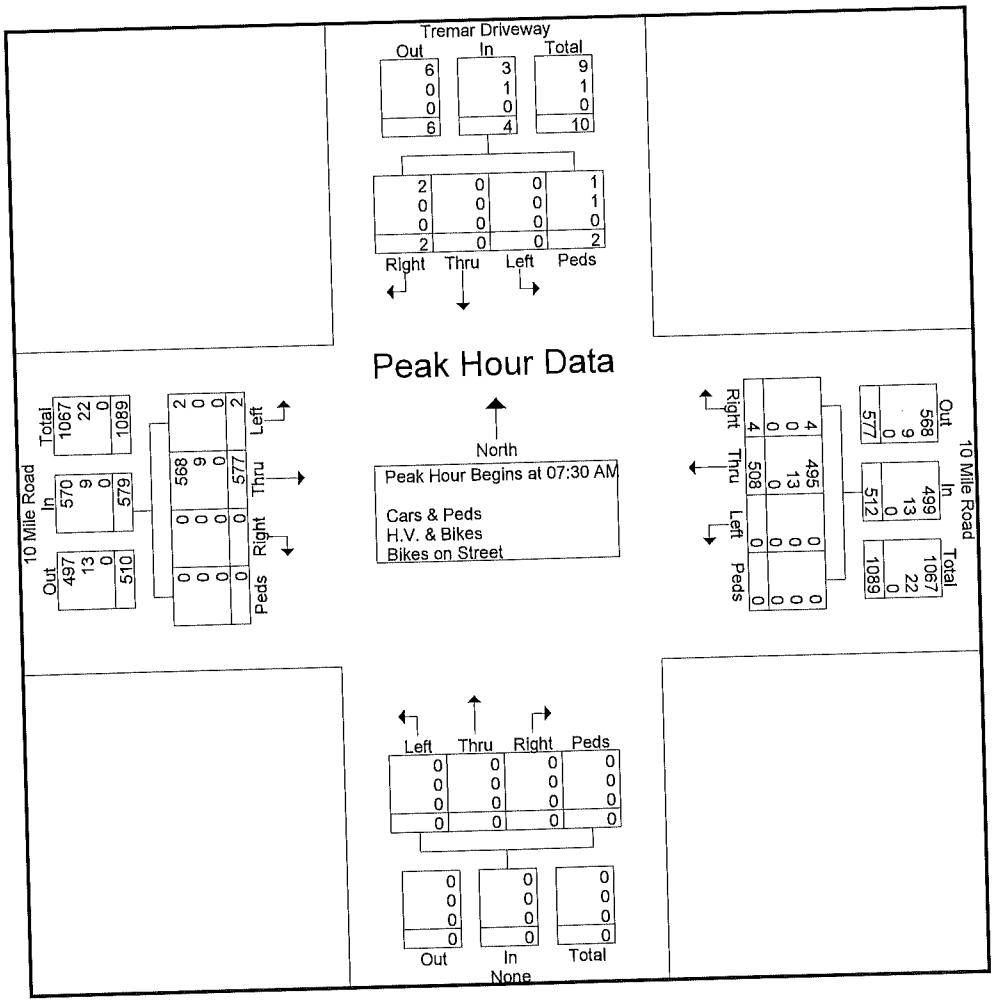
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Tremar
Weather:

File Name : TMC_1006_10 Mile & Tremar_Mar-16-2022
Site Code : 1006
Start Date : 3/16/2022
Page No : 3

	10 Mile Road Eastbound					10 Mile Road Westbound					None Northbound					Tremar Driveway Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	1	122	0	0	123	0	120	3	0	123	0	0	0	0	0	0	0	1	1	2	248
07:45 AM	0	151	0	0	151	0	189	0	0	189	0	0	0	0	0	0	0	0	1	1	341
08:00 AM	0	135	0	0	135	0	111	1	0	112	0	0	0	0	0	0	0	0	0	0	247
08:15 AM	1	169	0	0	170	0	88	0	0	88	0	0	0	0	0	0	0	1	0	1	259
Total Volume	2	577	0	0	579	0	508	4	0	512	0	0	0	0	0	0	0	2	2	4	1095
% App. Total	0.3	99.7	0	0		0	99.2	0.8	0		0	0	0	0		0	0	50	50		
PHF	.500	.854	.000	.000	.851	.000	.672	.333	.000	.677	.000	.000	.000	.000	.000	.000	.000	.500	.500	.500	.803
Cars & Peds	2	568	0	0	570	0	495	4	0	499	0	0	0	0	0	0	0	2	1	3	1072
% Cars & Peds	100	98.4	0	0	98.4	0	97.4	100	0	97.5	0	0	0	0	0	0	0	100	50.0	75.0	97.9
H.V. & Bikes	0	9	0	0	9	0	13	0	0	13	0	0	0	0	0	0	0	0	1	1	23
% H.V. & Bikes	0	1.6	0	0	1.6	0	2.6	0	0	2.5	0	0	0	0	0	0	0	0	50.0	25.0	2.1
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



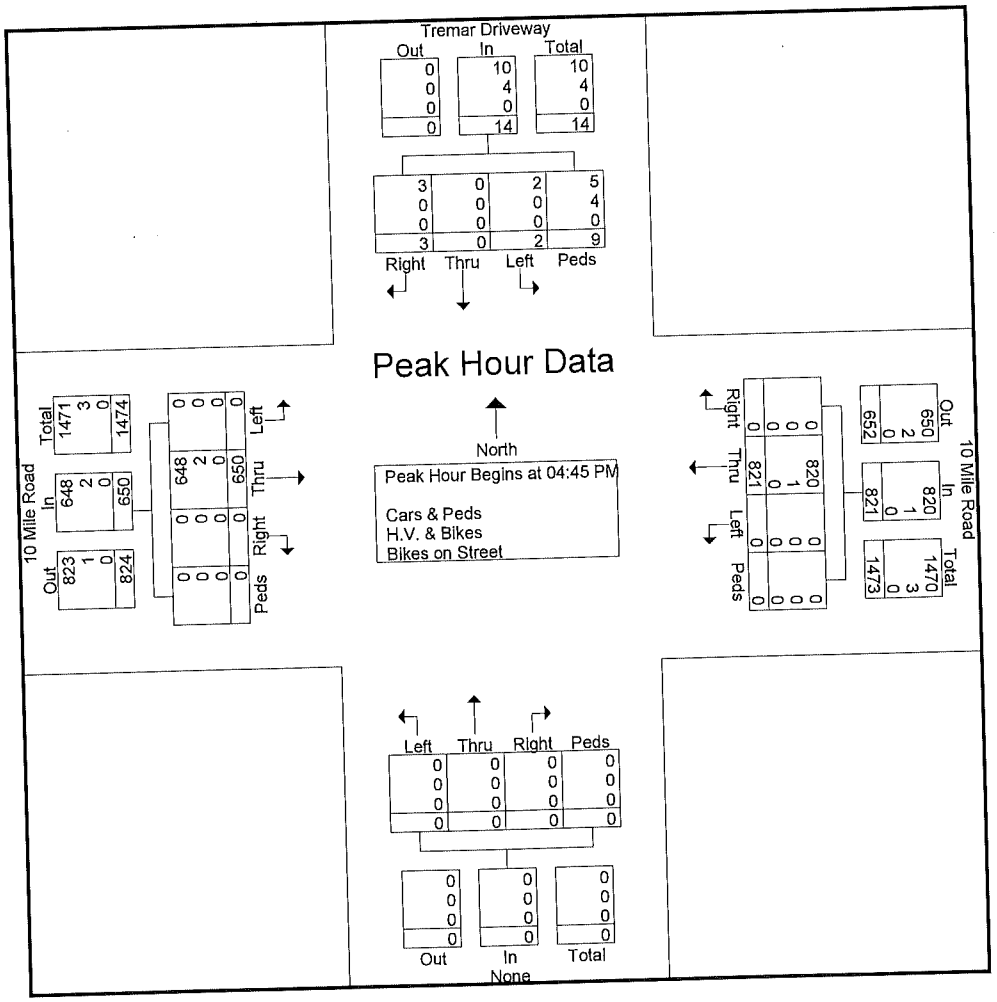
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Tremar
Weather:

File Name : TMC_1006_10 Mile & Tremar_Mar-16-2022
Site Code : 1006
Start Date : 3/16/2022
Page No : 4

	10 Mile Road Eastbound					10 Mile Road Westbound					None Northbound					Tremar Driveway Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	164	0	0	164	0	213	0	0	213	0	0	0	0	0	1	0	0	1	2	379
05:00 PM	0	142	0	0	142	0	201	0	0	201	0	0	0	0	0	1	0	1	2	4	347
05:15 PM	0	194	0	0	194	0	206	0	0	206	0	0	0	0	0	0	0	1	4	5	405
05:30 PM	0	150	0	0	150	0	201	0	0	201	0	0	0	0	0	0	0	1	2	3	354
Total Volume	0	650	0	0	650	0	821	0	0	821	0	0	0	0	0	2	0	3	9	14	1485
% App. Total	0	100	0	0		0	100	0	0		0	0	0	0		14.3	0	21.4	64.3		
PHF	.000	.838	.000	.000	.838	.000	.964	.000	.000	.964	.000	.000	.000	.000	.000	.500	.000	.750	.563	.700	.917
Cars & Peds	0	648	0	0	648	0	820	0	0	820	0	0	0	0	0	2	0	3	5	10	1478
% Cars & Peds	0	99.7	0	0	99.7	0	99.9	0	0	99.9	0	0	0	0	0	100	0	100	55.6	71.4	99.5
H.V. & Bikes	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	4	4	7
% H.V. & Bikes	0	0.3	0	0	0.3	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	44.4	28.6	0.5
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Wrenchers Driveway
Weather:

File Name : TMC_1008_10 Mile & Wrenchers_Mar-16-2022
Site Code : 1008
Start Date : 3/16/2022
Page No : 1

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				None Northbound				Wrenchers Driveway Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
*** BREAK ***																	
06:00 AM	0	35	0	0	0	34	0	0	0	0	0	0	0	0	0	0	69
06:15 AM	0	31	0	0	0	28	0	0	0	0	0	0	0	0	0	0	59
06:30 AM	1	57	0	0	0	47	0	0	0	0	0	0	0	0	0	0	105
06:45 AM	0	70	0	0	0	68	0	0	0	0	0	0	0	0	0	0	138
Total	1	193	0	0	0	177	0	0	0	0	0	0	0	0	0	0	371
07:00 AM	0	78	0	0	0	82	0	0	0	0	0	0	0	0	0	0	160
07:15 AM	0	119	0	0	0	74	0	0	0	0	0	0	0	0	0	0	193
07:30 AM	0	121	0	0	0	123	2	0	0	0	0	0	0	0	0	1	247
07:45 AM	0	151	0	0	0	186	2	0	0	0	0	0	0	0	1	1	341
Total	0	469	0	0	0	465	4	0	0	0	0	0	0	0	1	2	941
08:00 AM	2	133	0	0	0	111	3	0	0	0	0	0	0	0	1	0	250
08:15 AM	0	169	0	0	0	88	0	0	0	0	0	0	0	0	0	0	257
08:30 AM	0	145	0	0	0	88	0	0	0	0	0	0	0	0	1	2	236
08:45 AM	0	210	0	0	0	109	0	0	0	0	0	0	0	0	0	0	319
Total	2	657	0	0	0	396	3	0	0	0	0	0	0	0	2	2	1062
09:00 AM	2	125	0	0	0	115	0	0	0	0	0	0	0	0	0	1	243
09:15 AM	0	127	0	0	0	89	0	0	0	0	0	0	0	0	0	0	216
09:30 AM	0	107	0	0	0	95	0	0	0	0	0	0	0	0	1	0	203
09:45 AM	0	117	0	0	0	108	0	0	0	0	0	0	0	0	2	1	228
Total	2	476	0	0	0	407	0	0	0	0	0	0	0	0	3	2	890
10:00 AM	0	82	0	0	0	98	0	0	0	0	0	0	0	0	0	0	180
10:15 AM	1	90	0	0	0	112	0	0	0	0	0	0	0	0	0	3	206
10:30 AM	0	95	0	0	0	92	1	0	0	0	0	0	0	0	0	0	188
10:45 AM	0	97	0	0	0	93	0	0	0	0	0	0	0	0	0	1	191
Total	1	364	0	0	0	395	1	0	0	0	0	0	0	0	0	4	765
11:00 AM	0	85	0	0	0	108	1	0	0	0	0	0	0	0	2	0	196
11:15 AM	0	116	0	0	0	104	0	0	0	0	0	0	0	0	1	0	221
11:30 AM	0	108	0	0	0	104	1	0	0	0	0	0	1	0	0	0	214
11:45 AM	0	132	0	0	0	135	0	0	0	0	0	0	0	0	0	0	267
Total	0	441	0	0	0	451	2	0	0	0	0	0	1	0	3	0	898
12:00 PM	0	112	0	0	0	135	0	0	0	0	0	0	1	0	3	1	252
12:15 PM	0	104	0	0	0	129	1	0	0	0	0	0	0	0	0	0	234
12:30 PM	0	122	0	0	0	132	0	0	0	0	0	0	0	0	2	0	256
12:45 PM	1	131	0	0	0	146	0	0	0	0	0	0	1	0	0	2	281
Total	1	469	0	0	0	542	1	0	0	0	0	0	2	0	5	3	1023
01:00 PM	0	107	0	0	0	125	0	0	0	0	0	0	0	0	1	0	233
01:15 PM	2	118	0	0	0	125	1	0	0	0	0	0	1	0	0	0	247
01:30 PM	0	90	0	0	0	123	0	0	0	0	0	0	0	0	0	1	214
01:45 PM	0	103	0	0	0	128	0	0	0	0	0	0	0	0	0	3	234
Total	2	418	0	0	0	501	1	0	0	0	0	0	1	0	1	4	928
02:00 PM	1	116	0	0	0	126	0	0	0	0	0	0	0	0	0	0	243
02:15 PM	0	128	0	0	0	121	1	0	0	0	0	0	0	0	1	3	254
02:30 PM	0	155	0	0	0	154	0	0	0	0	0	0	0	0	0	1	310
02:45 PM	3	130	0	0	0	122	0	0	0	0	0	0	0	0	1	3	259
Total	4	529	0	0	0	523	1	0	0	0	0	0	0	0	2	7	1066
03:00 PM	1	164	0	0	0	163	0	0	0	0	0	0	0	0	0	0	328
03:15 PM	0	162	0	0	0	149	0	0	0	0	0	0	0	0	1	1	313
03:30 PM	0	137	0	0	0	155	0	0	0	0	0	0	0	0	0	1	293

Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Wrenchers Driveway
Weather:

File Name : TMC_1008_10 Mile & Wrenchers_Mar-16-2022
Site Code : 1008
Start Date : 3/16/2022
Page No : 2

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				None Northbound				Wrenchers Driveway Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:45 PM	0	122	0	0	0	153	0	0	0	0	0	0	0	0	0	5	280
Total	1	585	0	0	0	620	0	0	0	0	0	0	0	0	1	7	1214
04:00 PM	1	126	0	0	0	164	0	0	0	0	0	0	0	0	2	3	296
04:15 PM	0	131	0	0	0	155	0	0	0	0	0	0	0	0	0	1	287
04:30 PM	0	124	0	0	0	212	0	0	0	0	0	0	0	0	0	3	339
04:45 PM	0	167	0	0	0	213	0	0	0	0	0	0	0	0	0	1	381
Total	1	548	0	0	0	744	0	0	0	0	0	0	0	0	2	8	1303
05:00 PM	0	141	0	0	0	200	0	0	0	0	0	0	0	0	1	5	347
05:15 PM	0	195	0	0	0	205	0	0	0	0	0	0	1	0	2	4	407
05:30 PM	0	148	0	0	0	204	0	0	0	0	0	0	0	0	0	2	354
05:45 PM	0	145	0	0	0	177	0	0	0	0	0	0	0	0	0	2	324
Total	0	629	0	0	0	786	0	0	0	0	0	0	1	0	3	13	1432
06:00 PM	0	139	0	0	0	164	0	0	0	0	0	0	1	0	1	8	313
06:15 PM	0	139	0	0	0	140	0	0	0	0	0	0	0	0	1	2	282
06:30 PM	0	127	0	0	0	139	0	0	0	0	0	0	0	0	0	0	266
06:45 PM	0	114	0	0	0	172	0	0	0	0	0	0	0	0	1	0	287
Total	0	519	0	0	0	615	0	0	0	0	0	0	1	0	3	10	1148
** EAK ***																	
Grand Total	15	6297	0	0	0	6622	13	0	0	0	0	0	6	0	26	62	13041
Apprch %	0.2	99.8	0	0	0	99.8	0.2	0	0	0	0	0	6.4	0	27.7	66	
Total %	0.1	48.3	0	0	0	50.8	0.1	0	0	0	0	0	0	0	0.2	0.5	
Cars & Peds	14	6210	0	0	0	6524	12	0	0	0	0	0	6	0	22	46	12834
% Cars & Peds	93.3	98.6	0	0	0	98.5	92.3	0	0	0	0	0	100	0	84.6	74.2	98.4
H.V. & Bikes	1	86	0	0	0	97	1	0	0	0	0	0	0	0	4	16	205
% H.V. & Bikes	6.7	1.4	0	0	0	1.5	7.7	0	0	0	0	0	0	0	15.4	25.8	1.6
Bikes on Street	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Wrenchers Driveway
Weather:

File Name : TMC_1008_10 Mile & Wrenchers_Mar-16-2022
Site Code : 1008
Start Date : 3/16/2022

	10 Mile Road Eastbound					10 Mile Road Westbound					None Northbound					Wrenchers Driveway Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	121	0	0	121	0	123	2	0	125	0	0	0	0	0	0	0	0	1	1	247
07:45 AM	0	151	0	0	151	0	186	2	0	188	0	0	0	0	0	0	0	1	1	2	341
08:00 AM	2	133	0	0	135	0	111	3	0	114	0	0	0	0	0	0	0	1	0	1	250
08:15 AM	0	169	0	0	169	0	88	0	0	88	0	0	0	0	0	0	0	0	0	0	257
Total Volume	2	574	0	0	576	0	508	7	0	515	0	0	0	0	0	0	0	2	2	4	1095
% App. Total	0.3	99.7	0	0		0	98.6	1.4	0		0	0	0	0		0	0	50	50		
PHF	.250	.849	.000	.000	.852	.000	.683	.583	.000	.685	.000	.000	.000	.000	.000	.000	.000	.500	.500	.500	.803
Cars & Peds	2	564	0	0	566	0	496	6	0	502	0	0	0	0	0	0	0	1	1	2	1070
% Cars & Peds	100	98.3	0	0	98.3	0	97.6	85.7	0	97.5	0	0	0	0	0	0	0	50.0	50.0	50.0	97.7
H.V. & Bikes	0	9	0	0	9	0	12	1	0	13	0	0	0	0	0	0	0	1	1	2	24
% H.V. & Bikes	0	1.6	0	0	1.6	0	2.4	14.3	0	2.5	0	0	0	0	0	0	0	50.0	50.0	50.0	2.2
Bikes on Street	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Bikes on Street	0	0.2	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1

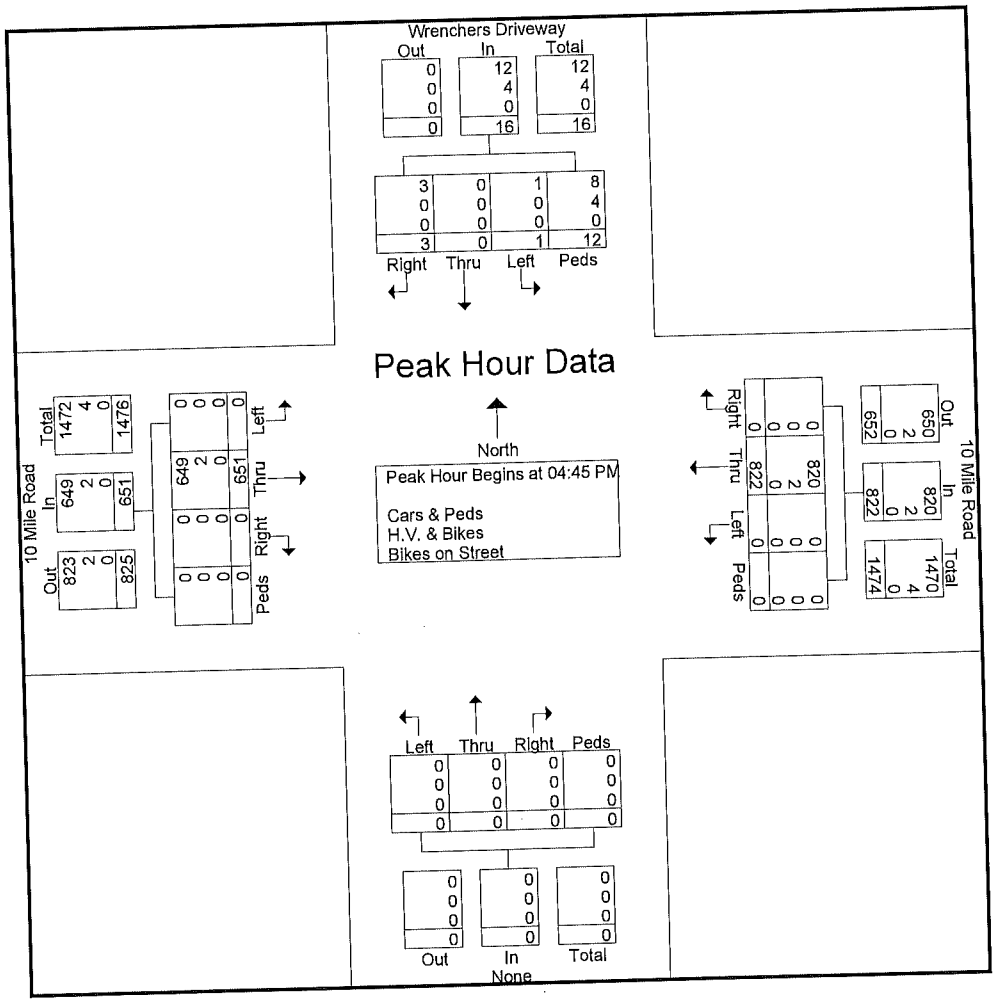
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Wrenchers Driveway
Weather:

File Name : TMC_1008_10 Mile & Wrenchers_Mar-16-2022
Site Code : 1008
Start Date : 3/16/2022
Page No : 4

	10 Mile Road Eastbound					10 Mile Road Westbound					None Northbound					Wrenchers Driveway Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	167	0	0	167	0	213	0	0	213	0	0	0	0	0	0	0	0	1	1	381
05:00 PM	0	141	0	0	141	0	200	0	0	200	0	0	0	0	0	0	0	1	5	6	347
05:15 PM	0	195	0	0	195	0	205	0	0	205	0	0	0	0	0	1	0	2	4	7	407
05:30 PM	0	148	0	0	148	0	204	0	0	204	0	0	0	0	0	0	0	0	2	2	354
Total Volume	0	651	0	0	651	0	822	0	0	822	0	0	0	0	0	1	0	3	12	16	1489
% App. Total	0	100	0	0		0	100	0	0		0	0	0	0		6.2	0	18.8	75		
PHF	.000	.835	.000	.000	.835	.000	.965	.000	.000	.965	.000	.000	.000	.000	.000	.250	.000	.375	.600	.571	.915
Cars & Peds	0	649	0	0	649	0	820	0	0	820	0	0	0	0	0	1	0	3	8	12	1481
% Cars & Peds	0	99.7	0	0	99.7	0	99.8	0	0	99.8	0	0	0	0	0	100	0	100	66.7	75.0	99.5
H.V. & Bikes	0	2	0	0	2	0	2	0	0	2	0	0	0	0	0	0	0	0	4	4	8
% H.V. & Bikes	0	0.3	0	0	0.3	0	0.2	0	0	0.2	0	0	0	0	0	0	0	0	33.3	25.0	0.5
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Meadowbrook Road
Weather:

File Name : tmc_1009_10 mile & meadowbrook_mar-16-2022
Site Code : 1009
Start Date : 3/16/2022
Page No : 1

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				Meadowbrook Road Northbound				Meadowbrook Road Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
*** BREAK ***																	
06:00 AM	1	33	3	0	3	24	4	0	3	9	2	0	3	1	2	0	88
06:15 AM	2	25	1	0	3	19	5	0	5	11	6	0	3	4	1	0	85
06:30 AM	7	56	1	0	5	34	7	0	2	14	6	0	3	2	9	0	146
06:45 AM	6	70	5	0	10	47	9	0	3	12	5	0	5	10	8	0	190
Total	16	184	10	0	21	124	25	0	13	46	19	0	14	17	20	0	509
07:00 AM	13	62	5	0	1	43	12	0	12	20	8	0	6	8	4	0	194
07:15 AM	16	85	9	0	6	40	10	0	11	38	10	0	8	22	6	0	261
07:30 AM	14	116	5	0	6	71	9	0	20	18	7	0	14	16	16	1	313
07:45 AM	17	95	11	0	11	93	10	0	34	38	12	0	11	19	33	0	384
Total	60	358	30	0	24	247	41	0	77	114	37	0	39	65	59	1	1152
08:00 AM	33	112	13	0	8	77	21	0	12	30	9	0	13	19	9	0	356
08:15 AM	19	138	11	0	8	55	17	0	10	33	7	0	16	23	7	0	344
08:30 AM	17	117	11	0	5	65	17	0	14	36	12	0	18	29	15	0	356
08:45 AM	43	131	13	0	9	76	14	0	12	48	20	0	17	23	24	0	430
Total	112	498	48	0	30	273	69	0	48	147	48	0	64	94	55	0	1486
09:00 AM	38	112	20	0	15	67	22	0	14	23	13	0	17	16	17	0	374
09:15 AM	31	80	12	0	5	69	18	0	12	28	5	0	7	18	16	0	301
09:30 AM	18	77	5	0	8	59	16	0	7	32	6	0	14	34	18	0	294
09:45 AM	26	76	7	0	7	59	12	0	18	34	7	0	22	25	22	0	315
Total	113	345	44	0	35	254	68	0	51	117	31	0	60	93	73	0	1284
10:00 AM	15	65	8	1	6	68	12	0	11	21	6	0	13	27	25	0	278
10:15 AM	10	61	14	0	7	68	15	0	10	21	10	0	13	27	11	0	267
10:30 AM	19	78	9	2	3	58	12	0	8	27	6	0	13	16	16	1	268
10:45 AM	17	64	12	0	12	69	14	0	19	23	5	0	14	28	16	1	294
Total	61	268	43	3	28	263	53	0	48	92	27	0	53	98	68	2	1107
11:00 AM	19	54	13	0	4	68	14	0	14	22	7	0	8	28	20	0	271
11:15 AM	18	81	9	0	6	73	13	0	19	24	9	0	22	19	17	0	310
11:30 AM	26	66	14	0	7	79	17	0	15	28	8	0	16	26	18	0	320
11:45 AM	19	94	19	0	6	105	19	0	25	29	7	0	24	31	29	0	407
Total	82	295	55	0	23	325	63	0	73	103	31	0	70	104	84	0	1308
12:00 PM	16	83	18	0	11	78	25	0	21	32	13	0	23	35	24	1	380
12:15 PM	18	83	13	0	17	82	19	0	17	26	12	0	22	38	21	0	368
12:30 PM	20	78	18	0	12	94	32	0	12	32	7	0	20	43	21	0	389
12:45 PM	26	89	21	0	12	104	19	0	20	39	11	0	29	43	22	0	435
Total	80	333	70	0	52	358	95	0	70	129	43	0	94	159	88	1	1572
01:00 PM	26	64	16	0	14	101	17	0	17	42	14	0	26	27	22	0	386
01:15 PM	21	83	16	0	10	86	20	0	15	26	6	0	18	40	19	0	360
01:30 PM	12	51	5	0	4	67	13	0	11	32	7	0	19	42	25	0	288
01:45 PM	13	80	15	0	7	90	18	0	15	25	15	0	16	36	18	1	349
Total	72	278	52	0	35	344	68	0	58	125	42	0	79	145	84	1	1383
02:00 PM	15	82	13	0	13	95	17	0	10	24	11	0	26	40	26	1	373
02:15 PM	19	76	17	0	6	79	24	0	18	30	13	0	24	41	20	0	367
02:30 PM	27	85	22	0	12	92	32	1	21	37	11	1	22	41	31	1	436
02:45 PM	23	92	20	0	19	100	22	0	17	35	11	0	23	52	25	0	439
Total	84	335	72	0	50	366	95	1	66	126	46	1	95	174	102	2	1615
03:00 PM	30	96	28	0	15	99	21	0	23	42	13	0	43	53	34	0	497
03:15 PM	26	90	27	0	10	116	14	0	23	49	8	0	40	33	23	1	460
03:30 PM	23	94	28	0	17	129	20	2	17	29	16	2	27	46	29	1	480

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3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Meadowbrook Road
Weather:

File Name : tmc_1009_10 mile & meadowbrook_mar-16-2022
Site Code : 1009
Start Date : 3/16/2022
Page No : 2

Groups Printed- Cars & Peds - H.V. & Bikes - Bikes on Street

	10 Mile Road Eastbound				10 Mile Road Westbound				Meadowbrook Road Northbound				Meadowbrook Road Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:45 PM	21	92	33	0	16	110	21	0	26	39	12	0	24	60	27	1	482
Total	100	372	116	0	58	454	76	2	89	159	49	2	134	192	113	3	1919
04:00 PM	20	93	25	0	22	132	26	0	18	39	15	0	28	45	22	0	485
04:15 PM	17	80	20	2	15	120	25	0	21	48	8	0	29	68	25	3	481
04:30 PM	21	108	29	1	15	148	19	0	22	53	11	0	15	65	28	0	535
04:45 PM	26	95	40	2	21	170	23	0	14	41	11	1	26	55	26	0	551
Total	84	376	114	5	73	570	93	0	75	181	45	1	98	233	101	3	2052
05:00 PM	17	96	26	1	18	153	25	0	17	53	9	1	19	59	27	2	523
05:15 PM	32	91	26	0	15	169	39	1	23	46	15	0	30	75	20	3	585
05:30 PM	23	114	35	2	14	150	36	0	15	46	11	0	22	66	31	2	567
05:45 PM	20	98	28	3	16	144	25	0	20	44	15	0	18	65	24	1	521
Total	92	399	115	6	63	616	125	1	75	189	50	1	89	265	102	8	2196
06:00 PM	25	103	15	2	15	116	12	0	17	38	9	0	24	53	23	0	452
06:15 PM	15	101	19	0	7	108	16	0	12	30	13	0	17	38	20	0	396
06:30 PM	23	77	23	0	11	102	21	0	11	47	2	2	15	46	26	2	408
06:45 PM	22	69	18	0	12	113	23	1	17	32	9	0	27	47	29	1	420
Total	85	350	75	2	45	439	72	1	57	147	33	2	83	184	98	3	1676
** PEAK ***																	
Grand Total	1041	4391	844	16	537	4633	943	5	800	1675	501	7	972	1823	1047	24	19259
Apprch %	16.5	69.8	13.4	0.3	8.8	75.7	15.4	0.1	26.8	56.2	16.8	0.2	25.1	47.2	27.1	0.6	
Total %	5.4	22.8	4.4	0.1	2.8	24.1	4.9	0	4.2	8.7	2.6	0	5	9.5	5.4	0.1	
Cars & Peds	1027	4336	836	15	526	4579	936	3	791	1665	491	5	950	1806	1021	23	19010
% Cars & Peds	98.7	98.7	99.1	93.8	98	98.8	99.3	60	98.9	99.4	98	71.4	97.7	99.1	97.5	95.8	98.7
H.V. & Bikes	14	55	8	1	11	54	7	2	9	10	10	2	22	17	26	1	249
% H.V. & Bikes	1.3	1.3	0.9	6.2	2	1.2	0.7	40	1.1	0.6	2	28.6	2.3	0.9	2.5	4.2	1.3
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

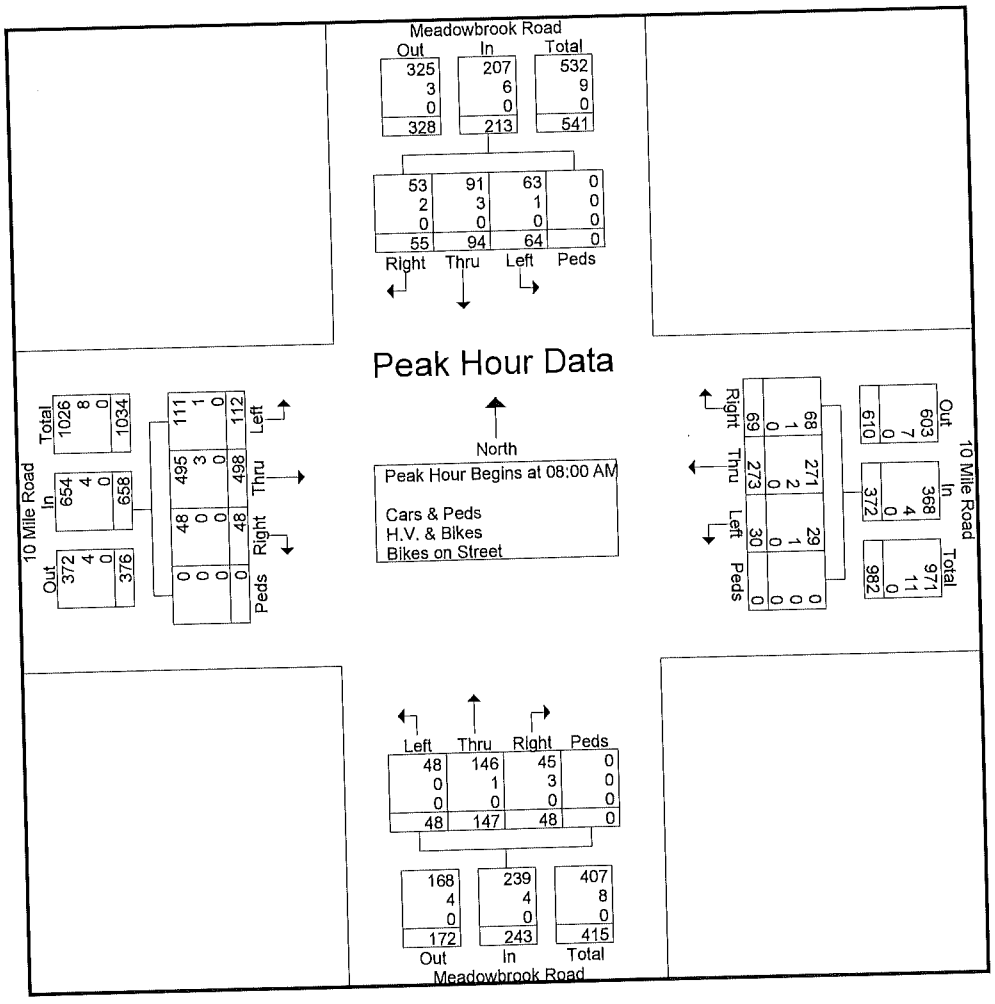
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Meadowbrook Road
Weather:

File Name : tmc_1009_10 mile & meadowbrook_mar-16-2022
Site Code : 1009
Start Date : 3/16/2022
Page No : 3

	10 Mile Road Eastbound					10 Mile Road Westbound					Meadowbrook Road Northbound					Meadowbrook Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	33	112	13	0	158	8	77	21	0	106	12	30	9	0	51	13	19	9	0	41	356
08:15 AM	19	138	11	0	168	8	55	17	0	80	10	33	7	0	50	16	23	7	0	46	344
08:30 AM	17	117	11	0	145	5	65	17	0	87	14	36	12	0	62	18	29	15	0	62	356
08:45 AM	43	131	13	0	187	9	76	14	0	99	12	48	20	0	80	17	23	24	0	64	430
Total Volume	112	498	48	0	658	30	273	69	0	372	48	147	48	0	243	64	94	55	0	213	1486
% App. Total	17	75.7	7.3	0		8.1	73.4	18.5	0		19.8	60.5	19.8	0		30	44.1	25.8	0		
PHF	.651	.902	.923	.000	.880	.833	.886	.821	.000	.877	.857	.766	.600	.000	.759	.889	.810	.573	.000	.832	.864
Cars & Peds	111	495	48	0	654	29	271	68	0	368	48	146	45	0	239	63	91	53	0	207	1468
% Cars & Peds	99.1	99.4	100	0	99.4	96.7	99.3	98.6	0	98.9	100	99.3	93.8	0	98.4	98.4	96.8	96.4	0	97.2	98.8
H.V. & Bikes	1	3	0	0	4	1	2	1	0	4	0	1	3	0	4	1	3	2	0	6	18
% H.V. & Bikes	0.9	0.6	0	0	0.6	3.3	0.7	1.4	0	1.1	0	0.7	6.3	0	1.6	1.6	3.2	3.6	0	2.8	1.2
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



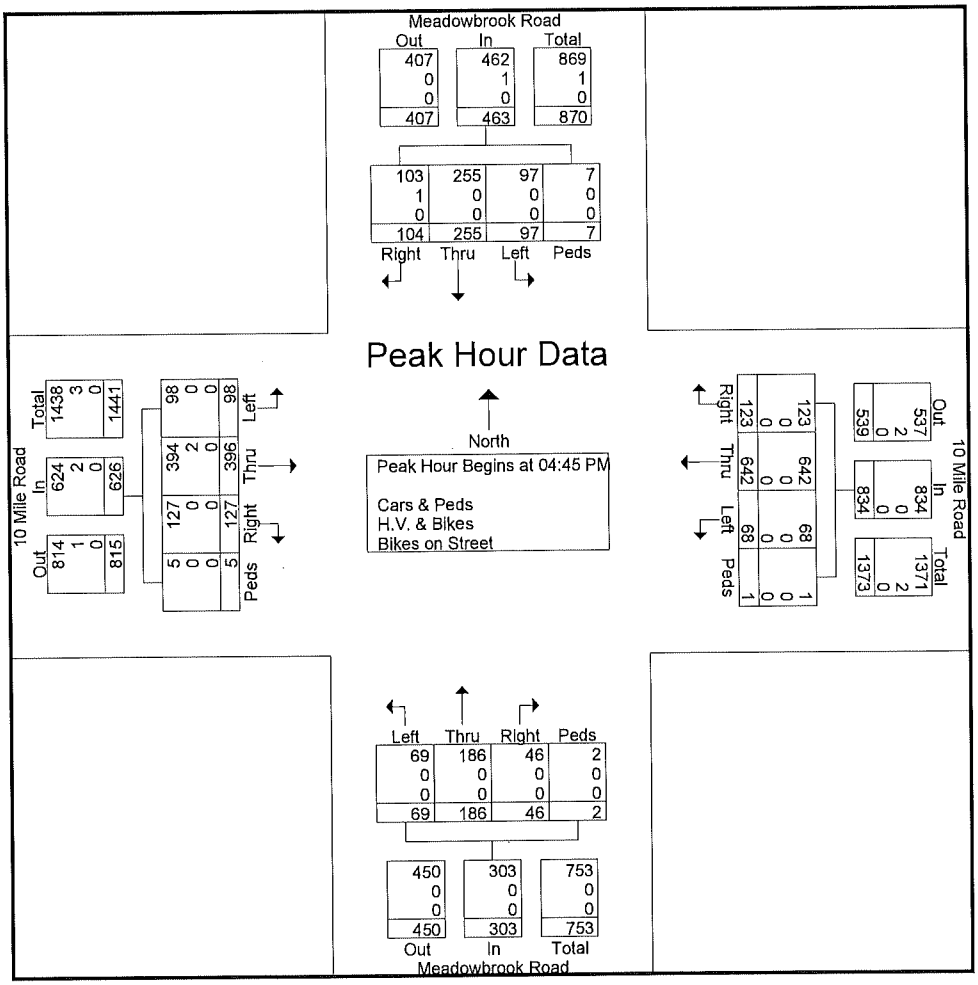
Midwestern Consulting

3815 Plaza Drive
Ann Arbor, MI, 48108
(734) 995-0200

Intersection
E/W: 10 Mile Road
N/S: Meadowbrook Road
Weather:

File Name : tmc_1009_10 mile & meadowbrook_mar-16-2022
Site Code : 1009
Start Date : 3/16/2022
Page No : 4

	10 Mile Road Eastbound					10 Mile Road Westbound					Meadowbrook Road Northbound					Meadowbrook Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	26	95	40	2	163	21	170	23	0	214	14	41	11	1	67	26	55	26	0	107	551
05:00 PM	17	96	26	1	140	18	153	25	0	196	17	53	9	1	80	19	59	27	2	107	523
05:15 PM	32	91	26	0	149	15	169	39	1	224	23	46	15	0	84	30	75	20	3	128	585
05:30 PM	23	114	35	2	174	14	150	36	0	200	15	46	11	0	72	22	66	31	2	121	567
Total Volume	98	396	127	5	626	68	642	123	1	834	69	186	46	2	303	97	255	104	7	463	2226
% App. Total	15.7	63.3	20.3	0.8		8.2	77	14.7	0.1		22.8	61.4	15.2	0.7		21	55.1	22.5	1.5		
PHF	.766	.868	.794	.625	.899	.810	.944	.788	.250	.931	.750	.877	.767	.500	.902	.808	.850	.839	.583	.904	.951
Cars & Peds	98	394	127	5	624	68	642	123	1	834	69	186	46	2	303	97	255	103	7	462	2223
% Cars & Peds	100	99.5	100	100	99.7	100	100	100	100	100	100	100	100	100	100	100	100	99.0	100	99.8	99.9
H.V. & Bikes	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
% H.V. & Bikes	0	0.5	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	1.0	0	0.2	0.1
Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes on Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Land Use: 710
General Office Building

Description

A general office building is a location where affairs of businesses, commercial or industrial organizations, or professional persons or firms are conducted. An office building houses multiple tenants that can include, as examples, professional services, insurance companies, investment brokers, a banking institution, a restaurant, or other service retailers. A general office building with a gross floor area of 10,000 square feet or less is classified as a small office building (Land Use 712). Corporate headquarters building (Land Use 714), single tenant office building (Land Use 715), medical-dental office building (Land Use 720), office park (Land Use 750), research and development center (Land Use 760), and business park (Land Use 770) are additional related uses.

Additional Data

If two or more general office buildings are in close physical proximity (within a close walk) and function as a unit (perhaps with a shared parking facility and common or complementary tenants), the total gross floor area or employment of the paired office buildings can be used for calculating the site trip generation. If the individual buildings are isolated or not functionally related to one another, trip generation should be calculated for each building separately.

For study sites with reported gross floor area and employees, an average employee density of 3.3 employees per 1,000 square feet GFA (or roughly 300 square feet per employee) has been consistent through the 1980s, 1990s, and 2000s. No sites counted in the 2010s reported both GFA and employees.

The average building occupancy varies considerably within the studies for which occupancy data were provided. The reported occupied gross floor area was 88 percent for general urban/suburban sites and 96 percent for the center city core and dense multi-use urban sites.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The average numbers of person trips per vehicle trip at the eight center city core sites at which both person trip and vehicle trip data were collected are as follows:

- 2.8 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 2.9 during Weekday, AM Peak Hour of Generator
- 2.9 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 3.0 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 18 dense multi-use urban sites at which both person trip and vehicle trip data were collected are as follows:

- 1.5 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.5 during Weekday, AM Peak Hour of Generator
- 1.5 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 1.5 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 23 general urban/suburban sites at which both person trip and vehicle trip data were collected are as follows:

- 1.3 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.3 during Weekday, AM Peak Hour of Generator
- 1.3 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 1.4 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in Alberta (CAN), California, Colorado, Connecticut, Georgia, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New York, Ontario (CAN)Pennsylvania, Texas, Utah, Virginia, and Washington.

Source Numbers

161, 175, 183, 184, 185, 207, 212, 217, 247, 253, 257, 260, 262, 273, 279, 297, 298, 300, 301, 302, 303, 304, 321, 322, 323, 324, 327, 404, 407, 408, 419, 423, 562, 734, 850, 859, 862, 867, 869, 883, 884, 890, 891, 904, 940, 944, 946, 964, 965, 972, 1009, 1030, 1058, 1061

General Office Building
(710)

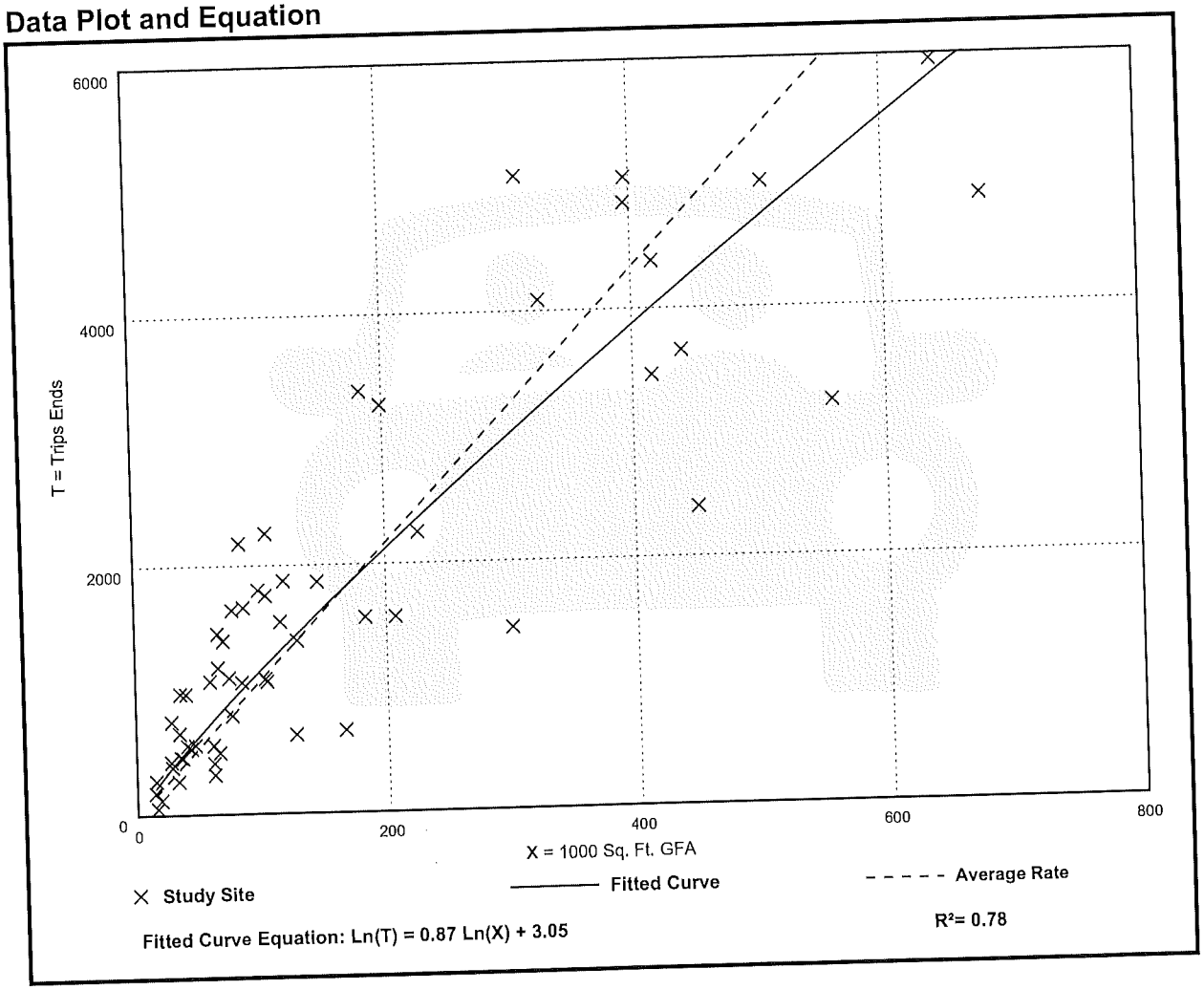
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 59
Avg. 1000 Sq. Ft. GFA: 163
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
10.84	3.27 - 27.56	4.76

Data Plot and Equation



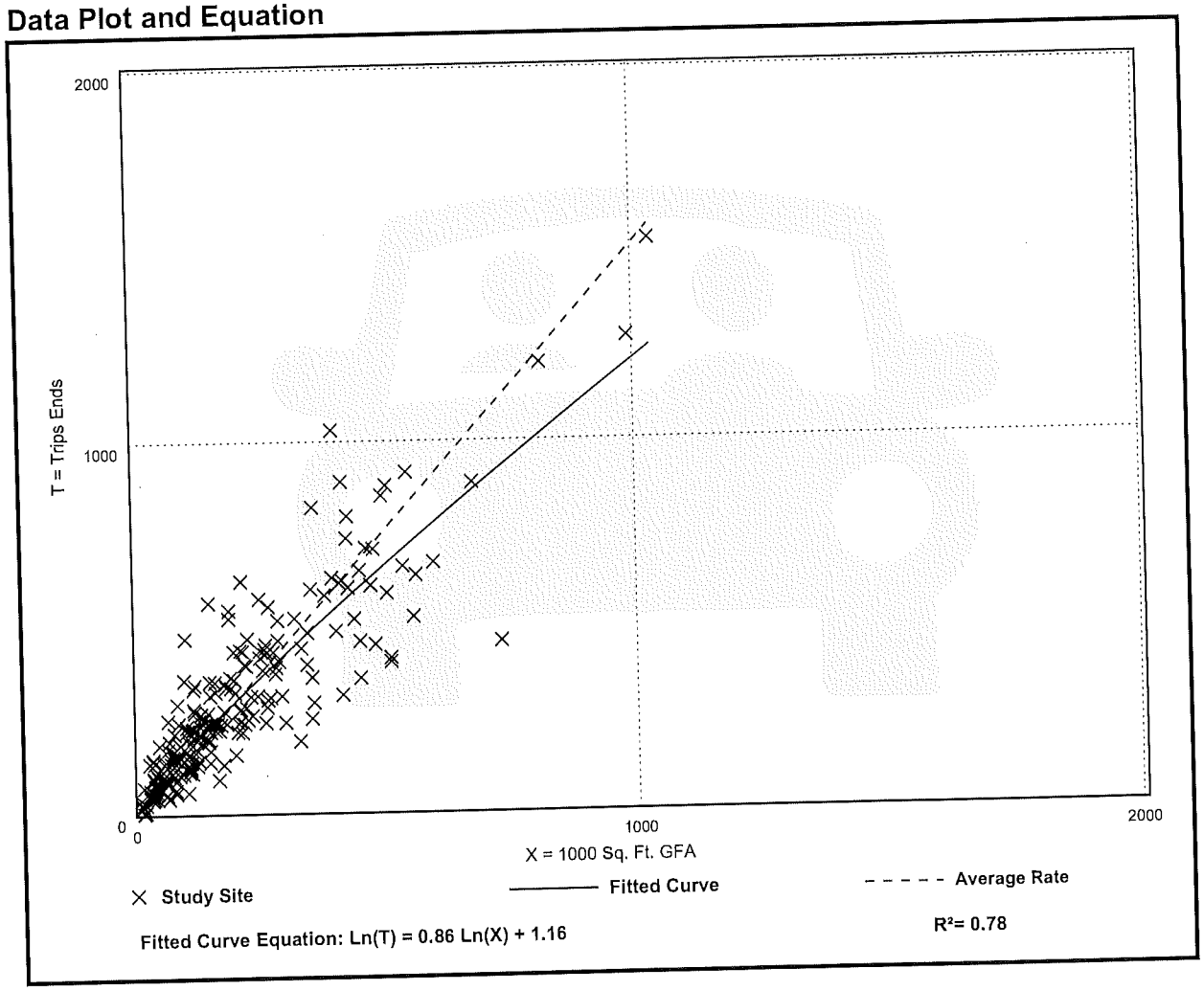
General Office Building
(710)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 221
Avg. 1000 Sq. Ft. GFA: 201
Directional Distribution: 88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.52	0.32 - 4.93	0.58

Data Plot and Equation



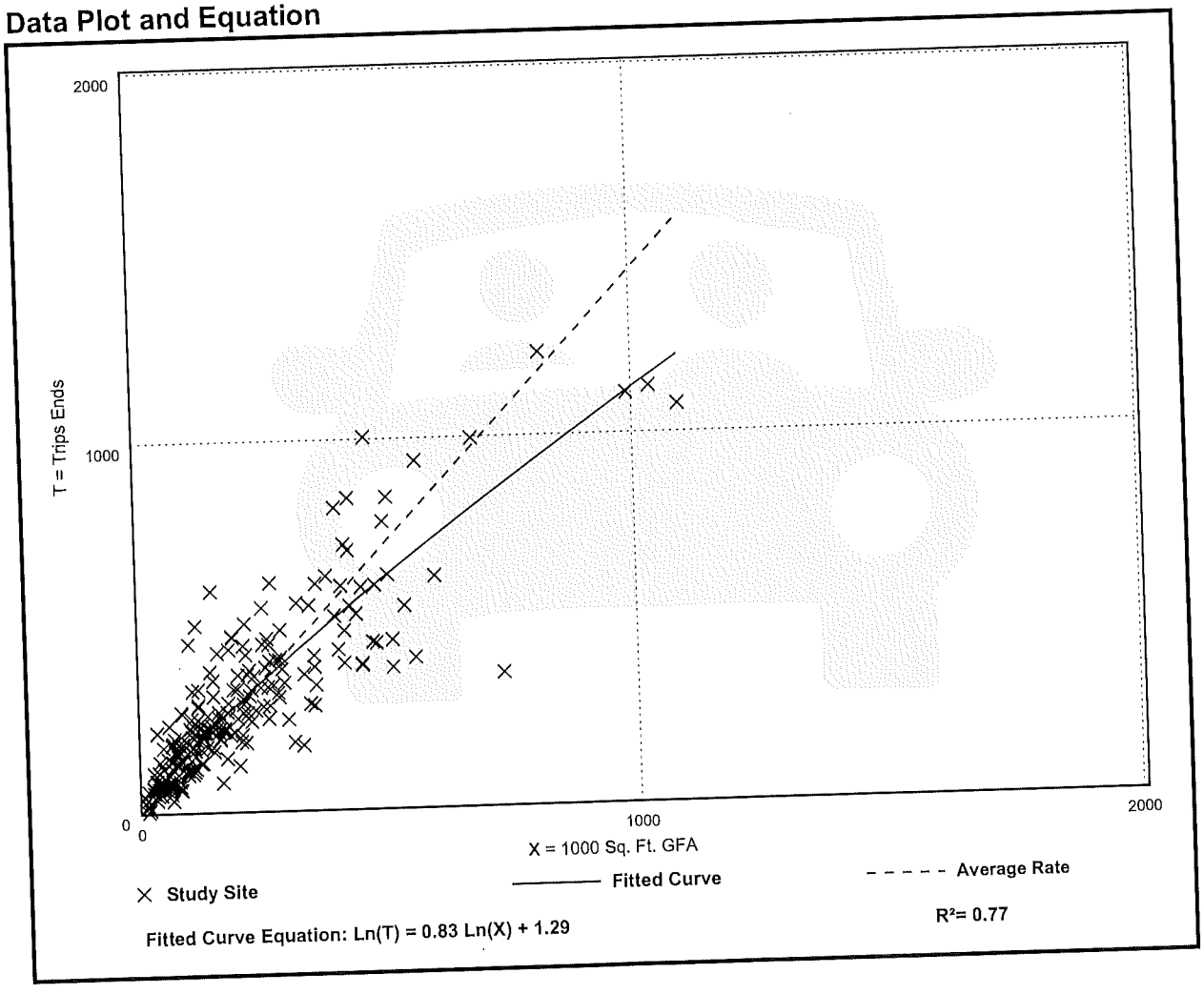
General Office Building
(710)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 232
Avg. 1000 Sq. Ft. GFA: 199
Directional Distribution: 17% entering, 83% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.44	0.26 - 6.20	0.60

Data Plot and Equation



Land Use: 110
General Light Industrial

Description

A light industrial facility is a free-standing facility devoted to a single use. The facility has an emphasis on activities other than manufacturing and typically has minimal office space. Typical light industrial activities include printing, material testing, and assembly of data processing equipment. Industrial park (Land Use 130) and manufacturing (Land Use 140) are related uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 2000s, and the 2010s in Colorado, Connecticut, Indiana, New Jersey, New York, Oregon, Pennsylvania, and Texas.

Source Numbers

106, 157, 174, 177, 179, 184, 191, 251, 253, 286, 300, 611, 874, 875, 912

General Light Industrial
(110)

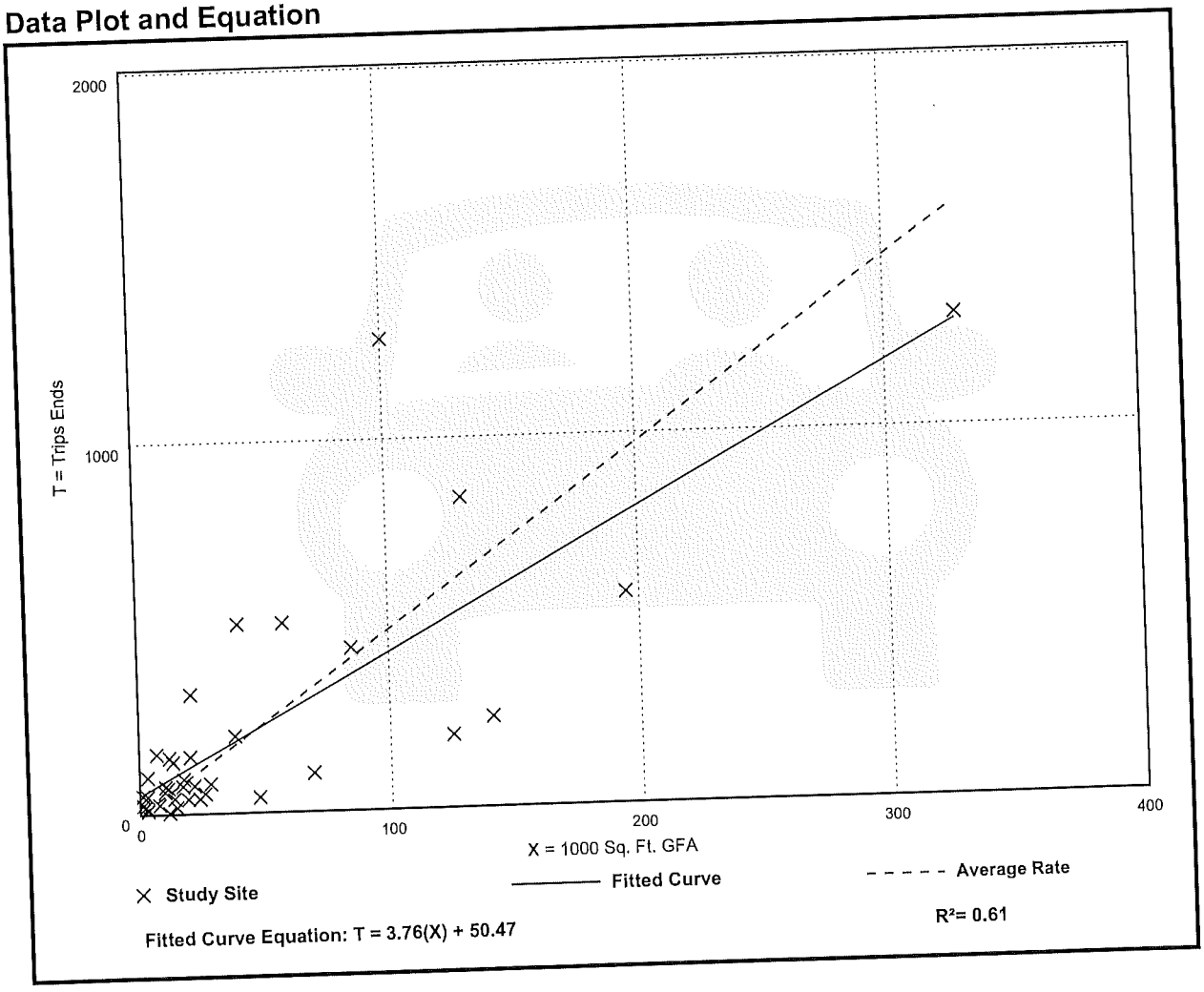
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 37
Avg. 1000 Sq. Ft. GFA: 45
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.87	0.34 - 43.86	4.08

Data Plot and Equation



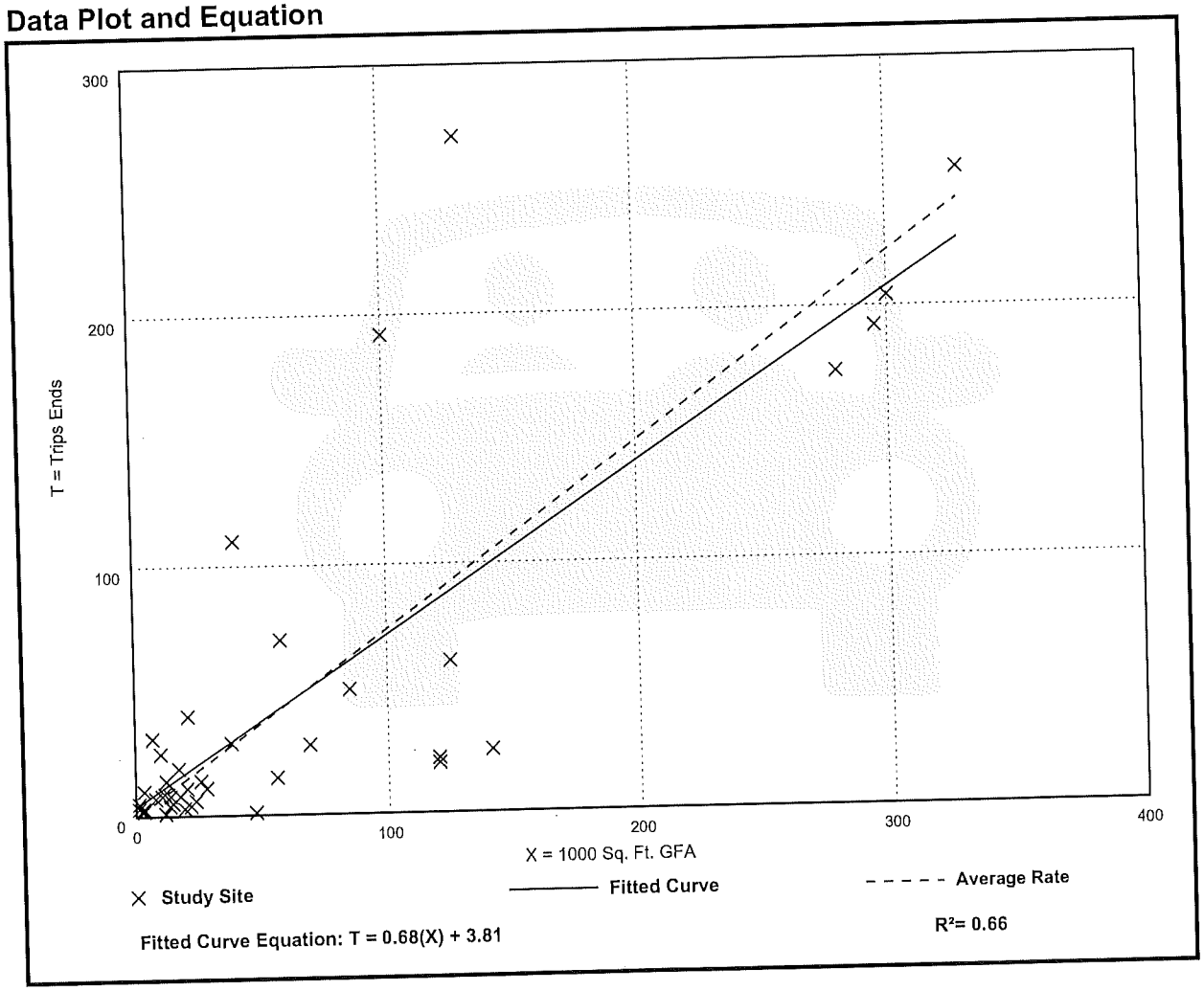
General Light Industrial
(110)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 41
Avg. 1000 Sq. Ft. GFA: 65
Directional Distribution: 88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.74	0.02 - 4.46	0.61

Data Plot and Equation



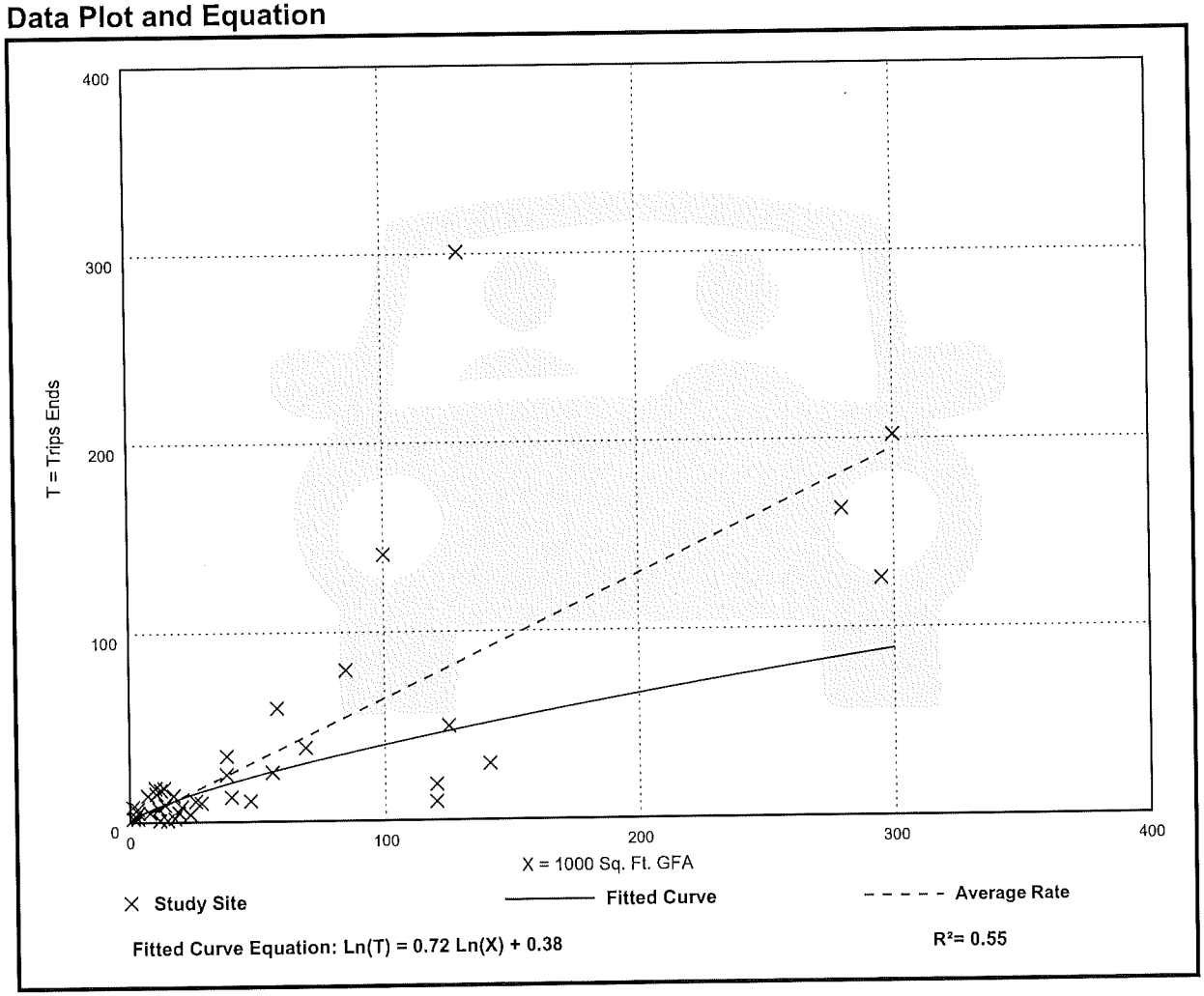
General Light Industrial
(110)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 40
Avg. 1000 Sq. Ft. GFA: 58
Directional Distribution: 14% entering, 86% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.65	0.07 - 7.02	0.56

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.72 Ln(X) + 0.38

R^2= 0.55

Land Use: 821
Shopping Plaza (40-150k)

Description

A shopping plaza is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. Each study site in this land use has between 40,000 and 150,000 square feet of gross leasable area (GLA). The term "plaza" in the land use name rather than "center" is simply a means of distinction between the different shopping center size ranges. Various other names are commonly used to categorize a shopping plaza within this size range, depending on its specific size and tenants, such as neighborhood center, community center, and fashion center.

Its major tenant is often a supermarket but many sites are anchored by home improvement, discount, or other stores. A shopping plaza typically contains more than retail merchandising facilities. Office space, a movie theater, restaurants, a post office, banks, a health club, and recreational facilities are common tenants. A shopping plaza is almost always open-air and the GLA is the same as the gross floor area of the building.

The 150,000 square feet GLA threshold value between shopping plaza and shopping center (Land Use 820) is based on an examination of trip generation data. For a shopping plaza that is smaller than the threshold value, the presence or absence of a supermarket within the plaza has a measurable effect on site trip generation. For a shopping center that is larger than the threshold value, the trips generated by its other major tenants mask any effects of the presence or absence of an on-site supermarket.

The 40,000 square feet GFA threshold between shopping plaza and strip retail plaza (Land Use 822) was selected based on an examination of the overall shopping center/plaza database. No shopping plaza with a supermarket as its anchor is smaller than 40,000 square feet GLA.

Shopping center (>150k) (Land Use 820), strip retail plaza (<40k) (Land Use 822), and factory outlet center (Land Use 823) are related uses.

Land Use Subcategory

The presence or absence of a supermarket in a shopping plaza has been determined to have a measurable effect on site trip generation. Therefore, data are presented for two subcategories for this land use: sites with a supermarket anchor and sites without a supermarket.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), British Columbia (CAN), California, Connecticut, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Jersey, New York, Ontario (CAN), Oregon, Pennsylvania, South Dakota, Texas, Vermont, Virginia, Washington, and Wisconsin.

Source Numbers

105, 110, 156, 159, 186, 198, 204, 211, 213, 239, 259, 260, 295, 301, 304, 305, 307, 317, 319, 358, 376, 390, 400, 404, 437, 444, 446, 507, 580, 598, 658, 728, 908, 926, 944, 946, 960, 973, 974, 1004, 1009, 1025, 1069

Shopping Plaza (40-150k) - Supermarket - Yes (821)

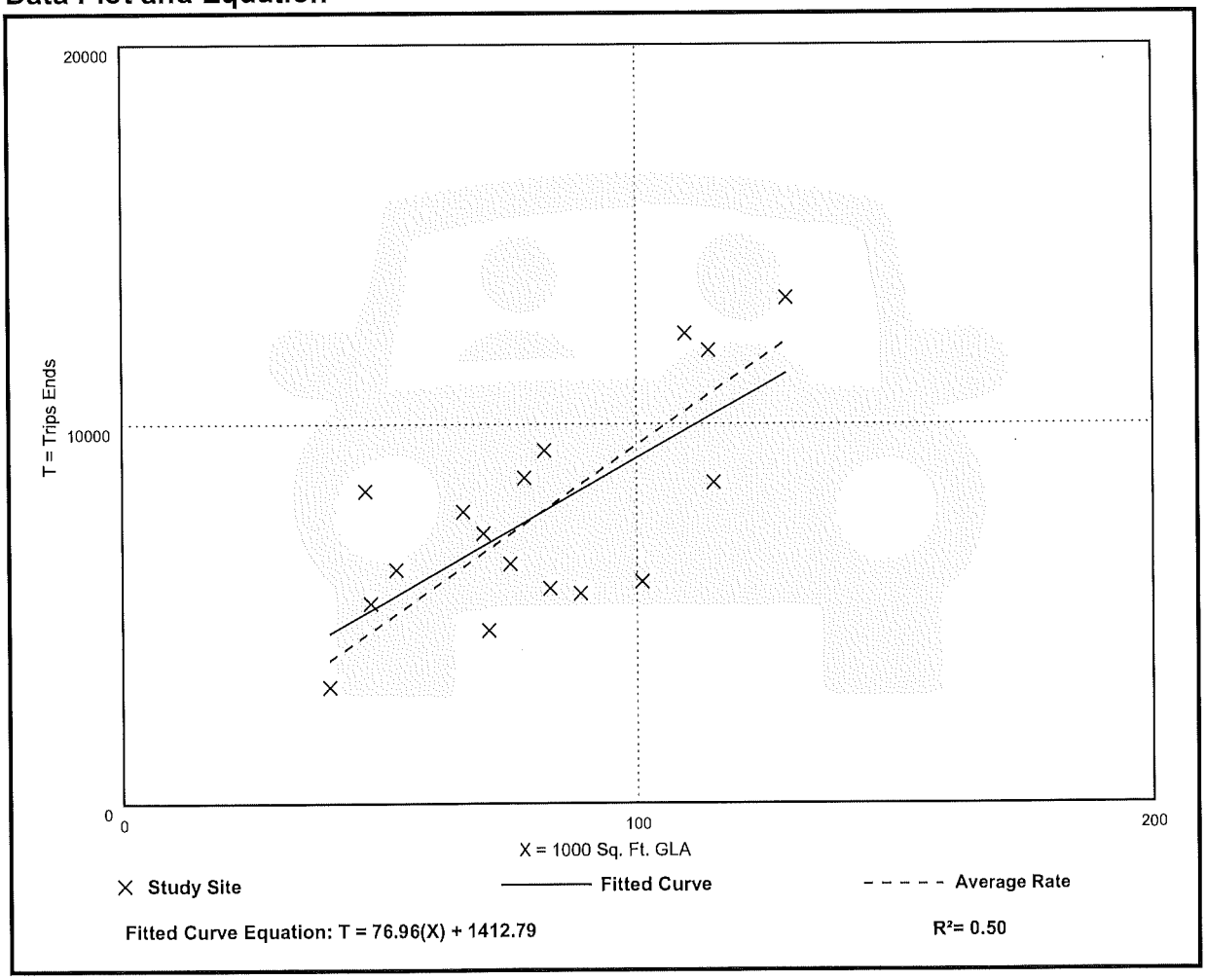
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 17
Avg. 1000 Sq. Ft. GLA: 81
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
94.49	57.86 - 175.32	26.55

Data Plot and Equation



Fitted Curve Equation: T = 76.96(X) + 1412.79

R^2= 0.50

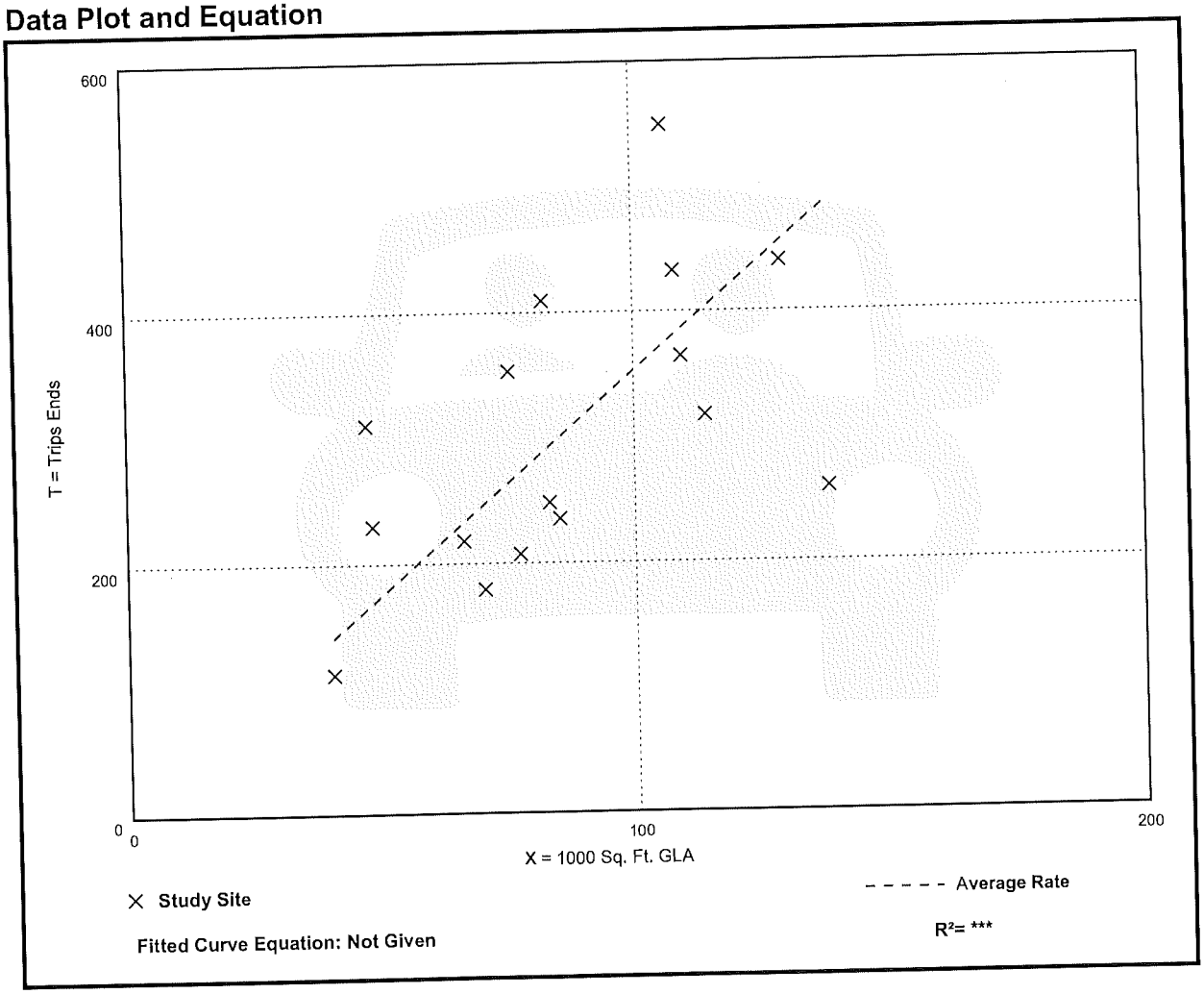
Shopping Plaza (40-150k) - Supermarket - Yes (821)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 16
Avg. 1000 Sq. Ft. GLA: 86
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
3.53	1.88 - 6.62	1.17

Data Plot and Equation



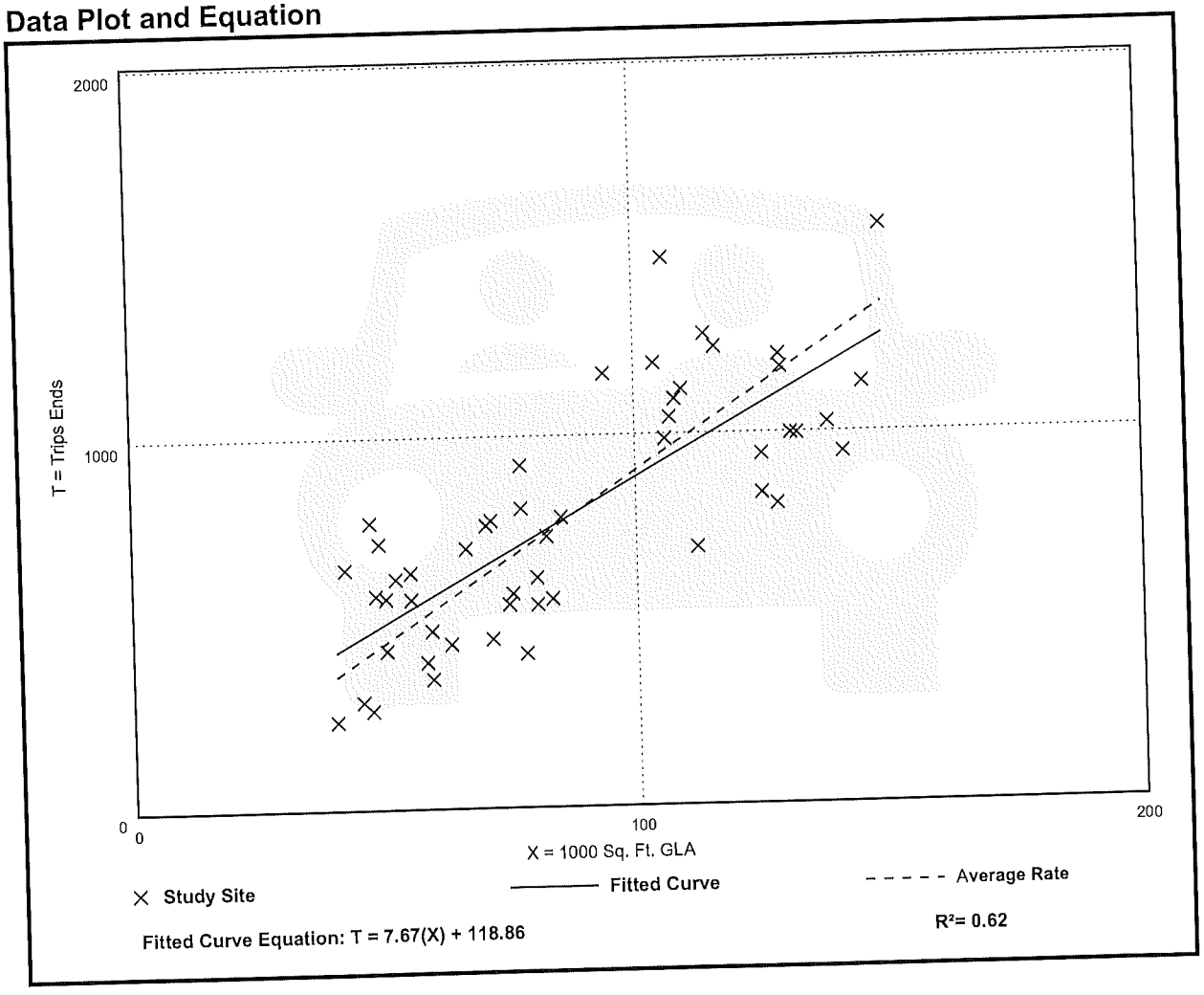
Shopping Plaza (40-150k) - Supermarket - Yes (821)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 51
Avg. 1000 Sq. Ft. GLA: 87
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
9.03	5.35 - 16.45	2.37

Data Plot and Equation



Vehicle Pass-By Rates by Land Use

Source: ITE *Trip Generation Manual*, 11th Edition

Land Use Code	821
Land Use	Shopping Plaza (40 - 150k)
Setting	General Urban/Suburban
Time Period	Weekday PM Peak Period
# Data Sites	15
Average Pass-By Rate	40%

Pass-By Characteristics for Individual Sites

GLA (000)	State or Province	Survey Year	# Interviews	Pass-By Trip (%)	Non-Pass-By Trips			Adj Street Peak Hour Volume	Source
					Primary (%)	Diverted (%)	Total (%)		
45	Florida	1992	844	56	24	20	44	—	30
50	Florida	1992	555	41	41	18	59	—	30
52	Florida	1995	665	42	33	25	58	—	30
53	Florida	1993	162	59	—	—	41	—	30
57.23	Kentucky	1993	247	31	53	16	69	2659	34
60	Florida	1995	1583	40	38	22	60	—	30
69.4	Kentucky	1993	109	25	42	33	75	1559	34
77	Florida	1992	365	46	—	—	54	—	30
78	Florida	1991	702	55	23	22	45	—	30
82	Florida	1992	336	34	—	—	66	—	30
92.857	Kentucky	1993	133	22	50	28	78	3555	34
100.888	Kentucky	1993	281	28	50	22	72	2111	34
121.54	Kentucky	1993	210	53	30	17	47	2636	34
144	New Jersey	1990	176	32	44	24	68	—	24
146.8	Kentucky	1993	—	36	39	25	64	—	34

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: Novi & 10 Mile DATE 6/22/21

CITY/TOWNSHIP: Novi BY: Dawn Bierlein

COUNTY#: 26 STATE#: _____ CHARGES: WO 00026 G

PLEASE PERFORM THE FOLLOWING:

_____ ELECTRICAL DEVICE: ____ INSTALL _____ MODERNIZE _____ MAINTENANCE

_____ UNDERGROUND: _____

_____ EDISON OK: _____ YES _____ NO JOB#: _____

_____ COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
_____ CHANGE TIMING.....																			
_____ CHANGE OFFSET.....																			
_____ CHANGE CYCLE LENGTH.....																			
_____ ADD DIAL/SPLIT.....																			

_____ CHANGE BREAKOUT OR EPROM: _____

_____ CHANGE HOURS OF OPERATION:

OLD: _____

NEW: _____

_____ REPROGRAM TBC

_____ INSTALL INTERCONNECT: _____ TBC _____ MINITROL _____ TONE

_____ MBT OK: _____ YES _____ NO

_____ NO CHANGE - RECORD CORRECTION

__X__ OTHER: Build TS2 P cabinet for contractor with Mod 60 SCATS controller, Gridsmart camera, Opticom, and PCTEL antenna. (Use existing Digi – Inspector to install)

(Rev1)

APPROVED BY: _____ DATE: 10/24/21

DATE INSTALLED: _____

INSTALLED BY: _____

INTERSECTION :- 26 NOVI & 10 MILE
DESCRIPTION PROMS :- X00020R / F4808
CONTROLLER TYPE :- STANDARD PERSONALITY CONTROLLER
SOFTWARE TYPE :- MOD 60 SCATS S30 **(TS2)**
INPUTS :-

1. SB NOVI LT (NL) NOTE: ALL DETECTION IS GRIDSMART
2. SB NOVI LT ADV (NL)
3. SB NOVI L (LK)
4. SB NOVI R (LK)
5. EB 10 MILE LT (NL)
6. EB 10 MILE LT ADV (NL)
7. EB 10 MILE L (LK)
8. EB 10 MILE R (LK)
9. NB NOVI LT (NL)
10. NB NOVI LT ADV (NL)
11. NB NOVI L (LK)
12. NB NOVI R (LK)
13. WB 10 MILE LT (NL)
14. WB 10 MILE LT ADV (NL)
15. WB 10 MILE L (LK)
16. WB 10 MILE R (LK)

Opticom 1: TB2 PREEMPT INPUT 3 (NB & SB NOVI)
Opticom 2: TB2 PREEMPT INPUT 4 (EB & WB 10 MILE)

PED 2: NB NOVI PED (EAST LEG) P.B. (WA)
PED 4: WB 10 MILE PED (NORTH LEG) P.B. (WB)
PED 6: SB NOVI PED (WEST LEG) P.B. (WC)
PED 8: EB 10 MILE PED (SOUTH LEG) P.B. (WD)

APPROACHES :-

A APPR 1 : SB NOVI	A APPR 2 : NB NOVI
B APPR 1 : EB 10 MILE LT	B APPR 2 : WB 10 MILE LT
C APPR 1 : EB 10 MILE	C APPR 2 : WB 10 MILE
D APPR 1 : SB NOVI LT	D APPR 2 : NB NOVI LT

FLEXIDATA:-

SEQUENCE	A,B,C,D	A,B,C,D
AUTO REL		
R- REL	A	A
R+ REL	B	B
Q- REL	C	C
Q+ REL	D	D
LOOKAHEAD		

PEDESTRIANS:-
2. NB NOVI PED (EAST LEG) P.B.
4. WB 10 MILE PED (NORTH LEG) P.B.
6. SB NOVI PED (WEST LEG) P.B.
8. EB 10 MILE PED (SOUTH LEG) P.B.

SPECIAL FEATURES :-
Controller Software must be 2070/M52 S30 or later (VC=5).
The personality revision number is currently 1 (=A).

Ped outputs mapped to phases as follows: ped 2 = 9, ped 4 = 10, ped 6 = 11 and ped 8 = 12. VC5 software reports them as mapped.

Left turns are permissive to NCHRP flashing yellow recommendation. Signal groups 13,14,15,16 provide flashing yellow (green aspect), yellow and red, i.e. upper aspects of 4 section turn display. Signal groups 1,3,5,7 provide the green (bottom) aspect, i.e. turn arrow.

A STAGE HAS A PERMANENT DEMAND. DEMAND FOR STAGES B, C, D IN FLEXI AND

ISOLATED. SET XSF8 (XL Value = 80) TO DISABLE.

Night Flash code: Set Y+ to activate the night flash in Flexilink
Signal Group 1 and 5 non-locked detectors will not call stage D directly.
If XSF7 is set signal Group 1 and 5 detectors will call stage C and then stage D.

IN MASTERLINK AND FLEXILINK:
Z- ON CAUSES D1 TURN TO APPEAR AND HOLD IN D STAGE
Z+ ON CAUSES D2 TURN TO APPEAR AND HOLD IN D STAGE
Z- & Z+ ON CAUSES BOTH TURNS TO APPEAR AND HOLD IN D

The XSF bits below will call & extend or only call the LT phase.
XSF09 (XH Value = 01) sets MAX recall for SG1 left turn.
XSF10 (XH Value = 02) sets min recall for SG1 left turn.
XSF11 (XH Value = 04) sets MAX recall for SG3 left turn.
XSF12 (XH Value = 08) sets min recall for SG3 left turn.
XSF13 (XH Value = 10) sets MAX recall for SG5 left turn.
XSF14 (XH Value = 20) sets min recall for SG5 left turn.
XSF15 (XH Value = 40) sets MAX recall for SG7 left turn.
XSF16 (XH Value = 80) sets min recall for SG7 left turn.

B1-C O/L OR B2-C O/L MAY APPEAR IN B1 OR B2 RESPECTIVELY
HOWEVER IF THE OVERLAP TERMINATES IN B THEN THE C AMBER
AND C RED TIMES ARE USED FOR B STAGE

Set BT = nS in SCATS data to enable Z5 flag in B stage to C.
This allows termination of o/lap phase minimum timer if the appropriate phase o/lap is to occur and C is next, otherwise phase minimum is guaranteed by phase minimum timer.

Flash rate for FYA is set with Timesettings 28 and 29.
TSM28=0.6 (on rate), TSM29=0.4 (off rate)

BACKPANEL :- SIZE P44-16 **TS2** CABINET

LOAD SWITCH 1:	SB NOVI LT (G: green arrow)	CL	-
		A	FLR
LOAD SWITCH 2:	NB NOVI		
LOAD SWITCH 3:	EB 10 MILE LT (G: green arrow)	DL	-
		B	FLR
LOAD SWITCH 4:	WB 10 MILE		
LOAD SWITCH 5:	NB NOVI LT (G: green arrow)	AL	-
		C	FLR
LOAD SWITCH 6:	SB NOVI		
LOAD SWITCH 7:	WB 10 MILE LT (G: green arrow)	BL	-
		D	FLR
LOAD SWITCH 8:	EB 10 MILE		
LOAD SWITCH 9:	NB NOVI PED (EAST LEG)	WA	
LOAD SWITCH 10:	WB 10 MILE PED (NORTH LEG)	WB	
LOAD SWITCH 11:	SB NOVI PED (WEST LEG)	WC	
LOAD SWITCH 12:	EB 10 MILE PED (SOUTH LEG)	WD	
LOAD SWITCH 13(OLA):	SB NOVI LT	CL	FLR
	G: flashing yellow arrow, Y: yellow arrow, R: red arrow		
LOAD SWITCH 14(OLB):	EB 10 MILE LT	DL	FLR
	G: flashing yellow arrow, Y: yellow arrow, R: red arrow		
LOAD SWITCH 15(OLC):	NB NOVI LT	AL	FLR
	G: flashing yellow arrow, Y: yellow arrow, R: red arrow		
LOAD SWITCH 16(OLD):	WB 10 MILE LT	BL	FLR
	G: flashing yellow arrow, Y: yellow arrow, R: red arrow		

MMU 2 :- (MENU : SET/VIEW CONFIG)

Field Check Enable	Channel 1: G Channel 2: G, Y, R Channel 3: G Channel 4: G, Y, R Channel 5: G Channel 6: G, Y, R Channel 7: G Channel 8: G, Y, R Channel 13: G, Y, R Channel 14: G, Y, R Channel 15: G, Y, R Channel 16: G, Y, R
Dual Indication Enable:	R+G: Channel 2,4,6,8,9,10,11,12,13,14,15,16 R+Y: Channel 2,4,6,8,13,14,15,16 G+Y: Channel 2,4,6,8,13,14,15,16
Red Fail Enable:	Enable: Channel 2,4,6,8,13,14,15,16
Y & R Clearance Disable:	Channel 2,4,6,8,13,14,15,16 Enabled
Flashing Yellow Arrow:	Select mode B Enable: Channel Pair 1-13,3-14,5-15,7-16
Unit Options:	All OFF except: Recurrent pulse LED Guard Program Memory Card
Program Card:	Compatible Channels: 1-5, 1-6, 1-11, 1-13, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-7, 3-8, 3-12, 3-14,3-16, 4-7, 4-8, 4-10, 4-12, 4-14, 4-16, 5-9, 5-13, 5-15, 6-9, 6-11, 6-13, 6-15, 7-10, 7-14, 7-16, 8-10, 8-12, 8-14, 8-16, 9-11, 9-13, 9-15, 10-12, 10-14, 10-16, 11-13, 11-15, 12-14, 12-16, 13-15, 14-16. Min Flash Time: 4+2+1 Min Yellow Change Disable: 9,10,11,12 Voltage Monitor Latch: NONE

Note :- Add Jumper 16 MMU Flash - 116 Monitor ST Out

```
*********************************
* CONTROLLER INFORMATION SHEET *
*      FOR SITE NO.  26        *
*     DAWN BIERLEIN            *
*          22-JUNE-2021        *
*********************************
```

CHECKSUMS
TIMES: AA/252
PERS: AC/254
TOTAL: 06/006

FLEXILINK PLAN DATA

Intersection # 26 **State #** _____ **Date:** 06/22/21 **Prepared By:** Dawn Bierlein

Intersection: Novi & 10 Mile **City:** Novi

Hours of Operation: 7 Days: 24 Hours **Approved By:** Rachel Jones

Hours of Flashing: None

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		100	120	120	80				
1	A		0	0	0	0				
2	B		40	48	39	29				
3	C		52	66	55	41				
4	D		88	106	104	68				
5	E									
6	F									
7	G									
8	R-									
9	R+									
10	Of (Y-)		0	0	0	0				
11	Y+	C								
12	Z-									
13	Z+									
14	Q-									
15	Q+									
16	XH									
17	XL									

NOTE: Stages with 1 second of phase time are skipped. Blank entries are default values equal to 0.
Except for an AWA controller, entries #8 to #15 (=254) and 'C' entry means continuous (=255).

							Timers		
Phase	**Direction**	**Min**	**Max**	**ECO**	**Amber**	**All Red**	**Gap**	**Hdwy**	**Waste**
A	Novi	10.0	50.0		4.3	2.0	3.0	1.2	6.0
B	10 Mile LT	4.0	15.0		4.3	2.0	3.0	1.2	6.0
C	10 Mile	10.0	50.0		4.3	2.0	3.0	1.2	6.0
D	Novi LT	4.0	15.0		4.3	2.0	3.0	1.2	6.0
E									
F									
G									

	Day	Hours	Plan#
SC1	14	0:00	4
SC2	8	6:00	2
SC3	8	9:00	1
SC4	8	15:00	3
SC5	8	19:00	4
SC6	13	18:00	4
SC7			
SC8			
SC9			
SC10			

Pedestrian Crossing Times

	Direction	Walk	CL 1	CL 2
2	NB Novi Ped (East Leg)	7.0	14.0	3.3
4	WB 10 Mile Ped (Nort Leg)	7.0	15.0	3.3
6	SB Novi Ped (West Leg)	7.0	14.0	3.3
8	EB 10 Mile Ped (South Leg)	7.0	15.0	3.3

TSM15 (Opticom Min Time) = 10
TSM16 (Opticom Alarm Time) = 200
Flash Rate Timesettings TSM28=0.6 (on rate); TSM29=0.4 (off rate)

DAY OF WEEK CODE NUMBER

0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER

Normal Operating Mode

Isolated	
Flexilink	
Masterlink	X
Master Isolated	
Flexi Isolated	

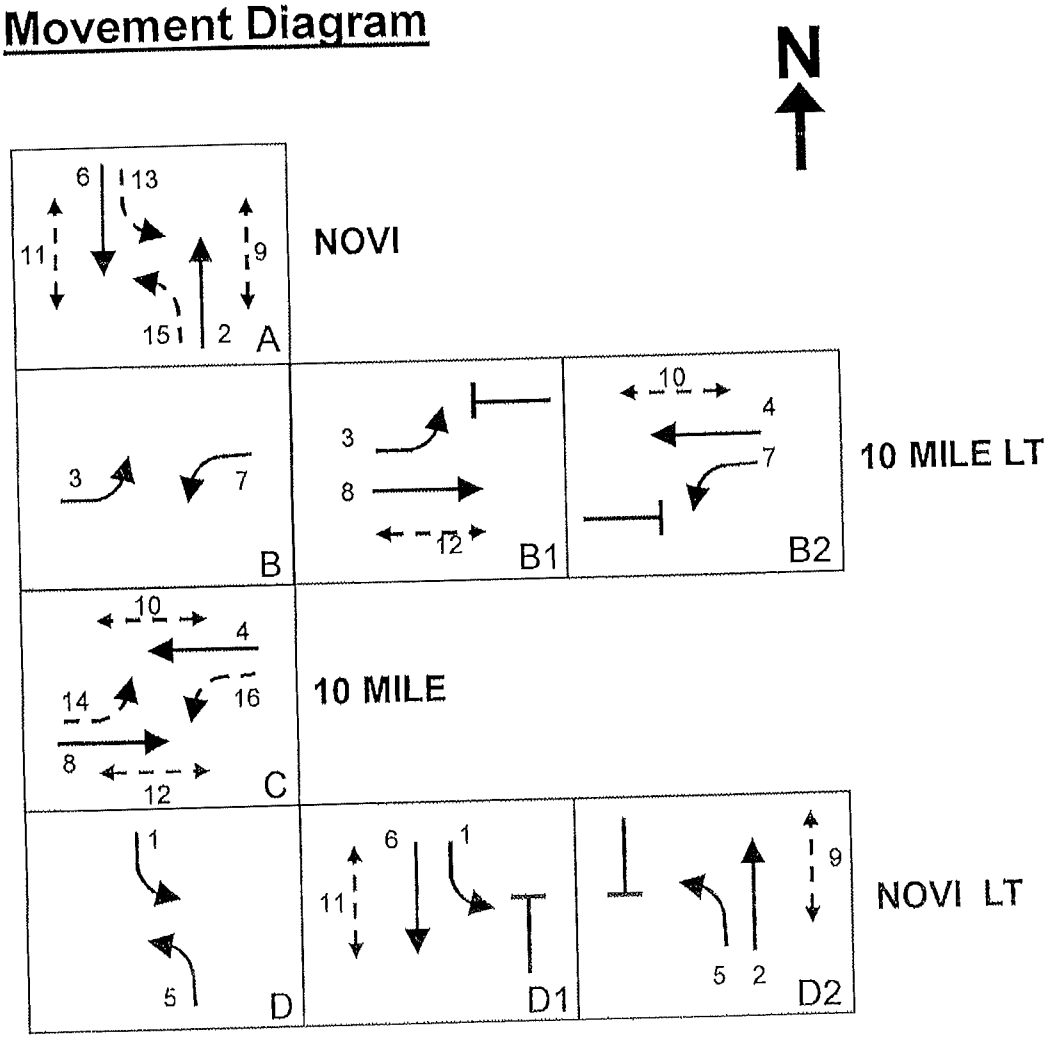
TS2 Gridsmart Detectors BIU #1

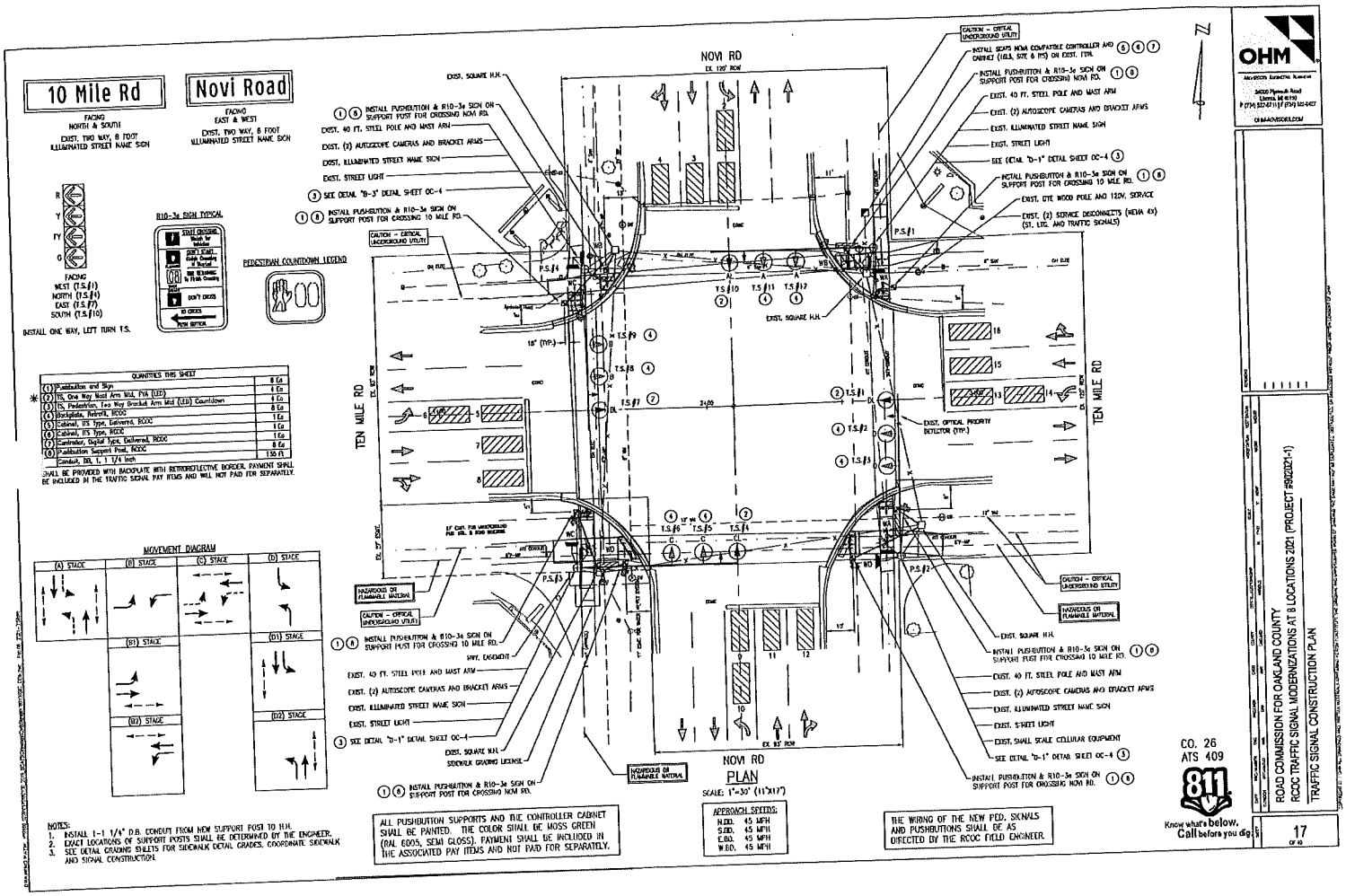
CO# 26

Detector # on print	Description	Phase	Output
1	SB Novi LT	1	1
2	SB Novi LT Adv	1	2
3	SB Novi Thru L	6	3
4	SB Novi Thru R	6	4
5	EB 10 Mile LT	3	5
6	EB 10 Mile LT Adv	3	6
7	EB 10 Mile Thru L	8	7
8	EB 10 Mile Thru R	8	8
9	NB Novi LT	5	9
10	NB Novi LT Adv	5	10
11	NB Novi Thru L	2	11
12	NB Novi Thru R	2	12
13	WB 10 Mile LT	7	13
14	WB 10 Mile LT Adv	7	14
15	WB 10 Mile Thru L	4	15
16	WB 10 Mile Thru R	4	16

#26 – NOVI & 10 MILE

- **Movement Diagram**



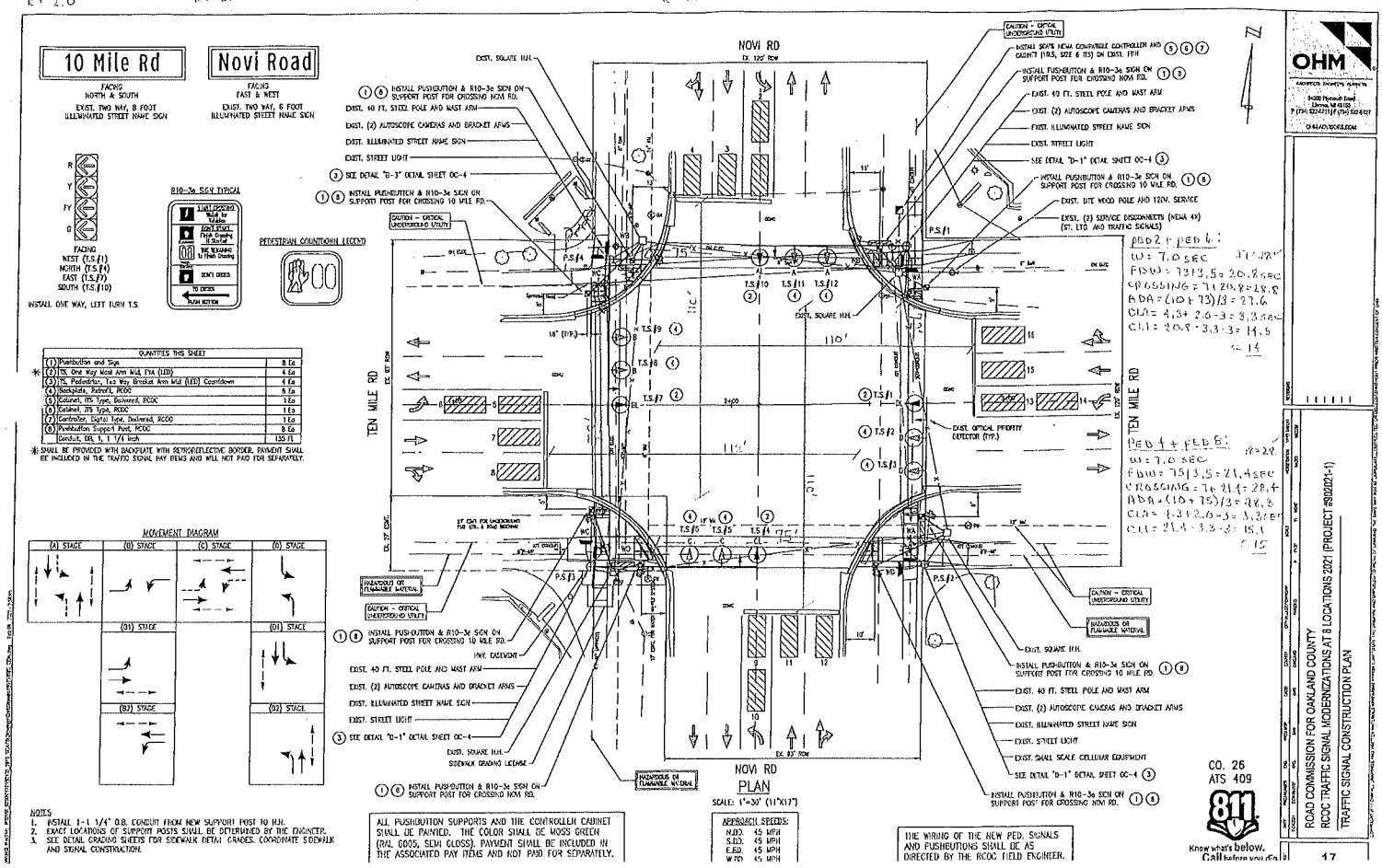

10 Mile Rd
FACING NORTH & SOUTH
EXIST. TWO WAY, 8 FOOT ILLUMINATED STREET NAME SIGN
Novi Road
FACING EAST & WEST
EXIST. TWO WAY, 8 FOOT ILLUMINATED STREET NAME SIGN
FACING
WEST (T.S.#1)
NORTH (T.S.#4)
EAST (T.S.#7)
SOUTH (T.S.#10)
INSTALL ONE WAY, LEFT TURN T.S.
R10-3e SIGN TYPICAL
PEDESTRIAN COUNTDOWN LEGEND
QUANTITIES THIS SHEET
(1) Pushbutton and Sign 8 Ea
(2) TS, One Way Mast Arm Mtd, PVA (LED) 1 Ea
(3) TS, Pedestrian, Two Way Bracket Arm Mtd (LED) Countdown 8 Ea
(4) Workzone, Network, ROCC 1 Ea
(5) Cabinet, ITS Type, Delivered, ROCC 1 Ea
(6) Cabinet, ITS Type, ROCC 1 Ea
(7) Controller, Digital Type, Delivered, ROCC 8 Ea
(8) Pushbutton Support Post, ROCC 130 Ft
Conduit, Rgd, 1, 1 1/4 Inch
SHALL BE PROVIDED WITH BACKPLATE WITH RETROREFLECTIVE BORDER. PAYMENT SHALL BE INCLUDED IN THE TRAFFIC SIGNAL PAY ITEMS AND WILL NOT PAID FOR SEPARATELY.
MOVEMENT DIAGRAM
(A) STAGE
(B) STAGE
(C) STAGE
(D) STAGE
(B1) STAGE
(B2) STAGE
(D1) STAGE
(D2) STAGE
NOTES:
1. INSTALL 1-1 1/4" D.B. CONDUIT FROM NEW SUPPORT POST TO H.H.
2. EXACT LOCATIONS OF SUPPORT POSTS SHALL BE DETERMINED BY THE ENGINEER.
3. SEE DETAIL GRADING SHEETS FOR SIDEWALK DETAIL GRADES. COORDINATE SIDEWALK AND SIGNAL CONSTRUCTION.
NOVI RD
EX. 120' ROW
TEN MILE RD
EX. 66' ROW
NOVI RD
EX. 85' ROW
PLAN
SCALE: 1"=30' (11"X17")
EXIST. SQUARE H.H.
INSTALL PUSHBUTTON & R10-3e SIGN ON SUPPORT POST FOR CROSSING NOVI RD.
EXIST. 40 FT. STEEL POLE AND MAST ARM
EXIST. (2) AUTOSCOPE CAMERAS AND BRACKET ARMS
EXIST. ILLUMINATED STREET NAME SIGN
EXIST. STREET LIGHT
SEE DETAIL "B-3" DETAIL SHEET OC-4
INSTALL PUSHBUTTON & R10-3e SIGN ON SUPPORT POST FOR CROSSING 10 MILE RD.
CAUTION - OPTICAL UNDERGROUND UTILITY
INSTALL SEMTS NEMA COMPATIBLE CONTROLLER AND CABINET (10.5, SITE 6 ITS) ON EXIST. FDN.
EXIST. (2) SERVICE DISCONNECTS (NEMA 4X) (ST. LTG. AND TRAFFIC SIGNALS)
EXIST. DTE WOOD POLE AND 120V. SERVICE
EXIST. SQUARE H.H.
EXIST. OPTICAL PRIORITY DETECTOR (TYP.)
HAZARDOUS OR FLAMMABLE MATERIAL
EXIST. SMALL SCALE CELLULAR EQUIPMENT
SEE DETAIL "D-1" DETAIL SHEET OC-4
INSTALL PUSHBUTTON & R10-3e SIGN ON SUPPORT POST FOR CROSSING NOVI RD.
APP. EASEMENT
SIDEWALK GRADING LICENSE
ALL PUSHBUTTON SUPPORTS AND THE CONTROLLER CABINET SHALL BE PAINTED. THE COLOR SHALL BE MOSS GREEN (RAL 6005, SEMI GLOSS). PAYMENT SHALL BE INCLUDED IN THE ASSOCIATED PAY ITEMS AND NOT PAID FOR SEPARATELY.
APPROACH SPEEDS:
N.BD. 45 MPH
S.BD. 45 MPH
E.BD. 45 MPH
W.BD. 45 MPH
THE WIRING OF THE NEW PED. SIGNALS AND PUSHBUTTONS SHALL BE AS DIRECTED BY THE ROCC FIELD ENGINEER.
CO. 26
ATS 409
811
Know what's below. Call before you dig.
OHM
ROAD COMMISSION FOR OAKLAND COUNTY
ROCC TRAFFIC SIGNAL MODERNIZATIONS AT 8 LOCATIONS 2021 (PROJECT #2022021-1)
TRAFFIC SIGNAL CONSTRUCTION PLAN
17
OF 42

WB NOVI: 4S @ 110'
Y = 4.3
R = 2.0

WB 10 MILE: 4S @ 110'
Y = 4.3
R = 2.0

SB NOVI: 4S @ 110'
Y = 4.3
R = 2.0

EB 10 MILE: 4S @ 112'
Y = 4.3
R = 2.0



QUANTITIES THIS SHEET	
(1) Pushbutton and Sign	8 Ea.
(2) TS, One Way Mast Arm Mtd, FYA (LED)	4 Ea.
(3) TS, Pedestrian, Two Way Breakaway Arm Mtd (LED) Countdown	4 Ea.
(4) Backplate, Retrofit, RCOC	8 Ea.
(5) Cabinet, ITS Type, Delivered, RCOC	1 Ea.
(6) Cabinet, ITS Type, RCOC	1 Ea.
(7) Controller, Digital Type, Delivered, RCOC	1 Ea.
(8) Pushbutton Support Post, RCOC	8 Ea.
Conduit, 3/4, 1, 1 1/4 Insh.	135 Ft.

* SHALL BE PROVIDED WITH BACKPLATE WITH RETROREFLECTIVE BORDER. PAYMENT SHALL BE INCLUDED IN THE TRAFFIC SIGNAL PAY ITEMS AND WILL NOT PAID FOR SEPARATELY.

MOVEMENT DIAGRAM

NOTES
1. INSTALL 1-1 1/4" O.B. CONDUIT FROM NEW SUPPORT POST TO H.H.
2. EXACT LOCATIONS OF SUPPORT POSTS SHALL BE DETERMINED BY RIC ENGINEER.
3. SEE DETAIL GRADING SHEETS FOR SIDEWALK DETAIL GRADES. COORDINATE SIDEWALK AND SIGNAL CONSTRUCTION.

ALL PUSHBUTTON SUPPORTS AND THE CONTROLLER CABINET SHALL BE PAINTED. THE COLOR SHALL BE MOSS GREEN (RAL 6005, SEMI GLOSS). PAYMENT SHALL BE INCLUDED IN THE ASSOCIATED PAY ITEMS AND NOT PAID FOR SEPARATELY.

PLAN
SCALE: 1"=30' (11"X17")

APPROACH SPEEDS:	
N.BD.	45 MPH
S.BD.	45 MPH
E.BD.	45 MPH
W.BD.	45 MPH

THE WIRING OF THE NEW PED. SIGNALS AND PUSHBUTTONS SHALL BE AS DIRECTED BY THE RCOC FIELD ENGINEER.

CO. 26
ATS 409

Know what's below. Call before you dig.

OHM
ROAD COMMISSION FOR OAKLAND COUNTY
RCOC TRAFFIC SIGNAL MODERNIZATIONS AT 8 LOCATIONS 2021 (PROJECT #2022021-1)
TRAFFIC SIGNAL CONSTRUCTION PLAN

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: 10 Mile & Meadowbrook DATE: 8/7/18

CITY/TOWNSHIP: NOVI BY: E LABIANO

COUNTY#: 446 STATE#: - CHARGES: 53821.0981 (Labor & Materials)

PLEASE PERFORM THE FOLLOWING:

____ ELECTRICAL DEVICE: ____ INSTALL ____ MODERNIZE ____ MAINTENANCE

____ UNDERGROUND: _____

____ EDISON OK: ____ YES ____ NO JOB#: _____ SEP 10 2018

____ COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
____ CHANGE TIMING.....																			
____ CHANGE OFFSET.....																			
____ CHANGE CYCLE LENGTH.....																			
____ ADD DIAL/SPLIT.....																			

____ CHANGE BREAKOUT OR EPROM: _____

____ CHANGE HOURS OF OPERATION:

OLD: _____

NEW: _____

____ REPROGRAM TBC

____ INSTALL INTERCONNECT: ____ TBC ____ MINITROL ____ TONE

____ MBT OK: ____ YES ____ NO

____ NO CHANGE - RECORD CORRECTION

__X__ OTHER: PLEASE SWAP OUT EXISTING FLIR CAMERAS WITH AIS-IV CAMERAS (6 CAMERAS) PLEASE CALL TOC TO CONFIRM CAMERAS AND COMMS.TURN ON LED GUARD IN MMU UNIT OPTIONS- CONFIRM: Jumper 16 MMU Flash - 116 Monitor ST Out

** Personality not changed, paperwork updated for AIS-IV cameras **

APPROVED BY: _____ DATE: 8/20 18

DATE INSTALLED: 9/6/18

INSTALLED BY: PRATIN LARSON

INTERSECTION :- 446 10 Mile & Meadowbrook
DESCRIPTION PROMS :- X00446 / F4808
CONTROLLER TYPE :- STANDARD PERSONALITY CONTROLLER
SOFTWARE :- MOD 52 SCATS S30
INPUTS :-

1. NB Meadowbrook LT (LK)
2. NB Meadowbrook LT Adv (LK)
3. NB Meadowbrook Thru L (LK)
4. NB Meadowbrook Thru R (LK)
5. WB 10 Mile LT (NL)
6. WB 10 Mile LT Adv (NL)
7. WB 10 Mile Thru L (LK)
8. WB 10 Mile Thru R (LK)
9. SB Meadowbrook LT (LK)
10. SB Meadowbrook LT Adv (LK)
11. SB Meadowbrook Thru L (LK)
12. SB Meadowbrook Thru R (LK)
13. EB 10 Mile LT (NL)
14. EB 10 Mile LT Adv (NL)
15. EB 10 Mile Thru L (LK)
16. EB 10 Mile Thru R (LK)

NOTE: ALL DETECTORS ARE AUTOSCOPE (RACKVISION, AIS-IV CAMERAS).

Opticom 1: TB2 PREEMPT INPUT 3 (CALLS EB & WB 10 Mile).
Opticom 2: TB2 PREEMPT INPUT 4 (CALLS NB & SB Meadowbrook).

PED 2: WB 10 Mile (North Leg) P.B.
PED 4: SB Meadowbrook (West Leg) P.B.
PED 6: EB 10 Mile (South Leg) P.B.
PED 8: NB Meadowbrook (East Leg) P.B.

APPROACHES :-
A APP 1 : EB 10 Mile Thru L,R
B APP 1 : EB 10 Mile LT,LT Adv
C APP 1 : NB Meadowbrook Thru L,R
D APP 1 : NB Meadowbrook LT,LT Adv

A APP 2 : WB 10 Mile Thru L,R
B APP 2 : WB 10 Mile LT,LT Adv
C APP 2 : SB Meadowbrook Thru L,R
D APP 2 : SB Meadowbrook LT,LT Adv

FLEXIDATA :-

SEQUENCE	A,B,C,D	A,B,C,D
AUTO REL		
R- REL	A	A
R+ REL	B	B
Q- REL	C	C
Q+ REL	D	D

PEDESTRIANS :-

2. WB 10 Mile (North Leg) (P-)
4. SB Meadowbrook (West Leg) (P-)
6. EB 10 Mile (South Leg) (P+)
8. NB Meadowbrook (East Leg) (P+)

SPECIAL FEATURES :-
Personality revision is 1 (=A).
A Stage has permanent demand. Demand for B,C and D stages in flexi and isol.
Set ZNEG to disable.
Pedestrians have automatic introduction using SCATS Y-.
EB 10 Mile LT has flashing red display (filter) in A stage(s).
NB Meadowbrook LT has flashing red display (filter) in C stage(s).
WB 10 Mile LT has flashing red display (filter) in A stage(s).
SB Meadowbrook LT has flashing red display (filter) in C stage(s).
Opticom 1 calls EB & WB 10 Mile.
Opticom 2 calls NB & SB Meadowbrook.

BACKPANEL :- SIZE P44-16 CABINET

LOAD SWITCH 1 - EB Ten Mile LT	CL	FLR
LOAD SWITCH 2 - WB Ten Mile	A	FLR
LOAD SWITCH 3 - NB Meadowbrook LT	DL	FLR
LOAD SWITCH 4 - SB Meadowbrook	B	FLR
LOAD SWITCH 5 - WB Ten Mile LT	AL	FLR
LOAD SWITCH 6 - EB Ten Mile	C	FLR
LOAD SWITCH 7 - SB Meadowbrook LT	BL	FLR
LOAD SWITCH 8 - NB Meadowbrook	D	FLR
LOAD SWITCH 9 - WB 10 Mile (North Leg)	WA	
LOAD SWITCH 10- SB Meadowbrook (West Leg)	WB	
LOAD SWITCH 11- EB 10 Mile (South Leg)	WC	
LOAD SWITCH 12- NB Meadowbrook (East Leg)	WD	

MMU 2: (MENU : SET/VIEW CONFIG)

Field Check Enable:
Channel 1: G, Y, R
Channel 2: G, Y, R
Channel 3: G, Y, R
Channel 4: G, Y, R
Channel 5: G, Y, R
Channel 6: G, Y, R
Channel 7: G, Y, R
Channel 8: G, Y, R

Dual Indication Enable:
R+G: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
R+Y: 1, 2, 3, 4, 5, 6, 7, 8
G+Y: 1, 2, 3, 4, 5, 6, 7, 8

Red Fail Enable: Enable: Channel 1,2,3,4,5,6,7,8

Y & R Clearance Disable: Channel 1,2,3,4,5,6,7,8 Enabled

Flashing Yellow Arrow: None

Unit Options:
All OFF except:
Recurrent pulse
LED Guard
Program Memory Card

Program Card:
Compatible Channels:
1-5,2-6,2-9,2-11,3-7,4-8,4-10,4-12,6-9,6-11,8-10,
8-12,9-11,10-12
Min Flash Time : 4+2+1
Min Yellow Change Disable: 9,10,11,12
Voltage Monitor Latch: None

Note :- Add Jumper 16 MMU Flash - 116 Monitor ST Out

```
*********************************
* CONTROLLER INFORMATION SHEET *
*      FOR SITE NO. 446        *
*      DAWN BIERLEIN           *
*        23-Sep-2013           *
*********************************
```

CHECKSUMS:
TIMES: 82 / 202
PERS: 0F / 017
TOTAL: 8D / 215

FLEXILINK PLAN DATA

Intersection # 446 State # _____ Date: 09/23/13 Prepared By: Dawn Bierlein

Intersection: Meadowbrook & Ten Mile City: Novi

Flash: None Approved By: Rachel Jones

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		80	120	120					
1	A		0	0	0					
2	B		28	55	46					
3	C		40	67	58					
4	D		68	102	100					
5	E									
6	F									
7	G									
8	R-									
9	R+									
10	Y-		44	17.	92					
11	Y+	C								
12	Z-									
13	Z+									
14	Q-									
15	Q+									
16										
17										

NOTE: STAGES WITH ONE SECOND PHASE TIMES ARE SKIPPED
BLANK ENTRIES ARE DEFAULT VALUES = 0 FOR ENTRIES #0 - #7, #16 - #17
254 FOR ENTRIES #8 - #15 'C' ENTRY MEANS CONTINOUS = 255

							Timers		
Phase	Direction	Min	Max	ECO	Amber	All Red	Gap	Hdwy	Waste
A	EB & WB 10 Mile	10.0	30.0		4.3	1.7	3.0	1.2	6.0
B	EB & WB 10 Mile LT	5.0	15.0		4.3	1.7	3.0	1.2	6.0
C	NB & SB Meadowbrook	10.0	20.0		3.9	2.5	3.5	1.2	6.0
D	NB & SB Meadowbrook LT	5.0	15.0		3.9	2.5	3.0	1.2	6.0
E									
F									
G									

TSM15 = Opticom Min Alarm Time = 10
TSM16 = Opticom Max Alarm Time = 200

	Day	Hours	Plan#
SC1	8	6:00	2
SC2	8	9:00	1
SC3	8	15:00	3
SC4	8	19:00	1
SC5	14	0:00	1
SC6			
SC7			
SC8			
SC9			
SC10			

Pedestrian Crossing Times

Direction	Walk	CL 1	CL 2
WB 10 Mile (North Leg)	7.0	12.0	3.0
SB Meadowbrook (West Leg)	7.0	13.0	3.4
EB 10 Mile (South Leg)	7.0	14.0	3.0
NB Meadowbrook (East Leg)	7.0	13.0	3.4

Normal Operating Mode

Isolated	Flexilink	Masterlink	Master Isolated	Flexi Isolated
		X		

DAY OF WEEK CODE NUMBER

0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER

TS2 Autoscope AIS-IV Cameras

CO#446 - 10 MILE & MEADOWBROOK

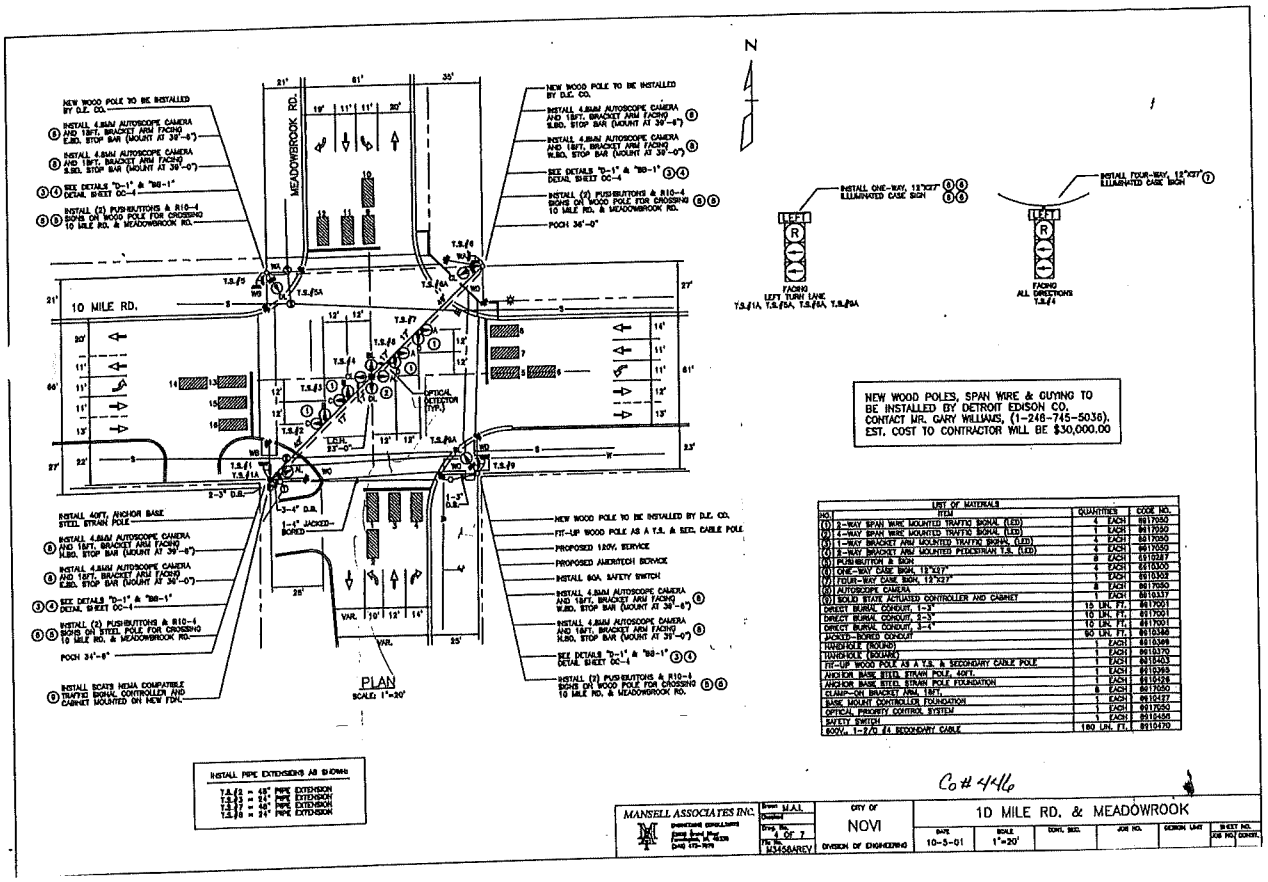
Camera #	Rack Select Switch Position / Detector BIU	Input/Output LED	Description	Detector Number on Print	Phase
1	1	1	NB Meadowbrook LT	1	3
1	1	2	NB Meadowbrook LT Adv	2	3
2	1	3	NB Meadowbrook Thru L	3	8
2	1	4	NB Meadowbrook Thru R	4	8
3	1	5	WB Ten Mile LT	5	5
3	1	6	WB Ten Mile LT Adv	6	5
4	1	7	WB Ten Mile Thru L	7	2
4	1	8	WB Ten Mile Thru R	8	2
5	1	9	SB Meadowbrook LT	9	7
5	1	10	SB Meadowbrook LT Adv	10	7
6	1	11	SB Meadowbrook Thru L	11	4
6	1	12	SB Meadowbrook Thru R	12	4
7	1	13	EB Ten Mile LT	13	1
7	1	14	EB Ten Mile LT Adv	14	1
8	1	15	EB 10 Mile Thru L	15	6
8	1	16	EB 10 Mile Thru R	16	6

Input / Output Indicators

TS2 Rack Select Switch Position 1 - Detectors 1-16
TS2 Rack Select Switch Position 2 - Detectors 17-32
TS2 Rack Select Switch Position 3 - Detectors 33-48
TS2 Rack Select Switch Position 4 - Detectors 49-64
TS2 Rack Select Switch Position 5 - Red Phases
TS2 Rack Select Switch Position 6 - Green Phases
TS2 Rack Select Switch Position 7-10 - All OFF

MVP Status LEDs

TS2 Rack Select Switch Position 1-7 - Cameras 1-4
TS2 Rack Select Switch Position 8 - Cameras 5-8
TS2 Rack Select Switch Position 9-10 - NOT USED



LIST OF MATERIALS

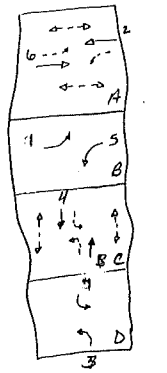
NO.	ITEM	QUANTITIES	CODE NO.
(1)	2-WAY SPAN WIRE MOUNTED TRAFFIC SIGNAL (LED)	4	EACH 8817050
(2)	4-WAY SPAN WIRE MOUNTED TRAFFIC SIGNAL (LED)	1	EACH 8817050
(3)	1-WAY BRACKET ARM MOUNTED TRAFFIC SIGNAL (LED)	4	EACH 8817050
(4)	3-WAY BRACKET ARM MOUNTED PEDESTRIAN T.S. (LED)	8	EACH 8817050
(5)	PUSH-BUTTON & SIGN	8	EACH 8910287
(6)	ONE-WAY CASE SIGN, 12"X27"	4	EACH 8810300
(7)	FOUR-WAY CASE SIGN, 12"X27"	1	EACH 8810302
(8)	AUTOSCOPE CAMERA	8	EACH 8817050
(9)	SOLID STATE ACTUATED CONTROLLER AND CABINET	1	EACH 8810337
	DIRECT BURIAL CONDUIT, 1-3"	15 LIN. FT.	8817001
	DIRECT BURIAL CONDUIT, 2-3"	10 LIN. FT.	8817001
	DIRECT BURIAL CONDUIT, 3-4"	10 LIN. FT.	8817001
	DIRECT BURIAL CONDUIT, 3-4"	90 LIN. FT.	8810388
	JACKED-BORED CONDUIT	1	EACH 8815396
	HANDHOLE (ROUND)	1	EACH 8818370
	HANDHOLE (SQUARE)	1	EACH 8818403
	FIT-UP WOOD POLE AS A T.S. & SECONDARY CABLE POLE	1	EACH 8810369
	ANCHOR BASE STEEL STRAIN POLE, ADPT.	1	EACH 8815428
	ANCHOR BASE STEEL STRAIN POLE FOUNDATION	1	EACH 8815428
	CLAMP-ON BRACKET ARM, 18FT.	8	EACH 8817050
	BASE MOUNT CONTROLLER FOUNDATION	1	EACH 8810427
	OPTICAL PRIORITY CONTROL SYSTEM	1	EACH 8817050
	SAFETY SWITCH	1	EACH 8815428
	600Vac 1-2/0 #4 SECONDARY CABLE	180 LIN. FT.	8815470

Co # 4/16

MANSELL ASSOCIATES INC.	Drawn M.A.L. Checked	CITY OF NOVI DIVISION OF ENGINEERING	1D MILE RD. & MEADOWROOK				
	Proj. No. 4 OF 7 File No. M345SURVEY		DATE 10-3-01	SCALE 1"=20'	CONT. SEC.	JOB NO.	DESIGN UNIT

SHEET NO. JOB NO. CONST.

Movement Diagram



HCM 6th Signalized Intersection Summary
1001: Novi Road & 10 Mile Road

11/22/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	426	148	85	350	83	155	447	113	78	361	157
Future Volume (veh/h)	200	426	148	85	350	83	155	447	113	78	361	157
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	1969	1969	1969	1953	1953	1953	1969	1969	1969	1969	1969	1969
Adj Flow Rate, veh/h	215	458	159	123	507	120	191	552	140	92	425	185
Peak Hour Factor	0.93	0.93	0.93	0.69	0.69	0.69	0.81	0.81	0.81	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	274	635	219	249	608	143	430	1314	332	381	1080	465
Arrive On Green	0.10	0.23	0.23	0.07	0.20	0.20	0.06	0.44	0.44	0.04	0.42	0.42
Sat Flow, veh/h	1875	2729	940	1860	2980	702	1875	2957	747	1875	2545	1097
Grp Volume(v), veh/h	215	313	304	123	315	312	191	348	344	92	311	299
Grp Sat Flow(s),veh/h/ln	1875	1870	1798	1860	1856	1826	1875	1870	1834	1875	1870	1771
Q Serve(g_s), s	10.9	18.5	18.8	6.2	19.5	19.7	7.0	15.3	15.4	3.3	13.8	14.0
Cycle Q Clear(g_c), s	10.9	18.5	18.8	6.2	19.5	19.7	7.0	15.3	15.4	3.3	13.8	14.0
Prop In Lane	1.00		0.52	1.00		0.38	1.00		0.41	1.00		0.62
Lane Grp Cap(c), veh/h	274	435	418	249	378	372	430	831	815	381	794	752
V/C Ratio(X)	0.78	0.72	0.73	0.49	0.83	0.84	0.44	0.42	0.42	0.24	0.39	0.40
Avail Cap(c_a), veh/h	274	525	505	302	521	513	430	831	815	418	794	752
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	42.4	42.5	35.1	45.8	45.9	18.5	22.8	22.8	18.6	23.8	23.9
Incr Delay (d2), s/veh	13.7	3.8	4.2	1.5	8.1	8.7	0.7	1.6	1.6	0.3	1.5	1.6
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(95%),veh/ln	9.8	13.6	13.3	5.1	14.6	14.6	5.3	11.0	10.9	2.5	10.2	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.9	46.2	46.7	36.7	53.9	54.6	19.3	24.3	24.4	18.9	25.3	25.5
LnGrp LOS	D	D	D	D	D	D	B	C	C	B	C	C
Approach Vol, veh/h		832			750			883			702	
Approach Delay, s/veh		47.1			51.3			23.3			24.5	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.6	59.6	14.6	34.2	14.0	57.2	18.0	30.8
Change Period (Y+Rc), s	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Max Green Setting (Gmax), s	7.7	41.7	11.7	33.7	7.7	41.7	11.7	33.7
Max Q Clear Time (g_c+I1), s	5.3	17.4	8.2	20.8	9.0	16.0	12.9	21.7
Green Ext Time (p_c), s	0.0	4.0	0.1	2.8	0.0	3.5	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	36.5
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	604	9	2	504	0	2	0	4	0	0	4
Future Vol, veh/h	1	604	9	2	504	0	2	0	4	0	0	4
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	100	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	69	69	69	60	60	60	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	14	14	14
Mvmt Flow	1	686	10	3	730	0	3	0	7	0	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	730	0	0	696	0	0	1059	1424	686	1433	1434	365
Stage 1	-	-	-	-	-	-	688	688	-	736	736	-
Stage 2	-	-	-	-	-	-	371	736	-	697	698	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.51	6.71	7.11
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.71	5.71	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.31	5.71	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.633	4.133	3.433
Pot Cap-1 Maneuver	872	-	-	*887	-	-	*559	*421	*593	*436	*398	604
Stage 1	-	-	-	-	-	-	*560	*490	-	*356	*402	-
Stage 2	-	-	-	-	-	-	*622	*424	-	*542	*476	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	872	-	-	*887	-	-	*551	*419	*593	*429	*396	604
Mov Cap-2 Maneuver	-	-	-	-	-	-	*551	*419	-	*429	*396	-
Stage 1	-	-	-	-	-	-	*559	*489	-	*356	*401	-
Stage 2	-	-	-	-	-	-	*613	*423	-	*535	*476	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.3	11
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	576	872	-	-	* 887	-	-	604
HCM Lane V/C Ratio	0.017	0.001	-	-	0.003	-	-	0.011
HCM Control Delay (s)	11.3	9.1	-	-	9.1	-	-	11
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	580	0	0	499	12	0	0	0	2	0	11
Future Vol, veh/h	24	580	0	0	499	12	0	0	0	2	0	11
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	75	-	-	75	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	68	68	68	92	92	92	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	13	13	13
Mvmt Flow	28	674	0	0	734	18	0	0	0	3	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	752	0	0	674	0	0	1097	1482	674	1473	1473	376
Stage 1	-	-	-	-	-	-	730	730	-	743	743	-
Stage 2	-	-	-	-	-	-	367	752	-	730	730	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.495	6.695	7.095
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.695	5.695	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.295	5.695	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.6235	4.1235	3.4235
Pot Cap-1 Maneuver	856	-	-	*926	-	-	*583	*331	*618	*337	*326	596
Stage 1	-	-	-	-	-	-	*584	*511	-	*354	*400	-
Stage 2	-	-	-	-	-	-	*626	*417	-	*566	*498	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	856	-	-	*926	-	-	*556	*320	*618	*329	*315	596
Mov Cap-2 Maneuver	-	-	-	-	-	-	*556	*320	-	*329	*315	-
Stage 1	-	-	-	-	-	-	*564	*494	-	*342	*400	-
Stage 2	-	-	-	-	-	-	*612	*417	-	*548	*482	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	0	12
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	856	-	-	* 926	-	-	530
HCM Lane V/C Ratio	-	0.033	-	-	-	-	-	0.031
HCM Control Delay (s)	0	9.3	-	-	0	-	-	12
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.1

Notes			
-: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↱		↕			↕	
Traffic Vol, veh/h	6	576	0	0	508	7	0	0	0	2	0	3
Future Vol, veh/h	6	576	0	0	508	7	0	0	0	2	0	3
Conflicting Peds, #/hr	1	0	0	0	0	1	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	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	68	68	68	92	92	92	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	0	0	0
Mvmt Flow	7	670	0	0	747	10	0	0	0	3	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	758	0	0	670	0	0	1439	1442	670	1432	1432	748
Stage 1	-	-	-	-	-	-	684	684	-	748	748	-
Stage 2	-	-	-	-	-	-	755	758	-	684	684	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	853	-	-	891	-	-	68	81	584	70	83	416
Stage 1	-	-	-	-	-	-	536	477	-	408	423	-
Stage 2	-	-	-	-	-	-	401	415	-	539	480	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	852	-	-	891	-	-	66	79	584	69	82	416
Mov Cap-2 Maneuver	-	-	-	-	-	-	66	79	-	69	82	-
Stage 1	-	-	-	-	-	-	529	471	-	402	423	-
Stage 2	-	-	-	-	-	-	396	415	-	532	473	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	0	32.8
HCM LOS			A	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	852	-	-	891	-	-	138
HCM Lane V/C Ratio	-	0.008	-	-	-	-	-	0.06
HCM Control Delay (s)	0	9.3	0	-	0	-	-	32.8
HCM Lane LOS	A	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	577	508	4	0	2
Future Vol, veh/h	2	577	508	4	0	2
Conflicting Peds, #/hr	1	0	0	1	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	85	85	68	68	60	60
Heavy Vehicles, %	2	2	3	3	0	0
Mvmt Flow	2	679	747	6	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	754	0	-	0	1092	748
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	344	-
Critical Hdwy	4.13	-	-	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.219	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	854	-	-	-	*372	416
Stage 1	-	-	-	-	*471	-
Stage 2	-	-	-	-	*804	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	853	-	-	-	*370	416
Mov Cap-2 Maneuver	-	-	-	-	*370	-
Stage 1	-	-	-	-	*469	-
Stage 2	-	-	-	-	*804	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	853	-	-	-	416
HCM Lane V/C Ratio	0.003	-	-	-	0.008
HCM Control Delay (s)	9.2	0	-	-	13.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱		↰↑↑	↰	↱
Traffic Vol, veh/h	577	0	0	512	0	0
Future Vol, veh/h	577	0	0	512	0	0
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	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	68	68	92	92
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	679	0	0	753	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	679	0	1056	679
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	377	-
Critical Hdwy	-	-	4.145	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.2285	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	*922	-	*584	*618
Stage 1	-	-	-	-	*584	-
Stage 2	-	-	-	-	*664	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*922	-	*584	*618
Mov Cap-2 Maneuver	-	-	-	-	*584	-
Stage 1	-	-	-	-	*584	-
Stage 2	-	-	-	-	*664	-

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	*922	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↑↱		Y	
Traffic Vol, veh/h	2	574	508	7	0	2
Future Vol, veh/h	2	574	508	7	0	2
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	69	69	60	60
Heavy Vehicles, %	2	2	3	3	50	50
Mvmt Flow	2	675	736	10	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	747	0	-	0	1421	374
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	679	-
Critical Hdwy	4.13	-	-	-	7.35	7.65
Critical Hdwy Stg 1	-	-	-	-	6.55	-
Critical Hdwy Stg 2	-	-	-	-	6.15	-
Follow-up Hdwy	2.219	-	-	-	3.975	3.775
Pot Cap-1 Maneuver	859	-	-	-	*364	521
Stage 1	-	-	-	-	*344	-
Stage 2	-	-	-	-	*517	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	858	-	-	-	*362	521
Mov Cap-2 Maneuver	-	-	-	-	*362	-
Stage 1	-	-	-	-	*342	-
Stage 2	-	-	-	-	*516	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	858	-	-	-	521
HCM Lane V/C Ratio	0.003	-	-	-	0.006
HCM Control Delay (s)	9.2	0	-	-	12
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	498	48	30	273	69	48	147	48	64	94	55
Future Volume (veh/h)	112	498	48	30	273	69	48	147	48	64	94	55
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	1953	1953	1953
Adj Flow Rate, veh/h	127	566	55	34	310	78	63	193	63	77	113	66
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.76	0.76	0.76	0.83	0.83	0.83
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	3	3	3
Cap, veh/h	820	1418	137	717	1223	303	240	238	202	138	163	138
Arrive On Green	0.22	0.41	0.41	0.22	0.41	0.41	0.08	0.12	0.12	0.04	0.08	0.08
Sat Flow, veh/h	1890	3472	337	1890	2994	742	1875	1969	1668	1860	1953	1655
Grp Volume(v), veh/h	127	307	314	34	193	195	63	193	63	77	113	66
Grp Sat Flow(s),veh/h/ln	1890	1885	1924	1890	1885	1851	1875	1969	1668	1860	1953	1655
Q Serve(g_s), s	0.0	13.8	13.9	0.0	8.1	8.3	0.0	11.5	4.1	0.9	6.8	4.6
Cycle Q Clear(g_c), s	0.0	13.8	13.9	0.0	8.1	8.3	0.0	11.5	4.1	0.9	6.8	4.6
Prop In Lane	1.00		0.18	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	820	770	786	717	770	756	240	238	202	138	163	138
V/C Ratio(X)	0.15	0.40	0.40	0.05	0.25	0.26	0.26	0.81	0.31	0.56	0.69	0.48
Avail Cap(c_a), veh/h	820	770	786	717	770	756	272	469	398	240	466	395
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.2	25.1	25.1	14.7	23.4	23.5	50.1	51.4	48.2	55.2	53.5	52.5
Incr Delay (d2), s/veh	0.1	1.5	1.5	0.0	0.8	0.8	0.6	6.4	0.9	3.5	5.2	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.9	10.3	10.5	0.8	6.6	6.6	3.2	10.1	3.2	4.2	6.3	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.3	26.6	26.6	14.8	24.2	24.3	50.6	57.8	49.0	58.7	58.7	55.1
LnGrp LOS	B	C	C	B	C	C	D	E	D	E	E	E
Approach Vol, veh/h		748			422			319			256	
Approach Delay, s/veh		24.4			23.5			54.7			57.8	
Approach LOS		C			C			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.7	55.0	15.9	16.4	32.7	55.0	11.4	20.9
Change Period (Y+Rc), s	* 6	* 6	6.4	6.4	* 6	* 6	6.4	6.4
Max Green Setting (Gmax), s	* 6	* 49	11.6	28.6	* 6	* 49	11.6	28.6
Max Q Clear Time (g_c+I1), s	2.0	15.9	2.0	8.8	2.0	10.3	2.9	13.5
Green Ext Time (p_c), s	0.0	3.6	0.1	0.7	0.1	2.2	0.1	1.1

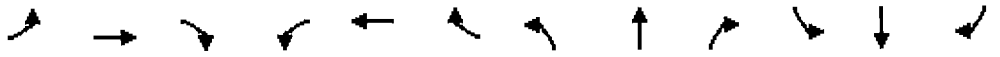
Intersection Summary	
HCM 6th Ctrl Delay	34.6
HCM 6th LOS	C

Notes

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

HCM 6th Signalized Intersection Summary
1001: Novi Road & 10 Mile Road

11/22/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	223	430	225	172	504	176	201	616	88	120	624	304
Future Volume (veh/h)	223	430	225	172	504	176	201	616	88	120	624	304
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		0.98	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	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	242	467	245	198	579	202	212	648	93	126	657	320
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	248	605	316	265	691	240	298	1319	189	351	922	449
Arrive On Green	0.08	0.25	0.25	0.08	0.25	0.25	0.08	0.40	0.40	0.06	0.38	0.38
Sat Flow, veh/h	1890	2394	1248	1890	2731	950	1890	3310	474	1890	2457	1197
Grp Volume(v), veh/h	242	367	345	198	399	382	212	369	372	126	504	473
Grp Sat Flow(s),veh/h/ln	1890	1885	1756	1890	1885	1796	1890	1885	1899	1890	1885	1768
Q Serve(g_s), s	9.7	21.7	21.9	9.4	24.1	24.2	8.2	17.5	17.6	4.9	27.4	27.4
Cycle Q Clear(g_c), s	9.7	21.7	21.9	9.4	24.1	24.2	8.2	17.5	17.6	4.9	27.4	27.4
Prop In Lane	1.00		0.71	1.00		0.53	1.00		0.25	1.00		0.68
Lane Grp Cap(c), veh/h	248	477	444	265	477	454	298	751	757	351	708	664
V/C Ratio(X)	0.97	0.77	0.78	0.75	0.84	0.84	0.71	0.49	0.49	0.36	0.71	0.71
Avail Cap(c_a), veh/h	248	671	625	265	671	639	298	751	757	395	708	664
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	41.6	41.7	32.5	42.5	42.5	24.9	27.0	27.0	21.8	31.9	31.9
Incr Delay (d2), s/veh	49.6	3.5	4.0	11.0	6.5	7.0	7.6	2.3	2.3	0.6	6.0	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.4	15.4	14.7	8.6	17.3	16.7	7.4	12.7	12.8	3.8	19.0	18.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.0	45.1	45.7	43.5	49.0	49.6	32.5	29.3	29.3	22.4	38.0	38.3
LnGrp LOS	F	D	D	D	D	D	C	C	C	C	D	D
Approach Vol, veh/h		954			979			953			1103	
Approach Delay, s/veh		56.0			48.1			30.0			36.3	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	54.1	16.0	36.6	16.0	51.4	16.0	36.6
Change Period (Y+Rc), s	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Max Green Setting (Gmax), s	9.7	32.7	9.7	42.7	9.7	32.7	9.7	42.7
Max Q Clear Time (g_c+I1), s	6.9	19.6	11.4	23.9	10.2	29.4	11.7	26.2
Green Ext Time (p_c), s	0.1	3.5	0.0	3.9	0.0	1.8	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	42.4
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	647	1	1	855	1	4	0	7	0	0	9
Future Vol, veh/h	6	647	1	1	855	1	4	0	7	0	0	9
Conflicting Peds, #/hr	8	0	0	0	0	8	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	100	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	60	60	60	66	66	66
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	7	752	1	1	900	1	7	0	12	0	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	909	0	0	753	0	0	1218	1677	752	1684	1678	459
Stage 1	-	-	-	-	-	-	766	766	-	911	911	-
Stage 2	-	-	-	-	-	-	452	911	-	773	767	-
Critical Hdwy	4.115	-	-	4.115	-	-	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	-	-	2.2095	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	752	-	-	*815	-	-	*514	*287	*545	*290	*286	554
Stage 1	-	-	-	-	-	-	*514	*450	-	*299	*356	-
Stage 2	-	-	-	-	-	-	*562	*356	-	*514	*450	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	746	-	-	*815	-	-	*497	*282	*545	*279	*281	550
Mov Cap-2 Maneuver	-	-	-	-	-	-	*497	*282	-	*279	*281	-
Stage 1	-	-	-	-	-	-	*509	*446	-	*294	*353	-
Stage 2	-	-	-	-	-	-	*547	*353	-	*498	*446	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	12.1	11.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	527	746	-	-	*815	-	-	550
HCM Lane V/C Ratio	0.035	0.009	-	-	0.001	-	-	0.025
HCM Control Delay (s)	12.1	9.9	-	-	9.4	-	-	11.7
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	631	0	0	824	8	0	0	0	20	0	44
Future Vol, veh/h	22	631	0	0	824	8	0	0	0	20	0	44
Conflicting Peds, #/hr	0	0	0	0	0	8	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	75	-	-	75	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	92	92	92	70	70	70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	0	0	0
Mvmt Flow	26	734	0	0	867	8	0	0	0	29	0	63

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	883	0	0	734	0	0	1220	1669	734	1665	1665	446
Stage 1	-	-	-	-	-	-	786	786	-	879	879	-
Stage 2	-	-	-	-	-	-	434	883	-	786	786	-
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	769	-	-	*853	-	-	*536	*261	*569	*266	*265	565
Stage 1	-	-	-	-	-	-	*537	*470	-	*313	*368	-
Stage 2	-	-	-	-	-	-	*574	*365	-	*538	*471	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	763	-	-	*853	-	-	*464	*250	*569	*257	*254	561
Mov Cap-2 Maneuver	-	-	-	-	-	-	*464	*250	-	*257	*254	-
Stage 1	-	-	-	-	-	-	*519	*454	-	*300	*365	-
Stage 2	-	-	-	-	-	-	*510	*362	-	*520	*455	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	0	16.3
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	763	-	-	*853	-	-	410
HCM Lane V/C Ratio	-	0.034	-	-	-	-	-	0.223
HCM Control Delay (s)	0	9.9	-	-	0	-	-	16.3
HCM Lane LOS	A	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↱		↕			↕	
Traffic Vol, veh/h	2	649	0	0	824	3	0	0	0	2	0	8
Future Vol, veh/h	2	649	0	0	824	3	0	0	0	2	0	8
Conflicting Peds, #/hr	1	0	0	0	0	6	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	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	92	92	92	60	60	60
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	2	755	0	0	867	3	0	0	0	3	0	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	876	0	0	755	0	0	1634	1635	755	1632	1632	873
Stage 1	-	-	-	-	-	-	759	759	-	873	873	-
Stage 2	-	-	-	-	-	-	875	876	-	759	759	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	775	-	-	808	-	-	33	42	538	33	43	352
Stage 1	-	-	-	-	-	-	503	442	-	348	370	-
Stage 2	-	-	-	-	-	-	347	369	-	503	442	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	771	-	-	808	-	-	32	42	538	33	42	350
Mov Cap-2 Maneuver	-	-	-	-	-	-	32	42	-	33	42	-
Stage 1	-	-	-	-	-	-	501	441	-	345	368	-
Stage 2	-	-	-	-	-	-	334	367	-	501	441	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	39.8
HCM LOS			A	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	771	-	-	808	-	-	120
HCM Lane V/C Ratio	-	0.003	-	-	-	-	-	0.139
HCM Control Delay (s)	0	9.7	0	-	0	-	-	39.8
HCM Lane LOS	A	A	A	-	A	-	-	E
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↑	↱	⅄	
Traffic Vol, veh/h	0	650	821	0	2	3
Future Vol, veh/h	0	650	821	0	2	3
Conflicting Peds, #/hr	5	0	0	5	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	84	84	95	95	70	70
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	774	864	0	3	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	869	0	-	0	1256	869
Stage 1	-	-	-	-	869	-
Stage 2	-	-	-	-	387	-
Critical Hdwy	4.115	-	-	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2095	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	779	-	-	-	*297	354
Stage 1	-	-	-	-	*414	-
Stage 2	-	-	-	-	*780	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	775	-	-	-	*294	352
Mov Cap-2 Maneuver	-	-	-	-	*294	-
Stage 1	-	-	-	-	*412	-
Stage 2	-	-	-	-	*776	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	775	-	-	-	326
HCM Lane V/C Ratio	-	-	-	-	0.022
HCM Control Delay (s)	0	-	-	-	16.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱		↰↑↑	↰	↱
Traffic Vol, veh/h	652	0	0	821	0	0
Future Vol, veh/h	652	0	0	821	0	0
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	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	95	95	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	776	0	0	864	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	776	0	1208	776
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	432	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	838	-	188	396
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	623	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	838	-	188	396
Mov Cap-2 Maneuver	-	-	-	-	188	-
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	623	-

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	838	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↱		⅄	
Traffic Vol, veh/h	0	651	822	0	1	3
Future Vol, veh/h	0	651	822	0	1	3
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	95	95	60	60
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	775	865	0	2	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	873	0	-	0	1648	441
Stage 1	-	-	-	-	873	-
Stage 2	-	-	-	-	775	-
Critical Hdwy	4.115	-	-	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2095	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	776	-	-	-	*343	570
Stage 1	-	-	-	-	*374	-
Stage 2	-	-	-	-	*514	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	770	-	-	-	*338	566
Mov Cap-2 Maneuver	-	-	-	-	*338	-
Stage 1	-	-	-	-	*371	-
Stage 2	-	-	-	-	*510	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	770	-	-	-	484
HCM Lane V/C Ratio	-	-	-	-	0.014
HCM Control Delay (s)	0	-	-	-	12.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	396	127	68	642	123	69	186	46	97	255	104
Future Volume (veh/h)	98	396	127	68	642	123	69	186	46	97	255	104
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		0.99	1.00		1.00	1.00		0.99
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	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	109	440	141	73	690	132	77	207	51	108	283	116
Peak Hour Factor	0.90	0.90	0.90	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	629	937	298	706	1050	201	139	262	222	243	336	282
Arrive On Green	0.25	0.33	0.33	0.25	0.33	0.33	0.04	0.13	0.13	0.08	0.17	0.17
Sat Flow, veh/h	1890	2812	893	1890	3151	602	1890	1984	1678	1890	1984	1667
Grp Volume(v), veh/h	109	294	287	73	413	409	77	207	51	108	283	116
Grp Sat Flow(s),veh/h/ln	1890	1885	1820	1890	1885	1868	1890	1984	1678	1890	1984	1667
Q Serve(g_s), s	0.0	14.8	15.0	0.0	22.4	22.5	0.9	12.1	3.3	0.3	16.6	7.5
Cycle Q Clear(g_c), s	0.0	14.8	15.0	0.0	22.4	22.5	0.9	12.1	3.3	0.3	16.6	7.5
Prop In Lane	1.00		0.49	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	629	628	607	706	628	623	139	262	222	243	336	282
V/C Ratio(X)	0.17	0.47	0.47	0.10	0.66	0.66	0.55	0.79	0.23	0.44	0.84	0.41
Avail Cap(c_a), veh/h	629	628	607	706	628	623	274	589	498	309	589	494
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	31.6	31.7	19.3	34.1	34.2	55.2	50.5	46.6	50.3	48.3	44.5
Incr Delay (d2), s/veh	0.1	2.5	2.6	0.1	5.3	5.4	3.4	5.3	0.5	1.3	5.7	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.9	11.2	11.1	2.1	16.1	16.1	4.3	10.6	2.5	5.5	13.4	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	34.1	34.3	19.4	39.4	39.5	58.6	55.7	47.1	51.6	54.0	45.5
LnGrp LOS	C	C	C	B	D	D	E	E	D	D	D	D
Approach Vol, veh/h		690			895			335			507	
Approach Delay, s/veh		32.9			37.8			55.1			51.6	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.9	46.0	11.4	26.7	35.9	46.0	15.9	22.2
Change Period (Y+Rc), s	* 6	* 6	6.4	6.4	* 6	* 6	6.4	6.4
Max Green Setting (Gmax), s	* 6	* 40	13.6	35.6	* 6	* 40	13.6	35.6
Max Q Clear Time (g_c+I1), s	2.0	17.0	2.9	18.6	2.0	24.5	2.3	14.1
Green Ext Time (p_c), s	0.0	3.2	0.1	1.7	0.1	4.2	0.2	1.3

Intersection Summary	
HCM 6th Ctrl Delay	41.7
HCM 6th LOS	D

Notes

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

HCM 6th Signalized Intersection Summary
1001: Novi Road & 10 Mile Road

11/22/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	430	149	86	354	84	157	451	114	79	365	159
Future Volume (veh/h)	202	430	149	86	354	84	157	451	114	79	365	159
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	1969	1969	1969	1953	1953	1953	1969	1969	1969	1969	1969	1969
Adj Flow Rate, veh/h	217	462	160	125	513	122	194	557	141	93	429	187
Peak Hour Factor	0.93	0.93	0.93	0.69	0.69	0.69	0.81	0.81	0.81	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	274	639	220	250	613	145	425	1307	330	377	1074	464
Arrive On Green	0.10	0.23	0.23	0.07	0.21	0.21	0.06	0.44	0.44	0.04	0.42	0.42
Sat Flow, veh/h	1875	2731	938	1860	2976	704	1875	2958	746	1875	2544	1098
Grp Volume(v), veh/h	217	315	307	125	319	316	194	351	347	93	314	302
Grp Sat Flow(s),veh/h/ln	1875	1870	1798	1860	1856	1825	1875	1870	1834	1875	1870	1771
Q Serve(g_s), s	10.9	18.6	18.9	6.3	19.8	20.0	7.1	15.5	15.6	3.3	14.0	14.2
Cycle Q Clear(g_c), s	10.9	18.6	18.9	6.3	19.8	20.0	7.1	15.5	15.6	3.3	14.0	14.2
Prop In Lane	1.00		0.52	1.00		0.39	1.00		0.41	1.00		0.62
Lane Grp Cap(c), veh/h	274	438	421	250	382	376	425	826	810	377	790	748
V/C Ratio(X)	0.79	0.72	0.73	0.50	0.83	0.84	0.46	0.43	0.43	0.25	0.40	0.40
Avail Cap(c_a), veh/h	274	525	505	302	521	513	425	826	810	413	790	748
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	42.3	42.4	34.9	45.7	45.7	18.8	23.0	23.1	18.8	24.1	24.1
Incr Delay (d2), s/veh	14.5	3.8	4.3	1.5	8.3	9.0	0.8	1.6	1.7	0.3	1.5	1.6
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(95%),veh/ln	9.9	13.7	13.4	5.1	14.8	14.8	5.4	11.2	11.1	2.6	10.4	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	46.2	46.7	36.5	54.0	54.7	19.5	24.6	24.7	19.1	25.6	25.8
LnGrp LOS	D	D	D	D	D	D	B	C	C	B	C	C
Approach Vol, veh/h		839			760			892			709	
Approach Delay, s/veh		47.3			51.4			23.6			24.8	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	59.3	14.6	34.4	14.0	57.0	18.0	31.0
Change Period (Y+Rc), s	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Max Green Setting (Gmax), s	7.7	41.7	11.7	33.7	7.7	41.7	11.7	33.7
Max Q Clear Time (g_c+I1), s	5.3	17.6	8.3	20.9	9.1	16.2	12.9	22.0
Green Ext Time (p_c), s	0.0	4.0	0.1	2.8	0.0	3.6	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	36.7
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	610	9	2	509	0	2	0	4	0	0	4
Future Vol, veh/h	1	610	9	2	509	0	2	0	4	0	0	4
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	100	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	69	69	69	60	60	60	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	14	14	14
Mvmt Flow	1	693	10	3	738	0	3	0	7	0	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	738	0	0	703	0	0	1070	1439	693	1448	1449	369
Stage 1	-	-	-	-	-	-	695	695	-	744	744	-
Stage 2	-	-	-	-	-	-	375	744	-	704	705	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.51	6.71	7.11
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.71	5.71	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.31	5.71	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.633	4.133	3.433
Pot Cap-1 Maneuver	866	-	-	*887	-	-	*559	*406	*593	*417	*384	600
Stage 1	-	-	-	-	-	-	*560	*490	-	*352	*398	-
Stage 2	-	-	-	-	-	-	*619	*421	-	*542	*476	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	866	-	-	*887	-	-	*551	*405	*593	*411	*382	600
Mov Cap-2 Maneuver	-	-	-	-	-	-	*551	*405	-	*411	*382	-
Stage 1	-	-	-	-	-	-	*559	*489	-	*352	*397	-
Stage 2	-	-	-	-	-	-	*610	*420	-	*535	*476	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.3	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	578	866	-	-	* 887	-	-	600
HCM Lane V/C Ratio	0.017	0.001	-	-	0.003	-	-	0.011
HCM Control Delay (s)	11.3	9.2	-	-	9.1	-	-	11.1
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	586	0	0	504	12	0	0	0	2	0	11
Future Vol, veh/h	24	586	0	0	504	12	0	0	0	2	0	11
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	75	-	-	75	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	68	68	68	92	92	92	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	13	13	13
Mvmt Flow	28	681	0	0	741	18	0	0	0	3	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	759	0	0	681	0	0	1108	1496	681	1487	1487	380
Stage 1	-	-	-	-	-	-	737	737	-	750	750	-
Stage 2	-	-	-	-	-	-	371	759	-	737	737	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.495	6.695	7.095
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.695	5.695	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.295	5.695	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.6235	4.1235	3.4235
Pot Cap-1 Maneuver	850	-	-	*887	-	-	*559	*356	*593	*374	*351	593
Stage 1	-	-	-	-	-	-	*560	*490	-	*351	*397	-
Stage 2	-	-	-	-	-	-	*622	*414	-	*543	*477	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	850	-	-	*887	-	-	*532	*344	*593	*365	*340	593
Mov Cap-2 Maneuver	-	-	-	-	-	-	*532	*344	-	*365	*340	-
Stage 1	-	-	-	-	-	-	*541	*474	-	*339	*397	-
Stage 2	-	-	-	-	-	-	*608	*414	-	*525	*462	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	0	11.9
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	850	-	-	*887	-	-	541
HCM Lane V/C Ratio	-	0.033	-	-	-	-	-	0.03
HCM Control Delay (s)	0	9.4	-	-	0	-	-	11.9
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↗		↕			↕	
Traffic Vol, veh/h	6	582	0	0	513	7	0	0	0	2	0	3
Future Vol, veh/h	6	582	0	0	513	7	0	0	0	2	0	3
Conflicting Peds, #/hr	1	0	0	0	0	1	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	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	68	68	68	92	92	92	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	0	0	0
Mvmt Flow	7	677	0	0	754	10	0	0	0	3	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	765	0	0	677	0	0	1453	1456	677	1446	1446	755
Stage 1	-	-	-	-	-	-	691	691	-	755	755	-
Stage 2	-	-	-	-	-	-	762	765	-	691	691	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	848	-	-	882	-	-	66	78	575	67	81	412
Stage 1	-	-	-	-	-	-	528	472	-	404	420	-
Stage 2	-	-	-	-	-	-	397	412	-	531	474	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	847	-	-	882	-	-	64	77	575	67	79	412
Mov Cap-2 Maneuver	-	-	-	-	-	-	64	77	-	67	79	-
Stage 1	-	-	-	-	-	-	521	466	-	398	420	-
Stage 2	-	-	-	-	-	-	392	412	-	524	468	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	0	33.4
HCM LOS			A	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	847	-	-	882	-	-	135
HCM Lane V/C Ratio	-	0.008	-	-	-	-	-	0.062
HCM Control Delay (s)	0	9.3	0	-	0	-	-	33.4
HCM Lane LOS	A	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑↑	↑	↱	Y	
Traffic Vol, veh/h	2	583	513	4	0	2
Future Vol, veh/h	2	583	513	4	0	2
Conflicting Peds, #/hr	1	0	0	1	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	85	85	68	68	60	60
Heavy Vehicles, %	2	2	3	3	0	0
Mvmt Flow	2	686	754	6	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	761	0	-	0	1102	755
Stage 1	-	-	-	-	755	-
Stage 2	-	-	-	-	347	-
Critical Hdwy	4.13	-	-	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.219	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	849	-	-	-	*366	412
Stage 1	-	-	-	-	*468	-
Stage 2	-	-	-	-	*804	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	848	-	-	-	*364	412
Mov Cap-2 Maneuver	-	-	-	-	*364	-
Stage 1	-	-	-	-	*466	-
Stage 2	-	-	-	-	*804	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	848	-	-	-	412
HCM Lane V/C Ratio	0.003	-	-	-	0.008
HCM Control Delay (s)	9.3	0	-	-	13.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱		↰↑↑	↰	↱
Traffic Vol, veh/h	583	0	0	517	0	0
Future Vol, veh/h	583	0	0	517	0	0
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	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	68	68	92	92
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	686	0	0	760	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	686	0	1066	686
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	380	-
Critical Hdwy	-	-	4.145	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.2285	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	*922	-	*584	*618
Stage 1	-	-	-	-	*584	-
Stage 2	-	-	-	-	*662	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*922	-	*584	*618
Mov Cap-2 Maneuver	-	-	-	-	*584	-
Stage 1	-	-	-	-	*584	-
Stage 2	-	-	-	-	*662	-

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	*922	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Notes			
-: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↱		⅄	
Traffic Vol, veh/h	2	580	513	7	0	2
Future Vol, veh/h	2	580	513	7	0	2
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	69	69	60	60
Heavy Vehicles, %	2	2	3	3	50	50
Mvmt Flow	2	682	743	10	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	754	0	-	0	1435	378
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	686	-
Critical Hdwy	4.13	-	-	-	7.35	7.65
Critical Hdwy Stg 1	-	-	-	-	6.55	-
Critical Hdwy Stg 2	-	-	-	-	6.15	-
Follow-up Hdwy	2.219	-	-	-	3.975	3.775
Pot Cap-1 Maneuver	854	-	-	-	*350	517
Stage 1	-	-	-	-	*341	-
Stage 2	-	-	-	-	*517	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	853	-	-	-	*348	517
Mov Cap-2 Maneuver	-	-	-	-	*348	-
Stage 1	-	-	-	-	*339	-
Stage 2	-	-	-	-	*516	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	853	-	-	-	517
HCM Lane V/C Ratio	0.003	-	-	-	0.006
HCM Control Delay (s)	9.2	0	-	-	12
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	503	48	30	276	70	48	148	48	65	95	56
Future Volume (veh/h)	113	503	48	30	276	70	48	148	48	65	95	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	1984	1984	1984	1984	1984	1984	1969	1969	1969	1953	1953	1953
Adj Flow Rate, veh/h	128	572	55	34	314	80	63	195	63	78	114	67
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.76	0.76	0.76	0.83	0.83	0.83
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	3	3	3
Cap, veh/h	815	1419	136	713	1219	306	240	241	204	138	163	138
Arrive On Green	0.22	0.41	0.41	0.22	0.41	0.41	0.08	0.12	0.12	0.04	0.08	0.08
Sat Flow, veh/h	1890	3476	334	1890	2986	749	1875	1969	1668	1860	1953	1655
Grp Volume(v), veh/h	128	310	317	34	196	198	63	195	63	78	114	67
Grp Sat Flow(s),veh/h/ln	1890	1885	1924	1890	1885	1850	1875	1969	1668	1860	1953	1655
Q Serve(g_s), s	0.0	14.0	14.0	0.0	8.3	8.5	0.0	11.6	4.1	1.0	6.8	4.6
Cycle Q Clear(g_c), s	0.0	14.0	14.0	0.0	8.3	8.5	0.0	11.6	4.1	1.0	6.8	4.6
Prop In Lane	1.00		0.17	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	815	770	786	713	770	755	240	241	204	138	163	138
V/C Ratio(X)	0.16	0.40	0.40	0.05	0.26	0.26	0.26	0.81	0.31	0.57	0.70	0.49
Avail Cap(c_a), veh/h	815	770	786	713	770	755	271	469	398	240	466	395
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.4	25.1	25.2	14.9	23.4	23.5	50.0	51.3	48.0	55.2	53.5	52.5
Incr Delay (d2), s/veh	0.1	1.6	1.5	0.0	0.8	0.8	0.6	6.4	0.9	3.6	5.4	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.0	10.4	10.6	0.8	6.7	6.7	3.2	10.2	3.2	4.3	6.4	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.5	26.7	26.7	14.9	24.2	24.4	50.6	57.8	48.9	58.8	58.9	55.2
LnGrp LOS	B	C	C	B	C	C	D	E	D	E	E	E
Approach Vol, veh/h		755			428			321			259	
Approach Delay, s/veh		24.5			23.6			54.6			57.9	
Approach LOS		C			C			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.5	55.0	16.1	16.4	32.5	55.0	11.4	21.1
Change Period (Y+Rc), s	* 6	* 6	6.4	6.4	* 6	* 6	6.4	6.4
Max Green Setting (Gmax), s	* 6	* 49	11.6	28.6	* 6	* 49	11.6	28.6
Max Q Clear Time (g_c+I1), s	2.0	16.0	2.0	8.8	2.0	10.5	3.0	13.6
Green Ext Time (p_c), s	0.0	3.7	0.1	0.7	0.1	2.2	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	34.6
HCM 6th LOS	C

Notes

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

HCM 6th Signalized Intersection Summary
1001: Novi Road & 10 Mile Road

11/22/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	434	227	174	509	178	203	622	89	121	630	307
Future Volume (veh/h)	225	434	227	174	509	178	203	622	89	121	630	307
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		0.98	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	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	245	472	247	200	585	205	214	655	94	127	663	323
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	248	612	318	265	696	243	294	1309	188	347	916	446
Arrive On Green	0.08	0.26	0.26	0.08	0.26	0.26	0.08	0.40	0.40	0.06	0.37	0.37
Sat Flow, veh/h	1890	2396	1246	1890	2727	953	1890	3310	474	1890	2456	1197
Grp Volume(v), veh/h	245	371	348	200	404	386	214	373	376	127	509	477
Grp Sat Flow(s),veh/h/ln	1890	1885	1757	1890	1885	1795	1890	1885	1899	1890	1885	1768
Q Serve(g_s), s	9.7	21.9	22.1	9.4	24.4	24.5	8.4	17.9	17.9	4.9	27.8	27.8
Cycle Q Clear(g_c), s	9.7	21.9	22.1	9.4	24.4	24.5	8.4	17.9	17.9	4.9	27.8	27.8
Prop In Lane	1.00		0.71	1.00		0.53	1.00		0.25	1.00		0.68
Lane Grp Cap(c), veh/h	248	481	449	265	481	459	294	746	751	347	703	659
V/C Ratio(X)	0.99	0.77	0.78	0.75	0.84	0.84	0.73	0.50	0.50	0.37	0.72	0.72
Avail Cap(c_a), veh/h	248	671	625	265	671	639	294	746	751	390	703	659
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.4	41.4	41.5	32.4	42.3	42.4	25.3	27.3	27.3	22.0	32.3	32.3
Incr Delay (d2), s/veh	53.2	3.6	4.1	11.5	6.7	7.2	8.8	2.4	2.4	0.6	6.4	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.9	15.6	14.9	8.7	17.5	16.9	7.6	12.9	13.0	3.9	19.3	18.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.6	45.0	45.6	43.9	49.1	49.6	34.1	29.7	29.7	22.6	38.7	39.1
LnGrp LOS	F	D	D	D	D	D	C	C	C	C	D	D
Approach Vol, veh/h		964			990			963			1113	
Approach Delay, s/veh		56.8			48.2			30.7			37.0	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	53.8	16.0	36.9	16.0	51.1	16.0	36.9
Change Period (Y+Rc), s	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Max Green Setting (Gmax), s	9.7	32.7	9.7	42.7	9.7	32.7	9.7	42.7
Max Q Clear Time (g_c+I1), s	6.9	19.9	11.4	24.1	10.4	29.8	11.7	26.5
Green Ext Time (p_c), s	0.1	3.5	0.0	4.0	0.0	1.6	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	43.0
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	653	1	1	864	1	4	0	7	0	0	9
Future Vol, veh/h	6	653	1	1	864	1	4	0	7	0	0	9
Conflicting Peds, #/hr	8	0	0	0	0	8	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	100	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	60	60	60	66	66	66
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	7	759	1	1	909	1	7	0	12	0	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	918	0	0	760	0	0	1230	1693	759	1700	1694	463
Stage 1	-	-	-	-	-	-	773	773	-	920	920	-
Stage 2	-	-	-	-	-	-	457	920	-	780	774	-
Critical Hdwy	4.115	-	-	4.115	-	-	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	-	-	2.2095	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	746	-	-	*815	-	-	*514	*275	*545	*275	*275	551
Stage 1	-	-	-	-	-	-	*514	*450	-	*296	*352	-
Stage 2	-	-	-	-	-	-	*558	*352	-	*514	*450	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	740	-	-	*815	-	-	*497	*270	*545	*265	*270	547
Mov Cap-2 Maneuver	-	-	-	-	-	-	*497	*270	-	*265	*270	-
Stage 1	-	-	-	-	-	-	*509	*446	-	*291	*349	-
Stage 2	-	-	-	-	-	-	*543	*349	-	*498	*446	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	12.1	11.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	527	740	-	-	*815	-	-	547
HCM Lane V/C Ratio	0.035	0.009	-	-	0.001	-	-	0.025
HCM Control Delay (s)	12.1	9.9	-	-	9.4	-	-	11.8
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	1											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	637	0	0	832	8	0	0	0	20	0	44
Future Vol, veh/h	22	637	0	0	832	8	0	0	0	20	0	44
Conflicting Peds, #/hr	0	0	0	0	0	8	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	75	-	-	75	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	92	92	92	70	70	70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	0	0	0
Mvmt Flow	26	741	0	0	876	8	0	0	0	29	0	63

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	892	0	0	741	0	0	1231	1685	741	1681	1681	450
Stage 1	-	-	-	-	-	-	793	793	-	888	888	-
Stage 2	-	-	-	-	-	-	438	892	-	793	793	-
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	763	-	-	*853	-	-	*536	*251	*569	*254	*255	562
Stage 1	-	-	-	-	-	-	*537	*470	-	*309	*365	-
Stage 2	-	-	-	-	-	-	*570	*361	-	*538	*471	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	757	-	-	*853	-	-	*464	*241	*569	*245	*244	558
Mov Cap-2 Maneuver	-	-	-	-	-	-	*464	*241	-	*245	*244	-
Stage 1	-	-	-	-	-	-	*519	*454	-	*296	*362	-
Stage 2	-	-	-	-	-	-	*506	*358	-	*520	*455	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	0	16.7
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	757	-	-	*853	-	-	399
HCM Lane V/C Ratio	-	0.034	-	-	-	-	-	0.229
HCM Control Delay (s)	0	9.9	-	-	0	-	-	16.7
HCM Lane LOS	A	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↰	↱		↔			↔	
Traffic Vol, veh/h	2	656	0	0	832	3	0	0	0	2	0	8
Future Vol, veh/h	2	656	0	0	832	3	0	0	0	2	0	8
Conflicting Peds, #/hr	1	0	0	0	0	6	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	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	92	92	92	60	60	60
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	2	763	0	0	876	3	0	0	0	3	0	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	885	0	0	763	0	0	1651	1652	763	1649	1649	882
Stage 1	-	-	-	-	-	-	767	767	-	882	882	-
Stage 2	-	-	-	-	-	-	884	885	-	767	767	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	769	-	-	797	-	-	31	40	527	32	41	348
Stage 1	-	-	-	-	-	-	493	435	-	344	367	-
Stage 2	-	-	-	-	-	-	343	366	-	493	435	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	765	-	-	797	-	-	30	40	527	31	40	346
Mov Cap-2 Maneuver	-	-	-	-	-	-	30	40	-	31	40	-
Stage 1	-	-	-	-	-	-	491	433	-	340	365	-
Stage 2	-	-	-	-	-	-	330	364	-	491	433	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	41.9
HCM LOS			A	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	765	-	-	797	-	-	114
HCM Lane V/C Ratio	-	0.003	-	-	-	-	-	0.146
HCM Control Delay (s)	0	9.7	0	-	0	-	-	41.9
HCM Lane LOS	A	A	A	-	A	-	-	E
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑	↱	Y	
Traffic Vol, veh/h	0	657	829	0	2	3
Future Vol, veh/h	0	657	829	0	2	3
Conflicting Peds, #/hr	5	0	0	5	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	84	84	95	95	70	70
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	782	873	0	3	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	878	0	-	0	1269	878
Stage 1	-	-	-	-	878	-
Stage 2	-	-	-	-	391	-
Critical Hdwy	4.115	-	-	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2095	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	773	-	-	-	*289	350
Stage 1	-	-	-	-	*410	-
Stage 2	-	-	-	-	*780	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	769	-	-	-	*287	348
Mov Cap-2 Maneuver	-	-	-	-	*287	-
Stage 1	-	-	-	-	*408	-
Stage 2	-	-	-	-	*776	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	769	-	-	-	321
HCM Lane V/C Ratio	-	-	-	-	0.022
HCM Control Delay (s)	0	-	-	-	16.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱		↰↑↑	↰	↱
Traffic Vol, veh/h	659	0	0	829	0	0
Future Vol, veh/h	659	0	0	829	0	0
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	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	95	95	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	785	0	0	873	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	785	0	1222	785
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	832	-	185	392
Stage 1	-	-	-	-	448	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	832	-	185	392
Mov Cap-2 Maneuver	-	-	-	-	185	-
Stage 1	-	-	-	-	448	-
Stage 2	-	-	-	-	619	-

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	832	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↱		⅄	
Traffic Vol, veh/h	0	658	830	0	1	3
Future Vol, veh/h	0	658	830	0	1	3
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	95	95	60	60
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	783	874	0	2	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	882	0	-	0	1665	445
Stage 1	-	-	-	-	882	-
Stage 2	-	-	-	-	783	-
Critical Hdwy	4.115	-	-	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2095	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	770	-	-	-	*328	566
Stage 1	-	-	-	-	*370	-
Stage 2	-	-	-	-	*514	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	764	-	-	-	*322	562
Mov Cap-2 Maneuver	-	-	-	-	*322	-
Stage 1	-	-	-	-	*367	-
Stage 2	-	-	-	-	*510	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	764	-	-	-	474
HCM Lane V/C Ratio	-	-	-	-	0.014
HCM Control Delay (s)	0	-	-	-	12.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	400	128	69	648	124	70	188	46	98	258	105
Future Volume (veh/h)	99	400	128	69	648	124	70	188	46	98	258	105
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		0.99	1.00		1.00	1.00		0.99
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	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	110	444	142	74	697	133	78	209	51	109	287	117
Peak Hour Factor	0.90	0.90	0.90	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	623	938	297	700	1051	200	139	264	223	244	340	286
Arrive On Green	0.25	0.33	0.33	0.25	0.33	0.33	0.04	0.13	0.13	0.08	0.17	0.17
Sat Flow, veh/h	1890	2814	892	1890	3153	601	1890	1984	1678	1890	1984	1667
Grp Volume(v), veh/h	110	296	290	74	417	413	78	209	51	109	287	117
Grp Sat Flow(s),veh/h/ln	1890	1885	1821	1890	1885	1869	1890	1984	1678	1890	1984	1667
Q Serve(g_s), s	0.0	14.9	15.1	0.0	22.7	22.7	1.0	12.2	3.3	0.5	16.8	7.5
Cycle Q Clear(g_c), s	0.0	14.9	15.1	0.0	22.7	22.7	1.0	12.2	3.3	0.5	16.8	7.5
Prop In Lane	1.00		0.49	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	623	628	607	700	628	623	139	264	223	244	340	286
V/C Ratio(X)	0.18	0.47	0.48	0.11	0.66	0.66	0.56	0.79	0.23	0.45	0.84	0.41
Avail Cap(c_a), veh/h	623	628	607	700	628	623	274	589	498	307	589	495
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	31.6	31.7	19.6	34.2	34.2	55.2	50.4	46.5	50.3	48.2	44.3
Incr Delay (d2), s/veh	0.1	2.5	2.7	0.1	5.4	5.5	3.5	5.3	0.5	1.3	5.7	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.0	11.3	11.2	2.2	16.3	16.2	4.3	10.6	2.5	5.5	13.5	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	34.2	34.4	19.7	39.7	39.7	58.7	55.7	47.0	51.6	53.9	45.3
LnGrp LOS	C	C	C	B	D	D	E	E	D	D	D	D
Approach Vol, veh/h		696			904			338			513	
Approach Delay, s/veh		33.1			38.1			55.1			51.4	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.6	46.0	11.4	27.0	35.6	46.0	16.0	22.4
Change Period (Y+Rc), s	* 6	* 6	6.4	6.4	* 6	* 6	6.4	6.4
Max Green Setting (Gmax), s	* 6	* 40	13.6	35.6	* 6	* 40	13.6	35.6
Max Q Clear Time (g_c+I1), s	2.0	17.1	3.0	18.8	2.0	24.7	2.5	14.2
Green Ext Time (p_c), s	0.0	3.3	0.1	1.7	0.1	4.3	0.2	1.3

Intersection Summary	
HCM 6th Ctrl Delay	41.8
HCM 6th LOS	D

Notes

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

HCM 6th Signalized Intersection Summary
1001: Novi Road & 10 Mile Road

11/22/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	466	149	106	376	115	157	451	147	113	365	159
Future Volume (veh/h)	202	466	149	106	376	115	157	451	147	113	365	159
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	1969	1969	1969	1953	1953	1953	1969	1969	1969	1969	1969	1969
Adj Flow Rate, veh/h	217	501	160	154	545	167	194	557	181	133	429	187
Peak Hour Factor	0.93	0.93	0.93	0.69	0.69	0.69	0.81	0.81	0.81	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	272	684	217	269	636	194	405	1131	366	355	1020	440
Arrive On Green	0.10	0.25	0.25	0.08	0.23	0.23	0.06	0.41	0.41	0.06	0.40	0.40
Sat Flow, veh/h	1875	2792	887	1860	2799	854	1875	2778	900	1875	2544	1098
Grp Volume(v), veh/h	217	335	326	154	361	351	194	374	364	133	314	302
Grp Sat Flow(s),veh/h/ln	1875	1870	1808	1860	1856	1798	1875	1870	1807	1875	1870	1771
Q Serve(g_s), s	10.6	19.7	20.0	7.5	22.4	22.5	7.4	17.8	17.9	5.0	14.5	14.8
Cycle Q Clear(g_c), s	10.6	19.7	20.0	7.5	22.4	22.5	7.4	17.8	17.9	5.0	14.5	14.8
Prop In Lane	1.00		0.49	1.00		0.48	1.00		0.50	1.00		0.62
Lane Grp Cap(c), veh/h	272	458	443	269	422	409	405	761	735	355	750	710
V/C Ratio(X)	0.80	0.73	0.74	0.57	0.85	0.86	0.48	0.49	0.49	0.38	0.42	0.42
Avail Cap(c_a), veh/h	272	525	508	302	521	505	405	761	735	366	750	710
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	41.7	41.7	33.1	44.5	44.5	20.3	26.4	26.4	20.4	25.9	25.9
Incr Delay (d2), s/veh	15.2	4.4	4.8	2.1	11.1	11.9	0.9	2.3	2.4	0.7	1.7	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.7	14.4	14.2	6.2	16.7	16.5	5.7	12.7	12.5	3.8	10.7	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	46.1	46.5	35.1	55.6	56.4	21.2	28.6	28.8	21.1	27.6	27.8
LnGrp LOS	D	D	D	D	E	E	C	C	C	C	C	C
Approach Vol, veh/h		878			866			932			749	
Approach Delay, s/veh		47.0			52.3			27.2			26.5	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	55.1	15.9	35.7	14.0	54.4	18.0	33.6
Change Period (Y+Rc), s	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Max Green Setting (Gmax), s	7.7	41.7	11.7	33.7	7.7	41.7	11.7	33.7
Max Q Clear Time (g_c+I1), s	7.0	19.9	9.5	22.0	9.4	16.8	12.6	24.5
Green Ext Time (p_c), s	0.0	4.2	0.1	2.9	0.0	3.6	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	38.4
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	685	37	13	567	0	17	0	13	0	0	4
Future Vol, veh/h	1	685	37	13	567	0	17	0	13	0	0	4
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	100	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	69	69	69	60	60	60	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	14	14	14
Mvmt Flow	1	778	42	19	822	0	28	0	22	0	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	822	0	0	820	0	0	1229	1640	778	1672	1682	411
Stage 1	-	-	-	-	-	-	780	780	-	860	860	-
Stage 2	-	-	-	-	-	-	449	860	-	812	822	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.51	6.71	7.11
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.71	5.71	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.31	5.71	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.633	4.133	3.433
Pot Cap-1 Maneuver	805	-	-	*773	-	-	*487	*355	*516	*336	*306	563
Stage 1	-	-	-	-	-	-	*487	*427	-	*298	*350	-
Stage 2	-	-	-	-	-	-	*560	*372	-	*472	*415	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	805	-	-	*773	-	-	*472	*345	*516	*316	*298	563
Mov Cap-2 Maneuver	-	-	-	-	-	-	*472	*345	-	*316	*298	-
Stage 1	-	-	-	-	-	-	*487	*426	-	*298	*341	-
Stage 2	-	-	-	-	-	-	*540	*363	-	*452	*414	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	13.2	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	490	805	-	-	*773	-	-	563
HCM Lane V/C Ratio	0.102	0.001	-	-	0.024	-	-	0.012
HCM Control Delay (s)	13.2	9.5	-	-	9.8	-	-	11.5
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	636	34	13	554	12	19	0	10	2	0	11
Future Vol, veh/h	24	636	34	13	554	12	19	0	10	2	0	11
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	75	-	-	75	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	68	68	68	92	92	92	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	13	13	13
Mvmt Flow	28	740	40	19	815	18	21	0	11	3	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	833	0	0	780	0	0	1262	1687	760	1684	1698	417
Stage 1	-	-	-	-	-	-	816	816	-	862	862	-
Stage 2	-	-	-	-	-	-	446	871	-	822	836	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.495	6.695	7.095
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.695	5.695	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.295	5.695	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.6235	4.1235	3.4235
Pot Cap-1 Maneuver	798	-	-	*849	-	-	*535	*249	*567	*238	*233	560
Stage 1	-	-	-	-	-	-	*535	*469	-	*299	*351	-
Stage 2	-	-	-	-	-	-	*562	*368	-	*520	*457	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	798	-	-	*849	-	-	*499	*235	*567	*224	*220	560
Mov Cap-2 Maneuver	-	-	-	-	-	-	*499	*235	-	*224	*220	-
Stage 1	-	-	-	-	-	-	*517	*452	-	*289	*343	-
Stage 2	-	-	-	-	-	-	*536	*360	-	*492	*441	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.2	12.4	13.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	521	798	-	-	* 849	-	-	455
HCM Lane V/C Ratio	0.061	0.035	-	-	0.023	-	-	0.036
HCM Control Delay (s)	12.4	9.7	-	-	9.3	-	-	13.2
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.1	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↱		↕			↕	
Traffic Vol, veh/h	6	609	33	12	558	7	18	0	10	2	0	3
Future Vol, veh/h	6	609	33	12	558	7	18	0	10	2	0	3
Conflicting Peds, #/hr	1	0	0	0	0	1	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	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	68	68	68	92	92	92	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	0	0	0
Mvmt Flow	7	708	38	18	821	10	20	0	11	3	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	832	0	0	746	0	0	1606	1609	727	1605	1618	822
Stage 1	-	-	-	-	-	-	741	741	-	858	858	-
Stage 2	-	-	-	-	-	-	865	868	-	747	760	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	801	-	-	801	-	-	40	50	531	41	50	377
Stage 1	-	-	-	-	-	-	488	439	-	354	376	-
Stage 2	-	-	-	-	-	-	348	370	-	484	426	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	800	-	-	801	-	-	38	47	531	38	47	377
Mov Cap-2 Maneuver	-	-	-	-	-	-	38	47	-	38	47	-
Stage 1	-	-	-	-	-	-	480	432	-	348	360	-
Stage 2	-	-	-	-	-	-	329	354	-	467	420	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	125.1	53.2
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	57	800	-	-	801	-	-	83
HCM Lane V/C Ratio	0.534	0.009	-	-	0.022	-	-	0.1
HCM Control Delay (s)	125.1	9.5	0	-	9.6	0	-	53.2
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	2.1	0	-	-	0.1	-	-	0.3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑	↱	Y	
Traffic Vol, veh/h	2	620	570	4	0	2
Future Vol, veh/h	2	620	570	4	0	2
Conflicting Peds, #/hr	1	0	0	1	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	85	85	68	68	60	60
Heavy Vehicles, %	2	2	3	3	0	0
Mvmt Flow	2	729	838	6	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	845	0	-	0	1208	839
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	369	-
Critical Hdwy	4.13	-	-	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.219	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	789	-	-	-	*302	369
Stage 1	-	-	-	-	*427	-
Stage 2	-	-	-	-	*804	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	788	-	-	-	*301	369
Mov Cap-2 Maneuver	-	-	-	-	*301	-
Stage 1	-	-	-	-	*425	-
Stage 2	-	-	-	-	*804	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	788	-	-	-	369
HCM Lane V/C Ratio	0.003	-	-	-	0.009
HCM Control Delay (s)	9.6	0	-	-	14.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱		↰↑	↰	↱
Traffic Vol, veh/h	612	8	3	553	21	13
Future Vol, veh/h	612	8	3	553	21	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	68	68	92	92
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	720	9	4	813	23	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	729	0	1135	720
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	415	-
Critical Hdwy	-	-	4.145	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.2285	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	*884	-	*560	*593
Stage 1	-	-	-	-	*560	-
Stage 2	-	-	-	-	*636	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*884	-	*555	*593
Mov Cap-2 Maneuver	-	-	-	-	*555	-
Stage 1	-	-	-	-	*560	-
Stage 2	-	-	-	-	*631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	555	593	-	-	*884	-
HCM Lane V/C Ratio	0.041	0.024	-	-	0.005	-
HCM Control Delay (s)	11.8	11.2	-	-	9.1	0
HCM Lane LOS	B	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-

Notes				
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon	

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↱		⋎	
Traffic Vol, veh/h	2	622	552	7	0	2
Future Vol, veh/h	2	622	552	7	0	2
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	69	69	60	60
Heavy Vehicles, %	2	2	3	3	50	50
Mvmt Flow	2	732	800	10	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	811	0	-	0	1542	406
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	736	-
Critical Hdwy	4.13	-	-	-	7.35	7.65
Critical Hdwy Stg 1	-	-	-	-	6.55	-
Critical Hdwy Stg 2	-	-	-	-	6.15	-
Follow-up Hdwy	2.219	-	-	-	3.975	3.775
Pot Cap-1 Maneuver	813	-	-	-	*343	494
Stage 1	-	-	-	-	*316	-
Stage 2	-	-	-	-	*474	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	812	-	-	-	*341	494
Mov Cap-2 Maneuver	-	-	-	-	*341	-
Stage 1	-	-	-	-	*314	-
Stage 2	-	-	-	-	*474	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	812	-	-	-	494
HCM Lane V/C Ratio	0.003	-	-	-	0.007
HCM Control Delay (s)	9.4	0	-	-	12.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	526	54	30	294	70	59	148	48	65	95	66
Future Volume (veh/h)	126	526	54	30	294	70	59	148	48	65	95	66
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	1953	1953	1953
Adj Flow Rate, veh/h	143	598	61	34	334	80	78	195	63	78	114	80
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.76	0.76	0.76	0.83	0.83	0.83
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	3	3	3
Cap, veh/h	805	1411	144	700	1236	292	240	241	204	138	163	138
Arrive On Green	0.22	0.41	0.41	0.22	0.41	0.41	0.08	0.12	0.12	0.04	0.08	0.08
Sat Flow, veh/h	1890	3455	352	1890	3026	715	1875	1969	1668	1860	1953	1655
Grp Volume(v), veh/h	143	326	333	34	206	208	78	195	63	78	114	80
Grp Sat Flow(s),veh/h/ln	1890	1885	1921	1890	1885	1856	1875	1969	1668	1860	1953	1655
Q Serve(g_s), s	0.0	14.8	14.9	0.0	8.7	8.9	0.0	11.6	4.1	1.0	6.8	5.6
Cycle Q Clear(g_c), s	0.0	14.8	14.9	0.0	8.7	8.9	0.0	11.6	4.1	1.0	6.8	5.6
Prop In Lane	1.00		0.18	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	805	770	784	700	770	758	240	241	204	138	163	138
V/C Ratio(X)	0.18	0.42	0.42	0.05	0.27	0.27	0.33	0.81	0.31	0.57	0.70	0.58
Avail Cap(c_a), veh/h	805	770	784	700	770	758	270	469	398	240	466	395
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.9	25.4	25.4	15.3	23.6	23.7	50.2	51.3	48.0	55.2	53.5	53.0
Incr Delay (d2), s/veh	0.1	1.7	1.7	0.0	0.9	0.9	0.8	6.4	0.9	3.6	5.4	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	11.0	11.2	0.8	7.1	7.1	4.0	10.2	3.2	4.3	6.4	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	27.1	27.1	15.4	24.4	24.5	51.0	57.8	48.9	58.8	58.9	56.8
LnGrp LOS	B	C	C	B	C	C	D	E	D	E	E	E
Approach Vol, veh/h		802			448			336			272	
Approach Delay, s/veh		24.8			23.8			54.5			58.3	
Approach LOS		C			C			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.5	55.0	16.1	16.4	32.5	55.0	11.4	21.1
Change Period (Y+Rc), s	* 6	* 6	6.4	6.4	* 6	* 6	6.4	6.4
Max Green Setting (Gmax), s	* 6	* 49	11.6	28.6	* 6	* 49	11.6	28.6
Max Q Clear Time (g_c+I1), s	2.0	16.9	2.0	8.8	2.0	10.9	3.0	13.6
Green Ext Time (p_c), s	0.0	3.9	0.1	0.7	0.1	2.3	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	34.8
HCM 6th LOS	C

Notes

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

HCM 6th Signalized Intersection Summary
1001: Novi Road & 10 Mile Road

11/22/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	470	227	216	551	232	203	622	125	177	630	307
Future Volume (veh/h)	225	470	227	216	551	232	203	622	125	177	630	307
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		0.99	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	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	245	511	247	248	633	267	214	655	132	186	663	323
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	246	706	340	283	736	310	270	1073	216	328	840	409
Arrive On Green	0.08	0.29	0.29	0.08	0.29	0.29	0.08	0.34	0.34	0.08	0.34	0.34
Sat Flow, veh/h	1890	2466	1187	1890	2571	1084	1890	3127	629	1890	2456	1197
Grp Volume(v), veh/h	245	390	368	248	464	436	214	395	392	186	509	477
Grp Sat Flow(s),veh/h/ln	1890	1885	1768	1890	1885	1770	1890	1885	1871	1890	1885	1768
Q Serve(g_s), s	9.7	22.4	22.5	9.7	28.0	28.0	8.8	20.9	20.9	7.6	29.2	29.2
Cycle Q Clear(g_c), s	9.7	22.4	22.5	9.7	28.0	28.0	8.8	20.9	20.9	7.6	29.2	29.2
Prop In Lane	1.00		0.67	1.00		0.61	1.00		0.34	1.00		0.68
Lane Grp Cap(c), veh/h	246	539	506	283	539	507	270	647	642	328	645	605
V/C Ratio(X)	1.00	0.72	0.73	0.88	0.86	0.86	0.79	0.61	0.61	0.57	0.79	0.79
Avail Cap(c_a), veh/h	246	671	629	283	671	630	270	647	642	330	645	605
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	38.6	38.6	34.2	40.6	40.6	28.0	32.7	32.8	24.7	35.6	35.6
Incr Delay (d2), s/veh	56.5	2.9	3.2	25.0	9.2	9.8	14.9	4.2	4.3	2.2	9.5	10.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	13.6	15.7	15.0	11.3	19.9	19.0	8.5	15.1	15.0	6.2	20.7	19.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.6	41.5	41.8	59.2	49.8	50.4	42.9	37.0	37.1	26.9	45.0	45.6
LnGrp LOS	F	D	D	E	D	D	D	D	D	C	D	D
Approach Vol, veh/h		1003			1148			1001			1172	
Approach Delay, s/veh		53.9			52.1			38.3			42.4	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.9	47.5	16.0	40.6	16.0	47.4	16.0	40.6
Change Period (Y+Rc), s	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Max Green Setting (Gmax), s	9.7	32.7	9.7	42.7	9.7	32.7	9.7	42.7
Max Q Clear Time (g_c+I1), s	9.6	22.9	11.7	24.5	10.8	31.2	11.7	30.0
Green Ext Time (p_c), s	0.0	3.2	0.0	4.2	0.0	0.9	0.0	4.3

Intersection Summary	
HCM 6th Ctrl Delay	46.7
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	734	48	37	949	1	62	0	40	0	0	9
Future Vol, veh/h	6	734	48	37	949	1	62	0	40	0	0	9
Conflicting Peds, #/hr	8	0	0	0	0	8	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	100	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	60	60	60	66	66	66
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	7	853	56	39	999	1	103	0	67	0	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1008	0	0	909	0	0	1445	1953	853	2015	2009	508
Stage 1	-	-	-	-	-	-	867	867	-	1086	1086	-
Stage 2	-	-	-	-	-	-	578	1086	-	929	923	-
Critical Hdwy	4.115	-	-	4.115	-	-	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	-	-	2.2095	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	690	-	-	*738	-	-	*465	*168	*494	*127	*143	515
Stage 1	-	-	-	-	-	-	*465	*407	-	*234	*295	-
Stage 2	-	-	-	-	-	-	*474	*295	-	*465	*407	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	685	-	-	*738	-	-	*431	*156	*494	*104	*133	511
Mov Cap-2 Maneuver	-	-	-	-	-	-	*431	*156	-	*104	*133	-
Stage 1	-	-	-	-	-	-	*461	*403	-	*230	*277	-
Stage 2	-	-	-	-	-	-	*437	*277	-	*398	*403	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	17.6	12.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	454	685	-	-	*738	-	-	511
HCM Lane V/C Ratio	0.374	0.01	-	-	0.053	-	-	0.027
HCM Control Delay (s)	17.6	10.3	-	-	10.2	-	-	12.2
HCM Lane LOS	C	B	-	-	B	-	-	B
HCM 95th %tile Q(veh)	1.7	0	-	-	0.2	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

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	22	696	55	43	886	8	67	0	39	20	0	44
Future Vol, veh/h	22	696	55	43	886	8	67	0	39	20	0	44
Conflicting Peds, #/hr	0	0	0	0	0	8	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	75	-	-	75	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	92	92	92	70	70	70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	0	0	0
Mvmt Flow	26	809	64	45	933	8	73	0	42	29	0	63

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	949	0	0	873	0	0	1450	1932	841	1949	1960	479
Stage 1	-	-	-	-	-	-	893	893	-	1035	1035	-
Stage 2	-	-	-	-	-	-	557	1039	-	914	925	-
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	727	-	-	*776	-	-	*488	*160	*518	*140	*149	538
Stage 1	-	-	-	-	-	-	*489	*428	-	*252	*312	-
Stage 2	-	-	-	-	-	-	*485	*309	-	*490	*429	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	721	-	-	*776	-	-	*400	*144	*518	*119	*134	534
Mov Cap-2 Maneuver	-	-	-	-	-	-	*400	*144	-	*119	*134	-
Stage 1	-	-	-	-	-	-	*471	*412	-	*241	*291	-
Stage 2	-	-	-	-	-	-	*403	*289	-	*433	*413	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.5	16.2	26.7
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	437	721	-	-	*776	-	-	256
HCM Lane V/C Ratio	0.264	0.035	-	-	0.058	-	-	0.357
HCM Control Delay (s)	16.2	10.2	-	-	9.9	-	-	26.7
HCM Lane LOS	C	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1	0.1	-	-	0.2	-	-	1.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	143.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↱		↕			↕	
Traffic Vol, veh/h	2	698	56	41	863	3	66	0	38	2	0	8
Future Vol, veh/h	2	698	56	41	863	3	66	0	38	2	0	8
Conflicting Peds, #/hr	1	0	0	0	0	6	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	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	92	92	92	60	60	60
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	2	812	65	43	908	3	72	0	41	3	0	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	917	0	0	877	0	0	1851	1852	845	1869	1881	914
Stage 1	-	-	-	-	-	-	849	849	-	1000	1000	-
Stage 2	-	-	-	-	-	-	1002	1003	-	869	881	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	748	-	-	661	-	-	~ 15	20	443	14	19	334
Stage 1	-	-	-	-	-	-	417	376	-	295	324	-
Stage 2	-	-	-	-	-	-	295	322	-	396	352	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	744	-	-	661	-	-	~ 13	18	443	11	16	332
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 13	18	-	11	16	-
Stage 1	-	-	-	-	-	-	415	374	-	292	280	-
Stage 2	-	-	-	-	-	-	246	278	-	357	350	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	$ 2478.1	112.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	20	744	-	-	661	-	-	49
HCM Lane V/C Ratio	5.652	0.003	-	-	0.065	-	-	0.34
HCM Control Delay (s)	$ 2478.1	9.9	0	-	10.8	0	-	112.5
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	14.5	0	-	-	0.2	-	-	1.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑	↱	Y	
Traffic Vol, veh/h	0	733	901	0	2	3
Future Vol, veh/h	0	733	901	0	2	3
Conflicting Peds, #/hr	5	0	0	5	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	84	84	95	95	70	70
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	873	948	0	3	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	953	0	-	0	1390	953
Stage 1	-	-	-	-	953	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	4.115	-	-	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2095	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	724	-	-	-	*247	317
Stage 1	-	-	-	-	*378	-
Stage 2	-	-	-	-	*756	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	721	-	-	-	*244	315
Mov Cap-2 Maneuver	-	-	-	-	*244	-
Stage 1	-	-	-	-	*376	-
Stage 2	-	-	-	-	*752	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	18.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	721	-	-	-	292
HCM Lane V/C Ratio	-	-	-	-	0.025
HCM Control Delay (s)	0	-	-	-	18.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱		↰↑↑	↰	↱
Traffic Vol, veh/h	715	20	12	888	13	6
Future Vol, veh/h	715	20	12	888	13	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	95	95	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	851	24	13	935	14	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	875	0	1345	851
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	494	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	769	-	154	359
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	580	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	769	-	149	359
Mov Cap-2 Maneuver	-	-	-	-	149	-
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	560	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	26.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	149	359	-	-	769	-
HCM Lane V/C Ratio	0.095	0.018	-	-	0.016	-
HCM Control Delay (s)	31.7	15.2	-	-	9.8	0.2
HCM Lane LOS	D	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	720	901	0	1	3
Future Vol, veh/h	0	720	901	0	1	3
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	95	95	60	60
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	857	948	0	2	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	956	0	-	0	1813	482
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	857	-
Critical Hdwy	4.115	-	-	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2095	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	722	-	-	-	*277	536
Stage 1	-	-	-	-	*339	-
Stage 2	-	-	-	-	*466	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	716	-	-	-	*273	532
Mov Cap-2 Maneuver	-	-	-	-	*273	-
Stage 1	-	-	-	-	*336	-
Stage 2	-	-	-	-	*462	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	716	-	-	-	430
HCM Lane V/C Ratio	-	-	-	-	0.016
HCM Control Delay (s)	0	-	-	-	13.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	424	148	69	686	124	83	188	46	98	258	125
Future Volume (veh/h)	117	424	148	69	686	124	83	188	46	98	258	125
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		0.99	1.00		1.00	1.00		0.99
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	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	130	471	164	74	738	133	92	209	51	109	287	139
Peak Hour Factor	0.90	0.90	0.90	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	611	915	316	681	1062	191	139	264	223	245	341	286
Arrive On Green	0.25	0.33	0.33	0.25	0.33	0.33	0.04	0.13	0.13	0.08	0.17	0.17
Sat Flow, veh/h	1890	2746	949	1890	3185	574	1890	1984	1678	1890	1984	1667
Grp Volume(v), veh/h	130	322	313	74	437	434	92	209	51	109	287	139
Grp Sat Flow(s),veh/h/ln	1890	1885	1810	1890	1885	1874	1890	1984	1678	1890	1984	1667
Q Serve(g_s), s	0.0	16.5	16.7	0.0	24.1	24.1	1.9	12.2	3.3	0.5	16.8	9.0
Cycle Q Clear(g_c), s	0.0	16.5	16.7	0.0	24.1	24.1	1.9	12.2	3.3	0.5	16.8	9.0
Prop In Lane	1.00		0.52	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	611	628	603	681	628	625	139	264	223	245	341	286
V/C Ratio(X)	0.21	0.51	0.52	0.11	0.69	0.70	0.66	0.79	0.23	0.45	0.84	0.49
Avail Cap(c_a), veh/h	611	628	603	681	628	625	274	589	498	307	589	495
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	32.2	32.2	20.7	34.7	34.7	55.4	50.4	46.5	50.2	48.1	44.9
Incr Delay (d2), s/veh	0.2	3.0	3.2	0.1	6.2	6.3	5.3	5.3	0.5	1.3	5.6	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.1	12.3	12.1	2.2	17.3	17.2	5.2	10.6	2.5	5.5	13.5	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.1	35.1	35.4	20.8	40.9	41.0	60.7	55.7	47.0	51.5	53.7	46.2
LnGrp LOS	C	D	D	C	D	D	E	E	D	D	D	D
Approach Vol, veh/h		765			945			352			535	
Approach Delay, s/veh		34.2			39.4			55.8			51.3	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.6	46.0	11.4	27.0	35.6	46.0	16.1	22.4
Change Period (Y+Rc), s	* 6	* 6	6.4	6.4	* 6	* 6	6.4	6.4
Max Green Setting (Gmax), s	* 6	* 40	13.6	35.6	* 6	* 40	13.6	35.6
Max Q Clear Time (g_c+I1), s	2.0	18.7	3.9	18.8	2.0	26.1	2.5	14.2
Green Ext Time (p_c), s	0.0	3.5	0.1	1.8	0.1	4.3	0.2	1.3

Intersection Summary	
HCM 6th Ctrl Delay	42.5
HCM 6th LOS	D

Notes

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

HCM 6th Signalized Intersection Summary
1001: Novi Road & 10 Mile Road

11/22/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	466	149	106	376	115	157	451	147	113	365	159
Future Volume (veh/h)	202	466	149	106	376	115	157	451	147	113	365	159
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	1969	1969	1969	1953	1953	1953	1969	1969	1969	1969	1969	1969
Adj Flow Rate, veh/h	217	501	160	154	545	167	194	557	181	133	429	187
Peak Hour Factor	0.93	0.93	0.93	0.69	0.69	0.69	0.81	0.81	0.81	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	272	684	217	269	636	194	405	1131	366	355	1020	440
Arrive On Green	0.10	0.25	0.25	0.08	0.23	0.23	0.06	0.41	0.41	0.06	0.40	0.40
Sat Flow, veh/h	1875	2792	887	1860	2799	854	1875	2778	900	1875	2544	1098
Grp Volume(v), veh/h	217	335	326	154	361	351	194	374	364	133	314	302
Grp Sat Flow(s),veh/h/ln	1875	1870	1808	1860	1856	1798	1875	1870	1807	1875	1870	1771
Q Serve(g_s), s	10.6	19.7	20.0	7.5	22.4	22.5	7.4	17.8	17.9	5.0	14.5	14.8
Cycle Q Clear(g_c), s	10.6	19.7	20.0	7.5	22.4	22.5	7.4	17.8	17.9	5.0	14.5	14.8
Prop In Lane	1.00		0.49	1.00		0.48	1.00		0.50	1.00		0.62
Lane Grp Cap(c), veh/h	272	458	443	269	422	409	405	761	735	355	750	710
V/C Ratio(X)	0.80	0.73	0.74	0.57	0.85	0.86	0.48	0.49	0.49	0.38	0.42	0.42
Avail Cap(c_a), veh/h	272	525	508	302	521	505	405	761	735	366	750	710
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	41.7	41.7	33.1	44.5	44.5	20.3	26.4	26.4	20.4	25.9	25.9
Incr Delay (d2), s/veh	15.2	4.4	4.8	2.1	11.1	11.9	0.9	2.3	2.4	0.7	1.7	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.7	14.4	14.2	6.2	16.7	16.5	5.7	12.7	12.5	3.8	10.7	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	46.1	46.5	35.1	55.6	56.4	21.2	28.6	28.8	21.1	27.6	27.8
LnGrp LOS	D	D	D	D	E	E	C	C	C	C	C	C
Approach Vol, veh/h		878			866			932			749	
Approach Delay, s/veh		47.0			52.3			27.2			26.5	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	55.1	15.9	35.7	14.0	54.4	18.0	33.6
Change Period (Y+Rc), s	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Max Green Setting (Gmax), s	7.7	41.7	11.7	33.7	7.7	41.7	11.7	33.7
Max Q Clear Time (g_c+I1), s	7.0	19.9	9.5	22.0	9.4	16.8	12.6	24.5
Green Ext Time (p_c), s	0.0	4.2	0.1	2.9	0.0	3.6	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	38.4
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	685	37	13	567	0	17	0	13	0	0	4
Future Vol, veh/h	1	685	37	13	567	0	17	0	13	0	0	4
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	100	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	69	69	69	60	60	60	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	14	14	14
Mvmt Flow	1	778	42	19	822	0	28	0	22	0	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	822	0	0	820	0	0	1229	1640	778	1672	1682	411
Stage 1	-	-	-	-	-	-	780	780	-	860	860	-
Stage 2	-	-	-	-	-	-	449	860	-	812	822	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.51	6.71	7.11
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.71	5.71	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.31	5.71	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.633	4.133	3.433
Pot Cap-1 Maneuver	805	-	-	*773	-	-	*487	*355	*516	*336	*306	563
Stage 1	-	-	-	-	-	-	*487	*427	-	*298	*350	-
Stage 2	-	-	-	-	-	-	*560	*372	-	*472	*415	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	805	-	-	*773	-	-	*472	*345	*516	*316	*298	563
Mov Cap-2 Maneuver	-	-	-	-	-	-	*472	*345	-	*316	*298	-
Stage 1	-	-	-	-	-	-	*487	*426	-	*298	*341	-
Stage 2	-	-	-	-	-	-	*540	*363	-	*452	*414	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	13.2	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	490	805	-	-	*773	-	-	563
HCM Lane V/C Ratio	0.102	0.001	-	-	0.024	-	-	0.012
HCM Control Delay (s)	13.2	9.5	-	-	9.8	-	-	11.5
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	636	34	13	554	12	19	0	10	2	0	11
Future Vol, veh/h	24	636	34	13	554	12	19	0	10	2	0	11
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	75	-	-	200	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	68	68	68	92	92	92	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	13	13	13
Mvmt Flow	28	740	40	19	815	18	21	0	11	3	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	833	0	0	780	0	0	1262	1687	390	1288	1698	417
Stage 1	-	-	-	-	-	-	816	816	-	862	862	-
Stage 2	-	-	-	-	-	-	446	871	-	426	836	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.76	5.76	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.63	4.13	3.43
Pot Cap-1 Maneuver	796	-	-	1154	-	-	243	126	*823	*214	113	555
Stage 1	-	-	-	-	-	-	658	602	-	*294	346	-
Stage 2	-	-	-	-	-	-	561	367	-	*752	566	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	796	-	-	1154	-	-	228	120	*823	*203	108	555
Mov Cap-2 Maneuver	-	-	-	-	-	-	228	120	-	*203	108	-
Stage 1	-	-	-	-	-	-	635	581	-	*284	340	-
Stage 2	-	-	-	-	-	-	538	361	-	*716	546	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.2	17.9	13.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	228	823	796	-	-	1154	-	-	436
HCM Lane V/C Ratio	0.091	0.013	0.035	-	-	0.017	-	-	0.037
HCM Control Delay (s)	22.4	9.4	9.7	-	-	8.2	-	-	13.5
HCM Lane LOS	C	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	0.1	-	-	0.1	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	609	33	12	558	7	18	0	10	2	0	3
Future Vol, veh/h	6	609	33	12	558	7	18	0	10	2	0	3
Conflicting Peds, #/hr	1	0	0	0	0	1	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	100	-	-	100	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	68	68	68	92	92	92	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	0	0	0
Mvmt Flow	7	708	38	18	821	10	20	0	11	3	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	832	0	0	746	0	0	1188	1609	373	1231	1623	417
Stage 1	-	-	-	-	-	-	741	741	-	863	863	-
Stage 2	-	-	-	-	-	-	447	868	-	368	760	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.5	5.5	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.5	4	3.3
Pot Cap-1 Maneuver	796	-	-	1146	-	-	261	139	*848	*241	138	590
Stage 1	-	-	-	-	-	-	687	626	-	*320	374	-
Stage 2	-	-	-	-	-	-	560	368	-	*804	615	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	795	-	-	1146	-	-	254	136	*848	*234	134	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	254	136	-	*234	134	-
Stage 1	-	-	-	-	-	-	681	620	-	*317	368	-
Stage 2	-	-	-	-	-	-	547	362	-	*787	609	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	16.4	15
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	254	848	795	-	-	1146	-	-	367
HCM Lane V/C Ratio	0.077	0.013	0.009	-	-	0.015	-	-	0.023
HCM Control Delay (s)	20.4	9.3	9.6	-	-	8.2	-	-	15
HCM Lane LOS	C	A	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	0	0	-	-	0	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑↱		Y	
Traffic Vol, veh/h	2	620	570	4	0	2
Future Vol, veh/h	2	620	570	4	0	2
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	68	68	60	60
Heavy Vehicles, %	2	2	3	3	0	0
Mvmt Flow	2	729	838	6	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	845	0	-	0	1211	423
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	369	-
Critical Hdwy	4.14	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.22	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	787	-	-	-	*289	585
Stage 1	-	-	-	-	*388	-
Stage 2	-	-	-	-	*804	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	786	-	-	-	*287	584
Mov Cap-2 Maneuver	-	-	-	-	*287	-
Stage 1	-	-	-	-	*386	-
Stage 2	-	-	-	-	*804	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	786	-	-	-	584
HCM Lane V/C Ratio	0.003	-	-	-	0.006
HCM Control Delay (s)	9.6	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	612	8	3	553	21	13
Future Vol, veh/h	612	8	3	553	21	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	68	68	92	92
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	720	9	4	813	23	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	729	0	1135	720
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	415	-
Critical Hdwy	-	-	4.145	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.2285	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	*884	-	*560	*593
Stage 1	-	-	-	-	*560	-
Stage 2	-	-	-	-	*636	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*884	-	*555	*593
Mov Cap-2 Maneuver	-	-	-	-	*555	-
Stage 1	-	-	-	-	*560	-
Stage 2	-	-	-	-	*631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	555	593	-	-	*884	-
HCM Lane V/C Ratio	0.041	0.024	-	-	0.005	-
HCM Control Delay (s)	11.8	11.2	-	-	9.1	0
HCM Lane LOS	B	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-

Notes				
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon	

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↱		Y	
Traffic Vol, veh/h	2	622	552	7	0	2
Future Vol, veh/h	2	622	552	7	0	2
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	69	69	60	60
Heavy Vehicles, %	2	2	3	3	50	50
Mvmt Flow	2	732	800	10	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	811	0	-	0	1542	406
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	736	-
Critical Hdwy	4.13	-	-	-	7.35	7.65
Critical Hdwy Stg 1	-	-	-	-	6.55	-
Critical Hdwy Stg 2	-	-	-	-	6.15	-
Follow-up Hdwy	2.219	-	-	-	3.975	3.775
Pot Cap-1 Maneuver	813	-	-	-	*343	494
Stage 1	-	-	-	-	*316	-
Stage 2	-	-	-	-	*474	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	812	-	-	-	*341	494
Mov Cap-2 Maneuver	-	-	-	-	*341	-
Stage 1	-	-	-	-	*314	-
Stage 2	-	-	-	-	*474	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	812	-	-	-	494
HCM Lane V/C Ratio	0.003	-	-	-	0.007
HCM Control Delay (s)	9.4	0	-	-	12.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	526	54	30	294	70	59	148	48	65	95	66
Future Volume (veh/h)	126	526	54	30	294	70	59	148	48	65	95	66
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	1953	1953	1953
Adj Flow Rate, veh/h	143	598	61	34	334	80	78	195	63	78	114	80
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.76	0.76	0.76	0.83	0.83	0.83
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	3	3	3
Cap, veh/h	805	1411	144	700	1236	292	240	241	204	138	163	138
Arrive On Green	0.22	0.41	0.41	0.22	0.41	0.41	0.08	0.12	0.12	0.04	0.08	0.08
Sat Flow, veh/h	1890	3455	352	1890	3026	715	1875	1969	1668	1860	1953	1655
Grp Volume(v), veh/h	143	326	333	34	206	208	78	195	63	78	114	80
Grp Sat Flow(s),veh/h/ln	1890	1885	1921	1890	1885	1856	1875	1969	1668	1860	1953	1655
Q Serve(g_s), s	0.0	14.8	14.9	0.0	8.7	8.9	0.0	11.6	4.1	1.0	6.8	5.6
Cycle Q Clear(g_c), s	0.0	14.8	14.9	0.0	8.7	8.9	0.0	11.6	4.1	1.0	6.8	5.6
Prop In Lane	1.00		0.18	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	805	770	784	700	770	758	240	241	204	138	163	138
V/C Ratio(X)	0.18	0.42	0.42	0.05	0.27	0.27	0.33	0.81	0.31	0.57	0.70	0.58
Avail Cap(c_a), veh/h	805	770	784	700	770	758	270	469	398	240	466	395
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.9	25.4	25.4	15.3	23.6	23.7	50.2	51.3	48.0	55.2	53.5	53.0
Incr Delay (d2), s/veh	0.1	1.7	1.7	0.0	0.9	0.9	0.8	6.4	0.9	3.6	5.4	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	11.0	11.2	0.8	7.1	7.1	4.0	10.2	3.2	4.3	6.4	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	27.1	27.1	15.4	24.4	24.5	51.0	57.8	48.9	58.8	58.9	56.8
LnGrp LOS	B	C	C	B	C	C	D	E	D	E	E	E
Approach Vol, veh/h		802			448			336			272	
Approach Delay, s/veh		24.8			23.8			54.5			58.3	
Approach LOS		C			C			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.5	55.0	16.1	16.4	32.5	55.0	11.4	21.1
Change Period (Y+Rc), s	* 6	* 6	6.4	6.4	* 6	* 6	6.4	6.4
Max Green Setting (Gmax), s	* 6	* 49	11.6	28.6	* 6	* 49	11.6	28.6
Max Q Clear Time (g_c+I1), s	2.0	16.9	2.0	8.8	2.0	10.9	3.0	13.6
Green Ext Time (p_c), s	0.0	3.9	0.1	0.7	0.1	2.3	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	34.8
HCM 6th LOS	C

Notes

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

HCM 6th Signalized Intersection Summary
1001: Novi Road & 10 Mile Road

11/22/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	470	227	216	551	232	203	622	125	177	630	307
Future Volume (veh/h)	225	470	227	216	551	232	203	622	125	177	630	307
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		0.99	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	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	245	511	247	248	633	267	214	655	132	186	663	323
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	276	703	338	313	733	309	258	1022	206	315	803	391
Arrive On Green	0.10	0.28	0.28	0.10	0.28	0.28	0.08	0.33	0.33	0.08	0.33	0.33
Sat Flow, veh/h	1890	2466	1187	1890	2571	1084	1890	3127	629	1890	2456	1197
Grp Volume(v), veh/h	245	390	368	248	464	436	214	395	392	186	509	477
Grp Sat Flow(s),veh/h/ln	1890	1885	1768	1890	1885	1770	1890	1885	1871	1890	1885	1768
Q Serve(g_s), s	11.0	22.4	22.5	11.2	28.0	28.0	9.1	21.4	21.4	7.8	29.9	29.9
Cycle Q Clear(g_c), s	11.0	22.4	22.5	11.2	28.0	28.0	9.1	21.4	21.4	7.8	29.9	29.9
Prop In Lane	1.00		0.67	1.00		0.61	1.00		0.34	1.00		0.68
Lane Grp Cap(c), veh/h	276	537	504	313	537	504	258	616	611	315	616	578
V/C Ratio(X)	0.89	0.73	0.73	0.79	0.86	0.86	0.83	0.64	0.64	0.59	0.83	0.83
Avail Cap(c_a), veh/h	276	655	614	313	655	615	258	616	611	315	616	578
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	38.7	38.7	29.6	40.7	40.7	29.2	34.4	34.4	26.0	37.3	37.3
Incr Delay (d2), s/veh	27.4	3.2	3.5	12.9	9.9	10.5	20.0	5.0	5.1	2.9	12.0	12.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.2	15.8	15.1	10.0	20.1	19.2	9.1	15.5	15.5	6.4	21.6	20.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.1	41.9	42.2	42.5	50.6	51.3	49.2	39.4	39.5	28.9	49.3	50.0
LnGrp LOS	E	D	D	D	D	D	D	D	D	C	D	D
Approach Vol, veh/h		1003			1148			1001			1172	
Approach Delay, s/veh		46.0			49.1			41.6			46.3	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	45.5	16.0	40.5	16.0	45.5	16.0	40.5
Change Period (Y+Rc), s	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Max Green Setting (Gmax), s	9.7	31.7	11.7	41.7	9.7	31.7	11.7	41.7
Max Q Clear Time (g_c+I1), s	9.8	23.4	13.2	24.5	11.1	31.9	13.0	30.0
Green Ext Time (p_c), s	0.0	2.9	0.0	4.1	0.0	0.0	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	45.9
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	734	48	37	949	1	62	0	40	0	0	9
Future Vol, veh/h	6	734	48	37	949	1	62	0	40	0	0	9
Conflicting Peds, #/hr	8	0	0	0	0	8	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	100	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	60	60	60	66	66	66
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	7	853	56	39	999	1	103	0	67	0	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1008	0	0	909	0	0	1445	1953	853	2015	2009	508
Stage 1	-	-	-	-	-	-	867	867	-	1086	1086	-
Stage 2	-	-	-	-	-	-	578	1086	-	929	923	-
Critical Hdwy	4.115	-	-	4.115	-	-	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	-	-	2.2095	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	690	-	-	*738	-	-	*465	*168	*494	*127	*143	515
Stage 1	-	-	-	-	-	-	*465	*407	-	*234	*295	-
Stage 2	-	-	-	-	-	-	*474	*295	-	*465	*407	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	685	-	-	*738	-	-	*431	*156	*494	*104	*133	511
Mov Cap-2 Maneuver	-	-	-	-	-	-	*431	*156	-	*104	*133	-
Stage 1	-	-	-	-	-	-	*461	*403	-	*230	*277	-
Stage 2	-	-	-	-	-	-	*437	*277	-	*398	*403	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	17.6	12.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	454	685	-	-	*738	-	-	511
HCM Lane V/C Ratio	0.374	0.01	-	-	0.053	-	-	0.027
HCM Control Delay (s)	17.6	10.3	-	-	10.2	-	-	12.2
HCM Lane LOS	C	B	-	-	B	-	-	B
HCM 95th %tile Q(veh)	1.7	0	-	-	0.2	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	696	55	43	886	8	67	0	39	20	0	44
Future Vol, veh/h	22	696	55	43	886	8	67	0	39	20	0	44
Conflicting Peds, #/hr	0	0	0	0	0	8	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	75	-	-	200	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	92	92	92	70	70	70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	0	0	0
Mvmt Flow	26	809	64	45	933	8	73	0	42	29	0	63

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	949	0	0	873	0	0	1450	1932	437	1492	1960	479
Stage 1	-	-	-	-	-	-	893	893	-	1035	1035	-
Stage 2	-	-	-	-	-	-	557	1039	-	457	925	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.52	6.52	6.92	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.52	5.52	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.52	5.52	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.21	-	-	3.51	4.01	3.31	3.5	4	3.3
Pot Cap-1 Maneuver	725	-	-	1093	-	-	174	84	*799	*160	80	538
Stage 1	-	-	-	-	-	-	629	577	-	*252	312	-
Stage 2	-	-	-	-	-	-	485	308	-	*756	555	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	719	-	-	1093	-	-	145	77	*799	*141	74	534
Mov Cap-2 Maneuver	-	-	-	-	-	-	145	77	-	*141	74	-
Stage 1	-	-	-	-	-	-	606	556	-	*241	297	-
Stage 2	-	-	-	-	-	-	410	293	-	*690	535	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	36.9	23.5
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	145	799	719	-	-	1093	-	-	295
HCM Lane V/C Ratio	0.502	0.053	0.036	-	-	0.041	-	-	0.321
HCM Control Delay (s)	52.6	9.8	10.2	-	-	8.4	-	-	23.5
HCM Lane LOS	F	A	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	2.4	0.2	0.1	-	-	0.1	-	-	1.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	698	56	41	863	3	66	0	38	2	0	8
Future Vol, veh/h	2	698	56	41	863	3	66	0	38	2	0	8
Conflicting Peds, #/hr	1	0	0	0	0	6	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	100	-	-	100	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	95	95	95	92	92	92	60	60	60
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	2	812	65	43	908	3	72	0	41	3	0	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	917	0	0	877	0	0	1389	1852	439	1412	1883	462
Stage 1	-	-	-	-	-	-	849	849	-	1002	1002	-
Stage 2	-	-	-	-	-	-	540	1003	-	410	881	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.21	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	746	-	-	1088	-	-	202	99	*802	*191	93	552
Stage 1	-	-	-	-	-	-	683	614	-	*264	323	-
Stage 2	-	-	-	-	-	-	499	322	-	*756	588	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	742	-	-	1088	-	-	190	94	*802	*175	88	549
Mov Cap-2 Maneuver	-	-	-	-	-	-	190	94	-	*175	88	-
Stage 1	-	-	-	-	-	-	681	612	-	*262	308	-
Stage 2	-	-	-	-	-	-	468	307	-	*715	586	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	25.8	14.8
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	190	802	742	-	-	1088	-	-	385
HCM Lane V/C Ratio	0.378	0.052	0.003	-	-	0.04	-	-	0.043
HCM Control Delay (s)	35	9.7	9.9	-	-	8.4	-	-	14.8
HCM Lane LOS	E	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.6	0.2	0	-	-	0.1	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↑	↑↕		↾	
Traffic Vol, veh/h	0	733	901	0	2	3
Future Vol, veh/h	0	733	901	0	2	3
Conflicting Peds, #/hr	5	0	0	5	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	95	95	70	70
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	873	948	0	3	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	953	0	-	0	1390	479
Stage 1	-	-	-	-	953	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	723	-	-	-	*236	538
Stage 1	-	-	-	-	*340	-
Stage 2	-	-	-	-	*756	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	720	-	-	-	*234	535
Mov Cap-2 Maneuver	-	-	-	-	*234	-
Stage 1	-	-	-	-	*338	-
Stage 2	-	-	-	-	*752	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	720	-	-	-	353
HCM Lane V/C Ratio	-	-	-	-	0.02
HCM Control Delay (s)	0	-	-	-	15.4
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱		↰↑	↰	↱
Traffic Vol, veh/h	715	20	12	888	13	6
Future Vol, veh/h	715	20	12	888	13	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	95	95	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	851	24	13	935	14	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	875	0	1345	851
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	494	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	769	-	154	359
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	580	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	769	-	149	359
Mov Cap-2 Maneuver	-	-	-	-	149	-
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	560	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	26.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	149	359	-	-	769	-
HCM Lane V/C Ratio	0.095	0.018	-	-	0.016	-
HCM Control Delay (s)	31.7	15.2	-	-	9.8	0.2
HCM Lane LOS	D	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↑↱		⅄	
Traffic Vol, veh/h	0	720	901	0	1	3
Future Vol, veh/h	0	720	901	0	1	3
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	95	95	60	60
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	857	948	0	2	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	956	0	-	0	1813	482
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	857	-
Critical Hdwy	4.115	-	-	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2095	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	722	-	-	-	*277	536
Stage 1	-	-	-	-	*339	-
Stage 2	-	-	-	-	*466	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	716	-	-	-	*273	532
Mov Cap-2 Maneuver	-	-	-	-	*273	-
Stage 1	-	-	-	-	*336	-
Stage 2	-	-	-	-	*462	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	716	-	-	-	430
HCM Lane V/C Ratio	-	-	-	-	0.016
HCM Control Delay (s)	0	-	-	-	13.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	424	148	69	686	124	83	188	46	98	258	125
Future Volume (veh/h)	117	424	148	69	686	124	83	188	46	98	258	125
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		0.99	1.00		1.00	1.00		0.99
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	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	130	471	164	74	738	133	92	209	51	109	287	139
Peak Hour Factor	0.90	0.90	0.90	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	611	915	316	681	1062	191	139	264	223	245	341	286
Arrive On Green	0.25	0.33	0.33	0.25	0.33	0.33	0.04	0.13	0.13	0.08	0.17	0.17
Sat Flow, veh/h	1890	2746	949	1890	3185	574	1890	1984	1678	1890	1984	1667
Grp Volume(v), veh/h	130	322	313	74	437	434	92	209	51	109	287	139
Grp Sat Flow(s),veh/h/ln	1890	1885	1810	1890	1885	1874	1890	1984	1678	1890	1984	1667
Q Serve(g_s), s	0.0	16.5	16.7	0.0	24.1	24.1	1.9	12.2	3.3	0.5	16.8	9.0
Cycle Q Clear(g_c), s	0.0	16.5	16.7	0.0	24.1	24.1	1.9	12.2	3.3	0.5	16.8	9.0
Prop In Lane	1.00		0.52	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	611	628	603	681	628	625	139	264	223	245	341	286
V/C Ratio(X)	0.21	0.51	0.52	0.11	0.69	0.70	0.66	0.79	0.23	0.45	0.84	0.49
Avail Cap(c_a), veh/h	611	628	603	681	628	625	274	589	498	307	589	495
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	32.2	32.2	20.7	34.7	34.7	55.4	50.4	46.5	50.2	48.1	44.9
Incr Delay (d2), s/veh	0.2	3.0	3.2	0.1	6.2	6.3	5.3	5.3	0.5	1.3	5.6	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.1	12.3	12.1	2.2	17.3	17.2	5.2	10.6	2.5	5.5	13.5	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.1	35.1	35.4	20.8	40.9	41.0	60.7	55.7	47.0	51.5	53.7	46.2
LnGrp LOS	C	D	D	C	D	D	E	E	D	D	D	D
Approach Vol, veh/h		765			945			352			535	
Approach Delay, s/veh		34.2			39.4			55.8			51.3	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.6	46.0	11.4	27.0	35.6	46.0	16.1	22.4
Change Period (Y+Rc), s	* 6	* 6	6.4	6.4	* 6	* 6	6.4	6.4
Max Green Setting (Gmax), s	* 6	* 40	13.6	35.6	* 6	* 40	13.6	35.6
Max Q Clear Time (g_c+I1), s	2.0	18.7	3.9	18.8	2.0	26.1	2.5	14.2
Green Ext Time (p_c), s	0.0	3.5	0.1	1.8	0.1	4.3	0.2	1.3

Intersection Summary	
HCM 6th Ctrl Delay	42.5
HCM 6th LOS	D

Notes

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