EMERSON PARK
JSP17-10 with Rezoning 18.717

EMERSON PARK JSP 17-10 AND ZONING MAP AMENDMENT 18.717

Consideration at the request of Pulte Homes of Michigan, LLC for Planning Commission's Recommendation to City Council for a Planned Rezoning Overlay Concept Plan associated with a Zoning Map amendment, from OS-1 (Office Service) to RM-2 (High Density Multi-Family Residential). The subject property is approximately 24-acre and is located on the west side of Novi Road and north side of Ten Mile Road in Section 22. The applicant is proposing a development of 120-unit multi-family attached condominiums with frontage and access to Novi Road

REQUIRED ACTION

Recommend to the City Council approval or denial of rezoning request OS-1 (Office Service) to RM-2 (High Density Multi-Family Residential) with a Planned Rezoning Overlay Concept Plan.

REVIEW	RESULT	DATE	COMMENTS
Planning	Approval recommended	08-16-17	• The Planning Commission may wish to discuss the offered public benefits, density proposed and conditions of approval and the other issues listed in the review letter • **Reduction of the minimum required building side setback by 34 feet (Required 75 feet, provided 41 feet)** • **Exceeding the maximum number of rooms (423 allowed, 480 provided)** • **Not meeting the minimum orientation for all buildings along an outer perimeter property line (45 degrees required, varied angles provided)** • **Reduction of minimum required sidewalk width for bike parking (6 feet required, 5 feet provided)** *(Staff Supports)*
Engineering	Approval recommended	06-23-17	• **Lack of required stub street at 1,300 intervals along property boundary to provide connection with adjacent property boundary.** *(Staff Supports)* • **Reducing the distance between the sidewalk and back of the curb. 15 feet required, 7.5 feet provided.** *(Staff Supports)* • Items to be addressed at the time of Preliminary Site Plan submittal
Landscaping	Approval recommended	06-21-17	• **Placement of street trees along Novi Road frontage, contingent on RCOC approval** *(Staff Supports)* • **Not meeting the minimum height of landscape berm along North boundary***(Staff does not*

			support) • **Lack of berms along a part of north boundary** *(Staff Supports)* • **Lack of berms along south property***(Staff Supports)* • **Lack of berms within Novi Road green belt***(Staff Supports)* • **Proposing sub canopy trees in lieu of some of the required Deciduous Canopy of Large evergreen trees** *(Staff Supports)* • Items to be addressed at the time of Preliminary Site Plan submittal
Wetlands	Approval recommended	02-28-17	• City of Novi Wetland Non-Minor Use Permit and Authorization to Encroach is required, MDEQ permit may be required and other items to be addressed at the time of Preliminary Site Plan submittal
Woodlands	Approval recommended	02-28-17	• Woodland Permit will be required for removal of the 20 % of site's regulated trees and other items to be addressed at the time of Preliminary Site Plan submittal
Traffic	Approval recommended	08-14-17	• Items to be addressed at the time of Preliminary Site Plan submittal
Traffic Study	Approval recommended	06-22-17	• Items to be addressed at the time of Preliminary Site Plan submittal
Façade	**Undetermined**	08-15-17	• Unable to make a determination as to the degree of compliance with the Façade Ordinance due to a lack of information • Items to be addressed at the time of Preliminary Site Plan submittal
Fire	Approval recommended	06-06-17	• Items to be addressed at the time of Preliminary Site Plan submittal

Motion sheet

Recommend Approval

In the matter of Emerson Park JSP 17-10 and Zoning Map Amendment 18.717, motion to **recommend approval** to the City Council to rezone the subject property OS-1 (Office Service) to RM-2 (High Density Multi-Family Residential) with a Planned Rezoning Overlay Concept Plan

1. The recommendation shall include the following ordinance deviations for consideration by the City Council:
   a. Planning Deviation from Sec. 3.1.8.D of Zoning Ordinance for reduction of the minimum required building side setbacks by 34 feet (Required 75 feet, provided 40 feet);

   b. Planning Deviation from Sec. 3.8.1.B of Zoning Ordinance for exceeding the maximum number of rooms (423 maximum allowed, 480 provided);

   c. Planning Deviation from Sec. 3.8.2.D of Zoning Ordinance for not meeting the minimum orientation for all buildings along an outer perimeter property line (45 degrees required, varied angles provided);

   d. Planning Deviation from Sec. 5.16.5.C of Zoning Ordinance for reduction of minimum required sidewalk width for bike parking (6 feet required, 5 feet provided);

   e. Landscape deviation from Sec. 5.5.3.E.i.c and 5.5.3.E.ii of Zoning Ordinance for reduction/absence of street trees along Novi Road frontage; (16 trees required, proposed contingent on RCOC approval);

   f. Landscape deviation Sec. 5.5.3.B.ii and iii of Zoning Ordinance for not meeting the minimum height of landscape berm along North boundary (4.5-6 feet required, 2.5 – 3 feet provided along approximately 950 of 1340 linear feet of boundary);

   g. Landscape deviation Sec. 5.5.3.B.ii and iii of Zoning Ordinance for absence of required berm along a portion of northern property boundary (no berm proposed for approximately 390 linear feet) due to location of proposed detention ponds;

   h. Landscape deviation from Sec. 5.5.3.B.ii and iii of Zoning Ordinance for lack of berms along the entire southern property boundary (4.5-6 feet required, 0 feet provided) due to existing wetlands;

   i. Landscape deviation from Sec. 5.5.3.B.ii and iii of Zoning Ordinance for lack of berms within Novi Road green belt (779 Linear feet frontage required, 0 feet provided) due to distance across detention ponds to buildings and heavy landscaping;

   j. Landscape deviation from Sec 5.5.3.E.ii of Zoning Ordinance for proposing sub canopy trees in lieu of some of the required Deciduous Canopy of Large evergreen trees (Approximately 21 percent of required Canopy trees are replaced with sub canopy trees) as it will provide additional visual and species diversity to the site;

k. City Council variance from Sec. 4.04, Article IV, Appendix C-Subdivision ordinance of City Code of Ordinances for absence of a stub street required at 1,300 feet interval along the property boudanry to provide connection to the adjacent property boundary, due to conflict with existing wetlands;

l. City Council variance from Chapter 7(c)(1) of Engineering Design manual for reducing the distance between the sidewalk and back of the curb. A minimum of 7.5 feet can be supported by staff;

2. Applicant complying with the conditions listed in the staff and consultant review letters.
3. If the City Council approves the rezoning, the Planning Commission recommends the following conditions be requirements of the Planned Rezoning Overlay Agreement:
   a. The Zoning Map amendment from OS-1 (Office Service) to RM-2 (High Density Multi-Family Residential) limits the maximum residential density to 6.2 dwelling units per acre (DUA) with a maximum of 120 three bedroom units, whereas the maximum allowed for proposed rezoning RM-2 is 15.6 DUA;
   b. Minor modifications to the approved Planned Rezoning Overlay Concept Plan (PRO) can be approved administratively, upon determination by the City Planner, that the modifications are minor, do not deviate from the general intent of the approved PRO Concept plan and result in reduced impacts on the surrounding development and existing infrastructure.
   c. Applicant complying with the conditions listed in the staff and consultant review letters.
4. While the applicant has offered a public benefit for improvements along Novi Road, details of the actual improvements being offered need to be further evaluated and resolved through discussion with the Planning Commission and the City Council with regard to the types of improvements, and the overall costs for any easements, installation and maintenance of such improvements.

This motion is made because

a. The applicant has presented a reasonable alternative to the Master Plan for Land Use recommendation of Community Office for the parcel as indicated in the applicant's letter dated March 20, 2017, noting the appropriateness of a residential use for the site given the close proximity to Main Street and Town Center and the ability for additional nearby residents to add vibrancy and support for local businesses,
b. The proposed plan meets several objectives of the Master Plan, as noted later in this review letter, including:
   i. *Provide residential developments that support healthy lifestyles by providing neighborhood open space between neighborhoods (by* including the proposed play space, pedestrian walks and pocket parks).
   ii. *Provide a wide range of housing opportunities that meet the needs of all demographic groups including but not limited to singles, couples, first time home buyers, families and the elderly* (the applicant has indicated that the proposed townhouse development meets the demand for "missing middle" housing, and will also provide an attractive alternative to the single family residential homes, by providing another option for young families and millennials to purchase property in the City.
   iii. *Protect and maintain the City's woodlands, wetlands, water features and open space (*A majority of site is preserved in Open space. Over 99.5% of wetlands are preserved and only 20 % of woodlands are proposed to be removed as a part of the development plans).

c. The proposed density of 6.2 units to the acre in attached townhouse format, provides a reasonable transition between the existing recommended density of no more than 3.3 units to the acre on the single family detached residential property to the west, and the non-residential uses proposed and existing along Novi Road.
d. The development plan will remove a long-standing non-conforming outdoor storage yard use of the property.
e. The City's Traffic Engineering Consultant has reviewed the Rezoning Traffic Impact Study and found that a reduction of 1,402 trips per day, 264 trips for the AM peak hour, and 225 trips for the PM peak hour is estimated based on the zoning change from Office to residential .
f. Submittal of a Concept Plan and any resulting PRO Agreement, provides assurance to the Planning Commission and to the City Council of the manner in which the property will be developed, and offers benefits that would not be likely to be offered under standard development options.
g. (Additional reasons here if any).

-OR-

Recommend Denial

In the matter of Emerson Park JSP 17-10 and Zoning Map Amendment 18.717, motion to **recommend denial** to the City Council to rezone the subject property OS-1 (Office Service) to RM-2 (High Density Multi-Family Residential) with a Planned Rezoning Overlay for the following reasons:

a. *The proposed rezoning is not consistent with the recommendations of 2016 Master Plan for Land Use.*
b. *(Additional reasons here if any).*

Maps

Location

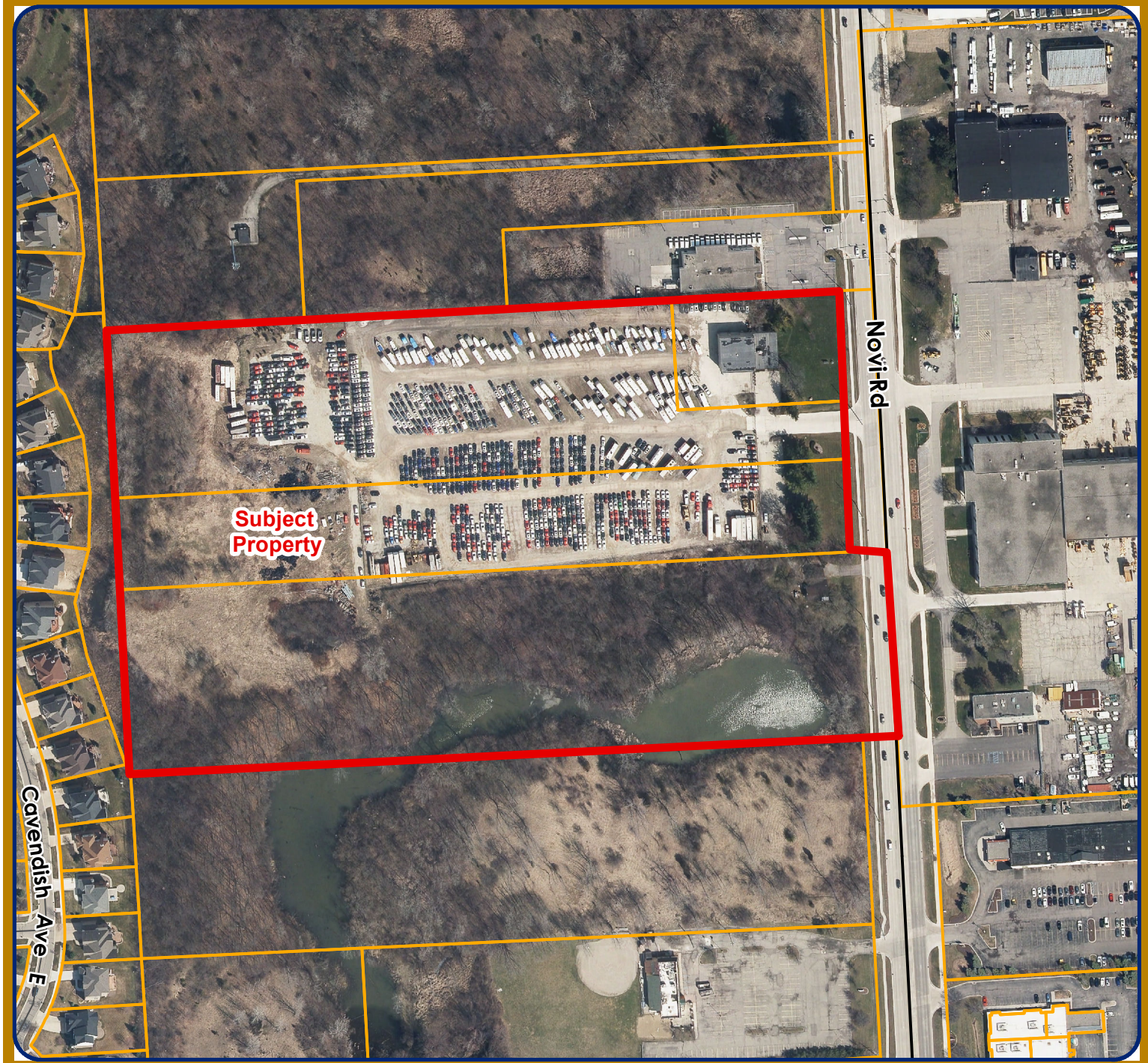
Zoning

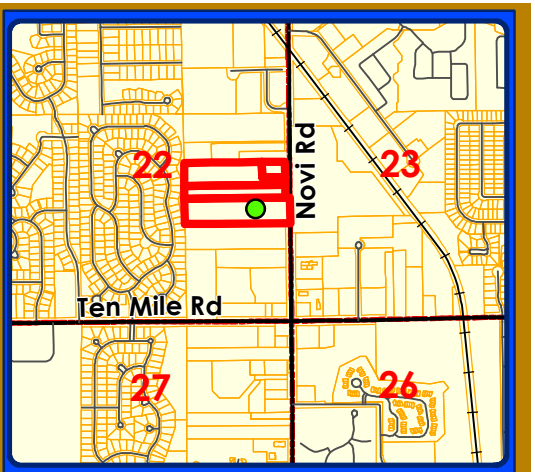
Future Land Use

Natural Features

17-10 Emerson Park

Location Map





LEGEND

Sections

City of Novi

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

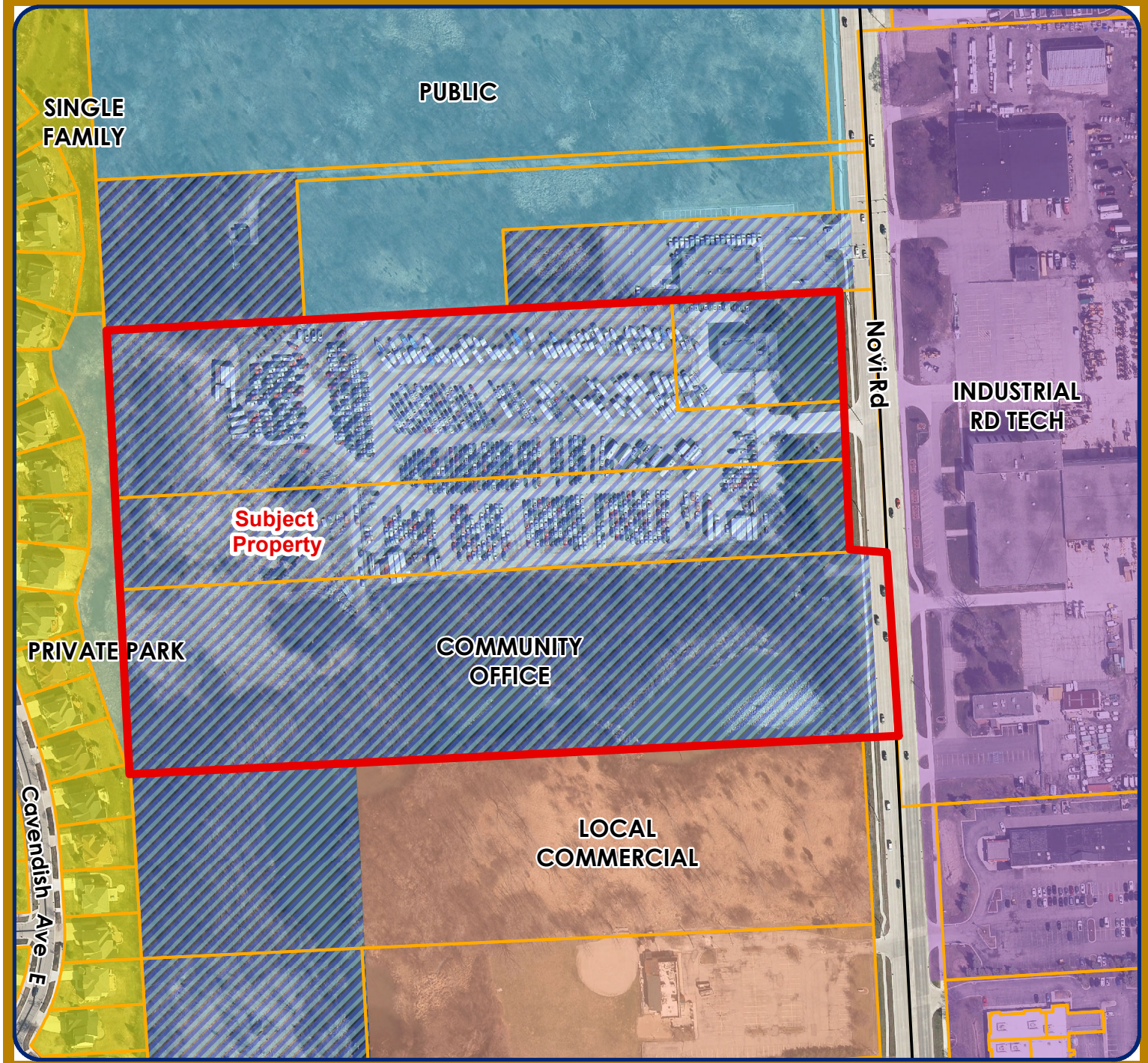
Map Author: Sri Komaragiri
Date: 08/17/17
Project:17-10 Emerson Park
Version #: 1

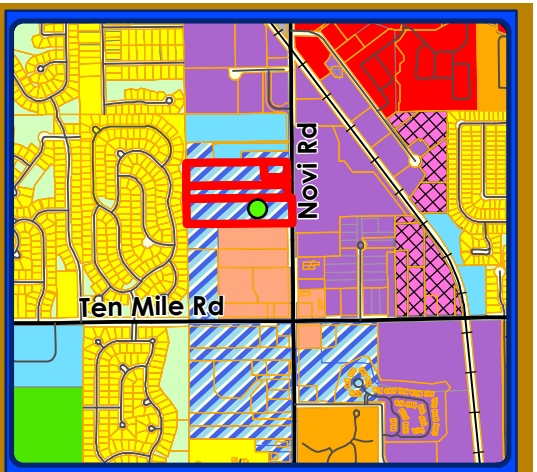
Feet
0 55 110 220 330

1 inch = 250 feet

17-10 Emerson Park

Future Land Use Map





LEGEND

FUTURE LAND USE

- Single Family
- Multiple Family
- Community Office
- Industrial RD Tech
- Heavy Industrial
- Local Commercial
- TC Commercial
- TC Gateway
- Public
- Public Park
- Private Park
- Cemetry

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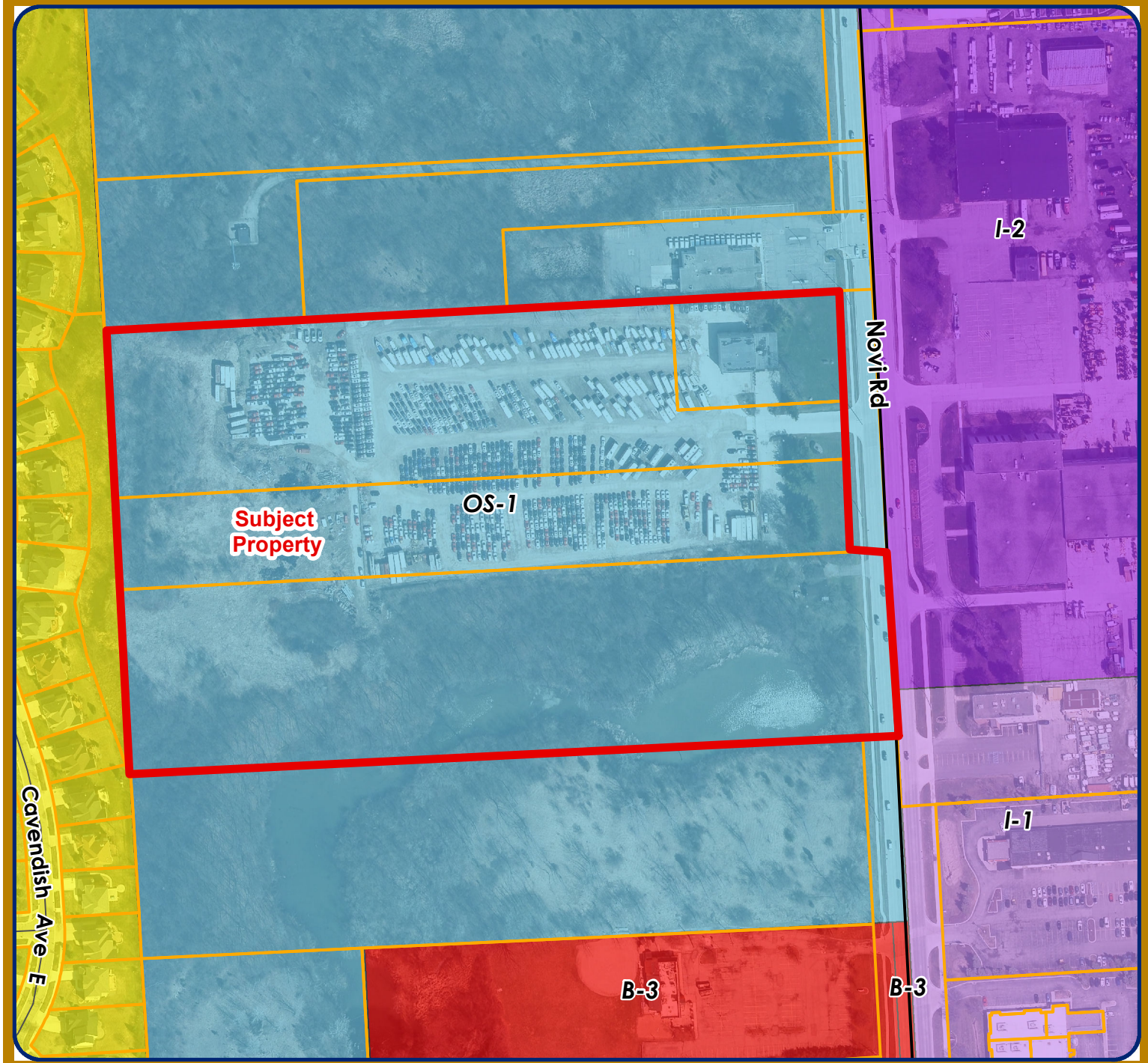
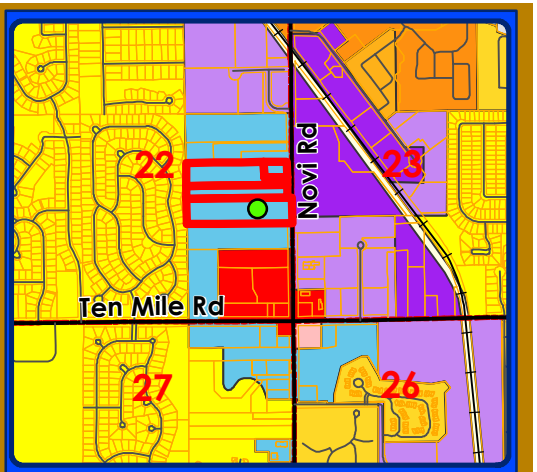
17-10 Emerson Park
Zoning Map





LEGEND

- Sections
- R-4: One-Family Residential District
- RM-1: Low-Density Multiple Family
- RM-2: High-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
- P-1: Vehicular Parking District
- TC-1: Town Center -1 District

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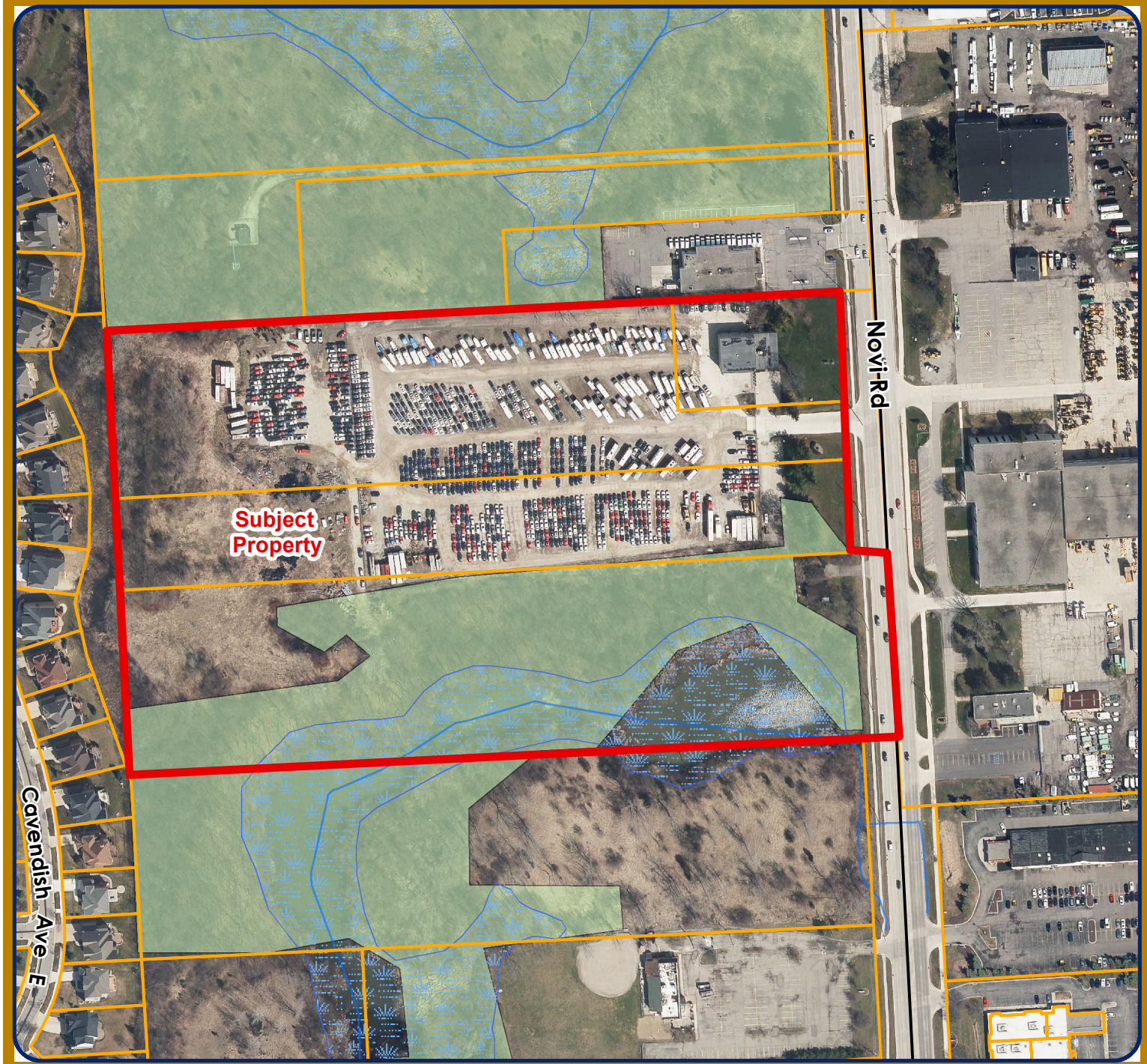
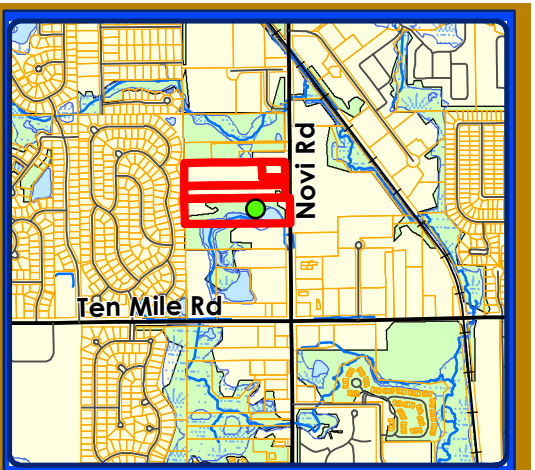
17-10 Emerson Park

Natural Features Map





LEGEND

- WETLANDS
- WOODLANDS

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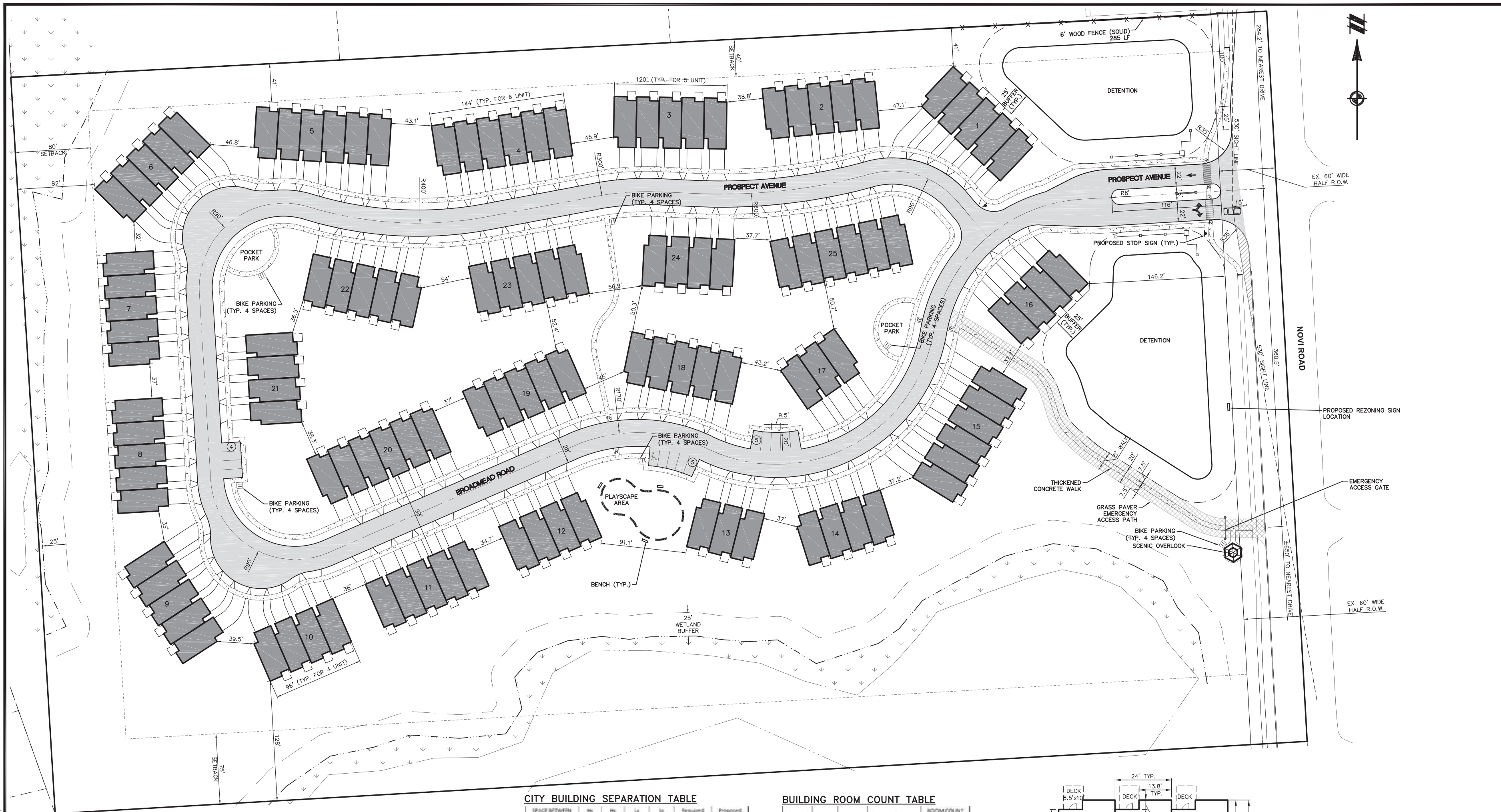
CONCEPT PLAN
(Full plan set available for viewing at the Community Development Department.)

Revised Preliminary Site Plan dated July 14, 2017



CITY BUILDING SEPARATION TABLE

SPACE BETWEEN BUILDINGS	Ha (feet)	Hb (feet)	La (feet)	Lb (feet)	Required spacing (feet)	Proposed spacing (feet)
1 & 2	32	32	corner	corner	30.0	47.1
2 & 3	32	32	42.3	43.7	35.7	38.8
3 & 4	32	32	39.5	40.9	34.7	45.9
4 & 5	32	32	45.5	35.2	34.8	43.1
5 & 6	32	32	corner	corner	30.0	46.8
6 & 7	32	32	corner	corner	30.0	32.0
7 & 8	32	32	38.8	38.8	34.1	37.0
8 & 9	32	32	41	29	33.0	33.0
9 & 10	32	32	corner	corner	30.0	39.5
10 & 11	32	32	50.0	50.0	38.0	38.0
11 & 12	32	32	39.7	39.7	34.6	34.7
12 & 13	32	32	corner	corner	30.0	91.1
13 & 14	32	32	36.9	19.1	30.7	37.0
14 & 15	32	32	35.4	25.3	29.6	37.2
15 & 16	32	32	12.8	3.3	24.0	37.7
17 & 18	32	32	corner	corner	30.0	43.2
18 & 19	32	32	10.6	35.4	29.0	46.0
19 & 20	32	32	38.8	38.8	34.1	37.0
20 & 21	32	32	38.9	38.9	34.3	38.3
21 & 22	32	32	corner	corner	30.0	36.5
22 & 23	32	32	49.5	23.4	33.5	54.0
23 & 24	32	32	30.8	38.7	32.9	56.9
24 & 25	32	32	38.7	48.4	35.9	37.7
25 & 17	32	32	48.0	22.4	33.1	50.7
18 & 24	32	32	75	94.3	49.7	50.3
19 & 23	32	32	71.4	85.2	47.4	52.4
Across Private Road	32	32	144.0	144.0	69.3*	93**

* THE MAXIMUM REQUIRED SPACING FOR TWO BUILDINGS ACROSS THE PRIVATE ROAD FROM EACH OTHER (TWO 6-PLEX BUILDINGS DIRECTLY ACROSS FROM EACH OTHER AND PARALLEL) WOULD REQUIRE A 69.3' SEPARATION PER THE ORDINANCE CALCULATION.

** THE BUILDINGS ACROSS FROM EACH OTHER ON EITHER SIDE OF THE PRIVATE DRIVE HAVE A MINIMUM SEPARATION OF 93' DUE TO THE PROPOSED ROAD SECTION.

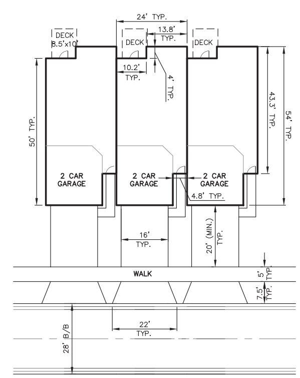
BUILDING ROOM COUNT TABLE

BUILDING NUMBER	LENGTH	HEIGHT	NUMBER OF THREE BEDROOM UNITS	ROOM COUNT (FOUR ROOMS PER UNIT)*
1	120	32	5	20
2	120	32	5	20
3	120	32	5	20
4	144	32	6	24
5	144	32	6	24
6	120	32	5	20
7	120	32	5	20
8	120	32	5	20
9	120	32	5	20
10	96	32	4	16
11	120	32	5	20
12	96	32	4	16
13	72	32	3	12
14	96	32	4	16
15	144	32	6	24
16	96	32	4	16
17	72	32	3	12
18	120	32	5	20
19	120	32	5	20
20	144	32	6	24
21	96	32	4	16
22	120	32	5	20
23	120	32	5	20
24	96	32	4	16
25	144	32	6	24
		TOTALS	120	480
		ALLOWED PER RM-1 ZONING		423

* ROOM COUNTS SHOWN PER CITY OF NOVI ZONING ORDINANCE 3.8.1.c

LAYOUT NOTES

1. THE PROPOSED DEVELOPMENT IS PLANNED TO BE DEVELOPED USING THE CITY'S PLANNED REZONING OVERLY DEVELOPMENT OPTION TO ALLOW FOR THE MULTI-FAMILY USE.
2. LANDSCAPE BUFFERS WILL BE PROVIDED ON THE SIDES OF THE DEVELOPMENT AS SHOWN BUFFERING THE PROPERTY FROM THE ADJACENT USES.
3. THE DEVELOPMENT WILL CONTAIN PRIVATE ROADS. THE PROPOSED CONNECTION WILL BE COORDINATED WITH THE ROAD COMMISSION OF OAKLAND COUNTY.
4. ALL SIDEWALKS AND SIDEWALK RAMPS SHALL BE ADA COMPLIANT.
5. SEE DETAIL SHEET FOR EYEBROW DIMENSIONAL DETAIL.
6. SIGHT DISTANCE TRIANGLES SHOWN FOR 3.5' EYE HEIGHT IN ACCORDANCE WITH MDOT TRAFFIC AND SAFETY STANDARDS FEBRUARY 6, 2008 (2004 AASHTO, EXHIBITS 9-55, 661). SIGHT DISTANCE FOR SPEED LIMIT FOR 45 MPH AND 4 LANES OF TRAFFIC IS 530'.
7. NO ON-STREET PARKING IS PROPOSED. UNIT GARAGE AND DRIVE WAY PARKING EXCEEDS CITY PARKING REQUIREMENTS.
8. PROPOSED BUILDING FACADES WILL HAVE A MINIMUM OF 30% BRICK OR STONE.
9. THE TOTAL PROPOSED FLOOR SQUARE FOOTAGE OF EACH DWELLING UNIT IS 1,860 SQUARE FEET.



TYPICAL UNIT DETAIL

NOT TO SCALE

LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- EXIST. SETBACK
- EXIST. TREE LINE
- EXIST. CURB AND GUTTER
- EXIST. FENCE
- EXIST. GRAVEL
- EXIST. BUILDING
- EXIST. WETLAND BUFFER
- EXIST. WETLAND
- PROP. SETBACK
- PROP. BUILDING
- PROP. BACK OF CURB
- PROP. WALK
- PROP. ASPH.
- PROP. ACCESS PATH

PRELIMINARY - NOT FOR CONSTRUCTION

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

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

ATWELL
866.850.4200 www.atwell-group.com
311 NORTH MAIN STREET
ANN ARBOR, MI 48104
734.994.4000

SECTION 22
TOWN 1 NORTH, RANGE 8 EAST
CITY OF NOVI
OAKLAND COUNTY, MICHIGAN

PULTE HOMES OF MICHIGAN, LLC
EMERSON PARK
PLANNED REZONING OVERLAY
LAYOUT PLAN

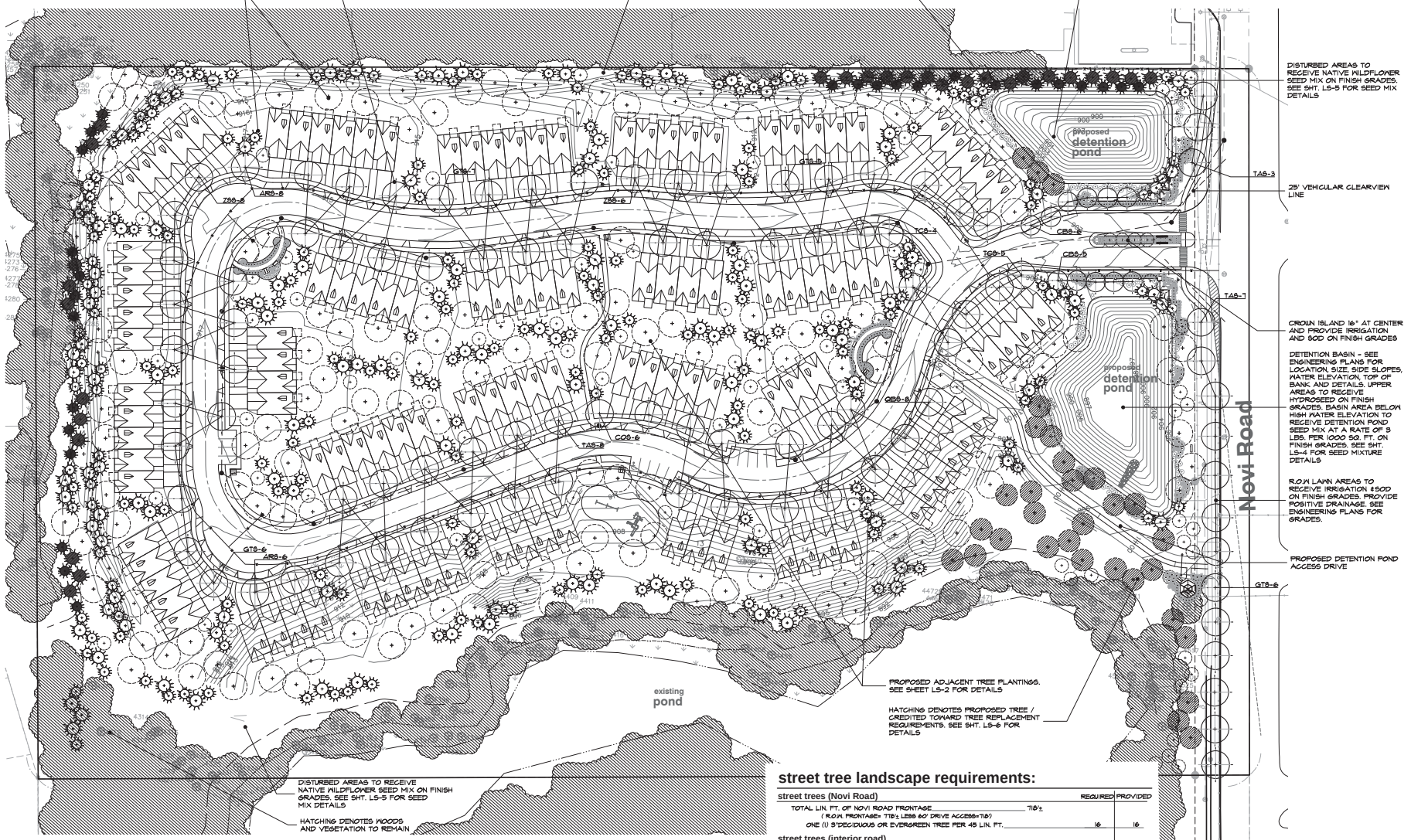
DATE: FEBRUARY 7, 2017

4-3-2017 PER CITY
7-14-2017 PER CITY

REVISIONS

SCALE: 1" = 50 FEET

DRAWN BY: CR
CHECKED BY: SS
P.M.: MB
JOB #: 16002400
FILE CODE: -
SHEET NO. 05



1A street tree planting detail

SCALE 1"=50'-0"

street tree landscape requirements:

	REQUIRED	PROVIDED
street trees (Novi Road)		
TOTAL LIN. FT. OF NOVI ROAD FRONTAGE 718'± (R.O.W. FRONTAGE= 718'± LESS 60' DRIVE ACCESS=718')		
ONE (1) 8'DECIDUOUS OR EVERGREEN TREE PER 45 LIN. FT.	16	16
street trees (interior road)		
TOTAL LIN. FT. OF INTERIOR ROAD (LESS DRIVE ACCESS) 3,544'± (DRIVE FRONTAGE= 4,401'± LESS 2,080' UNIT DRIVE ACCESS=2,821')		
MINIMUM STREET TREE SIZE REQUIRED 2 1/2" CALIPER AND MIN. 35' O.C. SPACING	80.8	88

FELINO A. PASCUAL and ASSOCIATES
Community Land Planner and registered Landscape Architect
24333 Orchard Lake Rd, Suite G
Farmington Hills, MI 48336
ph. (248) 557-5588
fax. (248) 557-5416

seal:

FELINO PASCUAL LANDSCAPE ARCHITECT No. 1433

client:

PULTE HOMES

100 Bloomfiled Hills Parkway, Suite 150, Bloomfield Hills, Michigan 48304

project:

EMERSON PARK

A planned residential community

project location:

City of Novi, MI
Novi Road

sheet title:

OVERALL PLANTING PLAN VIEW

job no./issue/revision date:

LS17.025.01	PSP	2-7-2017
LS17.025.03	PSP	3-1-2017
LS17.025.05	PSP	5-22-2017
LS17.025.05	PSP	5-30-2017
		6-5-2017
LS17.025.07	PSP	7-24-2017

drawn by: JP, KM, CS

checked by: FP

date: 1-19-2017

notice:

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 For free location of public utility lines

The location and elevations of existing underground utilities as shown on this drawing are only approximate. no guarantee is either expressed or implied as to the completeness of accuracy. contractor shall be exclusively responsible for determining the exact location and elevation prior to the start of construction

project no: LS17.025.01

sheet no: LS-1 of 6

PROPOSED PEDESTRIAN IMPROVEMENTS

ENGINEER'S OPINION OF PROBABLE COST

Project: Emerson Park: Pedestrian Enhancement
Atwell #: 16002400
Date: 5/30/2017

Purpose: Preliminary cost opinion for offsite pedestrian enhancement

Landscaping	**Quantity**	**Unit**	**Unit Price**	**Amount**
Street Trees	11	EA.	$300.00	$3,300.00
Ornamental Grass	2200	SF.	$12.00	$26,400.00
				$29,700

Amenities	**Quantity**	**Unit**	**Unit Price**	**Amount**
Bench	5	EA.	$1,200.00	$6,000.00
Lamp	5	EA.	$5,000.00	$25,000.00
Receptacle	5	EA.	$900.00	$4,500.00
Paver Landing	1,260	SF	$14.00	$17,640.00
				$53,100

Total:	**$82,800**

Cost Opinion Assumptions, Notes & Comments

- *Quantities are preliminary and subject to change*
- *The above provides for estimated labor/installation fees but does not include costs for construction services, staking, inspections, testing, dewatering, borings, franchise utilities, engineering, permitting, corporation fees, & mobilization fees. It should be noted that the above is only an engineer's opinion of probable construction cost for the proposed project and no guarantee is made to the accuracy or completeness thereof. Since actual construction cost will be determined by contractor bidding, we can not make a guarantee that the final construction quantities and/or costs will not vary from the number presented.*

EMERSON PARK

A MULTI-FAMILY RESIDENTIAL DEVELOPMENT
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

NOVI ROAD PEDESTRIAN ENHANCEMENTS - SAMPLE ILLUSTRATION

TYPICAL STREETSCAPE DETAIL
NO SCALE

115'

PEDESTRIAN ENHANCEMENT LOCATIONS
SCALE: 1"=150'

MAINTENANCE PLAN

PLANTING BEDS
1.) SPRING AND FALL CLEAN UP
2.) WATERING VEGETATION FOR ONE YEAR AFTER PLANTING
3.) TREE PRUNING AS NEEDED

RECEPTACLES
1.) EMPTY GARBAGE ON A WEEKLY OR BI-WEEKLY BASIS

INSPECTION
1.) ROUTINE INSPECTION OF LIGHT POLES, BENCHES, RECEPTACLES, PAVEMENT
2.) ROUTINE INSPECTION OF PLANTING BEDS FOR BED MAINTENANCE
I. WEEDING
II. PLANT HEALTH

QUANTITIES

STREET TREES:	11 EA.
ORNAMENTAL GRASS:	2200 SQ.FT.
BENCHES:	5 EA.
LAMPS:	5 EA.
RECEPTACLE:	5 EA.
PAVER LANDING:	1260 SQ.FT.

PROPOSED STREET TREE-SWEET GUM
NO SCALE

BENCH
NO SCALE

TRASH RECEPTACLE
NO SCALE

PROPOSED ORNAMENTAL GRASS- JAPANESE BLOOD GRASS
NO SCALE

STREET LIGHT
NO SCALE

FOR ILLUSTRATIVE PURPOSES ONLY

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

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES OR OF ANY OTHER PERSONS.

ATWELL
866.850.4200 www.atwell-group.com
311 NORTH MAIN STREET
ANN ARBOR, MI 48104
734.994.9001

SECTION 22
TOWN 1 NORTH, RANGE 8 EAST
CITY OF NOVI
OAKLAND COUNTY, MICHIGAN

PULTE HOMES OF MICHIGAN, LLC
EMERSON PARK
PLANNED REZONING OVERLAY
PEDESTRIAN ENHANCEMENTS

DATE
FEBRUARY 7, 2017

REVISIONS

0 75 150
SCALE: 1" = 150 FEET
DRAWN BY: CR
CHECKED BY: SS
P.M.: MB
JOB #: 16002400
FILE CODE: --
SHEET NO. 01

K:\16000s\16002400\DWG\LIBRARY\EXHIBITS\16002400-PEDESTRIAN ENHANCEMENTS.DWG 5/31/2017 8:07 AM MATT BUSH

PROPOSED CONCEPTUAL ELEVATIONS

PLANNED REZONING OVERLAY NARRATIVE

ATWELL

July 25, 2017

RECEIVED
JUL 25 2017
CITY OF NOVI
COMMUNITY DEVELOPMENT

Ms. Sri Komaragiri
City of Novi – Planning Department
45175 West Ten Mile Road
Novi, Michigan 48375

Re: Pulte Homes, Princeton Park
Planned Rezoning Overlay (PRO) Submittal Package – Revised
JSP 16-72

Ms. Komaragiri,

Thank you for the additional project feedback provided in your latest Planning Review Letter, dated June 27, our meeting with staff on July 10 and our follow-up call on July 19. We have revised the enclosed Concept PRO plan submittal accordingly. For your use, below is a summary of the most recent revisions that we have made to the plan submittal documents;

- Revised the northern road geometry to add more undulation and provide for more visual variation along this road corridor.

- Removed three (3) additional units. The new geometry resulted in a reduction of Three (3) units, bringing our total unit count to 120. The net density is reduced to 6.2 DU/acre, and the total number of rooms to 480.

- Removed three (3) parking spaces along the road in locations as requested by planning staff.

- Upgraded garages - The developer has agreed to provide upgraded garage doors with windows in the garage doors to increase the aesthetics along the internal roadway network.

- Zoning proposal - In response to the feedback received in the latest planning review letter and our following discussions with City planners, we are proposing a PRO rezoning with a RM-2 zoning underlay, in accordance with the original staff recommendation. This would make the proposed three bedroom unit density for the development (6.2 DU/acre) in compliance with maximum density allowed per ordinance under the RM-2 zoning for a three bedroom product (15.6 DU/acre). As discussed, a one or two bedroom condominium product is not an option for the developer. The developer is confident in the housing product's success and associated room count in this product and location. Specifically, a three bedroom product is imperative for the success of the target millennial customers with a live-work lifestyle. Many buyers are anticipated to either work at home at some time during their career and/or appreciate the additional flex space of the third bedroom. Pulte Homes constantly "life tests" the housing product, and feel that the proposed attached single-family condominium values will be most successful with the additional bedroom. As depicted on the proposed plans that would be finalized with the PRO agreement, the developer does not intend to provide for an increased density and mid-rise apartment housing product style as may be allowed with RM-2 zoning, and instead is providing a more appropriate lower density and housing style that is compatible with the surrounding area, including the low intensity office/retail developments along Novi Road. This mid-block pocket residential is an

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www.atwell-group.com

appropriate addition to Novi Road and the downtown core, and also creates an appropriate transition housing zone for the single-family development to the west.

- As the buildings are not proposed to be four or more stories, we are still requesting a deviation to allow for 480 proposed rooms. This would be a minor increase from the 423 room allowance per ordinance based on the net density of the site. We believe this deviation would be appropriate as it will not negatively impact any neighbor, nor alter the essential character of the land. The development is still preserving a large on-site wetland body (which greatly reduces the net site area) and higher quality trees to the south of the site. As noted in our prior planning study, we believe the housing product size and unit count is a great fit for the property and surrounding area.

In addition to the above referenced items, below is a summary of the previous revisions that have been made since the last Planning Commission public hearing held on May 10, 2017:

- Removed two (2) units from the plan adjacent to the play scape area. The removal of these units provided for additional functionality of open space, allowed for visitor parking, and improved the vista to the wetland pond. The total unit count has dropped from 125 at the PC meeting in May to 120 units today.
- Added three 6-foot long pedestrian benches along the play scape area. Users can now sit on the benches and watch their children play while overlooking the wetland natural resource.
- Added fourteen (14) additional parking spaces throughout the development, including five directly adjacent to the play scape area.
- Revised the layout of the driveways to provide for improved access to the loop road. The driveways have been revised in accordance with the ranges specified in the City of Novi standard detail, Figure IX.5.
- Modified the emergency access to place the pedestrian walkway centered over the access grass pavers. Shrubs have been added every twenty (20) feet along the edges of the access drive pavers to better delineate the pathway and clearly define limits of the access for winter maintenance and snow removal.
- Added additional "all season" evergreen trees and supplemental plantings along the western property line. The additional plantings will improve the screening from the residential single-family neighborhood to the west. These additional plantings will be in coordination with the adjacent property HOA Property Manager and adjacent homeowners.
- Added a 6-foot tall solid wood fence along the northeast of the property. The fence will provide improved screening from the Post Office building and the adjacent parking lot areas. Additional plantings have been added in this particular area as well.

In addition to the revised concept PRO plans, we have also proposed to clarify our proposal regarding the community benefit offering and housing product.

- Public Benefit: Novi Road Pedestrian Enhancement Plan – **As discussed, the developer is providing a $90,000 public benefit contribution to the City for their discretionary use in providing improvements to the downtown corridor (Novi Road area).** Per the request of the Planning Commission, a plan was provided as a sample of one potential use of the public benefit contribution provided by the developer. The sample improvements have been specified at key areas along Novi Road between the development and Main Street, including low maintenance plantings, decorative brick insets and benches. We have requested and are in the process of obtaining RCOC feedback stating that the illustrative road improvements are generally acceptability for pedestrian improvements om the ROW, and will provide a response prior to the next Planning Commission meeting. The development HOA Master deed will be

set up to provide appropriate funding for future maintenance of the Novi Road pedestrian improvements. Moreover, if the city determines the specific use they want to apply the funds to, Pulte is willing to provide the necessary design and construction of appropriate work (i.e. Not art pieces), provided that determination is made within an 18-month from completion of the PRO Agreement. Enhancement uses discussed with city staff for the funding along Novi Road have included;

  - Novi Road Pedestrian improvements – decorative sidewalks, plantings, lighting, and benches
  - An art piece / entrance improvements to the city cemetery on Novi Road, across from Downtown
  - An enhanced pedestrian focused area (lighted gazebo, decorative walls, etc., etc.) along Novi Road at the project frontage or the city parcel, just north of the project.

- Revised Building Elevations
  The revised elevations include the front, side and rear of the buildings. The developer is committing to a minimum of proposing the first floor of the building façade to be covered in brick material. As referenced above, the developer has also agreed to provide upgraded garage doors with windows in the garages to increase the aesthetics along the internal roadway network.

We understand that with these latest revisions and commitments; will meet the intent of the discussions with the Planning Commission and your office. We look forward to your earliest review and acceptance of this Concept rezoning proposal. **As discussed, we respectfully request your recommendation for approval and forwarding onto the Planning Commission for consideration at their August 23rd meeting.** For your record, in additional to the previous submitted documents, included with this re-submittal are the following documents:

- Seven (7) copies of the revised PRO concept plans with landscaping, signed & sealed
- Illustrative Sample of a Public Benefit Pedestrian Improvement along Novi Road (Previously Provided)
- Sample Building Floor Plan – 3 bedroom units (previously provided)
- Sample Building Elevations (previously provided)

Thank you for your continued assistance and cooperation with respect to this project. Should you have any remaining questions or need anything else from us to help facilitate your review and approvals, please do not hesitate to contact me direct at (810) 923-6878.

Sincerely,
ATWELL, LLC

Matthew W. Bush, P.E.
Project Manager / Engineer

LAND USE NARRATIVE
Prepared by: CIB PLANNING

CIB PLANNING

Community Image Builders

March 20, 2017

Mr. Joe Skore
Pulte Group
100 Bloomfield Hills Parkway, Suite 140
Bloomfield, Michigan 48304-290

Subject: **Princeton Park PRO Rezoning,** located on the west side of Novi Road, north of W. Ten Mile Road and south of Grand River Ave, approximately 24 acres.

Dear Mr. Skore:

At your request, we have reviewed the above request to rezone an approximate 24 acre parcel from OS-1, Office Service District to RM-1, Multi-Family Residential with a Planned Rezoning Overlay (PRO). The property is currently used primarily for the outdoor storage of automobiles and recreational vehicles. Proposed is the development of a 125 unit, attached townhouse project with a boulevard entry onto Novi Road, stormwater detention facilities, open space, an interconnected pathway system, a proposed off-site pedestrian pathway, and other site amenities. This letter is submitted as an evaluation of the appropriateness of the proposed rezoning request, understanding the future land use designation for the site is Community Office. Moreover, this letter is in response to the Planning Department request to elaborate on why this project meets the Objectives in the Master Plan and the benefits outweigh possible impacts from the change in use.

For the sake of conciseness, this letter will not re-state the existing land use, zoning, and master plan designation for the subject and surrounding sites. Instead, it will focus on the key factors that relate to implementation of the Goals and Objectives in the Master Plan. Based upon our review of the application and related materials, a visit to the site, and examination of the City of Novi Zoning Ordinance and Master Plan, we offer the following for your consideration:

ANALYSIS OF REQUEST

The PRO Option is provided in the zoning ordinance to allow a change in zoning, with conditions, to provide greater public benefit, offsetting possible impacts from the change in land use. While the current Future Land Use designation of Community Office makes sense from a transitional use perspective, a more detailed examination of the site, market conditions, available land, and surrounding land uses indicates that the proposed townhouse development will prove more beneficial to the community.

17195 Silver Parkway, #309
Fenton, MI 48430

Phone: 810-335-3800
Email: avantini@cibplanning.com

Site Conditions. The southern 1/3 and western edge of the property have steep slopes and wetlands that restrict development to the area generally occupied by the storage facility. These same conditions limit the future development of the remaining area to the south that is also planned and zoned for office use. The result will be a project with small office buildings that lack exposure to Novi Road and are located mid-block, away from other anchor retail and office uses. As indicated in the supporting real estate letters, the market for mid-block commercial development is poor and it is unlikely that developers would take such a risk when better alternatives exist in the area.

Competing Office Districts. Just a short distance from the subject site is the area designated on the Future Land Use Map as Town Center Gateway. This key, vibrant location is designated for a mixture of uses, including office. Most prospective office users would be drawn to the Town Center location over the subject site. Likewise, the City West overlay along Grand River Ave., from Taft Road to Beck Road, indicates a planned mixture of uses including office. As with the Town Center, this area and the properties to the east on Grand River Ave. will be more attractive to office users given nearby anchor uses such as Providence Park and the Novi Town Center.

Master Plan Goals and Objectives. One of the Goals of the Master Plan is to "provide a wide range of attractive housing choices." This is further supported by the corresponding Objective to "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." These goals and objectives are supported by the Housing Plan section of the Master Plan with a good explanation of the "Missing Middle" housing. This term refers to "housing types that achieve medium-density yields and provide high-quality, marketable options between the scales of single-family homes and mid-rise flats for walkable urban living. They are designed to meet the specific needs of shifting demographics and the new market demand, and are a key component to a diverse neighborhood. They are classified as 'missing' because very few of these housing types have been built since the early 1940's due to regulatory constraints."

The proposed townhouse development not only meets the demand for "missing middle" housing, but also fills a specific niche in the market. A considerable amount of land in Novi is developed for single-family residential use and it is difficult for young families and even "millennials" to purchase property in Novi since available housing options are limited. The development of Princeton Park will help meet this demand and make new construction available to families with children.

Lack of Available Sites. Although areas in the city are designated for multiple-family development, few of them are vacant and available for townhouse development. Most of the RM-1 and RM-2 zoned districts are developed, limiting the ability to build a project like Princeton Park in Novi. Much of the future multiple-family housing will likely be located in the Town Center and City West areas and be higher density in character, such as flats and condominiums. Current and prospective Novi residents may have to look outside the city for townhouse units due to the limited number of available sites.

Close Proximity to Downtown & Town Center. The location of Princeton Park places it within close walking distance to both the Downtown and Town Center areas. The addition of residents to the

area will only strengthen those commercial districts, support local businesses, and continue to create a more vibrant atmosphere.

Provision for Public Improvements. One of the key benefits of the Princeton Park PRO is the Neighborhood Connector Pathway and supporting sidewalks. The proposed pathway system, including the Connector through City land, will not only improve pedestrian connectivity for the subject development, but also for the abutting subdivision to the west. This will encourage those residents to walk to the Town Center and Downtown areas rather than use vehicles to get there. Another side benefit is that less vehicles will be on the road, especially during already congested peak periods.

CONCLUSION

With the proposed benefits, quality site design, and an understanding of the current and future office market, the proposed Princeton Park PRO request represents a small departure from the current Future Land Use Plan designation of Community Office. With single-family residential development to the west, a townhouse project is an appropriate transitional use and allows full development of this long, narrow property. A failed office project could prove problematic for the abutting properties and make development of adjacent land difficult. Moreover, the Princeton Park project meets the goals and objectives of the Master Plan while supporting nearby projects like the Town Center and Downtown area. The introduction of additional "Middle Housing" into the city will further implement the intent of the Master Plan and be a benefit to residents.

If you have any further questions, please contact us at 810-335-3800.

Sincerely,

CIB Planning

Carmine P. Avantini, AICP
President

PLANNING REVIEW

CONCEPT PLAN SUBMITTAL SCHEDULE		
Type of Submittal	**Plan Date**	**Reviewed by**
Concept Plan	February 08, 2017	All Agencies
Revised Concept Plan	April 03, 2017	Planning, Engineering, Landscape and Fire
2nd Revised Concept Plan	June 05, 2017	Planning, Engineering, Landscape and Fire
3rd Revised Concept	**July 14, 2017**	**Planning, Traffic and Facade**

PLAN REVIEW CENTER REPORT

August 16, 2017

Planning Review

Princeton Park

JSP17-10 with Rezoning 18.717

PETITIONER

Pulte Homes of Michigan, LLC

REVIEW TYPE

Rezoning Request from OS-1 (Office Service) to RM-2 (High Density Multi-Family Residential) with a Planned Rezoning Overlay (PRO): **Revision 3**

PROPERTY CHARACTERISTICS

Section	22	
Site Location	West of Novi (on Novi Road); North of W Ten Mile Road; Parcel Id's: 50-22-22-400-006, 007, 019 and 020	
Site School District	Novi Community School District	
Site Zoning	OS-1 Office Service	
Adjoining Zoning	North	OS-1 Office Service
	East	I-2 General Industrial
	West	R-4 One Family Residential
	South	OS-1 Office Service
Current Site Use	RV storage Facility (Non-conforming use)	
Adjoining Uses	North	Postal Office/vacant
	East	Single Family Residences
	West	Churchill Crossing
	South	Vacant
Site Size	24 Acres (Net Site Acreage 19.4 Acres)	
Plan Date	July 14, 2017 (Revision 3)	

PROJECT SUMMARY

The petitioner is requesting a Zoning Map amendment for a 24-acre property on the west side of Novi Road and north side of Ten Mile Road (Section 22) from OS-1 (Office Service) to RM-2 (high Density Multi-Family Residential) utilizing the City's Planned Rezoning Overlay (PRO) option. The applicant states that the rezoning request is necessary to allow the development of a 120-unit Multi-family residential development.

The applicant has proposed a 120-unit multi-family for-sale residential development with frontage and access to Novi Road. The PRO Concept Plan shows two detention ponds on either side of the proposed entrance Boulevard. The detention ponds also serve as screening from Novi Road frontage. The concept plan also includes pocket parks and pedestrian walks spread throughout the development for active and passive recreation. All proposed internal roads are private. This is not a gated community. This could be most likely a phased development.

PROJECT REVIEW HISTORY

The applicant submitted for a Pre-Application Meeting, which was held on December 12, 2016. Staff has indicated that the proposed zoning conflicts the future land use designation and requested additional information to make an informed decision.

Previous Master Planning and Zoning Committee Results:

The plan was presented to Master Planning and Zoning Committee on March 28, 2017. The change from Office to residential use received favorable comments from the Committee with a note to work with the staff on proposed density. The following summarizes briefly the recommendations provided by the Committee and the staff at the meeting:

1. **Change of Zoning:** The Committee was favorable to the proposed Zoning change and removal of long standing legal non-conforming storage yard. The applicant is suggested to consider a different floor plan to cater older adults as well.

2. **Density:** The Committee was in favor for the residential use in the proposed location and also indicated that slightly higher density would be acceptable as well. However, staff believes that given the style of housing the applicant is proposing, higher density would mean greater lot coverage and less open space for residential amenities. Thus, RM-2 would be more appropriate if the housing style involves apartment style tall buildings.

3. **Usable Open Space**: The applicant is suggested to consider other options to provide more usable open space that are designed for active and passive recreation.

4. **Public benefits:** Staff suggested considering improving pedestrian experience from the proposed development to Main street area with an understanding that the Novi Road falls under Oakland County jurisdiction and any improvements are subject to their review and approval. Committee suggested to reconsider the other benefits proposed.

5. **Neighborhood Connector:** Staff recommends that the residential connector would be a good idea to continue considering. The applicant can work with City parks for alternative options in conjunction with the neighborhood connector, such as location for public display of art. Staff suggests keeping options open if we find any resistance for improvement from RCOC.

6. **Building Elevations:** Staff suggests applicant consider enhanced elevations.

Changes made since last Planning Commission Public hearing on May 10, 2017

1. **Development Standards:**

	Original (February 08)	March 22	June 02	Current
Number of Units	129	125	123	120
Proposed Zoning	RM-1	RM-1/RM-2	RM-2	RM-2
Proposed Density	6.6	6.4	6.3	6.2
Setbacks (75 ft.)	40 ft.	40 ft.	48 ft.	41 ft.
Number of rooms	516	500	492	480

1. **Layout:** Two units near the play scape area were removed to improve the visibility of natural features for other residents. The road layout along the norther part is modified to allow for more curvature to provide visual distinction along the road corridor.
2. **Screening from neighbors:** Additional "all season" evergreen trees are added along western boundary to provide more screening between the developments to address concerns of the current residents. A six foot tall fence along with few additional plants is added along northeast property line to provide screening from the existing Post Office, which is immediately adjacent.

3. **Usable Open Space and Site Amenities:** A central pocket park and a pedestrian walk running east west have been eliminated from the courtyard as the proposed buildings have been realigned to meet the building separation requirements, thus reducing the depth of the courtyard. Additional site amenities (three 6 feet benches) have been added to the play scape area.
4. **On-street Parking:** Fourteen perpendicular parking spaces have been introduced for play scape and possible mail box locations.
5. **Distance between unit driveways**: The minimum distance between driveways has been increased from 5 feet to varying widths up to 7 feet to enable easier maneuvering. Additional landscape has been added in a few of those locations.
6. **Emergency Access**: It has been modified per the request of the Fire Marshal. A concrete sidewalk is now placed in the middle of the emergency access grass pavers, and shrubs are located every 20 feet to delineate the path.
7. **Public Benefits:** The list of public benefits has been modified. The applicant offered to provide a key neighborhood pedestrian connection for the development and the adjacent developments out to Novi Road as a public benefit. This is no longer being offered based on the discussion with Churchill home Owners Association. Correspondence with Road Commission of Oakland County has been provided regarding feasibility of suggested pedestrian improvements along Novi Road.
8. **Studies:** Additional narrative is provided by CIB Planning evaluating the appropriateness of the proposed rezoning request. See attached report. Traffic study has been supplemented with comparisons between existing and proposed zoning.

Previous Planning Commission Meeting Results:
The Planning Commission held a Public hearing on May 10, 2017 and postponed their recommendation. The Planning Commission Action Summary is attached to the letter.

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 to RM-2) and the applicant enters into a PRO agreement with the City, whereby the City and the applicant agree to tentative approval of a conceptual plan for development of the site. 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. The PRO runs with the land, so future owners, successors, or assignees are bound by the terms of the agreement, absent modification by the City of Novi. If the development has not begun within two (2) years, the rezoning and PRO concept plan expires and the agreement becomes void.

COMMENTS

1. **Density and Compatibility:** The applicant is requesting to rezone from OS-1 (Office Service) to RM-2 (High Density Multi-Family Residential) in order to allow the construction of low-rise attached townhome buildings with a density of 6.2 dwelling units per acre (maximum density allowed with RM-2 is 15.6 DUA). The applicant has chosen the RM-2 District, instead of the RM-1 District because the maximum allowed density for the RM-1 District is 5.6 dwelling units to the acre. The applicant has been working with the staff to minimize the impacts of the proposed density. Changes that have been made to the plan include the following:

    - To increase plantings around the perimeter of the site to provide a buffer between the proposed residential development and the surrounding residential and non-residential uses.
    - The applicant's Traffic Study has been revised to address concerns about traffic congestion along Novi Road.

- More site amenities and usable open space are provided so that the future residents have reasonable recreational opportunities within the development.

Staff noted that rezoning to RM-1, Low Density Multiple Family would provide a more gradual transition from one residential zoning district to another based on density hierarchy. As it is a Planned Rezoning Overlay concept plan, the applicant has agreed to include the proposed maximum density (6.2 DUA), maximum building height, and the total number of units as conditions of the agreement. In the past, staff has expressed concerns about the density and the compatibility of the proposed development with the surrounding planned and developed uses. Some of the concerns still remain, but staff notes that the recent changes have alleviated most of those concerns.

2. **Providing More Housing Opportunities**: The proposed multi-family development fulfills one of the Master Plan objectives by providing housing closer to the Town Center which may encourage younger residents to choose to live in Novi by providing housing options within walking distance of shopping, dining, entertainment, recreation and employment.

3. **Novi Road Pedestrian Improvements and Connectivity to Main Street and the Town Center:** The applicant has made the argument that the proposed multiple family use, even though not supported by Master Plan, is partly justified by the proximity to the Town Center**.** The applicant has proposed to fund pedestrian enhancements along Novi Road to encourage pedestrian connectivity from the residential development to Main Street and the Novi Town Center and provided conceptual plan illustrating potential improvements along Novi Road. The applicant has contacted Scott Sintkowski, Permit Engineer with RCOC for preliminary input on the proposed conceptual pedestrian improvements and has received favorable response. Staff notes that the following concerns still remain:
    a. The proposed improvements require regular maintenance and the applicant has not provided any information as how maintenance will be addressed. The Road Commission for Oakland County does not maintain infrastructure placed in their Right of Way. If the Planning Commission and City Council decide to proceed with the proposed Right of Way enhancements, on-going maintenance responsibilities should be incorporated into that discussion.
    b. The existing topography and landscaping along Novi road does not appear to be taken into consideration in the applicant's rendering at the proposed improvement locations.
    c. The estimate also does not include the survey, design and permitting costs. If the City accepts the donation as a Public benefit, the City will be responsible for designing, permitting and constructing the proposed improvements.
    d. Staff anticipates that there may be some resistance to the improvements once details are provided (for example, corner clearance, existing topography, offset distance, easements, and ROW acquisitions). **In the event that the proposed improvements are not approved by the RCOC, the applicant has indicated that the City may redirect the funds for another appropriate public infrastructure improvement project near the project vicinity.** The City may wish to consider alternative public benefits to public land, such as the historic city cemetery north of the subject site on Novi Road, and or other public land in the area.

4. **Design and Layout Concerns:** The proposed layout plans a dense development in order to maximize the number of units on site. The applicant has worked with staff address most of the previous concerns as listed on Page 2.
    a. The elimination of pathway connection to the northern parcel eliminates the opportunity for inter parcel connectivity. **The applicant should consider providing a connection to their northern property line for future connectivity.**

5. **Façade**: Façade review is not typically required for Concept PRO plan unless the applicant wants to demonstrate that the buildings will be an enhancement, which would be unlikely to be achieved if it were not a Planned Rezoning Overlay. Applicant did not indicate any additional enhancement to the building elevations. The applicant has provided conceptual front and rear elevations and proposes brick to first floor belt line. The elevations provided appear to deviate significantly from the requirements of the Façade Ordinance. A greater amount of brick or stone is typically required on the front facades due to the large area occupied by the garage doors, for example by extending brick or stone to the second floor roof line on portions of the facade. If no deviations are requested at this time, the elevations should conform to the requirements of Façade Region 1 at the time of Preliminary Site Plan.

RECOMMENDATION

Staff recommends the Planning Commission consider the rezoning request from OS-1 (Office Service) to RM-2 (High Density Multi-Family Residential) in order to allow the construction of low-rise attached townhome buildings with a density of a maximum of 6.2 dwelling units per acre along with the revised concept plan (the required public hearing was held in May 2017), and recommend approval to the City Council of the proposed PRO Concept Plan, for the following reasons:

1. The applicant has presented a reasonable alternative to the Master Plan for Land Use recommendation of Community Office for the parcel as indicated in the applicant's letter dated March 20, 2017, noting the appropriateness of a residential use for the site given the close proximity to Main Street and Town Center and the ability for additional nearby residents to add vibrancy and support for local businesses,
2. The proposed plan meets several objectives of the Master Plan, as noted later in this review letter, including:
    a. *Provide residential developments that support healthy lifestyles by providing neighborhood open space between neighborhoods (by* including the proposed play space, pedestrian walks and pocket parks).
    b. *Provide a wide range of housing opportunities that meet the needs of all demographic groups including but not limited to singles, couples, first time home buyers, families and the elderly* (the applicant has indicated that the proposed townhouse development meets the demand for "missing middle" housing, and will also provide an attractive alternative to the single family residential homes, by providing another option for young families and millennials to purchase property in the City.
    c. *Protect and maintain the City's woodlands, wetlands, water features and open space (*A majority of site is preserved in Open space. Over 99.5% of wetlands are preserved and only 20 % of woodlands are proposed to be removed as a part of the development plans).
3. The proposed density of 6.2 units to the acre in attached townhouse format, provides a reasonable transition between the existing recommended density of no more than 3.3 units to the acre on the single family detached residential property to the west, and the non-residential uses proposed and existing along Novi Road.
4. The development plan will remove a long-standing non-conforming outdoor storage yard use of the property.
5. The City's Traffic Engineering Consultant has reviewed the Rezoning Traffic Impact Study and found that a reduction of 1,402 trips per day, 264 trips for the AM peak hour, and 225 trips for the PM peak hour is estimated based on the zoning change from Office to residential .
6. Submittal of a Concept Plan and any resulting PRO Agreement, provides assurance to the Planning Commission and to the City Council of the manner in which the property will be developed, and offers benefits that would not be likely to be offered under standard development options.

7. While the applicant has offered a public benefit for improvements along Novi Road, details of the actual improvements being offered need to be further evaluated and resolved through discussion through discussion with the Planning Commission and the City Council with regard to the types of improvements, and the overall costs for any easements, installation and maintenance of such improvements.

COMPARISON OF ZONING DISTRICTS

The following table provides a comparison of the current (OS-1) and proposed (RM-2) zoning classifications. The applicant is requesting a change of use from Office Service uses to High Density Multi-Family Residential. The types of uses proposed in these two districts are entirely different from each other. The proposed use has higher setback and open space requirements than the existing zoning.

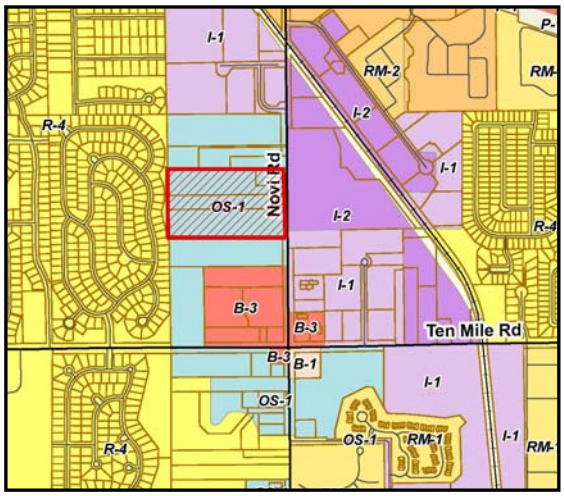
	OS-1 Zoning (Existing)	**RM-2 Zoning (Proposed)**
Principal Permitted Uses	See attached copy of Section 3.1.21.B	See attached copy of Section 3.1.8.B Multi-Family Development, as proposed, is a permitted use
Special Land Uses	See attached copy of Section 3.1.21.C	See attached copy of Section 3.1.8.C
Minimum 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.	Subject to Sec. 3.8.1 (Reviewed in the attached Plan Review Chart)
Maximum Lot Coverage		45%
Building Height	30 feet	5 stories -or- 65 feet whichever is less
Building Setbacks	Front: 20 feet Side: 15 feet Rear: 20 feet	Front: 75 ft. Side: 75 ft. Rear: 75 ft.
Usable Open Space	Not Applicable	200 sq. ft. Minimum usable open space per dwelling unit
Minimum Square Footage	Not Applicable	One bedroom unit: 500 sq ft Two bedroom unit: 750 sq ft. Three bedroom unit: 900 sq ft. Four bedroom unit 1,000 sq ft. Efficiency unit: 400 sq ft.

COMPATIBILITY WITH SURROUNDING LAND USE

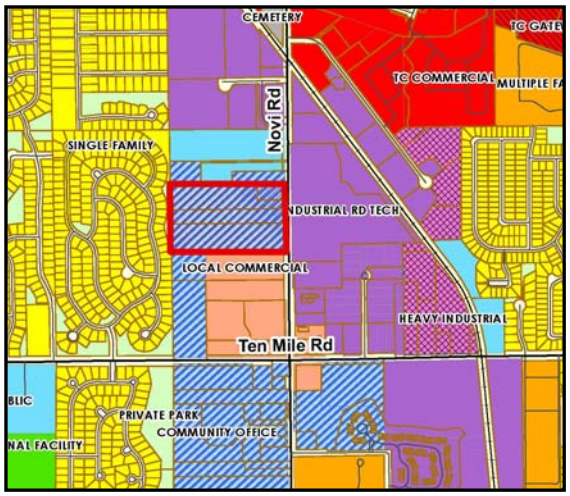
The surrounding land uses are shown in the above chart. The compatibility of the proposed rezoning with the zoning and uses on the adjacent properties should be considered by the Planning Commission in making the recommendation to City Council on the rezoning request. The following table summarizes the 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	Vehicle storage lot (legal non-conforming use)	Community Office (uses consistent with OS-1 Zoning District)
Eastern Parcels (across Novi Road)	I-2 General Industrial	Industrial/Research Office	Industrial Research Development and Technology (uses consistent with I-1 Zoning District)
Western Parcels	R-4 One Family Residential	Churchill Crossing (Single family residential development)	Single Family Residential (uses consistent with R Zoning Districts)

Northern Parcels	OS-1 Office Service	Postal Office/vacant	Community Office (uses consistent with OS-1 Zoning District)
Southern Parcels	OS-1 Office Service	Vacant	Local Commercial (uses consistent with B-1 and B-2 Zoning Districts)



Existing Zoning



Future Land Use

The subject parcel is currently zoned OS-1 (Office Service) and is being used as vehicle storage lot as a long standing legal non-conforming use.

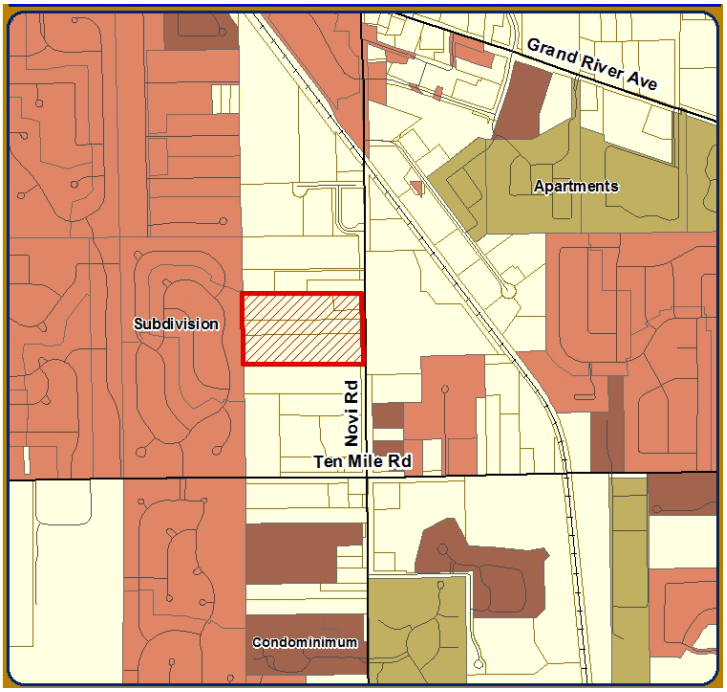
The United States postal service is located on the property directly **north** of the subject property. The other property abutting on north is owned by the City. The remaining property has an existing wireless tower located. The future uses for this property are very unlikely to change.

The property on the **south** is currently vacant and can be developed with existing allowed office uses or rezoned to master planned commercial uses.

The property to the **west** of the subject property is an existing single family development. The applicant has indicated that they have approached the Home owners association and have received favorable responses for the proposed rezoning proposal.

To the **east** across Novi are developed as Industrial/office uses**.**

The image to the right indicates the type of residential development within the vicinity of subject property. A PRO was approved (Ridgeview Villas) on the southeast corner of Ten Mile and Novi Road. This was rezoned from OS-1 to RM-1. The proposed rezoning would be a big shift in terms of density from single family residential to high density residential.



Impacts to the surrounding properties as a result of the proposal would be expected as part of the development of any development on the subject property and could include construction noise and additional traffic. The loss of woodland area on the property would present an aesthetic change but that would also happen with development under the current zoning.

Existing land use patterns indicate a concentration of commercial and industrial uses along Grand River Avenue, Novi Road, Twelve Mile and I-96 corridor. The properties to the north and south are currently vacant. North property is owned by the City and is zoned and master planned for office use. Southern property is zoned for office and master planned for commercial. This opens up a possibility for variety of retail and service uses that could abut the proposed residential use. It could range from a low intensity use such as office to high intensity use such as a hotel or a theater. Compatibility of a residential use with future uses can be ambiguous. The applicant has provided letters from real estate agents to justify their argument that the subject property is best suited for residential development as opposed to commercial. The applicant mentioned that it is not viable to propose a mixed use development to maintain the office uses along Novi Road as staff initially suggested.

The applicant has provided additional justification about the proposed housing product and density. While, the density proposed is more than what staff envisioned for the subject property, it is way below the maximum density of RM-2 (15.6 allowed, 6.2 proposed). Staff recommends including the maximum density, housing style and maximum height of the buildings as PRO condition.

DEVELOPMENT POTENTIAL AND DENSITY PROPOSED

The land is currently used as vehicle storage lot, which is a long standing legal non-conforming use. The site plan proposes a development of 120 units with 6.2 DUA for high density multifamily development which is below the maximum density allowed for three bedroom units under RM-2 zoning (15.6 DUA allowed, 6.2 DUA proposed). The master plan designation expects the subject property to be developed as small and medium scale offices. Development under the current OS-1 could result in the construction of a substantial amount of office space. Development under the proposed RM-2 zoning without a PRO option could result in as many as 302 three bedroom units or 401 two bedroom units, based on net acreage provided. Up to 33% of the units are permitted to be one bedroom which would result in additional density on the site.

As is evident, the existing, proposed and anticipated uses are much different from each other. The Master Plan for Land Use does not anticipate residential uses of this property, so no density guidelines are provided on the plan. Staff analyzed the impacts of the proposed rezoning in the following sections.

The applicant submitted a narrative from CIB planning that assesses and supports the applicant's request for change of use. Staff notes that the market assessment from the current draft update to Master plan indicate that an increasing share of the City's residents and larger market want a different housing pattern.

REVIEW CONCERNS

Engineering: An initial engineering review was done as part of the rezoning with PRO application to analyze the information that has been provided thus far. The development will contain private roads and is also proposed to be served by public sewer and water located within the Novi Road right-of-way. Per Engineering review, the existing OS-1 land use for this site is considered equivalent of 2.4 DUA. The proposed rezoning is adding more density for the subject property (6.2 DUA) which would create additional impact than anticipated. Based on preliminary analysis, City anticipates no additional improvements to existing utilities infrastructure to accommodate the proposed density. A full scale engineering review would take place during the course of the Site Plan Review

process for any development proposed on the subject property, regardless of the zoning. The proposed density may require additional contractual sewer capacity downstream of Eight Mile Road as the proposed density results in higher sanitary sewer discharge.

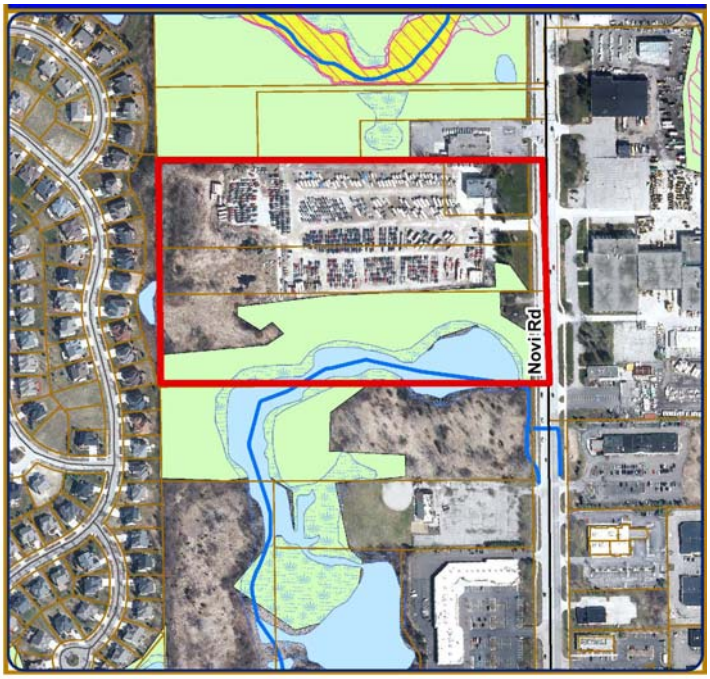
Traffic: The City's traffic consultant has reviewed the **Rezoning Traffic Impact Study** and notes that additional information is required to determine the impacts of the proposed rezoning as compared to existing land use. Additional improvements along Novi road are warranted. The review states that there were no background developments identified near the study area. The applicant should consider revising the study with the possible development within the vacant southern parcel or future residential developments existing onto Novi Road. Refer to the traffic review letter for additional information.

Non-Motorized Improvements: The developer is proposing to contribute funds in the amount of $90,000 for the City to apply to the enhancement of the pedestrian experience along Novi Road to the Downtown Area, subject to RCOC approval.

City of Novi Non-motorized plan planned for an off-road neighborhood connector to the north of the property through the City property connecting the sidewalks along Novi road to the existing single family subdivision on the west of the subject property. Initially, the applicant indicated that they would work with the City to provide this connector. However, it is no longer proposed with the revision as a result of resistance from the neighboring subdivision.

Woodlands: The southern one-third (approximately) of the proposed site contains areas noted as City Regulated Wetlands and City Regulated Woodlands and is currently undeveloped. The Woodland Review letter indicates that about 20 percent of the regulated woodland trees on the site are proposed to be removed, while 80 percent of the regulated woodland trees are proposed to be preserved. The applicant is proposing to provide all required 88 replacements on site and installed in conservation easement. The letter notes that the "upsizing" of Woodland Replacement trees for additional Woodland Replacement credit is not supported by the City of Novi.

Wetlands: The site contains wetlands along the southern property line. The Concept plan is proposing a total of 0.09-acre permanent wetland impacts a total permanent wetland buffer impact of 3.36-acre. The City's threshold for the requirement of wetland mitigation is 0.25-acre of proposed wetland impact. Please refer to the wetland review letter for additional information.



Open Space: The site plan indicates preserving 9.8 acres (50%) of open space excluding wetlands and storm water detention.

Usable Open Space: The usable open spaces are supposed to be designed and intended for the private recreational use of residents of the building. They should be directly accessible by means of common passageway. The layout indicates three pocket parks spread around the development along pedestrian paths, pergola and other amenities near proposed detention ponds and a play scape area. The detail indicated includes all the open space along the southern property line. There is no accessible path to this area. The

applicant should provide accurate usable open space calculations that meet the criteria.

Staff Comment: The layout appears to meet the minimum requirement of usable Open Space. The applicant has provided additional amenities with the revised submittal. Staff agrees that the there is sufficient usable open space in the development. However the values provided under Site data are not accurate. Refer to plan review chart of notes and update the calculations.

2016 MASTER PLAN FOR LAND USE: GOALS AND OBJECTIVES

The proposed development would follow objectives listed in the 2016 Master Plan for Land Use update (adopted by Planning Commission on July 26, 2017) as listed below. Staff comments are in **bold.**

1. **Quality and Variety of Housing:**
   - **a.** *Provide residential developments that support healthy lifestyles by providing neighborhood open space between neighborhoods.* **The development proposes multiple opportunities for active and passive recreation through the use of play space, pedestrian walks and pocket parks. Refer to comments on 'Usable Open Space' in the letter.**

   - *b. Provide a wide range of housing opportunities. 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.* **One of the implementation strategies suggested by our Master Plan to achieve the above goal is to encourage younger resident to remain by providing housing options within walking distance of shopping, dinging, entertainment, recreation and employment. The proposed multi-family development fulfills the objective by providing housing closer to Town center development which provides multiple opportunities as suggested above. The proposal is geared towards young families such as millennials to address their low maintenance needs.**

2. **Community Identity**
   - *a. Maintain quality architecture and design throughout the City.* **The developer has agreed to provide enhanced elevations at the time of Site plan review**.

3. **Environmental Stewardship**
   - *a. Protect and maintain the City's woodlands, wetlands, water features and open space.* **A majority of site is preserved in Open space. Over 99.5% of wetlands are preserved and only 20 % of woodlands are proposed to be removed.**

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 completely voluntary by the applicant, the applicant and City Council can agree on a series of conditions to be included as part of the approval.

The applicant is required to submit a conceptual plan and a list of terms that they are willing to include with the PRO agreement. The applicant has submitted a conceptual plan showing the general layout of the internal roads and lots, location of proposed detention ponds, location of proposed open space and preserved natural features and a general layout of landscaping throughout the development. The applicant has provided a narrative describing the proposed public benefits. At this time, staff can identify seven conditions to be included in the agreement:

1. Maximum number of units shall be 120

2. Maximum height of building shall be 2 stories and 32 feet
3. The development will have only three bedroom units
4. Maximum Density of the development shall be 6.2 DUA
5. All building facades will have brick up to the first floor belt line. Upgraded garage doors with windows.
6. Additional buffer screening is provided for existing residents in the adjacent neighborhood along western property boundary
7. Secondary emergency access will be maintained clear of snow or any other obstacles.

Staff Comment: Additional conditions will be determined as we move forward. While reconsidering the rezoning category requested, the applicant is suggested to provide additional comments that may be included in the agreement.

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. The proposed PRO agreement would be considered by City Council after tentative approval of the proposed concept plan and rezoning.

The concept plan submitted with an application for a rezoning with a PRO is not required to contain the same level of detail as a preliminary site plan. Staff has reviewed the 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 deviations from the Zoning Ordinance and other applicable ordinances shown on the concept plan. The applicant has submitted a narrative describing the requested deviations. **The applicant should consider submitting supplemental material discussing how if each deviation *"...were not granted, [it would] 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."***

1. Planning Deviations:
    a. Reduction of the minimum required building side setback by 27 feet (Required 75 feet, provided 41 feet)
    b. Exceeding the maximum number of rooms (423 allowed, 480 provided)
    c. Not meeting the minimum orientation for all buildings (45 degrees required, varied angles provided)
    d. Reduction of minimum required sidewalk width for bike parking (6 feet required, 5 feet provided)
    e. Reduction of minimum required sidewalk width for Public sidewalk along entire frontage along Novi Road (6 feet required, 5 feet existing).
2. Engineering DCS Deviations:
    a. Exceeding the maximum allowed distance of 1,300 feet for intervals between streets to the property boundary.
    b. Reducing the distance between the sidewalk and back of the curb. A minimum of 7.5 feet can be supported by staff
3. Traffic Deviations: **The applicant indicated that they will revise the plans to meet the Traffic code.**

   a. Exceeding the maximum length of the boulevard
   b. Absence of exiting taper out of the development
4. Landscape Deviations:
   a. Placement of street trees along Novi Road frontage, contingent on RCOC approval
   b. Not meeting the minimum height of landscape berm along North boundary
   c. Proposing a fence along part of Southern Boundary in lieu of berm.
   d. Lack of berms along south property
   e. Lack of berms within Novi Road green belt
   f. Proposing sub canopy trees in lieu of some of the required Deciduous Canopy of Large evergreen trees.
5. Façade Deviations: The elevations provided appear to deviate significantly from the requirements of the Façade Ordinance. Refer to Façade review for more details.

Staff Comment: Refer to other review letters for more details on additional information being requested. Further deviations may be identified once more clarification is provided.

APPLICANT BURDEN UNDER PRO ORDINANCE

The Planned Rezoning Overlay ordinance 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) Approval of the application shall accomplish, among other things, and as determined in the discretion of the City Council, the integration of the proposed land development project with the characteristics of the project area, and result in an enhancement of the project area as compared to the existing zoning, and such enhancement 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 on the basis of which 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; provided, 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.*

PUBLIC BENEFIT UNDER PRO ORDINANCE

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 the public benefits of the proposed PRO rezoning would clearly outweigh the detriments. The following benefits are being offered by the applicant (as listed in their narrative)

The following are the benefits provided with the original concept plan that remain:

1. *Redevelopment Potential of Property*: Removal of unsightly vehicular storage and improvement to storm water treatment and storage. The current parking lot drains direct to the south waterbody. **There is a redevelopment potential for the property even if the**

property is developed according to existing zoning, but perhaps not as likely. The benefit of removing a long standing legal non-conforming use can be considered as a public benefit.

2. *Increased Buffers to West:* The development proposes an approximately 160 feet setback to the nearest residential unit to the west and natural wetlands and trees along the property line are being preserved to the greatest extent possible. **The plan proposes additional evergreen screening from properties to the west. Staff acknowledges that the location of detention creates a good buffer along Novi frontage. However, the options for relocation of the pond within the development are considered to be limited, without compromising the requested density. The current proposed location of the proposed detention ponds are also considered as the optimal location given the grades on the site.**

3. *Strategic Residential Location:* The development is located within walkable distance to the south of the Grand River Corridor and within proximity to Town Center District. **The proximity of the Grand River Corridor and Town Center District subjects the site to more scrutiny as these areas are prone to generating more traffic. Pedestrian enhancements would further justify the location, but they are subject to RCOC's approval.**

4. *Providing Alternative Housing:* The product proposed with the development will fit the low-maintenance needs of age groups at the younger end of the spectrum, including millennials and young families. **Staff agrees that there is a need for the proposed type of housing within the City based on findings of our 2016 Master Plan update.**

5. *Preservation of natural features:* The proposed development layout has been modified to preserve the on-site wetlands to the south and west of the site in additional to preserving the higher quality woodland areas and limited disturbance to the steep slopes of the south. In particular, special attention was provided to saving the only higher quality trees located on the south west corner of the site. **Any additional impact to the existing wetlands would trigger the mitigation requirements and would decrease the land available for development. The proposed site plan maximizes the development within the site. This is not considered as a public benefit. This happens to be an incidental benefit. The applicant is also requesting a deviation to method of calculating density for the preserved wetlands. If the request is approved, then the applicant also benefits by the preservation of natural features.**

6. *Site Amenities:* The development proposes a number of community pocket parks, a play scape area, and public gathering spaces with a scenic overlook to the existing on-site wetlands. These amenities will provide opportunities for social and passive recreation interaction at these pedestrian nodes. **The applicant has responded to staff's request and provided better amenities as part of the development. This can be considered public benefit.**

The following are the benefits added with the revised concept plan after the Master Planning and Zoning Committee meeting

7. *Adding Residential Density to the Downtown area:* The proposed development will add meaningful residential density in walking and biking distance to the Novi Downtown district, which will further work to the success of the growing and emerging downtown. **Staff**

maintains that the proposed density is not compatible with the surroundings for reasons listed in Page 4 under Recommendation. Staff does not consider this as a public benefit.

8. *Pedestrian Enhancement on Novi Road:* The developer is proposing to contribute funds in the amount of $90,000 for the City to apply to the enhancement of the pedestrian experience along Novi Road to the Downtown Area. The Design team will discuss the appropriate enhancements to the pedestrian corridor of Novi Road, and coordinate city and client improvements with the RCOC offices, as appropriate. The applicant provided a conceptual plan indicating the proposed improvements. **An estimate for the proposed improvements for up to $82,800 is also provided. The applicant has contacted Scott Sintkowski, Permit Engineer with RCOC for preliminary input on the proposed conceptual pedestrian improvements and has received favorable response. On-going maintenance of the proposed improvements has not been quantified or the responsibility for the maintenance determined.** The estimate provided by the applicant for the proposed donation towards pedestrian improvements along Novi Road only includes the installation of the suggested improvements. It should be revised to take into account the survey, design and permitting costs prior to installation and maintenance costs after installation. It is staff's opinion that the value of the proposed benefit is reduced without properly considering the associated costs. The applicant may reconsider and revise the public benefits offered to meet the intent of the Section 7.13.2.D.ii of our Zoning Ordinance. The revisions are subject to review and approval of City Council prior to approval of concept plan. **Refer to more comments on Page 4.**

The following are the benefits removed with the revised concept plan after the Master Planning and Zoning Committee meeting

9. *Neighborhood Connector: The developer proposed to coordinate and work with the City to provide a key neighborhood pedestrian connection for the development and the adjacent developments out to Novi Road. This connector is part the City's non-motorized transportation Master Plan.*

The applicant should consider removing item 2,4, 5 and 7 from list of Public benefits for the reasons explained above. They do not meet the intent of public benefits as defined in Section 7.13.2.D.ii

SUMMARY OF OTHER REVIEWS

Planning, Traffic and Façade updated their reviews based on the revised plans. Comments from original reviews for all disciplines still apply.

a. Engineering Review (dated 06-23-17): Few deviations are identified in the letter. Additional comments to be addressed with revised concept plan submittal. Engineering is **recommending** approval.
b. Landscape Review (dated 06-21-17):: Landscape review has identified deviations that may be required. Staff supports only a few. Refer to review letter for more comments. Landscape recommends approval.
c. Wetland Review (dated 02-28-17): A City of Novi Wetland Minor Use Permit and an authorization to encroach into 25 foot buffer setback are required for this site plan at the time of Preliminary Site Plan review. Additional comments to be addressed with revised Site Plan submittal. Wetlands recommend approval.
d. Woodland Review (dated 02-28-17): A City of Novi woodland permit is required for the proposed plan at the time of Preliminary Site Plan review. Additional comments to be addressed with revised Concept Plan submittal. Woodland is recommending approval.

e. Traffic Review (dated 08-14-17): Few deviations are identified in the letter. Additional Comments to be addressed with the revised concept submittal. Traffic recommends approval.
f. Traffic Impact Study Review (dated 06-22-17): Traffic recommends approval.
g. Facade Review (dated 08-15-17): There appear to be significant deviations on the proposed elevations. Façade review was unable to make a determination as to the degree of compliance with the Façade Ordinance due to a lack of information
h. Fire Review (dated 06-06-17): Additional Comments to be addressed with revised concept plan submittal. Fire recommends approval

NEXT STEP: PLANNING COMMISSION

The Site Plan is scheduled to go before Planning Commission for consideration on August 23, 2017. Please provide the following by **August 17, 2017** if you wish to keep the schedule.

1. Concept Plan submittal (dated July 14, 2017) in PDF format. **NO CHANGES MADE**
2. A response letter addressing ALL the comments from ALL the review letters and **a request for waivers as you see fit.**
3. A color rendering of the Site Plan, if any.

If the applicant has any questions concerning the above review or the process in general, do not hesitate to contact me at 248.735.5607 or skomaragiri@cityofnovi.org

Sri Ravali Komaragiri – Planner

Attachments:
Planning Review Chart
Section 3.1.8.B – RM-2 Permitted Uses
Section 3.1.8.C - RM-2 Special Land Uses
Section 3.1.21.B – OS-1 Permitted Uses
Section 3.1.21.C – OS-1 Special Land Uses
Previous Planning Commission Meeting Action
Residential entryway lighting

Previous Planning Commission Meeting Action (May 10, 2017)

In the matter of Princeton Park JSP 17-10 and Zoning Map Amendment 18.717, motion postpone making a recommendation on the proposed PRO and Concept Plan to allow the applicant time to consider further modifications to the Concept Plan as discussed in the review letters, or provide additional usable open space on site prior to consideration by the City Council to rezone the subject property OS-1 (Office Service) to RM-2 (High Density Multi-Family Residential) with a Planned Rezoning Overlay This recommendation is made for the following reasons:

a. *The Planning Commission would like the applicant to further discuss whether the proposed density and change of use is compatible with the existing and future land use in the surroundings. Existing land use patterns indicate a concentration of commercial and industrial uses along Novi Road. The applicant may consider reducing the density to conform to maximum density for RM-1, as RM-1 would be compatible with the low intensity office/retail development along Novi Road. RM-1 also creates a zone of transition from the nonresidential districts and major thoroughfares to the existing Single- Family development (to west) as intended in our Zoning Ordinance.*
b. *The Planning Commission may wish to further discuss if the proposed public benefits outweigh the detriments of the zoning change. Most of the benefits offered by the applicant may be considered incidental benefits from the development. Some of the benefits, though substantial, are dependent on other agencies approval. The applicant should initiate preliminary discussions with other agencies involved and provide more information to justify the viability of the benefits being offered.*
c. *The Concept Plan appears to provide the minimum required usable common open space as required by the code, with the central open space, three pockets and a play area for the enjoyment by the residents. The initial plan reviewed at the Pre-Application meeting included one additional pocket park and additional pedestrian connections on the central courtyard, which have now been removed from the plan.*
d. *The Concept plan can be revised to address design and layout concerns shared in the Planning review. The proposed layout plans a dense development in order to maximize the number of units on site. Modifications to site design can result in reduction of density, more usable open space, creates interest and breaks the continuous layout. Reduction in density to be consistent with maximum allowed in RM-1 will allow more compatible zoning and reduce deviations with regards to building orientation and number of rooms.*

Additional discussion is needed regarding the other Traffic and Engineering issues listed in the staff and consultant review letters. The proposed site entry is aligned with the existing Michigan CAT entrance. Traffic Engineers have inquired how proposed signal timing and other optimization changes listed in the Traffic Study will affect the intersection of the existing CAT driveway and site driveway along Novi Road. The proposed density may require additional contractual sewer capacity downstream of Eight Mile Road as the proposed density increase results in higher sanitary sewer discharge

PLANNING REVIEW CHART: RM-1 with PRO

Review Date: August 11, 2017
Review Type: Planner Rezoning Overlay Concept Plan: 3rd Revision
Project Name: JSP 17-10 Princeton Park (18.717)
Plan Date: July 14, 2017
Prepared by: Sri Komaragiri, Planner
E-mail: skomaragiri@cityofnovi.org; **Phone:** (248) 735-5607

Items in **Bold** need to be addressed by the applicant and/or the Planning Commission Public hearing for the PRO Concept Plan. Underlined items need to be addressed on the Preliminary Site Plan.

tem	Required Code	Proposed	Meets Code	Comments
Zoning and Use Requirements				
Master Plan *(adopted August 25, 2010)*	Community Office	120 Unit residential development with PRO overlay; The proposed units will be "for sale" 6.2 maximum dwelling units per acre (Three Bedrooms)	No	**Planning Commission recommendation & City Council approval PRO Concept Plan – City Council approval PRO agreement – Site Plan or Plat normal approval process**
Area Study	The site does not fall under any special category	NA	NA	
Zoning *(Effective December 25, 2013)*	OS-1 Office Service	RM-2 High Density Multi-Residential District	No	
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.	Multi-Family Residential	No	**The proposed rezoning category would allow Multi-family uses**
Phasing		In the response letter, the applicant indicated two phases	Yes	**Show phase lines on the concept plan and add notes in this regard on the plan as well**
Planned Rezoning Overlay Document Requirements (SDM: *Site development Manual)*				
Written Statement *(Site Development Manual)* *The statement should describe the following*	Potential development under the proposed zoning and current zoning	Partial Information is provided as part of the revised TIS	No	Staff provided our interpretation in the review letter
	Identified benefit(s) of the development	Public benefits are identified in the narrative	Yes?	**Refer to review letter for staff comments on the proposed benefits**
	Conditions proposed for inclusion in the PRO Agreement (i.e., Zoning Ordinance deviations, limitation on total units, etc)	Zoning deviations are listed in the narrative, but not the conditions	Yes?	Staff has made some suggestive conditions in the review letter to be included in PRO agreement
Sign Location Plan *(Page 23,SDM)*	Installed within 15 days prior to public hearing	Signs are installed at the site	Yes	

tem	Required Code	Proposed	Meets Code	Comments
	Located along all road frontages			
Traffic Impact Study *(Site development manual)*	A Traffic Impact Study as required by the City of Novi Site Plan and Development Manual.	Applicant submitted a Traffic Impact Study	Yes	A revised TIS has been reviewed. Refer to the review for more comments
Community Impact Statement *(Sec. 2.2)*	- Over 30 acres for permitted non-residential projects - Over 10 acres in size for a special land use - All residential projects with more than 150 units - A mixed-use development, staff shall determine	Not required	NA	
The remainder of the review is against RM-2 standards, which is the requested rezoning district				
Height, bulk, density and area limitations *(Sec 3.1.8.D)*				
Frontage on a Public Street. *(Sec. 5.12)*	Frontage on a Public Street is required	The site has frontage and access to Novi Road	Yes	
Minimum Zoning Lot Size for each Unit: in Acres *(Sec 3.8.1)*	RM-1 and RM-2 Required Conditions			
Minimum Zoning Lot Size for each Unit: Width in Feet *(Sec 3.8.1)*				
Open Space Area *(Sec 3.1.8.D)*	200 sf of Minimum usable open space per dwelling unit For a total of 123 dwelling units, <u>required Open Space: 24,600 SF</u>	Open Space area indicated on sheet 08 The layout indicates three pocket parks spread around the development along pedestrian paths, pergola and other amenities near proposed detention ponds and a play scape area. The detail indicated includes all the open space along the southern property line. There is no accessible path to this area. This should be excluded. Only spaces that meet	Yes	**The open space meets the minimum requirements, but the numbers are misleading. Please update the values as listed below in your response letter.** **The following should be included in the Usable Open Space** - **Building decks** - **Pocket Parks** - **Play scape area** - **Sidewalks and trails** - **Central Courtyard** **Rest of the area such as wetlands, buffer, woodlands, rear and side yards excluding**

tem	Required Code		Proposed	Meets Code	Comments
			the definition in Article 2 such as balconies, courtyard, play areas.		**buildings, drives, parking should be included in regular open space calculations** **Revise the open space calculations and exhibit accordingly**
Maximum % of Lot Area Covered (By All Buildings)	*45%*		17 %	Yes	**Did this change with the reduction of units?**
Building Height *(Sec. 3.20)*	65 ft. or 5 stories whichever is less		2 stories and 32 feet	Yes	
Minimum Floor Area per Unit *(Sec. 3.1.8.D)*	Efficiency	400 sq. ft.	Not proposed	NA	
	1 bedroom	500 sq. ft.	Not proposed	NA	
	2 bedroom	750 sq. ft.	Not proposed	Yes	
	3 bedroom	900 sq. ft.	1,860 sq. ft.	Yes	
	4 bedroom	1,000 sq. ft.	Not Proposed	NA	
Maximum Dwelling Unit Density/Net Site Area *(Sec. 3.1.8.D)*	Efficiency	Max 10%	Not proposed	Yes	**<u>The proposed density should be a condition of PRO agreement</u>**
	1 bedroom	31.1 Max 33%	Not proposed		
	2 bedroom	20.7	Not proposed		
	3+ bedroom	15.8	6.2 DUA Total site area: 24 Acres ROW Area: 1.1 Acres Wetlands: 3.5 Acres Net Site Area: 19.4 Acres		
Residential Building Setbacks *(Sec 3.1.8.D)*					
Front (along Novi Road)	75 ft.		147 ft.	yes	**<u>North setback is considered a deviation</u>**
Rear (West)	75 ft.		82 ft.	Yes	
Side (North & South)	75 ft.		North: 41 ft. South: 128 ft. (including decks)	No	
Parking Setback *(Sec 3.1.8.D) (Sec 3.1.12.D)Refer to applicable notes in Sec 3.6.2*					
Front	20 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	10 ft.			Yes	
Side	10 ft.			Yes	
Note To District Standards *(Sec 3.6.2)*					
Exterior Side Yard Abutting a Street	All exterior side yards abutting a street shall		No exterior side yards	NA	

tem	Required Code		Proposed	Meets Code	Comments
(Sec 3.6.2.C)	be provided with a setback equal to front yard.				
Off-Street Parking in Front Yard *(Sec 3.6.2.E)*	Off-street parking is allowed in front yard		Parking is not proposed in the front yard	NA	
Distance between buildings *(Sec 3.6.2.H)*	It is governed by sec. 3.8.2 or by the minimum setback requirements, whichever is greater		RM-2 code has additional requirements for distance between buildings.	Yes	**See Comments on Page 8**
Wetland/Watercourse Setback *(Sec 3.6.2.M)*	A setback of 25ft from wetlands and from high watermark course shall be maintained		Wetlands exist on south and west side of the site. minimal impacts are proposed	Yes?	
Parking setback screening *(Sec 3.6.2.P)*	Required parking setback area shall be landscaped per sec 5.5.3.		Parking lots are not proposed	NA	
Modification of parking setback requirements *(Sec 3.6.2.Q)*	The Planning Commission may modify parking setback requirements based on its determination according to Sec 3.6.2.Q		None required	NA	
RM-1 and RM-2 Required Conditions *(Sec 3.8)& (Sec 3.10)*					
Total number of rooms *(Sec. 3.8.1)*	For building less than four stories: Total No. of rooms < Net site area in SF/2000 **8,45,064 SF/2000 = 423** For buildings more than four stories: Total No. of rooms < Net site area in SF/700		Total number of rooms = 480 All buildings are less than four stories	Yes	**Total proposed number of rooms is exceeding the maximum number of rooms allowed for this property.** **<u>This is considered a deviation</u>**
Public Utilities *(Sec. 3.8.1)*	All public utilities should be available		All public utilities are available	Yes	
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 either 3 or 4 bedroom units	Yes	
Room Count per Dwelling Unit Size *(Sec. 3.8.1.C)* **An extra room such*	**Dwelling Unit Size**	**Room Count ***		Yes	For the purpose of determining lot area requirements and density in a multiple-family
	Efficiency	1	Not proposed		
	1 bedroom	2	Not proposed		

tem	Required Code		Proposed	Meets Code	Comments
as den count towards an extra room	2 bedroom	3	Not proposed		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.
	3 or more bedrooms	4	4 (2 bedroom units with a den are also calculated as 3 or more bedroom units)		
Setback along natural shore line *(Sec. 3.8.2.A)*	A minimum of 150 feet along natural shore line is required.		No natural shore line 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 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.		144 ft.	Yes	
Modification of maximum length *(Sec. 3.8.2.C)*	Planning Commission may modify the extra length up to 360 ft. if		Applicant is not proposing extra length than allowed	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.				
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		Buildings orientation do not meet the minimum requirement for all buildings With the current revision, few more units have been rotated to have a slight angle	No	**<u>This is considered a deviation</u>** **Applicants Response:** *This is not feasible as the space required to rotate all the buildings at 45 degree angles to the north, west and south property lines (buildings*

tem	Required Code	Proposed	Meets Code	Comments
	angle of forty-five (45) degrees to said property line.			*2-14) would require the elimination of all the internal units (buildings 17-25) and make the driveway interfaces with the proposed roadway to be very awkward.*
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	NA	
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	None proposed	Yes	
	No closer than 8 ft. for other walls or	Appears to be in conformance	Yes	
	No closer than 20 ft. from ROW and property line	Appears to be 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.	All sidewalks along the private drive are 5 feet wide.	Yes	
	Where feasible sidewalks shall be connected to other pedestrian features abutting the site.	The plan proposed sidewalks on both sides of the streets, a pathway running north south in the central courtyard. There are sidewalk connections from the central sidewalk system to public sidewalks. An additional connection is provided to Novi Road which is also used as an emergency access path.	Yes	
	All sidewalks shall comply with barrier free design standards	Layout notes indicate that all sidewalks shall be ADA compliant	Yes	
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	All distances are in conformance with the requirement as listed on the plan.	Yes	
Minimum Distance	In no instance shall this	Buildings are setback by	Yes	

tem	Required Code	Proposed	Meets Code	Comments
between the buildings *(Sec. 3.8.2.H)*	distance be less than thirty (30) feet unless there is a corner-to-corner relationship in which case the minimum distance shall be fifteen (15) feet.	at least 30 ft. from each other		
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 120 Three or more BR units, required spaces = 300 spaces**	Garage Spaces: 240 In front of Garage: 240 Along street: 14 **TOTAL PROVIDED: 494**	Yes	**Notes indicate no on-street parking. Correct the notes.**
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 - 90° Parking proposed along private drives	Yes	The parking spaces shall meet the City code at the time of Preliminary Site plan.
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 barrier free space is provided near play scape area. It does not indicate access aisle Signage is not indicated at the moment	No?	The parking spaces shall meet the City code at the time of Preliminary Site plan.
Barrier Free Space Dimensions *Barrier Free Code*	- 8' wide with an 8' wide access aisle for van accessible spaces - 5' wide with a 5' wide access aisle for regular accessible spaces			
Barrier Free Signs *Barrier Free Code*	One sign for each accessible parking space.			
Minimum number of Bicycle Parking *(Sec. 5.16.1)* Multiple-family residential	One (1) space for each five (5) dwelling units **Required: 24 Spaces**	Total Proposed: 28 Spaces See sheet Ls-5	**Yes**	

tem	Required Code	Proposed	Meets Code	Comments
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 Shall be accessible via 6 ft. paved sidewalk	Yes Bicycle Parking is proposed in multiple (7) locations. All sidewalks are 5 feet wide. It is residential development	Yes?	**Label the width of the sidewalk** **The width of sidewalk is considered a deviation. Staff supports the deviation as the racks are proposed along private drive and sidewalks.**
Bicycle Parking Lot layout *(Sec 5.16.6)*	Parking space width: 6 ft. One tier width: 10 ft. Two tier width: 16 ft. Maneuvering lane width: 4 ft. Parking space depth: 2 ft. single, 2 ½ ft. double	Locations are indicated, but the layout is not specified	Yes?	Provide the layout plan at the time of Preliminary Site plan
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	Curb side Refuse pick up is being proposed for this residential development	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	Not proposed	NA	
Roof top equipment and wall mounted utility equipment *Sec.*	All roof top equipment must be screened and all wall mounted utility	Not Applicable	NA	

tem	Required Code	Proposed	Meets Code	Comments
4.19.2.E.ii	equipment must be enclosed and integrated into the design and color of the building			
Roof top appurtenances screening	Roof top appurtenances shall be screened in accordance with applicable facade regulations, and shall not be visible from any street, road or adjacent property.	Not Applicable	NA	
Sidewalks and Other Requirements				
Non-Motorized Plan	Proposed Off-Road Trails and Neighborhood Connector Pathways. A residential neighborhood connector is indicated on the master plan connecting Novi Road to residential neighborhood to the west	No Connections to the proposed trails are proposed	Yes?	The applicant initially proposed a connector, but neighboring residents did not want a connection to their neighborhood due to concerns about safety.
Sidewalks *(Subdivision Ordinance: Sec. 4.05)*	Sidewalks are required on both sides of proposed drives	Sidewalks are proposed on both sides of the proposed private drive	Yes	**The applicant should consider widening the existing sidewalk to 6 feet to meet the current sidewalk standards and taper it to meet the existing 5 foot sidewalk or request a deviation**
Public Sidewalks *(Chapter 11, Sec.11-276(b), Subdivision Ordinance: Sec. 4.05)*	A 6 foot sidewalk is required along Novi Road	5 foot sidewalk existing along Novi Road	Yes?	
Entryway lighting *Sec. 5.7*	One street light is required per entrance.	Eight pole lights are proposed along Novi Road frontage Decorative pole and acorn style fixtures are proposed	Yes	**Applicant to work with engineering and DTE on the location and type of the fixtures are proposed in the right of way**
Building Code and Other Requirements				
Building Code	Building exits must be connected to sidewalk system or parking lot.	All exits are connected to internal sidewalk through the driveways	Yes	
Design and Construction Standards Manual	Land description, Sidwell number (metes and bounds for acreage parcel, lot number(s), Liber, and page for subdivisions).	Provided	Yes	

tem	Required Code	Proposed	Meets Code	Comments
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).	Provided	Yes	
Economic Impact	- Total cost of the proposed building & site improvements - Number of anticipated jobs created (during construction & after building is occupied, if known)	Information will be provided at a later time	NA	
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.	A monument sign is proposed in the entrance boulevard No dimensions are provided for the lettering placed upon the sign structure. The height of the sign complies with the ordinance allowance of 5 ft.	No	**Provide additional information to identify deviations**
Development and Street Names	Development and street names must be approved by the Street Naming Committee before Preliminary Site Plan approval	The applicant has recently changed the name to Emerson park from Princeton Park. All development and street names are approved	Yes	
Property Split	The proposed property split must be submitted to the Assessing Department for approval.	The subject property is proposing a combination of four lots.	Yes	<u>The applicant must create this parcel prior to Stamping Set approval. Plans will not be stamped until the parcel is created.</u>
Other Legal Requirements				
PRO Agreement	A PRO Agreement shall	Not applicable at this	NA	<u>PRO Agreement shall be</u>

tem	Required Code	Proposed	Meets Code	Comments
(Sec. 7.13.2.D(3)	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	moment		approved by the City Council after the Concept Plan is tentatively approved
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	NA	A Master Deed draft shall be submitted prior to Stamping Set approval.
Conservation easements	Conservation easements may be required for woodland impacts	Not applicable at this moment	NA	The following documents will be required during Site Plan review process after the Concept PRO approval
Lighting and Photometric Plan (Sec. 5.7)				
Intent *(Sec. 5.7.1)*	Establish appropriate minimum levels, prevent unnecessary glare, reduce spillover onto adjacent properties & reduce unnecessary transmission of light into the night sky	Site lighting includes pole lighting along Novi road and bollard lighting within the site.		A lighting and photometric plan is not required until Final site plan**. However, it would be better if any deviations are identified prior to Concept plan approval.**
Lighting Plan *(Sec. 5.7.A.i)*	Site plan showing location of all existing & proposed buildings, landscaping, streets, drives, parking areas & exterior lighting fixtures			
Building Lighting *(Sec. 5.7.2.A.iii)*	Relevant building elevation drawings showing all fixtures, the portions of the walls to be illuminated, illuminance levels of walls and the aiming points of any remote fixtures.			
Lighting Plan *(Sec.5.7.2.A.ii)*	Specifications for all proposed & existing lighting fixtures			
	Photometric data			
	Fixture height			
	Mounting & design			
	Glare control devices *(Also see Sec. 5.7.3.D)*			
	Type & color rendition of lamps			

tem	Required Code	Proposed	Meets Code	Comments
	Hours of operation			
	Photometric plan illustrating all light sources that impact the subject site, including spill-over information from neighboring properties			
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)			
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			
Security Lighting *(Sec. 5.7.3.H)* Lighting for security purposes shall be directed only onto the area to be secured.	- All fixtures shall be located, shielded and aimed at the areas to be secured. - Fixtures mounted on the building and designed to illuminate the facade are preferred			
Required Conditions *(Sec.5.7.3.E)*	Average light level of the surface being lit to the lowest light of the surface being lit shall not exceed 4:1			
Required Conditions *(Sec. 5.7.3.F)*	Use of true color rendering lamps such as metal halide is preferred over high & low pressure sodium lamps			
Min. Illumination *(Sec. 5.7.3.k)*	Parking areas: 0.2 min			
	Loading & unloading areas: 0.4 min			
	Walkways: 0.2 min			
	Building entrances, frequent use: 1.0 min			
	Building entrances, infrequent use: 0.2 min			

tem	Required Code	Proposed	Meets Code	Comments
Max. Illumination adjacent to Non-Residential *(Sec. 5.7.3.K)*	When site abuts a non-residential district, maximum illumination at the property line shall not exceed 1 foot candle			
Cut off Angles *(Sec. 5.7.3.L)*	when adjacent to residential districts - All cut off angles of fixtures must be 90° - maximum illumination at the property line shall not exceed 0.5 foot candle			

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.

3.1.8 RM-2 High Density, Mid-Rise Multiple-Family District

A. INTENT

The RM-2, High Density, Mid-Rise Multiple-Family Residential district is designed to provide for the residential needs of persons desiring the apartment type of accommodation with central services in a mid-rise configuration. It is the intent of the RM-2 districts to provide high density living facilities in areas, or adjacent to areas, of intense commercial or office development. RM-2 districts should be of sufficient size to accommodate necessary recreation, open space, off-street parking and other on-site amenities. The RM-2 district is not intended for isolated residential areas.

User Note: For uses listed in **bold blue**, refer to Article 4, or click on use, for use-specific standards

B. PRINCIPAL PERMITTED USES

i. Multiple-family dwellings
ii. **Accessory buildings and uses** §4.19 customarily incident to any of the above uses

The following uses are regulated according to the standards and regulations in the **RM-1 Low-Density, Low Rise Multiple-Family (Section 3.1.7):**

iii. **Independent and congregate elderly living facilities** § 4.20
iv. **Accessory buildings and uses** §4.19 customarily incident to any of the above uses

The following uses are regulated according to the standards and regulations in the **RT Two-Family Residential District (Section 3.1.6):**

v. Two-family dwellings (site built)
vi. **Shared elderly housing** § 4.20
vii. **Accessory buildings and uses** §4.19 customarily incident to any of the above uses

The following uses are regulated according to the standards and regulations in the **R-4 One Family Residential District (Section 3.1.5):**

viii. One-family detached dwellings
ix. **Farms and greenhouses** § 4.1
x. Publicly owned and operated parks, parkways and outdoor recreational facilities
xi. **Cemeteries** § 4.2
xii. **Home occupations** § 4.4
xiii. **Keeping of horses and ponies** § 4.8
iv. **Family day care homes** § 4.5
v. **Accessory buildings and uses** §4.19 customarily incident to any of the above uses

C. SPECIAL LAND USES

i. **Retail commercial services and office uses** §4.22

3.1.21

OS-1 Office Service District

A. 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.

User Note: For uses listed in **bold blue**, refer to Article 4, or click on use, for use-specific standards

B. PRINCIPAL PERMITTED USES

i. Professional office buildings
ii. Medical office, including laboratories and clinics
iii. **Facilities for human care** §4.64
iv. Financial institution uses with drive-in facilities as an accessory use only
v. Personal service establishments
vi. Off-street parking lots
vii. Places of worship
viii. Other uses similar to the above uses
ix. **Accessory structures and uses** §4.19 customarily incident to the above permitted uses
x. Publicly owned and operated parks, parkways and outdoor recreational facilities
xi. **Public or private health and fitness facilities and clubs** §4.34

C. SPECIAL LAND USES

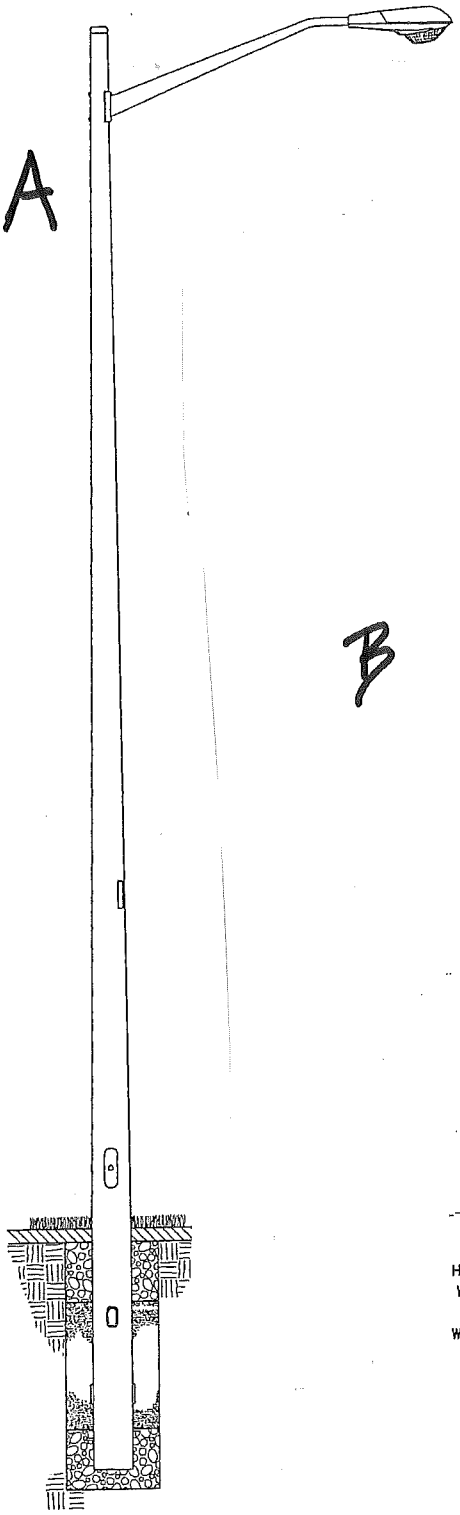
i. **Mortuary establishments** §4.17
ii. Publicly owned buildings, telephone exchange buildings, and public utility offices, but not including storage yards, transformer stations, or gas regulator stations
iii. **Day Care Centers and Adult Day Care Centers** §4.12.2
iv. **Public or private indoor and private outdoor recreational facilities** §4.38
v. An **accessory use** §4.19 customarily related to a use authorized by this Section

RESIDENTIAL ENTRYWAY LIGHTING

1. One light per entrance is required by the City.
2. City pays for one (1) light per entrance if you chose Option A.
3. Any of the three decorative options (referred to as DTE lights) listed in the attached PDF will be developer's responsibility.
4. Street lights within public right of way have to be one of the four in the PDF.
5. Private street lighting, which is developers responsibility does not have to be one of the four options. If you chose to use the DTE lights within the development along private streets, you need to work with the City.
6. Refer to Section 5.7 EXTERIOR LIGHTING of our zoning ordinance for other applicable standards
7. You can contact Darcy Rechtein at *248.735.5695* for further details.
8. See attached lighting options.

RESIDENTIAL DEVELOPMENT ENTRANCE LIGHTING OPTIONS

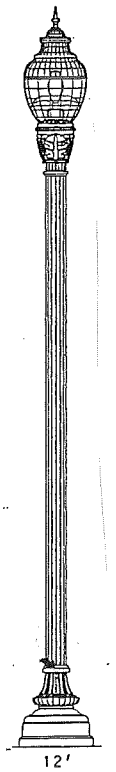
A



SILVER
CODE 80 - 30'
CODE 81 - 30' DUAL
CODE 82 - 40'
CODE 83 - 40' DUAL

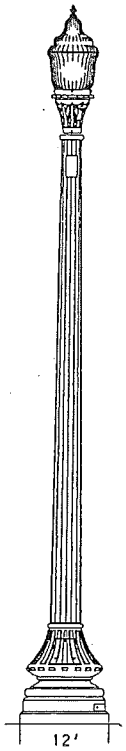
BLACK
CODE 70 - 30'
CODE 71 - 30' DUAL
CODE 72 - 40'
CODE 73 - 40' DUAL

B



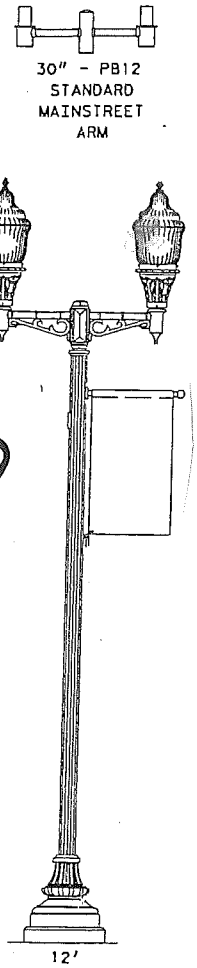
12'
5" DIA.
HAZEL PARK
WADSWORTH
POST &
WASHINGTON
POSTLITE

C



12'
MAINSTREET
POST W/
GRANVILLE
LUMINAIRE
& LEAF
HOUSING

D



30" - PB12
STANDARD
MAINSTREET
ARM

12'
WADSWORTH
POST W/
GRANVILLE
LEAF LUM'S.
BANNER ARM,
TIE DOWN &
MAINSTREET
38" P832
DECORATIVE
ARM

ENGINEERING REVIEW

CONCEPT PLAN SUBMITTAL SCHEDULE		
Type of Submittal	**Plan Date**	**Reviewed by**
Concept Plan	February 08, 2017	All Agencies
Revised Concept Plan	April 03, 2017	Planning, Engineering, Landscape and Fire
2nd Revised Concept Plan	**June 05, 2017**	**Planning, Engineering, Landscape and Fire**
3rd Revised Concept	July 14, 2017	Planning, Traffic and Facade

PLAN REVIEW CENTER REPORT

June 23, 2017

Engineering Review

JSP17-0010
Princeton Park PRO

Applicant
Pulte Homes

Review Type
Revised Concept plan review

Property Characteristics

- Site Location: N. of 10 Mile Road and W. of Novi Road
- Site Size: 24 acres
- Plan Date: May 30, 2017
- Design Engineer: Atwell – Matt Bush, P.E.

Project Summary

- Construction of a 123 unit attached multi-family subdivision on approximately 24 acres. Site access would be provided by a new roadway with a single curb cut onto Novi Road.
- Water service would be provided by tapping the existing 24-inch water main on the west side of Novi Road.
- Sanitary sewer service would be provided by connection to an existing manhole on the 8-inch sanitary sewer on the west side of Novi Road.
- Storm water would be collected on site and detained in a proposed on-site basin.

Recommendation

The revised Concept Plan can be recommended for conditional approval, subject to the comments included in this review.

Comments on the Concept Plan set:

The revised Concept Plan and/or Preliminary Site Plan submittal should address the following:

General

1. **A stub street to the property boundary at intervals not to exceed 1,300 feet along the perimeter is required by ordinance. Request a deviation from Appendix C Section 4.04(A)(1) of the Novi City Code. City staff supports this request.**

Water Main

2. Note that hydrants shall be placed no less than seven (7) feet, but no more than fifteen (15) feet, from the back of curb or the edge of pavement where there is no curb. Hydrants shall be placed approximately five hundred (500) feet apart.
3. Provide a water main stub for future connection to future development on adjacent property in the northwest quadrant of the site.
4. Provide water main modeling calculations demonstrating that the required water supply of 3,000 gpm will be available.
5. Provide additional valves to limit pipe runs to a maximum of 800 feet between valves.

Sanitary Sewer

6. Provide the diameter and material type for all proposed and existing sanitary sewer at the time of Preliminary Site Plan submittal.
7. Provide a sanitary sewer monitoring manhole, unique to this site, within a dedicated access easement or within the road right-of-way. If not in the right-of-way, provide a 20-foot wide access easement to the monitoring manhole from the right-of-way (rather than a public sanitary sewer easement).

Storm Sewer

8. Revise the plan set to provide rear yard drainage systems to minimize the distance that surface drainage must pass through to reach a drainage structure. **Untreated sheet flow into wetland areas is not permitted.**
9. Provide the location for all residential sump leads. All leads must discharge into the on-site storm sewer network.
10. Provide an oil/gas separator with a four (4) foot sump at the last structure prior to discharge into the basins.

Paving & Grading

11. **The location of the sidewalk adjacent to the curb is not in accordance with the Engineering Design Manual section 7.4.2.C.1, which requires that sidewalk on private roadways to be placed 15 feet from the back of curb. Given the**

constraints of the site, a deviation to provide minimum of 7.5 feet from back of curb to edge of sidewalk is supported by staff.

12. Revise the emergency access cross section shown on Sheet C-08 to show the 5 foot sidewalk in the center of the pavers as shown in the site layout per fire marshal comments.
13. A plan for snow clearing and year round maintenance of the emergency access path should be addressed in the master deed.
14. The non-motorized Master Plan requires 6 foot sidewalk along the Novi Road frontage. Any sidewalk to be constructed must be 6 feet in width.
15. A public sidewalk easement is required where sidewalk is out of the public right-of-way crossing Prospect Avenue

Storm Water Management Plan

16. The Storm Water Management Plan for this development shall be designed in accordance with the Storm Water Ordinance and Chapter 5 of the Engineering Design Manual.
17. The SWMP must detail the storm water system design, calculations, details, and maintenance as stated in the ordinance. The SWMP must address the discharge of storm water off-site, and evidence of its adequacy must be provided. This should be done by comparing pre- and post-development discharge areas, rates and volumes. The area being used for this off-site discharge should be delineated and the ultimate location of discharge shown. The applicant is responsible for verifying that the proposed discharge point(s) has adequate capacity to accept the designed drainage flows.
    a. Revise the plan set to provide a pre- and post-development tributary area map.
    b. Include in the post-development tributary map details to account for all disturbed areas that are not maintained in their respective natural states.
    c. Explain how the developed c factor of 0.6 is calculated.
    d. Clarify the detention basin elevations for first flush and bank full volumes to make the table of elevations consistent with the volumes calculated.
    e. Show the calculations used to determine the existing and proposed run off rates and volumes.
18. The 25 foot vegetated buffer cannot encroach on adjacent lots or property or public right-of-way.
19. Revise the plan set to provide a minimum length to width ratio of 3 to 1 for the proposed detention basins. Additional pretreatment may be required if this requirement cannot be met.

Off-Site Easements

20. Any off-site easements must be executed prior to final approval of the plans. Drafts shall be submitted at the time of the Preliminary Site Plan submittal.
21. The extents of off-site construction easements and sidewalk easements shall be shown on the plans.

A letter from either the applicant or the applicant's engineer must be submitted with future submittals highlighting the changes made to the plans addressing each of the comments listed above and indicating the revised sheets involved.

General Notes to consider for future submittals:

1. A full engineering review of the revised Concept plan set was not performed due to the limited information provided in this submittal. A more detailed review of utilities, easements, site layout, grading, storm water management and soil erosion control will be performed as the design progresses into preliminary and final site plan submittals.
2. The Master Plan for Land Use indicates OS-1 as the master planned land use for this site, with a density of 2.8 Residential Equivalent Units (REU) per acre. The applicant is requesting a Planned Rezoning Overlay to rezone to RM-1 with a density of 6.6 REU per acre. The City's existing infrastructure has sufficient capacity to accommodate the increased density in this proposed development, however, any time parcels are rezoned to a use that results in a higher sanitary sewer discharge, acquisition of additional contractual sewer capacity downstream of Eight Mile Road may be required at the time of build-out.
3. The site plan shall be designed in accordance with the Design and Construction Standards (Chapter 11).
4. Soil borings shall be provided for a preliminary review of the constructability of the proposed development (roads, basin, etc.). Borings identifying soil types, and groundwater elevation should be provided at the time of Preliminary Site plan.
5. A right-of-way permit will be required from the City of Novi and Oakland County. Novi Road is under the jurisdiction of the Road Commission for Oakland County.
6. Site grading shall be limited to 1V:4H (25-percent), excluding landscaping berms.
7. Provide at least 3-foot of buffer distance between the sidewalk and any fixed objects, including hydrants. Note on the plan any location where the 3-foot separation cannot be provided.
8. Provide location dimensions for all proposed water main, sanitary sewer, and storm sewer from a proposed fixed point.
9. 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 distance from any existing or proposed utility. All utilities shall be shown on the landscape plan, or other appropriate sheet, to confirm the separation distance.
10. The grade of the drive approach shall not exceed 2-percent within the first 25 feet of the intersection. Provide spot grades as necessary to establish this grade.

11. Provide top of curb/walk and pavement/gutter grades to indicate height of curb adjacent to parking stalls and/or drive areas.
12. Provide curb returns with a maximum slope of 3% at intersections.
13. Show the overland routing that would occur in the event the basin cannot accept flow. This route shall be directed to a recognized drainage course or drainage system.

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 Darcy Rechtien at (248) 735-5695 with any questions.

Darcy N. Rechtien

Darcy N. Rechtien, P.E.

MEMORANDUM

TO: BARBARA MCBETH, CITY PLANNER

FROM: DARCY RECHTIEN, STAFF ENGINEER

SUBJECT: REVIEW OF REZONING IMPACT ON PUBLIC UTILITIES
REZONING REQUEST 18.717
PRINCETON PARK

DATE: MAY 5, 2017

In response to your request, we have reviewed the proposed rezoning of the parcel west of Novi Road, north of Ten Mile Road for availability and potential impacts to public utilities. It is our understanding that the applicant is requesting that 24 acres be rezoned from OS-1 (Office service) to RM-2 (high-density multi-family). The Master Plan for Land Use indicates OS-1 as the master planned land use for this site, with a density of 2.8 Residential Equivalent Units (REU) per acre. The applicant is requesting a Planned Rezoning Overlay to rezone to RM-2 with a density of 6.4 REU per acre.

Water Service

The proposed development is in the Twelve Oaks Pressure District. Water service would be provided by tapping the existing 24-inch water main on the west side of Novi Road. The proposed rezoning would have minimal impact on available capacity, pressure and flow and the water supply system.

Sanitary Sewer Service

The development is located in the Interceptor Sewer District. Service would be provided by connection to an existing manhole on the 8-inch sanitary gravity main on the west side of Novi Road. The City's existing infrastructure has sufficient capacity to accommodate the increased density in this proposed development, however, any time parcels are rezoned to a use that results in a higher sanitary sewer discharge, acquisition of additional contractual sewer capacity downstream of Eight Mile Road may be required at the time of build-out.

Summary

In summary, the water main facilities that are in place are adequate to serve the proposed change in zoning with little or no impact on the rest of the water system and the water master plan. The City's sanitary sewer facilities have capacity to support the additional flows that would be anticipated with a higher use residential zoning. Therefore, we conclude that the rezoning would have a minimal impact on the public

utilities; however any increase in sanitary flow may require the acquisition of additional capacity downstream of Eight Mile Road at the time of build-out.

cc: George Melistas.; Engineering Senior Manager
Ben Croy, P.E.; Water & Sewer Senior Manager

LANDSCAPE REVIEW

CONCEPT PLAN SUBMITTAL SCHEDULE		
Type of Submittal	**Plan Date**	**Reviewed by**
Concept Plan	February 08, 2017	All Agencies
Revised Concept Plan	April 03, 2017	Planning, Engineering, Landscape and Fire
2nd Revised Concept Plan	**June 05, 2017**	**Planning, Engineering, Landscape and Fire**
3rd Revised Concept	July 14, 2017	Planning, Traffic and Facade

PLAN REVIEW CENTER REPORT

June 21, 2017

Revised PRO Concept Plan Landscape Review

Review Type | **Job #**

2nd Revised PRO Concept Plan Landscape Review | JSP17-0010

Property Characteristics

- Site Location: West side of Novi Road, just south of Post Office
- Site Zoning: OS-1 – proposed RM-1
- Adjacent Zoning: OS-1 to north, I-2 to east, B-3 to south, R-4 to west
- Plan Date: 4/3/2017

Ordinance Considerations

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

Recommendation:

This project is **recommended for approval**. The conceptual landscape plans have a number of landscape deviations proposed, some of which are supported, and others are not, as detailed in this letter. The basic concept and layout indicate that there is sufficient room provided to meet city requirements.

NOTE: As this plan has not been approved, the new landscape revisions may be used for this project if desired. The calculations would need to be revised and a revised landscape plan submitted for Planning Commission consideration. In this case, the revisions would not have much impact on the plans. The primary differences that would impact this project would be the allowance for removing the frontage within the clear vision zones on Novi Road and 12.5 Mile Road from the street tree requirement, and removing the widths of the access ways from the required greenbelt plantings for the same frontages. Also, the requirement for building frontage landscaping was reduced from 60% to 35%.

Landscape Deviations on Plan:

(NOTE: These do not include errors or omissions on the plan which are not assumed to be intentional deviations and which will need to be corrected during Preliminary and Final Site Plan Review)

1. A number of required street trees adjacent to the Novi Road entry will not be allowed per the Road Commission for Oakland County sight distance standards. The full extent of the deviation will be determined when the plans are reviewed by the RCOC. This deviation is supported by staff.
2. Landscaped berm to north does not meet minimum requirement of 4.5-6'. Staff does not support this deviation as there appears to be room for a taller buffer (at least 4.5 feet), and there is a need for the buffer as plans for that property are unknown at this time.

3. A 6 foot tall ornamental fence is proposed to buffer the area between the post office and the detention pond, as well as Building #1. The ordinance requires a waiver for not providing the berm, and would require a masonry wall in place of it, with landscaping. As most of the section with the fence is detention pond, not buildings, and the post office building is on the other side of the fence near Building #1, this deviation is supported by staff.
4. The required landscaped buffer is not provided along the south property line. A 6-8 foot high berm is required along the B-3 boundary. The existing wetland/pond/vegetation provides sufficient screening and the topography makes creating the required berm impractical so this deviation is supported by staff.
5. The required four foot tall berms in the Novi Road greenbelt are not provided. While the proposed landscaping and distance provide separation between the units and Novi Road and all off-street parking and vehicular use areas are screened from view of Novi Road by the landscaping and buildings. Staff supports this deviation.
6. Applicant is requesting additional woodland replacement credits for upsized evergreen trees planted throughout the site. This is a deviation and is not allowed per the Landscape Design Manual. Staff does not support this deviation. (Note: The applicant's response letter indicated that the credits would not be requested, but the plans still show the upsizing credits for the replacement trees – based on the response letter, the additional credits shown will be disregarded).
7. Applicant is proposing 82 subcanopy trees to be included in total of 384 trees required (21%). The requirement is for deciduous canopy or large evergreen trees, not subcanopy trees. The deviation is supported by staff as it provides additional diversity of plantings.

Existing Soils (Preliminary Site Plan checklist #10, #17)

Soil information is provided.

Existing and proposed overhead and underground utilities, including hydrants.(LDM 2.e.(4))

Utilities are shown on the Landscape Plans.

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

Existing trees and proposed removals have been shown on Sheets 2 through 4.

Proposed trees to be saved (Sec 37 Woodland Protection 37-9, LDM 2.e.(1))

1. **Show proposed tree fencing at a minimum of 1' outside of tree driplines.**
2. **Include tree planting detail that shows fencing at 1' outside of tree driplines.**

Woodland Replacement Trees

As noted above, upsizing of trees cannot be used to reduce the number of replacement trees required. Please revise the calculations to remove the upsizing credit. The upsizing would require a landscape deviation in the PRO agreement, which is not supported by staff. The applicant's response letter indicates that they will not be requesting additional credits for upsizing.

Proposed topography. 2' contour minimum (LDM 2.e.(1))

Provided.

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

1. **The required berm along Novi Road is not provided. As there is much greater distance between the homes and the Road than is required (a minimum of 150 feet is provided whereas only 34 feet is required) and the buildings and a significant amount of landscaping is proposed in that area to screen the buildings from the road, this deviation is supported by staff.**
2. The required quantities of greenbelt landscaping are provided.
3. **Please ensure that tree species and locations for Novi Road greenbelt trees are**

compatible with the overhead utility lines. If necessary, subcanopy trees can be used as substitutes for canopy trees at a rate of 2 subcanopy trees per 1 canopy tree.

Street Tree Requirements (Zoning Sec. 5.5.3.E.i.c and 5.5.3.E.ii)

1. **The required number of street trees along Novi Road is provided. Please add the sight distance triangles per the Road Commission for Oakland County Road requirements along Novi Road. If the RCOC prohibits any or all of those trees, a waiver for the prohibited trees will be supported. A copy of their review will need to be provided.**
2. **Please add the clear vision zone for the interior road intersection and move the trees outside of that zone. There is still at least one tree within the clear vision zone that cannot be there.**
4. There is a contradiction between the two figures used as a basis for the street trees calculations. 3349 lf is shown as the basis, but the calculations show the number to be 2821 lf. The latter figure was used for the tree requirement**. Please use the correct number as the basis and remove the incorrect figure from the calculations. If the correct figure is 2,080 lf, then more than the required number of street trees is provided.**
5. It appears that the distance between driveways has been increased to 7-8 feet. This should help the survival of the trees planted between driveways. Also, the long-term survival of the trees in that situation is doubtful, given the small area for roots to collect air and water. Furthermore, some species are known to cause upheaval in paved surfaces.
6. **Please ensure that tree species and locations for Novi Road greenbelt trees are compatible with the overhead utility lines. If necessary, subcanopy trees can be used as substitutes for canopy trees at a rate of 2 subcanopy trees per 1 canopy tree.**

Multi-family Landscaping Requirements (Zoning Sec 5.5.3.E.ii)

1. The street tree requirement is discussed above.
2. **Based on 130 ground level dwelling units, 390 deciduous canopy or large evergreen trees are required as site landscaping. 384 new trees and 6 existing trees are provided, 82 of which are subcanopy trees (21%). This variance is supported, but the applicant is asked to add at least one more native species to the mix of subcanopy trees to provide a greater percentage of native species in the plan.**

Detention Basin Landscaping (LDM3)

1. It appears that there is now 75% coverage of the rim per the ordinance.
2. **Please show the high water line on the Landscape Plans.**

Transformer/Utility Box Screening (Zoning Sec 5.5.3.D.)

1. The detail is provided on Sheet 4.
2. **When proposed transformers/utilities/fire hydrants are available, add them to the landscape plan and adjust plant spacing accordingly.**

Plant List (LDM 1.d.(1).(d) and LDM 2.h. and t.)

1. Plant lists have been provided that meet the city requirements.
2. Please add a legend or unique labeling, indicating which trees are greenbelt trees and which are Multifamily interior trees.

Planting Notations and Details (LDM)

1. **Details provided meet City of Novi requirements.**
2. **Please add a multi-stem tree planting detail.**
3. **Include all standard City of Novi landscape notes on plans. Available upon request.**
4. For final site plans, costs per the City of Novi Community Development Fee Schedule need to be provided for all plants, including seed and sod, and mulch proposed to be used on the site.

Irrigation (LDM 1.a.(1)(e) and 2.s)

Irrigation plan for landscaped areas is required for Final Site Plan.

Snow Deposit Areas (LDM.2.q.)

Please indicate areas to be used for snow plowing that won't harm existing or proposed landscaping.

Proposed off-site plantings along Novi Road

1. **Based on our experience with street trees here in Novi, Sweetgum (*Liquidambar styraciflua*) does not do well here in Novi, so a different canopy tree species is recommended.**
2. **The Road Commission for Oakland County will need to be consulted regarding any plantings in the Novi Road right-of-way.**
3. **While the blood grass appears to be a safe choice in terms of height, tolerance of urban conditions and invasiveness, only the non-invasive 'Rubra' cultivar should be used, and it would be nice to add some short flowering species to support butterflies in the spring and fall in the beds.**

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

WETLANDS REVIEW

CONCEPT PLAN SUBMITTAL SCHEDULE		
Type of Submittal	**Plan Date**	**Reviewed by**
Concept Plan	**February 08, 2017**	**All Agencies**
Revised Concept Plan	April 03, 2017	Planning, Engineering, Landscape and Fire
2nd Revised Concept Plan	June 05, 2017	Planning, Engineering, Landscape and Fire
3rd Revised Concept	July 14, 2017	Planning, Traffic and Facade

Environmental Consulting & Technology, Inc.

February 28, 2017

Ms. Barbara McBeth
City Planner
Community Development Department
City of Novi
45175 W. Ten Mile Road
Novi, Michigan 48375

Re: Princeton Park (JSP17-0010)
Wetland Review of the Concept Plan (PSP17-0014)

Dear Ms. McBeth:

Environmental Consulting & Technology, Inc. (ECT) has reviewed the Concept Plan (*Conceptual Planned Rezoning Overlay (PRO)*) plan for the proposed Princeton Park multi-family residential development project prepared by Atwell dated February 7, 2017 (Plan). The Plan was reviewed for conformance with the City of Novi Wetland and Watercourse Protection Ordinance and the natural features setback provisions in the Zoning Ordinance.

The project is located west of Novi Road between Ten Mile Road and Grand River Avenue (Section 22), just south of the U.S. Post Office. The northern two-thirds (approximately) of the proposed project site is currently used as a storage facility for cars, boats, trailers and other vehicles. The southern one-third (approximately) of the proposed site contains areas noted as City Regulated Wetlands and City Regulated Woodlands and is currently undeveloped.

The site plan appears to propose the construction of twenty-six (26) multi-family residential buildings (totaling 129 units), associated utilities, parking, and two (2) storm water detention basins located on the east portion of the site. The ultimate outfall for the storm water detention basins is an existing wetland area located on the southern portion of the development site.

ECT recommends approval of the Concept Plan for wetlands with the condition that the Applicant satisfactorily address the items noted in the "Comments" section of this letter at the time of Preliminary Site Plan submittal.

The following wetland related items are required for this project:

Item	Required/Not Required/Not Applicable
Wetland Permit (specify Non-Minor or Minor)	Required (Minor)
Wetland Mitigation	Not necessary as wetland impacts do not exceed 0.25-acre
Wetland Buffer Authorization	Required
MDEQ Permit	To be determined. It is the applicant's responsibility to contact the MDEQ in order to determine the need for a wetland use permit (for direct impact/fill of Wetland #3) and/or stormwater discharge to Wetland #1.
Wetland Conservation Easement	Required

2200 Commonwealth Blvd., Suite 300 Ann Arbor, MI 48105

(734) 769-3004

FAX (734) 769-3164

Based on our review of the Plan, Novi aerial photos, Novi GIS, the City of Novi Official Wetlands and Woodlands Maps (see Figure 1, attached) it appears as if this proposed project site contains City-regulated wetlands and woodlands. The City's wetland and woodland map shows that the overall property contains wetlands to the south. However, a review of aerial photos of the site and the proposed site plan, the site contains three (3) areas of wetland (Wetlands #1, #2, and #3), along both the southern and western portion of the site.

Wetlands

As noted, there appear to be three (3) wetland areas located on the site totaling 3.36 acres:

Wetland #1

Wetland #1 (2.9 acres) is a scrub-shrub/open-water wetland located along the southern portion of the site. This wetland is associated with the existing northern tributary of Chapman Creek.

Wetland #2

Wetland #2 (0.37-acre) is an emergent wetland located along the west side of the site. Wetland #2 was created as part of the Churchill Crossing residential development located west of the subject parcel. This area is located within a Michigan Department of Environmental Quality (MDEQ) conservation easement based on the data provided on the MDEQ Wetlands Map Viewer (http://www.mcgi.state.mi.us/wetlands/mcgiMap.html).

Wetland #3

Wetland #3 (0.09-acre) is an isolated, emergent/scrub-shrub wetland located near the southwest corner of the site. It appears as though during wet periods drainage from Wetland #3 flows through an upland area and eventually drains to Wetland #1.

On-Site Wetland Evaluation

ECT visited the site on Tuesday, February 21, 2017 for the purpose of a Wetland Boundary Delineation. The wetland flagging and tree identification provided on the Plan was completed by Atwell. The wetlands were marked with pink survey tape flagging at the time of our inspection. Based on our site inspection, the wetland boundaries appear to be accurately portrayed on the Plan.

Wetland Impact Review

As noted, three (3) areas of wetland exist on this parcel (Wetland #1, #2, and #3). The proposed site development appears to be partly designed around the existing on-site wetland and 25-foot wetland setback areas. The *Layout Plan* (Sheet 05) indicates that the proposed development will impact Wetland #3 and the storm water outlet is currently planned to be directed to the 25-foot setback of Wetland #1, in the southeast portion of the site. The following table summarizes the existing wetlands and the proposed wetland impacts as shown on the Plan:

Table 1. Proposed Wetland Impacts

Wetland Area	*Wetland Area (acres)*	*City Regulated?*	*MDEQ Regulated?*	*Impact Area (acre)*	*Estimated Impact Volume (cubic yards)*
1	2.90	Yes City Regulated /Essential	To Be Determined	None Indicated	None
2	0.37	Yes City Regulated /Essential	Yes	None Indicated	None
3	0.09	Yes City Regulated /Essential	To Be Determined	0.09	Not Provided
TOTAL	3.36	--	--	0.09	Not Provided

In addition to wetland impacts, the Plan also appears to propose impacts to the 25-foot natural features setback of Wetland #3. The applicant shall indicate the area of all existing on-site wetland buffers/setbacks on the preliminary site plan as well as indicate the area of all proposed impacts to these areas (both permanent and temporary).

The applicant shall show the following information on subsequent site plans:

- Area (square feet or acres) of all on-site wetland areas;
- Area (square feet of acres) of all on-site 25-foot wetland setback areas;
- Area (square feet) and volume (cubic yards) of all wetland impacts (both permanent and temporary);
- Area (square feet) of all wetland buffer impacts (both permanent and temporary).

The Applicant shall provide wetland conservation easements as directed by the City of Novi Community Development Department for any areas of remaining wetland. A Conservation Easement shall be executed covering all remaining wetland areas on site as shown on the approved plans. 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 and Watercourse permit.

Wetland Mitigation

The MDEQ generally requires mitigation for impacts greater than one-third acre and the City usually requires mitigation for impacts greater than one-quarter acre (0.25-acre). Wetland mitigation is not required for the currently-proposed impacts.

Permits & Regulatory Status

All of the wetlands appear to be considered essential by the City as they appear to meet one or more of the essentiality criteria set forth in the City's Wetland and Watercourse Protection Ordinance (i.e., stormwater storage/flood control, wildlife habitat, etc.). This information has been noted in the *Proposed Wetland Impacts* table, above. Any impacts to wetlands or wetland buffers would require approval and authorization from the City of Novi. The project as proposed will require a City of Novi *Wetland Minor Use Permit* as well as an *Authorization to Encroach the 25-Foot Natural Features Setback.* This permit and authorization are required for the proposed impacts to wetlands and regulated wetland setbacks.

The on-site wetlands may also be regulated by the Michigan Department of Environmental Quality (MDEQ) due to size or proximity to a watercourse (i.e., within 500 feet of the northern tributary of Chapman Creek). Final determination of regulatory status should be made by the MDEQ however. A permit from this agency may be required for any direct impacts, or potentially for stormwater discharge from the proposed detention basin. The current Plan proposes to fill Wetland #3 and includes the outlet of pre-treated stormwater from the proposed detention basin to Wetland #1. It is the applicant's responsibility to contact the MDEQ in order to determine the need for a wetland use permit. It should be noted that a City of Novi Wetland Permit cannot be issued until the applicant receives either authorization or a letter of no jurisdiction from the MDEQ

Comments

Please consider the following comments when preparing the Preliminary Site Plan submittal:

1. The applicant shall indicate the area of all on-site wetland buffers/setbacks on the Plan as well as indicate the area of all proposed impacts to these areas (both permanent and temporary). The plan should include area (square feet or acres) impact quantities for all wetland and wetland buffer impacts as well as volume quantities for all wetland impacts (i.e., cubic yards of wetland cut and/or fill).

2. Please clarify/indicate how any temporary wetland buffer impacts will be restored (i.e., what seed mix will be used in the area of the stormwater outfall construction to Wetland #1). The Details and Plant Material List (Sheet LS-4 of 6) includes a Native Wildflower Seed Mix (from Nativescape, LLC). The Plan should clarify if this seed mix is proposed within areas of temporary wetland buffer impact.

3. It is the Applicant's responsibility to confirm the need for a permit from the MDEQ for any proposed wetland impact and/or proposed stormwater discharge to Wetland #1. A City of Novi Wetland Permit cannot be issued until the applicant receives either authorization or a letter of no jurisdiction from the MDEQ

4. The Applicant shall provide wetland conservation easements as directed by the City of Novi Community Development Department for any areas of remaining wetland. A Conservation Easement shall be executed covering all remaining wetland areas on site as shown on the approved plans. 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 and Watercourse permit. In addition, all proposed conservation easements shall be indicated and clearly labeled on the Plan. It should be noted that Wetland #2 appear to already be included within an MDEQ Conservation Easement.

Recommendation

ECT recommends approval of the Revised Concept Plan for wetlands with the condition that the Applicant satisfactorily address the items noted in the "Comments" section of this letter at the time of Preliminary Site Plan submittal.

If you have any questions regarding the contents of this letter, please contact us.

Respectfully submitted,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

Pete Hill, P.E.
Senior Associate Engineer

cc: Sri Komaragiri, City of Novi Planner
Richelle Leskun, City of Novi Planning Assistant
Rick Meader, City of Novi Landscape Architect
Kirsten Mellem, City of Novi Planner

Attachments: Figure 1 – City of Novi Regulated Wetland and Woodland Map
Site Photos

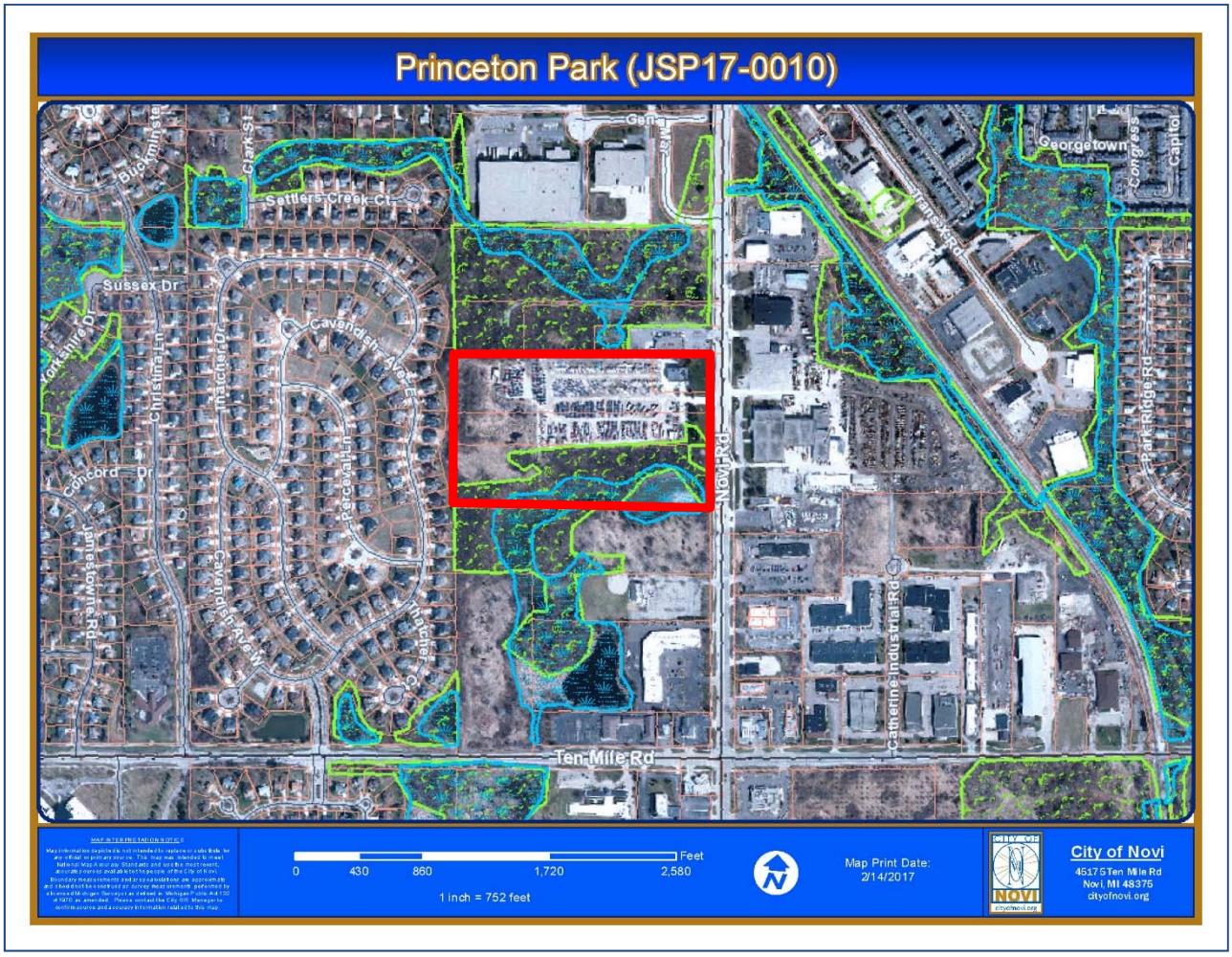


Figure 1. City of Novi Regulated Wetland & Woodland Map (approximate project area is highlighted in red). Regulated Woodland areas are shown in green and regulated Wetland areas are shown in blue).

Site Photos

Photo 1. Looking southwest at Wetland Area #1 on the south side of the site (ECT, February 21, 2017).

Photo 2. Looking west at Wetland Area #2 on the west side of the site (ECT, February 21, 2017).

Photo 3. Looking east at Wetland Area #3 in the south/west section of the Site (ECT, February 21, 2017).

Photo 4. Looking east at upland drainage feature from Wetland Area #3 in the south/west section of the site (ECT, February 21, 2017).

WOODLANDS REVIEW

CONCEPT PLAN SUBMITTAL SCHEDULE		
Type of Submittal	**Plan Date**	**Reviewed by**
Concept Plan	**February 08, 2017**	**All Agencies**
Revised Concept Plan	April 03, 2017	Planning, Engineering, Landscape and Fire
2nd Revised Concept Plan	June 05, 2017	Planning, Engineering, Landscape and Fire
3rd Revised Concept	July 14, 2017	Planning, Traffic and Facade

Environmental Consulting & Technology, Inc.

February 28, 2017

Ms. Barbara McBeth
City Planner
Community Development Department
City of Novi
45175 West Ten Mile Road
Novi, MI 48375

Re: Princeton Park (JSP17-0010)
Woodland Review of the Concept Plan (PSP17-0014)

Dear Ms. McBeth:

Environmental Consulting & Technology, Inc. (ECT) has reviewed the Concept Plan (*Conceptual Planned Rezoning Overlay (PRO)*) plan for the proposed Princeton Park multi-family residential development project prepared by Atwell dated February 7, 2017 (Plan). The Plan was reviewed for conformance with the City of Novi Woodland Protection Ordinance Chapter 37.

The project is located west of Novi Road between Ten Mile Road and Grand River Avenue (Section 22), just south of the U.S. Post Office. The northern two-thirds (approximately) of the proposed project site is currently used as a storage facility for cars, boats, trailers and other vehicles. The southern one-third (approximately) of the proposed site contains areas noted as City Regulated Wetlands and City Regulated Woodlands and is currently undeveloped.

The site plan appears to propose the construction of twenty-six (26) multi-family residential buildings (totaling 129 units), associated utilities, parking, and two (2) storm water detention basins located on the east portion of the site. The ultimate outfall for the storm water detention basins is an existing wetland area located on the southern portion of the development site.

ECT recommends approval of the Concept Plan for woodlands with the condition that the Applicant satisfactorily address the items noted in the "Comments" section of this letter at the time of Preliminary Site Plan submittal.

The following woodland related items are required for this project:

Item	Required/Not Required/Not Applicable
Woodland Permit	Required
Woodland Fence	Required
Woodland Conservation Easement	Required

What follows is a summary of our findings regarding on-site woodlands associated with the proposed project.

Woodland Evaluation

ECT completed an on-site woodland evaluation on Tuesday, February 21, 2017. As noted above, the site does contain area designated as City of Novi Regulated Woodland. A significant portion of the proposed limits of disturbance for the project is located outside of the areas mapped as City Regulated woodland (see Figure 1). The

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majority of the Regulated Woodland area is located on the southern portion of the project site (see Figure 1). Tree survey information has been provided on the *Tree List* plan (Sheet 03). This sheet includes a tree list that indicates the proposed woodland impacts and required Woodland Replacement tree credits for these removals. The Plan indicates that a total of 328 trees have been surveyed for the project. Of the trees surveyed, 262 trees are located within the area designated as Regulated Woodland (80% of the surveyed trees are located within the regulated woodland area). Fifty percent (50%) of the surveyed trees are comprised of the following tree species:

- Eastern cottonwood (26% of the surveyed trees);
- Silver maple (12% of the surveyed trees);
- Sugar maple (12% of the surveyed trees);

The other 50% of the surveyed trees include the following tree species:

- Siberian elm (8%);
- Black cherry (7%);
- Boxelder (6%);
- Basswood (5%);
- Common apple (5%);
- White pine (4%);
- Bitternut hickory (3%); and
- Norway spruce, black walnut, quaking aspen, eastern red cedar, American elm, black willow, black locust, corkscrew willow, Norway maple, and common pear.

The majority of the trees are listed as being in Good condition.

Woodland Impact Review & Woodland Replacement Credits

It should be noted that the purpose of the City of Novi Woodland Protection Ordinance (Chapter 37) is to:

1. *Provide for the protection, preservation, replacement, proper maintenance and use of trees and woodlands located in the city in order to minimize disturbance to them and to prevent damage from erosion and siltation, a loss of wildlife and vegetation, and/or from the destruction of the natural habitat. In this regard, it is the intent of this chapter to protect the integrity of woodland areas as a whole, in recognition that woodlands serve as part of an ecosystem, and to place priority on the preservation of woodlands, trees, similar woody vegetation, and related natural resources over development when there are no location alternatives;*

2. *Protect the woodlands, including trees and other forms of vegetation, of the city for their economic support of local property values when allowed to remain uncleared and/or unharvested and for their natural beauty, wilderness character of geological, ecological, or historical significance; and*

3. *Provide for the paramount public concern for these natural resources in the interest of health, safety and general welfare of the residents of the city.*

As shown, there appear to be impacts proposed to regulated woodlands associated with the site construction. The Plan notes that a total of 54 of the 262 on-site, regulated trees (approximately 20% of the regulated trees) will be removed as a result of the proposed project.

A *Woodland Summary* Table has been included on the *Tree List* (Sheet 03). The Applicant has noted the following:

- Total Regulated Trees 262
- Regulated Trees Removed: 54 (20% Removal)
- Regulated Trees Preserved: 208 (80% Preservation)

- Stems to be Removed 8" to 11": 30 x 1 replacement (Requiring 30 Replacements)
- Stems to be Removed 11" to 20": 13 x 2 replacements (Requiring 26 Replacements)
- Stems to be Removed 20" to 30": 4 x 3 replacements (Requiring 12 Replacements)
- Stems to be Removed 30"+: 0 x 4 replacements (Requiring 0 Replacements)
- Multi-Stemmed Trees (7 trees): (Requires 20 Replacements)

- Total Replacement Trees Required: 88 Replacements

Sheet LS-6 of 6 (Tree Replacement Planting Plan) states that all tree replacement plantings are to be located and installed in conservation easement areas (greenbelt, park/open space, and detention pond) per City Standards and approval. This Plan notes that the following Woodland Replacement Tree Material will be provided on-site:

- 31 – 2 ½" caliper deciduous trees;
- 29 – 12' evergreen trees;
- 29 – 14' evergreen trees.

The proposed deciduous tree species all appear to be acceptable per the City's Woodland Tree Replacement Chart (swamp white oak, sugar maple, red maple, American sweetgum, northern hackberry, and bur oak).

The applicant has proposed both 12' and 14' tall white spruce and black hills spruce (Picea glauca 'densata'). It should be noted that the black hills spruce is not a species approved by the City for Woodland Replacement.

In addition, per the Landscape Design Manual Section 3.c.(2) no additional Woodland Replacement credits can be gained by using larger plant material than those specified in the table 3.c.(1). As a rule, the standard woodland replacement tree credits listed on the Woodland Replacement Chart in Section 37 must be used, including the 1.5 trees : 1 Woodland Credit evergreen ratio. All deciduous replacement trees shall be two and one-half (2 ½) inches caliper or greater and count at a 1-to-1 replacement ratio. Based on this requirement, it appears as if the Plan is currently proposing 31 deciduous replacement trees (providing 31 credits at 1:1 replacement ratio) and 58 coniferous replacement trees (will provide 38.6 credits at 1.5:1 replacement ratio). As such, the plan appears to provide for a total of 69.6 Woodland Replacement Credits (as opposed to the 107 credits noted in the *Woodland Tree Replacement Summary*). The "upsizing" of Woodland Replacement trees for additional Woodland Replacement credit is not supported by the City of Novi. As such acceptable replacement evergreen trees shall be provided at a 1.5:1 replacement ratio. The applicant should review and revise the calculations on the Plan and the tree replacement plant list as necessary.

City of Novi Woodland Review Standards and Woodland Permit Requirements
Based on Section 37-29 (*Application Review Standards*) of the City of Novi Woodland Ordinance, the following standards shall govern the grant or denial of an application for a use permit required by this article:

No application shall be denied solely on the basis that some trees are growing on the property under consideration. However, the protection and conservation of irreplaceable natural resources from pollution, impairment, or destruction is of paramount concern. Therefore, the preservation of woodlands, trees, similar woody vegetation, and related natural resources shall have priority over development when there are location alternatives.

In addition,

"The removal or relocation of trees shall be limited to those instances when necessary for the location of a structure or site improvements and when no feasible and prudent alternative location for the structure or improvements can be had without causing undue hardship".

There are a significant number of replacement trees required for the construction of the proposed development. While, the overall ecological values of the existing woodlands cannot be immediately replaced through the planting of woodland replacement trees, the applicant shall clarify whether all of the required Woodland Replacement tree credits will be provided on-site or if a portion will be paid into the City of Novi Tree Fund.

Woodland Comments

Please consider the following comments when preparing subsequent site plan submittals:

1. A Woodland Permit from the City of Novi would be required for proposed impacts to any trees 8-inch diameter-at-breast-height (DBH) or greater and located within an area designated as City Regulated Woodland, or any tree 36-inches DBH regardless of location on the site. Such trees shall be relocated or replaced by the permit grantee. All deciduous replacement trees shall be two and one-half (2 ½) inches caliper or greater and all coniferous replacement trees shall be six (6) feet in height (minimum). All Woodland Replacement trees shall be species that are listed on the City's Woodland Tree Replacement Chart (attached).

2. The applicant has proposed both 12' and 14' tall white spruce and black hills spruce (Picea glauca 'densata'). It should be noted that the black hills spruce is not a species approved by the City for Woodland Replacement. Please review and revise the Plan as necessary based on the attached Woodland Tree Replacement Chart.

3. The "upsizing" of Woodland Replacement trees for additional Woodland Replacement credit is not supported by the City of Novi. As such acceptable replacement evergreen trees shall be provided at a 1.5:1 replacement ratio. The applicant should review and revise the calculations on the Plan and the tree replacement plant list as necessary.

4. A Woodland Replacement Performance financial guarantee for the planting of replacement trees will be required. This financial guarantee will be based on the number of on-site woodland replacement trees (credits) being provided at a per tree value of $400. This financial guarantee will be calculated based on the following:

   Number of on-site Woodland Replacements x $400/replacement credit x 1.2).

   This financial guarantee will be $35,200 (88 Woodland Replacements required x $400/credit).

Based on a successful inspection of the installed on-site Woodland Replacement trees, the original Woodland Financial Guarantee shall be returned to the Applicant. Twenty-five percent (25%) of the value of the Woodland Replacement material shall be kept for a period of 2-years after the successful inspection of the tree replacement installation as a *Woodland Maintenance and Guarantee Bond*.

5. The Applicant will be required to pay the City of Novi Tree Fund at a value of $400/credit for any Woodland Replacement tree credits that cannot be placed on-site.

6. Replacement material should not be located 1) within 10' of built structures or the edges of utility easements and 2) over underground structures/utilities or within their associated easements. In addition, replacement tree spacing should follow the *Plant Material Spacing Relationship Chart for Landscape Purposes* found in the City of Novi *Landscape Design Manual.*

7. The Applicant shall provide preservation/conservation easements as directed by the City of Novi Community Development Department for any areas of remaining woodland and woodland replacement trees. The applicant shall demonstrate that the 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.

Recommendation

ECT recommends approval of the Concept Plan for woodlands with the condition that the Applicant satisfactorily address the items noted in the "Comments" section of this letter at the time of Preliminary Site Plan submittal.

If you have any questions regarding the contents of this letter, please contact us.

Respectfully submitted,

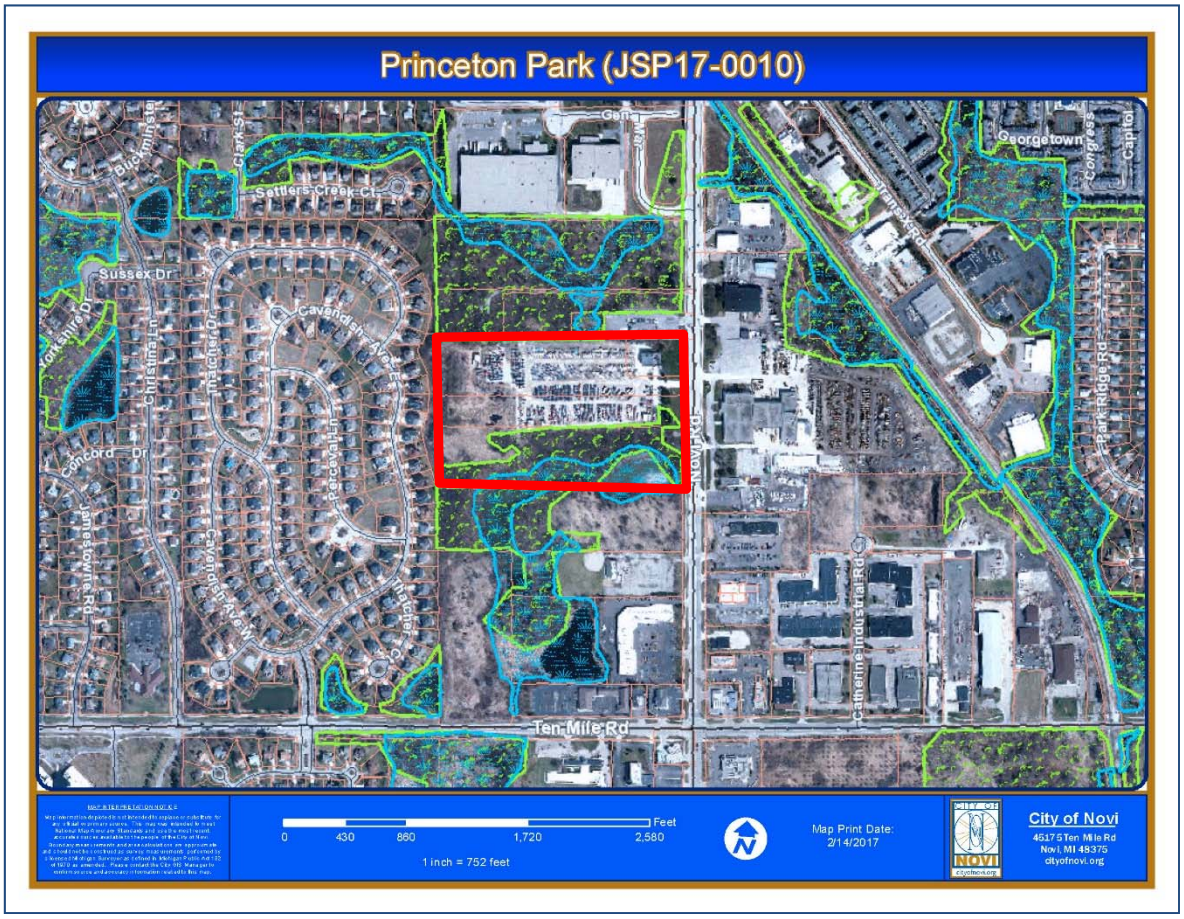
ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

Pete Hill, P.E.
Senior Associate Engineer

cc: Sri Komaragiri, City of Novi Planner
Richelle Leskun, City of Novi Planning Assistant
Rick Meader, City of Novi Landscape Architect
Kirsten Mellem, City of Novi Planner

Attachments: Figure 1 – City of Novi Regulated Wetland and Woodland Map
Woodland Tree Replacement Chart
Site Photos

Figure 1. City of Novi Regulated Wetland & Woodland Map (approximate project area is highlighted in red). Regulated Woodland areas are shown in green and regulated Wetland areas are shown in blue).



Woodland Tree Replacement Chart

(from Chapter 37 Woodlands Protection)
(All canopy trees to be 2.5" cal or larger, evergreens as listed)

Common Name	Botanical Name
Black Maple	Acer nigrum
Striped Maple	Acer pennsylvanicum
Red Maple	Acer rubrum
Sugar Maple	Acer saccharum
Mountain Maple	Acer spicatum
Ohio Buckeye	Aesculus glabra
Downy Serviceberry	Amelanchier arborea
Yellow Birch	Betula alleghaniensis
Paper Birch	Betula papyrifera
American Hornbeam	Carpinus caroliniana
Bitternut Hickory	Carya cordiformis
Pignut Hickory	Carya glabra
Shagbark Hickory	Carya ovata
Northern Hackberry	Celtis occidentalis
Eastern Redbud	Cercis canadensis
Yellowwood	Cladrastis lutea
Beech	Fagus sp.
Thornless Honeylocust	Gleditsia triacanthos inermis
Kentucky Coffeetree	Gymnocladus diocus
Walnut	Juglans sp.
Eastern Larch	Larix laricina
Sweetgum	Liquidambar styraciflua
Tuliptree	Liriodendron tulipfera
Tupelo	Nyssa sylvatica
American Hophornbeam	Ostrya virginiana
White Spruce_(1.5:1 ratio) (6' ht.)	Picea glauca
Black Spruce_(1.5:1 ratio) (6' ht.)	Picea mariana
Red Pine	Pinus resinosa
White Pine_(1.5:1 ratio) (6' ht.)	Pinus strobus
American Sycamore	Platanus occidentalis
Black Cherry	Prunus serotina
White Oak	Quercus alba
Swamp White Oak	Quercus bicolor
Scarlet Oak	Quercus coccinea
Shingle Oak	Quercus imbricaria
Burr Oak	Quercus macrocarpa
Chinkapin Oak	Quercus muehlenbergii
Red Oak	Quercus rubra
Black Oak	Quercus velutina
American Bladdernut	Staphylea trifolia
Bald Cypress	Taxodium distichum
American Basswood	Tilia americana
Hemlock (1.5:1 ratio) (6' ht.)	Tsuga canadensis

Site Photos

Photo 1. Looking west at area of regulated woodland just north of Wetland Area #1 on the south side of the site (ECT, February 21, 2017).

Photo 2. Looking south at area of regulated woodland just north of Wetland Area #1 on the south side of the site (ECT, February 21, 2017).

TRAFFIC REVIEW

CONCEPT PLAN SUBMITTAL SCHEDULE		
Type of Submittal	**Plan Date**	**Reviewed by**
Concept Plan	February 08, 2017	All Agencies
Revised Concept Plan	April 03, 2017	Planning, Engineering, Landscape and Fire
2nd Revised Concept Plan	June 05, 2017	Planning, Engineering, Landscape and Fire
3rd Revised Concept	**July 14, 2017**	**Planning, Traffic and Facade**

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

Project name:
PSP17-0014 Emerson Park Revised Concept Traffic Review

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

From:
AECOM

Date:
August 14, 2017

CC:
Sri Komaragiri, Kirsten Mellem, George Melistas, Theresa Bridges, Darcy Rechtien

Memo

Subject: Emerson Park Revised Concept Traffic Review

The revised concept site plan was reviewed to the level of detail provided and AECOM **recommends approval** for the applicant to move forward with the condition that the comments provided below are adequately addressed to the satisfaction of the City.

GENERAL COMMENTS

1. The applicant, Pulte Homes of Michigan, LLC, is proposing a multi-family residential community located on a 24-acre parcel located on the west side of Novi Road, north of 10 Mile Road and south of Grand River Avenue. The parcel is currently being used for vehicle storage. The development will consist of 120 three-bedroom units.
2. The parcel is currently under OS-1 (Office Service) zoning. However, the developer is using the City's planned rezoning overlay (PRO) option in order to allow for a multi-family housing use (RM-1 zoning).
3. Novi Road is under the jurisdiction of the Road Commission for Oakland County.

TRAFFIC IMPACTS

1. AECOM performed an initial trip generation estimate based on the ITE Trip Generation Manual, 9th Edition, as follows:

   ITE Code: 230 (Residential Townhouses/Condominiums)
   Development-specific Quantity: 120 dwelling units
   Zoning Change: Planned Rezoning Overlay (PRO) from OS-1 to RM-1. The existing land-use of the parcel is vehicle storage. Information to estimate the existing number of trips to and from the parcel is unavailable; however, the traffic impacts incurred from the existing development are expected to be negligible.

Trip Generation Summary			
	City of Novi Threshold	**Estimated Trips**	**Analysis**
AM Peak-Hour, Peak-Direction Trips	100	50	Fitted Curve Equation

PM Peak-Hour, Peak-Direction Trips	100	47	Fitted Curve Equation
Daily (One-Directional) Trips	750	754	Fitted Curve Equation

2. The number of trips does exceed the City's threshold of more than 750 trips per day or 100 trips per either the AM or PM peak hour. AECOM recommends performing the following traffic impact study in accordance with the City's requirements:

Traffic Impact Study Recommendation	
Type of Study	**Justification**
Traffic Impact Study	The applicant has provided a TIS dated 2/6/2017. The TIS has been reviewed separately and comments have been provided in a separate letter to the City and developer dated 3/2/2017.

EXTERNAL SITE ACCESS AND OPERATIONS

The following comments relate to the external interface between the proposed development and the surrounding roadway(s).

1. The applicant has proposed an entrance in alignment with the Michigan CAT construction equipment driveway on the west side of Novi Road.
2. The driveway design is generally compliant with City standards; however, the following items were areas of concern:
    a. The island nose offset was not provided. Please provide dimensions in future submittals.
    b. The island length (116') was greater than the maximum allowable length. Please update to be between 30' and 100'.
    c. See Figure IX.3 in the City of Novi Code of Ordinances for further information on boulevard dimension guidance.
3. **The applicant has provided an exclusive right turn lane into the development. The applicant is also required to provide an exiting taper out of the development.**
4. The applicant has indicated that sight distance is expected to exceed the City's minimum required distance; however, the sight distance measurements were calculated from 15' from the edge of pavement, while the City requires such measurements to be taken from 20' from the edge of pavement. The applicant should re-measure sight distances from the correct location in accordance with Figure VIII-E in the City of Novi Code of Ordinances.
5. Based upon an estimation that the two (2) driveways on the west side of Novi Road located to the north and south of the proposed driveway generate less than 400 trips per peak hour, driveway spacing requirements are in compliance with City standards.
6. The applicant has provided an emergency access path to the development, which is also located off of Novi Road. The following are areas of concern with regard to the proposed emergency access path:
    a. The applicant is proposing turf pavers for the emergency access path. The use of turf pavers shall be approved by the Fire Marshal.
    b. The emergency route is also a shared pedestrian path. While the emergency access route is not intended to be used often, the safety of the pedestrians may be a concern.
    c. Emergency vehicles would be required to access the emergency path by mounting the curb on Novi Road and then crossing over several sidewalks to gain access to the main roadway within the site. If the sidewalks and curbs are not designed to support the weight and operation of an emergency vehicle, they

may become damaged. The design of the infrastructure components should be reviewed and updated accordingly to satisfy the needs of the emergency access route.

d. The applicant should strongly consider paving the emergency access path in its entirety due to the aforementioned concerns.

7. The proposed driveway is located approximately 185 feet south of the stop bar for northbound Novi Road traffic at the signalized intersection with the U.S. Post Office. The impacts of this are discussed within the TIS letter.

INTERNAL SITE OPERATIONS

The following comments relate to the on-site design and traffic flow operations.

1. General Traffic Flow
    a. **The minimum horizontal curve radius is required to be 100 feet.**
    b. On-street parking shall be restricted using signage in areas with curve radii less than 230 feet.
    c. The proposed eyebrow detail is in compliance with City standards.
2. Parking Facilities
    a. The development has proposed a two-car garage with each unit in addition to a minimum 20' x 16' driveway.
    b. The applicant has provided 14 parking spaces with 10 located near the playscape area and four (4) on the west side of the development. The parking spaces are proposed with 20 foot lengths. It should be noted that the City requires 19 foot long parking spaces when abutting a 6” curb; or, 17 foot long spaces when abutting a 4” curb. For more information please consult Section 5.3 of the City’s Zoning Ordinance.
    c. The applicant has provided one (1) accessible parking space. The applicant should provide an access aisle adjacent to the accessible parking space in addition to any applicable details for pavement markings.
    d. The applicant is required to provide one (1) bicycle parking space for every five (5) dwelling units, totaling 24 bicycle parking spaces. The applicant has indicated that they have provided 28 bicycle parking spaces; however, only 24 are indicated on the plans. The applicant should update the
    e. The bicycle parking lot layout detail is in compliance with City standards.
    f. The applicant should indicate whether on street parking will be permitted and any “no parking” areas, as applicable.
3. The roadway width is in compliance with City standards.
4. Sidewalk Requirements
    a. Provide dimensions for sidewalk width throughout the development.
    b. Update the sidewalk ramp and detectable warning detail R-28-I to R-28-J.
    c. The outside edge of the sidewalk shall be a minimum of 15 feet from the back of curb. Based on discussions with the City, a deviation to provide a minimum of 7.5 feet from the back of curb to the edge of sidewalk would be supported.
    d. The applicant should provide sidewalk ramps at the T-intersection to provide a crossing area at the intersection.
    e. The applicant could consider providing crosswalks at main crossings on the ring road.
5. All on-site signing and pavement markings shall be in compliance with the Michigan Manual on Uniform Traffic Control Devices. The following is a discussion of the proposed signing.
    a. In future submittals, include a signing quantities table with any applicable details. The proposed stop signs in this submittal have been noted.
    b. In future submittals, include additional details related to all pavement markings within the site.

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

Sincerely,

AECOM

Sterling J. Frazier, E.I.T.
Reviewer, Traffic/ITS Engineer

Maureen N. Peters, PE
Senior Traffic/ITS Engineer

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

Project name:
JSP17-0010 Princeton Park Traffic Impact Study Review

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

From:
AECOM

Date:
March 3, 2017

CC:
Sri Komaragiri, Kirsten Mellem, George Melistas, Theresa Bridges, Richelle Leskun, Darcy Rechtien

Memo

Subject: Princeton Park Traffic Impact Study Review

The traffic impact study was reviewed to the level of detail provided and AECOM **recommends approval** for the applicant to move forward with the condition that the comments provided below are adequately addressed to the satisfaction of the City.

General Comments

1. The applicant, Pulte Homes of Michigan, LLC, is proposing a multi-family residential community located on a 24-acre parcel located on the west side of Novi Road, north of 10 Mile Road and south of Grand River Avenue. The parcel is currently being used for vehicle storage. The development will consist of 129 three-bedroom units. However the impact study was performed for 130 three-bedroom units. AECOM is comfortable accepting the TIS results using 130 units as it is a more conservative approach and the difference in impact should be negligible.
2. The site will be accessed via one driveway to Novi Road.
3. Novi Road is under the jurisdiction of the Road Commission for Oakland County (RCOC).
4. The impact study identifies the impacts at the following locations:
    a. Novi Road and Post Office Drive/Michigan CAT Power Systems Driveway
    b. Novi Road and Michigan CAT Construction Equipment North Drive
    c. Novi Road and Michigan CAT Construction Equipment South Drive
    d. The proposed site access driveway
5. The proposed site driveway offset distance with the U.S. Post Office driveway are in compliance with the City's commercial driveway spacing requirements
6. A right turn deceleration taper for southbound Novi Road traffic is warranted at the site driveway.
7. The study should describe how the proposed signal timing and optimization changes will affect the existing, background, and future delay and queueing at the site driveway and the Michigan CAT Equipment north driveway.
8. The site is currently zoned as OS-1 and will require a zoning change. The impact study should include analysis and results indicating the potential impacts for the maximum building size that is permitted under OS-1 zoning. The traffic impacts for the maximum building size permitted under OS-1 zoning shall then be compared to the proposed site's trip generation estimates and traffic impacts.

Data Collection

1. Turning movement counts were collected on Wednesday, December 14, 2016 from 7:00-9:00AM and 4:00-6:00PM at each study intersection.

2. Existing lane use, traffic control, and signal timing were obtained from RCOC.

Existing Conditions

1. Several minor street approaches and turning movements at the study intersections currently operate below level of service (LOS) D during both peak periods.
2. A queueing analysis determined that significant queueing was not observed during the peak periods at minor street approaches.
3. Reducing the cycle length from 120 seconds to 60 seconds and the optimization of splits at Novi Road and Post Office Drive/Michigan CAT Power Systems Driveway is expected to improve the existing LOS to acceptable conditions at the signalized intersection. However, the following should be considered before any changes are made:
    a. The study does not address how the cycle length and split optimization affects the two study intersections located south of the signal, primarily the approaches at the site development driveway and the Michigan CAT Equipment north driveway.
    b. The reduction of the cycle length may improve the side street delays at the post office/CAT main driveway; however, further analysis would need to be conducted to determine the impact of the changes to the upstream and downstream signalized intersections to review how the corridor progression would be affected by the change.
    c. The proposed cycle length change does not address development-generated impacts, but rather existing condition operations. At this time, the development is not indicating detrimental impacts to Novi Road and the approaches of concern should be contained within the site driveway and the CAT driveway(s), which is relatively consistent with existing conditions.

Background Conditions

1. The study assumes a background traffic growth rate of 1%. The study states that the build-out year is 2019; however, in the calculation of background traffic and the right-turn taper analysis the study uses a build-out year of 2021.
2. There were not any background developments that were identified near the study area.
3. The existing traffic volumes were multiplied with a growth rate of 1% over five years (2021). The resulting background traffic volumes were then balanced. The study text should be updated to include a buildout year of 2021 instead of 2019. Also, provide text that indicates that existing driveway volumes are not expected to increase or decrease and will not be multiplied by the growth rate.
4. Reducing the cycle length from 120 seconds to 60 seconds and the optimization of splits at Novi Road and Post Office drive/Michigan CAT Power Systems driveway is expected to raise the background LOS to acceptable conditions at the signalized intersection. However, the study does not address how the cycle length and split optimization affects the two study intersections located south of the signal, primarily the approaches at the site development driveway and the Michigan CAT Equipment north driveway, or the up- and downstream signalized intersections and corridor progression.

Trip Generation and Future Analysis

1. The study uses ITE code 230 (Residential Condominiums/Townhouse) for 130 dwelling units in order to estimate the site trip generation forecast. The study estimates that the development will generate 808 trips per day with 64 and 75 trips for the AM and PM peak hours respectively.
2. The trip distributions calculated in the site trip distribution table (Table 6) are acceptable based on the methodology described in the study.

3. Reducing the cycle length from 120 seconds to 60 seconds and the optimization of splits at Novi Road and Post Office Drive/Michigan CAT Power Systems Driveway is expected to raise the future LOS to acceptable conditions at the signalized intersection. However, the study does not address how the cycle length and split optimization affects the two study intersections located south of the signal, primarily the approaches at the site development driveway and the Michigan CAT Equipment north driveway, or the up- and downstream signalized intersections and corridor progression.
4. While the added delay to the roadway network from existing conditions may seem significant, the added delay is primarily isolated to the site driveway and the Michigan CAT Power Systems Driveway adjacent to the site driveway.

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

Sincerely,

AECOM

Sterling J. Frazier, E.I.T.
Reviewer, Traffic/ITS Engineer

Matthew G. Klawon, PE
Manager, Traffic Engineering and ITS Engineering Services

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

Project name:
JSP17-0010 Princeton Park Traffic Impact Study Addendum Review

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

From:
AECOM

Date:
June 22, 2017

CC:
Sri Komaragiri, Kirsten Mellem, George Melistas, Theresa Bridges, Richelle Leskun, Darcy Rechtien

Memo

Subject: Princeton Park Traffic Impact Study Addendum Review

The traffic impact study addendum was reviewed to the level of detail provided and AECOM **recommends approval** for the applicant to move forward. The comments provided below are a summary of the TIS addendum and further support for our recommendation.

General Comments

1. According to the concept site plan, the development will consist of 123 three-bedroom units. However the original impact study was performed for 130 three-bedroom units. The addendum adequately shows the difference in trips between a 123 unit site and a 130 unit site. The analysis resulted in 38 fewer trips per day, three fewer trips during the AM peak hour, and four fewer trips during the PM peak hour.
2. The original study did not adequately describe how the proposed signal changes will affect the existing, background, and future delay and queueing at the site driveway as well as the Michigan CAT north driveway. The addendum states that the proposed cycle length of the signal at Novi Road and the US Post Office/Michigan CAT main driveway was reduced from 120 seconds to 60 seconds. A reduction in the cycle length from 120 seconds to 60 seconds is not expected to affect progression along Novi Road because the cycle length is half of the existing cycle length. The addendum added that there isn't a methodology in the Highway Capacity Manual (HCM) for calculating delays or queues of up-stream or down-stream two-way stop controlled intersections and concludes that the driveways will operate the same under both the 120 second cycle length and the 60 second cycle length. These could not be adequately analyzed in SimTraffic because the intersection of 10 Mile and Novi Road was not included in the analysis. Because the Michigan CAT main driveway has excess capacity, it is expected that vehicles will utilize that access point if queueing along Novi Road affects the ability to access the site's north driveway.
3. The original study did not include an analysis indicating the difference in trips between the existing zoning and the proposed zoning. The addendum includes a comparison of the number of estimated trips for the rezoning. A reduction of 1,402 trips per day, 264 trips for the AM peak hour, and 225 trips for the PM peak hour is estimated based on the zoning change.

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

Sincerely,

AECOM

Sterling J. Frazier, E.I.T.
Reviewer, Traffic/ITS Engineer

Matthew G. Klawon, PE
Manager, Traffic Engineering and ITS Engineering Services

FACADE REVIEW

CONCEPT PLAN SUBMITTAL SCHEDULE		
Type of Submittal	**Plan Date**	**Reviewed by**
Concept Plan	February 08, 2017	All Agencies
Revised Concept Plan	April 03, 2017	Planning, Engineering, Landscape and Fire
2nd Revised Concept Plan	June 05, 2017	Planning, Engineering, Landscape and Fire
3rd Revised Concept	**July 14, 2017**	**Planning, Traffic and Facade**

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

August 15, 2017

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

Attn: Ms. Barb McBeth – Director of Community Development

Re: FACADE ORDINANCE REVIEW
Emerson Park, Concept Plan, JSP17-0109, PSP17-0014
Façade Region: 1, Zoning District: OS-1

Dear Ms. McBeth:

The following is the Facade Review of the "3rd Revised Concept" elevations provided by the Pulte Group for compliance with Section 5.15, the Façade Ordinance. This submittal includes colored renderings of the front facades and floor plans of one model. Drawings of the side and rear elevations and material callouts for all facades were not provided. The color sample board required by Section 5.15.4.D of the Façade Ordinance was not provided. The percentages of materials listed below are based solely on visual interpretation of the renderings.

Unit A	Front	Rear	Side	Side	Ordinance Maximum (Minimum)
Stone or Brick	**8%**	**N.P.**	**N.P.**	**N.P.**	100% (30% Min)
Horizontal Siding	45%	**N.P.**	**N.P.**	**N.P.**	50% (Note 11)
Asphalt Shingles	**32%**	**N.P.**	**N.P.**	**N.P.**	25%
Wood Trim	15%	**N.P.**	**N.P.**	**N.P.**	15%

Unit B	Front	Rear	Side (Entrance)	Rear Concealed Units	Ordinance Maximum (Minimum)
Stone or Brick	**5%**	**N.P.**	**N.P.**	**N.P.**	100% (30% Min)
Horizontal Siding	20%	**N.P.**	**N.P.**	**N.P.**	50% (Note 11)
Shake Siding	17%	**N.P.**	**N.P.**	**N.P.**	50%
Asphalt Shingles	**43%**	**N.P.**	**N.P.**	**N.P.**	25%
Wood Trim	15%	**N.P.**	**N.P.**	**N.P.**	25%

Recommendation: We are unable to make a determination as to the degree of compliance with the Façade Ordinance due to a lack of information. The applicant should provide the following information. Please refer to Section 5.15.4 of the Ordnance for specific requirements;

1. Scaled drawings of the front, side and rear elevations with all proposed materials clearly identified.
2. Scaled floor plans for all models and options.
3. Façade material sample board indicating the color and texture of all materials identified on the elevations.

The elevations provided appear to deviate significantly from the requirements of the Façade Ordinance. For example, the Ordinance requires that all facades have a minimum of 30% brick or stone. It appears that less than 10% is provided on the front facades. Although Section 5.15.9 the Ordinance allows deviations from the strict application of the percentages, we would not support a Waiver for this great of a deviation. Substantial compliance can generally be achieved by extending brick or stone up to the second floor belt line on the side and rear facades. A greater amount of brick or stone is typically required on the front facades due to the large area occupied by the garage doors, for example by extending brick or stone to the second floor roof line on portions of the facade.

Sincerely,
DRN & Associates, Architects PC

Douglas R. Necci, AIA

FIRE REVIEW

CONCEPT PLAN SUBMITTAL SCHEDULE		
Type of Submittal	**Plan Date**	**Reviewed by**
Concept Plan	February 08, 2017	All Agencies
Revised Concept Plan	April 03, 2017	Planning, Engineering, Landscape and Fire
2nd Revised Concept Plan	**June 05, 2017**	**Planning, Engineering, Landscape and Fire**
3rd Revised Concept	July 14, 2017	Planning, Traffic and Facade

June 6, 2017

TO: Barbara McBeth- City Planner
Sri Ravali Komaragiri- Plan Review Center
Kirsten Mellem- Plan Review Center

RE: Emerson Park-fka Princeton Park

PSP# 17-0087

Project Description:
Build a 25 multi-tenant buildings off of Novi Rd. north of Ten Mile Rd.

Comments:

1. **On plan #08, Gate for emergency access road MUST have an opening of not less than 20' (IFC 5036.2.1 and 503.6)**
2. **If locking the gate for the emergency access, you MUST either have "Break away chains or a Knox Lock." (IFC 503.5.1)**
3. **Using grass pavers for emergency access road. MUST have a permanent way of labeling the edge of the access road.**

Recommendation:
APPROVAL with CONDITIONS

Sincerely,

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

cc: file

Novi Public Safety Administration
45125 W. Ten Mile Road
Novi, Michigan 48375
248.348.7100
248.347.0590 fax

cityofnovi.org

APPLICANTS RESPONSE LETTER

August 18, 2017

Ms. Sri Komaragiri
City of Novi – Planning Department
45175 West Ten Mile Road
Novi, Michigan 48375

Re: Pulte Homes, Princeton Park
Planned Rezoning Overlay (PRO) Submittal Package – Revision 3
JSP 16-72

Ms. Komaragiri,

Thank you for the additional project feedback provided in your latest Planning Review Letter, dated August 16, and your recommendations of approval for the upcoming Planning Commission meeting. For your use and as requested, we offer the following clarifications to our proposal in response to your August 17 email correspondence:

- City Department Reviews
  It is noted that the current concept plan dated July 14 is **recommended for PRO approval by all review disciplines.** As previously stated, the applicant will continue to work with the City to address the remaining comments from these disciplines and respond to each of the noted comments with the submittal of the Preliminary Site Plan. **The developer is not requesting deviations on the following items** and these requests will be addressed with the submittal of the Preliminary Site Plan;

  - Traffic: Add a exiting drive taper out of the development
  - Traffic: Reduce the boulevard island length by 16'
  - Council: Increase the existing sidewalk along our frontage from 5' to 6' in width.

- Public Benefit: Novi Road Pedestrian Enhancement Plan
  The developer is proposing to provide a $90,000 public benefit contribution to the City for their discretionary use in providing improvements to the downtown corridor (Novi Road area). Per the request of the Planning Commission, a plan was provided as a sample of one potential use of the public benefit contribution provided by the developer. The sample improvements have been specified at key areas along Novi Road between the development and Main Street, including low maintenance plantings, decorative brick insets and benches. We have obtained RCOC feedback stating that the illustrative road improvements would be acceptable for pedestrian improvements in the ROW.

  It has been noted that the City has concerns regarding the soft costs (surveying, design, and permitting) that the City may also incur should they choose to apply the contribution toward the sample plan. Industry standard for soft costs would be 15% of the hard costs, or $13,500. **The developer is willing to make an additional contribution of $14,000 to be applied towards the soft costs ($104,000 total contribution).** Moreover, if the city determines the specific use they want to apply the funds to, Pulte is willing to provide the necessary design and construction of appropriate work (i.e. Not art pieces), provided that determination is made within an 18-month from completion of the PRO Agreement. **The development HOA Master deed will be set up to provide appropriate funding for future maintenance of the Novi Road pedestrian improvements.**

311 N. Main Street, Ann Arbor, MI 48104 Tel: 734.994.4000 Fax: 734.994.1590
www.atwell-group.com

Note that the provided plan is just an example of what could be funded with the contribution. Enhancement uses discussed with city staff for the funding along Novi Road have included;

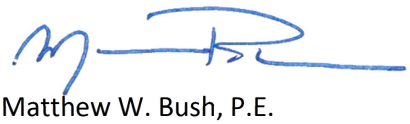
- Novi Road Pedestrian improvements – decorative sidewalks, plantings, lighting, and benches
- An art piece / entrance improvements to the city cemetery on Novi Road, across from Downtown
- An enhanced pedestrian focused area (lighted gazebo, decorative walls, etc., etc.) along Novi Road at the project frontage or the city parcel, just north of the project.

- Building Façade and Elevations
  As previously stated, it is the applicant's intent to comply with the building façade requirement to have a minimum of 30% brick or stone. **A deviation is not being requested for this item.** Scaled building elevation drawings, floor plans for the models, and façade material samples will be provided with the Preliminary Site Plan submittals. Note that the developer has also agreed to provide upgraded garage doors with windows in the garages to increase the aesthetics along the internal roadway network.

- List of Public Benefits
  Refer to the previously provided submittal narrative dated April 3rd for a comprehensive list of the proposed public benefits. These still apply, including the master plan analysis found in this narrative and the CIB Planning PRO Rezoning Analysis letter, dated March 20, 2017.

We understand that the current PRO concept plan and developer commitments, the proposed plan will meet the intent of the discussions with the Planning Commission and your office. We look forward to the Planning Commission meeting on August 23rd. Thank you for your continued assistance and cooperation with respect to this project. Should you have any remaining questions or need anything else from us to help facilitate the process, please do not hesitate to contact me direct at (810) 923-6878.

Sincerely,
ATWELL, LLC



Matthew W. Bush, P.E.
Project Manager / Engineer

LETTERS OF SUPPORT

Steve Schafer

From: Arkan Jonna <ajonna@afjonna.com>
Sent: Wednesday, January 18, 2017 10:14 AM
To: 'Steve Schafer'
Subject: Novi

Good morning Steve, trust all is well. Steve we went to the site that Pulte is proposing to develop on Novi Road. Unfortunately, the site is not well suited for a retail/office use as it is not close enough to the Grand River or 10 mile Road intersections. We have found that mid-block retail that far from an intersection do not perform well for retail use. Thank you for sending us this opportunity but, we have to pass on this one. Good luck with the development I think it will be an excellent site for the Townhomes you are proposing.

Thanks Again,
Arkan

A.F. JONNA
DEVELOPMENT & MANAGEMENT CO

Arkan Jonna
4036 Telegraph Road, Suite 201
Bloomfield Hills, MI 48302
Ph: (248) 593-6200 Ext. 101
Cell: (248) 830-9495
Fax: (248) 593-6203
AJonna@AFJonna.com

To View Our Properties, please visit our website: www.afjonna.com

MID-AMERICA®

Mid-America Real Estate Group 38500 Woodward Avenue, Suite 100

MidAmericaGrp.com Bloomfield Hills, Michigan 48304

Mr. Joe Skore
Pulte Homes
100 Bloomfield Hills Pkwy, Suite 300
Bloomfield Hills, MI 48304

Re: Novi, MI

Dear Joe:

I reviewed the site plan you presented me for the proposed development on Novi Road between 10 mile and Grand River. While this may be a very good residential site I do not believe it is a good site for retail or office. There is enough small retail and small office availability at the corners of both 10 mile and at Grand River and there is really very little demand from "credit worthy" tenants for a mid-block site. This area also competes with the Novi Town Center trade area and that is where most of the quality tenants want to locate. As evidenced by the tenant turnover and vacancies in both centers at the corner of 10 mile and at Grand River I do not believe anymore retail or office should be built in an unanchored mid-block development.

If you have any questions please feel free to call me.

Sincerely,

Bradley S. Rosenberg

Bradley S. Rosenberg
Principal
Mid-America Real Estate – Michigan, Inc.

Steve Schafer

From: Arkan Jonna <ajonna@afjonna.com>
Sent: Wednesday, January 18, 2017 10:14 AM
To: 'Steve Schafer'
Subject: Novi

Good morning Steve, trust all is well. Steve we went to the site that Pulte is proposing to develop on Novi Road. Unfortunately, the site is not well suited for a retail/office use as it is not close enough to the Grand River or 10 mile Road intersections. We have found that mid-block retail that far from an intersection do not perform well for retail use. Thank you for sending us this opportunity but, we have to pass on this one. Good luck with the development I think it will be an excellent site for the Townhomes you are proposing.

Thanks Again,
Arkan

A.F. JONNA
DEVELOPMENT & MANAGEMENT CO

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To View Our Properties, please visit our website: www.afjonna.com

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38500 Woodward Avenue, Suite 100
Bloomfield Hills, Michigan 48304

Mr. Joe Skore
Pulte Homes
100 Bloomfield Hills Pkwy, Suite 300
Bloomfield Hills, MI 48304

Re: Novi, MI

Dear Joe:

I reviewed the site plan you presented me for the proposed development on Novi Road between 10 mile and Grand River. While this may be a very good residential site I do not believe it is a good site for retail or office. There is enough small retail and small office availability at the corners of both 10 mile and at Grand River and there is really very little demand from "credit worthy" tenants for a mid-block site. This area also competes with the Novi Town Center trade area and that is where most of the quality tenants want to locate. As evidenced by the tenant turnover and vacancies in both centers at the corner of 10 mile and at Grand River I do not believe anymore retail or office should be built in an unanchored mid-block development.

If you have any questions please feel free to call me.

Sincerely,

Bradley S. Rosenberg

Bradley S. Rosenberg
Principal
Mid-America Real Estate – Michigan, Inc.

TRAFFIC STUDY

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

Memo

VIA EMAIL

To:	**Mr. Joe Skore** **Pulte Group**
From:	**Michael J. Labadie, PE** **Julie M. Kroll, PE, PTOE** **Steven J. Russo, PE** **Fleis & VandenBrink**
Date:	**February 6, 2017**
Re:	**Pulte Group Residential Development** **City of Novi, Michigan** **Traffic Impact Study**

Introduction

This memorandum presents the results of the Traffic Impact Study (TIS) for the proposed Pulte Group residential development. The project site is located at 24855 Novi Road in Novi, Michigan. The proposed development includes 130 attached (for sale) residential units. Site access is proposed via one site driveway to Novi Road. Per the City of Novi Community Development Department's *Site Plan and Development Manual (Section 1)*, a Traffic Impact Study (TIS) is required.

Novi Road is under the jurisdiction of the Road Commission for Oakland County (RCOC). This TIS has been completed to identify the impacts (if any) of the proposed development on the following study intersections:

- Novi Road & Post Office Drive/Michigan CAT Power Systems Driveway,
- Novi Road & Michigan CAT Construction Equipment North Drive,
- Novi Road & Michigan CAT Construction Equipment South Drive, and
- The proposed site access location.

The scope of the study was developed based on Fleis & VandenBrink's (F&V) knowledge of the study area, understanding of the development program, accepted traffic engineering practice, and methodologies published by the Institute of Transportation Engineers (ITE). Additionally, F&V solicited input regarding the scope of work from RCOC and the City of Novi traffic consultant, AECOM.

Data Collection

The existing weekday turning movement traffic volume data were collected by F&V subconsultant Traffic Data Collection, Inc. (TDC) on Wednesday, December 14, 2016. Intersection turning movement counts were collected during the weekday AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak periods at all study intersections. This data was used as a baseline to establish existing traffic conditions without the proposed development. The peak hour volumes for each intersection were utilized for this study and the volumes were balanced upward through the study network. Additionally, F&V collected an inventory of existing lane use and traffic controls and obtained existing traffic signal timing information from RCOC. The applicable data referenced in this memorandum are attached.

27725 Stansbury Boulevard, Suite 150
Farmington Hills, MI 48334
P: 248.536.0080
F: 248.536.0079
www.fveng.com

Existing Conditions

Existing peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro (Version 9) traffic analysis software. This analysis was based on the existing lane use and traffic control shown on the attached Figure 1, the existing peak hour traffic volumes shown on the attached Figure 2, and the methodologies presented in the *Highway Capacity Manual 2010* (HCM). Typically, LOS D is considered acceptable, with LOS A representing minimal delay, and LOS F indicating failing conditions. Additionally, SimTraffic network simulations were reviewed to evaluate network operations and vehicle queues. The existing conditions results are attached and summarized in Table 1.

Table 1: Existing Intersection Operations

Intersection	Control	Approach	AM Peak Delay (s/veh)	AM Peak LOS	PM Peak Delay (s/veh)	PM Peak LOS
1. Novi Road & US Post Office Drive / Michigan CAT Main Drive	Signalized	EB	60.4	E	58.3	E
		WB	54.8	D	56.4	E
		NB	2.2	A	3.1	A
		SB	2.0	A	2.9	A
		Overall	**5.1**	**A**	**6.9**	**A**
2. Novi Road & Michigan CAT Equipment North Drive	STOP (Minor)	EB	35.4	E	64.8	F
		WB	16.3	C	62.2	F
		NB LT	0*	A	0*	A
		SB LT	10.5	B	0*	A
3. Novi Road & Michigan CAT Equipment South Drive	STOP (Minor)	WB	16.6	C	17.8	C
		NB	Free		Free	
		SB LT	10.4	B	10.9	B

*No traffic demand is present.

The results of the existing conditions analysis show that several approaches and movements at the study intersections currently operate at a LOS E or F during both peak periods. The vehicle simulations were further reviewed and the simulations show that significant vehicle queuing was not observed during the peak periods at minor street approaches. In addition, the adjacent signals on Novi Road at 10 Mile and the Post Office Driveway meter traffic, providing gaps for vehicles to exit the driveways.

Existing Conditions Improvements

In order to improve traffic operations to a LOS D or better for all intersection approaches and movements, mitigation measures were evaluated, as summarized below. It is noted that high delays experienced at the stop-controlled commercial driveways are a result of high traffic volumes on Novi Road. Queuing issues are not present at these locations and operations were observed to be acceptable. Therefore, these unsignalized driveways were not included in the network improvements analysis.

Novi Road & US Post Office Drive / Michigan CAT Main Drive

Signal timing adjustments are expected to mitigate critical LOS under existing conditions. The following improvements should be implemented:

- Reduce cycle length from 120 seconds to 60 seconds to reduce delays experienced by vehicles egressing the commercial drives on the east and west legs, and
- Optimize signal phase splits and coordinate signals with the intersections along the Novi Road corridor.

The existing intersection operations with the proposed mitigation measures are summarized in Table 2.

Table 2: Existing Intersection Operations with Improvements

Intersection	Control	Approach	AM Peak Delay (s/veh)	AM Peak LOS	PM Peak Delay (s/veh)	PM Peak LOS
1. Novi Road & US Post Office Drive / Michigan CAT Main Drive	Signalized	EB	28.7	C	28.1	C
		WB	26.4	C	26.8	C
		NB	3.4	A	4.4	A
		SB	3.0	A	4.1	A
		Overall	**4.6**	**A**	**5.9**	**A**

The results of the existing conditions analysis with improvements show that the signalized study intersection approaches and movements are expected to operate acceptably at a LOS C or better during both peak periods. A review of network simulations showed acceptable traffic operations during both peak hours.

Background Conditions

Historical traffic volume data was reviewed in order to determine the applicable growth rate for the existing traffic volumes to the project build-out year of 2019. The historical growth rates for Novi Road were referenced. RCOC data indicates that between 2010 and 2014, the Average Annual Daily Traffic (AADT) volumes were generally increasing in the 1% to 3% range. In addition, the SEMCOG community profile for the City of Novi was reviewed; this showed a declining population growth from 2015 to 2040 and a marginal employment growth from 2010 to 2040. Therefore, a background traffic growth of 1% per year was assumed for this study for the analysis of background conditions ***without the proposed development.***

In addition to background growth, it is important to account for traffic that is expected to be generated by approved developments within the vicinity of the study area that have yet to be constructed or are currently under construction. No background developments were identified near the study area that are expected to be completed prior to the site buildout of the proposed development.

Background Operations

Background peak hour vehicle delays and LOS were calculated based on the existing lane use and traffic control shown on the attached Figure 1, the background traffic volumes shown on the attached Figure 3, and the methodologies presented in the HCM. The results of the background conditions assessment are attached and summarized in Table 3.

Table 3: Background Intersection Operations

Intersection	Control	Approach	AM Peak Delay (s/veh)	AM Peak LOS	PM Peak Delay (s/veh)	PM Peak LOS
1. Novi Road & US Post Office Drive / Michigan CAT Main Drive	Signalized	EB	60.4	E	58.3	E
		WB	54.8	D	56.4	E
		NB	2.3	A	3.2	A
		SB	2.0	A	3.0	A
		Overall	**5.0**	**A**	**6.8**	**A**
2. Novi Road & Michigan CAT Equipment North Drive	STOP (Minor)	EB	38.5	E	76.6	F
		WB	16.9	C	75.2	F
		NB LT	0*	A	0*	A
		SB LT	10.7	B	0*	A
3. Novi Road & Michigan CAT Equipment South Drive	STOP (Minor)	WB	17.3	C	18.7	C
		NB	Free		Free	
		SB LT	10.6	B	11.2	B

*No traffic demand is present.

The results are summarized in Table 3 and show that all study intersection approaches and movements are expected to continue to operate in a manner similar to existing conditions during both the AM and PM peak hours and minor increases in delay will not be discernable. Review of network simulations also indicates traffic operations will be similar to existing conditions.

Background Conditions Improvements

In order to improve traffic operations to a LOS D or better for all intersection approaches and movements under background conditions, mitigation measures that were identified under existing conditions were applied. The results of the background conditions assessment with improvements are attached and summarized in Table 4.

Table 4: Background Intersection Operations with Improvements

Intersection	Control	Approach	AM Peak Delay (s/veh)	AM Peak LOS	PM Peak Delay (s/veh)	PM Peak LOS
1. Novi Road & US Post Office Drive / Michigan CAT Main Drive	Signalized	EB	28.7	C	28.1	C
		WB	26.4	C	26.8	C
		NB	3.5	A	4.6	A
		SB	3.1	A	4.2	A
		Overall	**4.6**	**A**	**6.0**	**A**

The results of the background conditions analysis with improvements show that all study intersection approaches and movements are expected to operate acceptably at a LOS C or better during both peak periods. A review of network simulations showed acceptable traffic operations during both peak hours.

Site Trip Generation Analysis

The number of AM and PM peak hour vehicle trips that would be generated by the proposed development was forecast based on data published by ITE in the *Trip Generation Manual, 9th Edition*. The site trip generation forecast for the proposed development is summarized in Table 5.

Table 5: Site Trip Generation

Land Use	ITE Code	Amount	Units	Average Daily Traffic	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Residential Townhouse	230	130	D.U.	808	11	53	64	50	25	75

The vehicle trips that would be generated by the proposed development were assigned to the study road network based on existing peak hour traffic patterns, the proposed site plan, and the methodologies published by ITE. This methodology indicates that new trips will return to their direction of origin. The site trip distributions used in the analysis are summarized in Table 6.

Table 6: Site Trip Distribution

To / From	New Trips Via	AM	PM
North	Novi Road	60%	50%
South	Novi Road	40%	50%
		100%	100%

The site-generated vehicle trips were assigned to the study road network based on these trip distribution patterns and are shown on the attached Figure 4. The site-generated trips were added to the background traffic volumes to calculate the future peak hour traffic volumes shown on the attached Figure 5.

Future Conditions

Future peak hour vehicle delays and LOS ***with the proposed development*** were calculated based on the existing lane use and traffic control, the future traffic volumes, the proposed site access plan, and the methodologies presented in the HCM. Additionally, SimTraffic simulations were reviewed to evaluate network operations and vehicle queues. The results of the future conditions analysis are attached and are summarized in Table 7.

Table 7: Future Intersection Operations

Intersection	Control	Approach	AM Peak Delay (s/veh)	AM Peak LOS	PM Peak Delay (s/veh)	PM Peak LOS
1. Novi Road & US Post Office Drive / Michigan CAT Main Drive	Signalized	EB	60.4	E	58.3	E
		WB	54.8	D	56.4	E
		NB	2.3	A	3.2	A
		SB	2.0	A	3.0	A
		Overall	**5.0**	**A**	**6.8**	**A**
2. Novi Road & Michigan CAT Equipment North Drive / Site Drive	STOP (Minor)	EB	41.4	E	79.5	F
		WB	16.9	C	93.1	F
		NB LT	9.3	A	11.5	B
		SB LT	10.7	B	0*	A
3. Novi Road & Michigan CAT Equipment South Drive	STOP (Minor)	WB	17.4	C	19.1	C
		NB	Free		Free	
		SB LT	10.7	B	11.3	B

*No traffic demand is present.

The results show that all study intersection approaches and movements are expected to continue to operate in a manner similar to background conditions during both the AM and PM peak hour, except the proposed Site Drive intersection with Novi Road. With the addition of the proposed development, the Site Drive operates at a LOS E and F during the AM and PM peak hours, respectively, and the Michigan CAT driveway opposite the site driveway operates at a LOS F during the PM peak hour.

A review of network simulations showed traffic operations which are similar to background conditions with acceptable traffic operations observed during both the AM and PM peak hours. No significant vehicle queues are expected at the proposed Site Drive or the existing Michigan CAT driveway.

Future Conditions Improvements

In order to improve traffic operations to a LOS D or better for all intersection approaches and movements under future conditions, mitigation measures that were identified under existing conditions were applied. The results of the future conditions assessment with improvements are attached and summarized in Table 8.

The results of the future conditions analysis with improvements show that all study intersection approaches and movements are expected to operate acceptably at a LOS C or better during both peak periods. A review of network simulations showed acceptable traffic operations during both peak hours.

Table 8: Future Intersection Operations with Improvements

Intersection	Control	Approach	AM Peak Delay (s/veh)	AM Peak LOS	PM Peak Delay (s/veh)	PM Peak LOS
1. Novi Road & US Post Office Drive / Michigan CAT Main Drive	Signalized	EB	28.7	C	28.1	C
		WB	26.4	C	26.8	C
		NB	3.6	A	4.6	A
		SB	3.1	A	4.3	A
		Overall	**4.6**	**A**	**6.0**	**A**

Access Management

The offset distance at the proposed site driveway to Novi Road was evaluated according to the commercial driveway spacing requirements outlined in Section 11-216 of the City Ordinance. These requirements indicate that the proposed site driveway requires a minimum offset of 230 feet from the existing Post Office driveway to the north and Michigan CAT drive to the south. The proposed site drive on Novi Road meets these driveway spacing requirements and is will align with the existing Michigan CAT drive which consistent with access management best practices..

The RCOC warrants for right-turn lanes were evaluated at the site access point to Novi Road. The results of this analysis show that a right-turn deceleration taper is warranted at the proposed Site Drive. The right-turn deceleration taper should be designed in accordance with RCOC and the City of Novi requirements.

Conclusions

The conclusions of this Traffic Impact Study are as follows:

1. The results of the existing conditions analysis show that several approaches and movements at the study intersections currently operate at a LOS E or F during both peak periods. The vehicle simulations were further reviewed and significant vehicle queuing was not observed during the peak periods at minor street approaches. In addition, the adjacent signals on Novi Road at 10 Mile and the Post Office Driveway meter traffic, providing gaps for vehicles to exit the driveways.
2. The following mitigation measures are recommended under existing conditions in order to improve traffic operations to a LOS D or better for all intersection approaches and movements.

   Novi Road & US Post Office Drive / Michigan CAT Main Drive

   - Reduce cycle length from 120 seconds to 60 seconds to reduce delays experienced by vehicles egressing the commercial drives on the east and west legs, and
   - Optimize signal phase splits and coordinate signals with the intersections along the Novi Road corridor.
3. The analysis of background conditions ***without the proposed development*** show operations similar to existing conditions and any increases in delay would not be discernable.
4. The analysis of future conditions ***with the proposed development*** shows that operations would be similar to background conditions. A review of network simulations showed traffic operations which are similar to background conditions with acceptable traffic operations observed during both the AM and PM peak hours. No significant vehicle queues are expected at the proposed Site Drive or the existing Michigan CAT driveway. The development is not expected to have a significant impact on the study intersections.
5. A right turn deceleration taper is warranted at the site access point on Novi Road.
6. The proposed site driveway should be designed in accordance with RCOC and City of Novi requirements.

Attached: Figures 1-5
Traffic Volume Data
SEMCOG Data
Synchro / SimTraffic Results
RCOC Auxiliary Lane Warrants

SJR:jmk

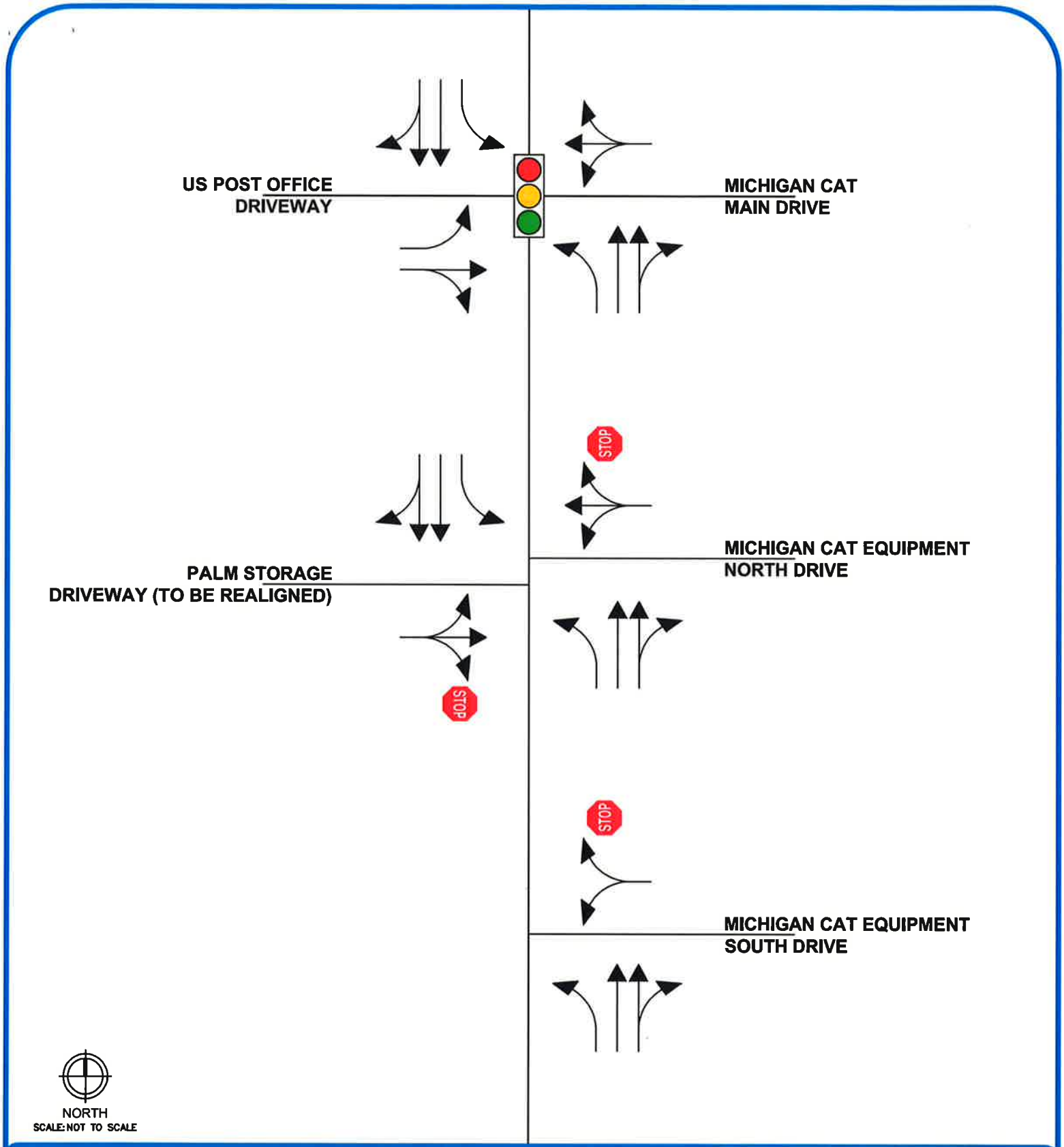

FIGURE 1
LANE USE AND TRAFFIC CONTROL

PULTE GROUP RESIDENTIAL DEVELOPMENT - NOVI, MI

LEGEND

- ROADS
- LANE USE
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION

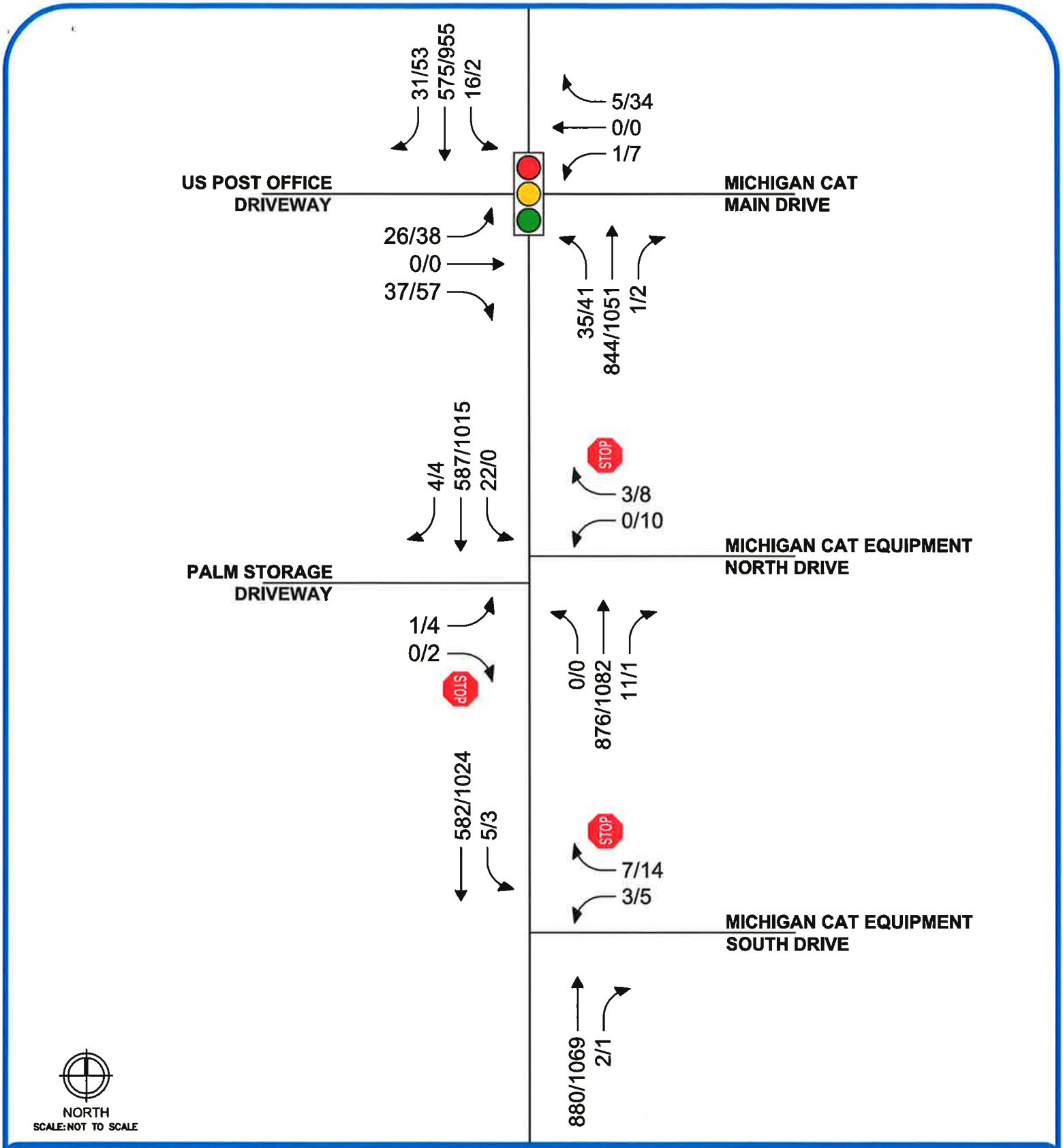

FIGURE 2
EXISTING TRAFFIC VOLUMES

PULTE GROUP RESIDENTIAL DEVELOPMENT - NOVI, MI

LEGEND

- ROADS
- TRAFFIC VOLUMES (AM/PM)
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION

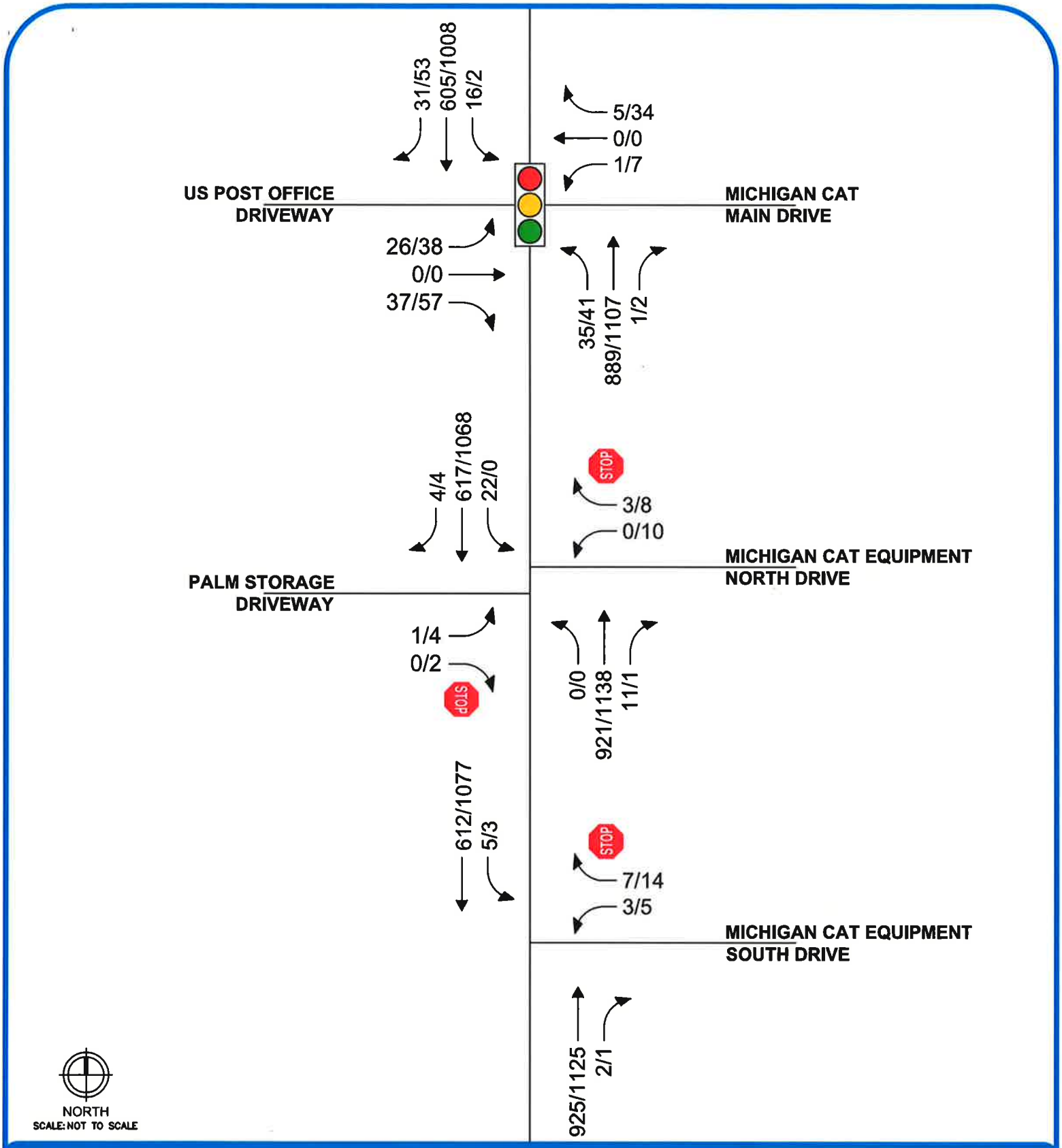

FIGURE 3
BACKGROUND TRAFFIC VOLUMES

PULTE GROUP RESIDENTIAL DEVELOPMENT - NOVI, MI

LEGEND

- ROADS
- TRAFFIC VOLUMES (AM/PM)
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION

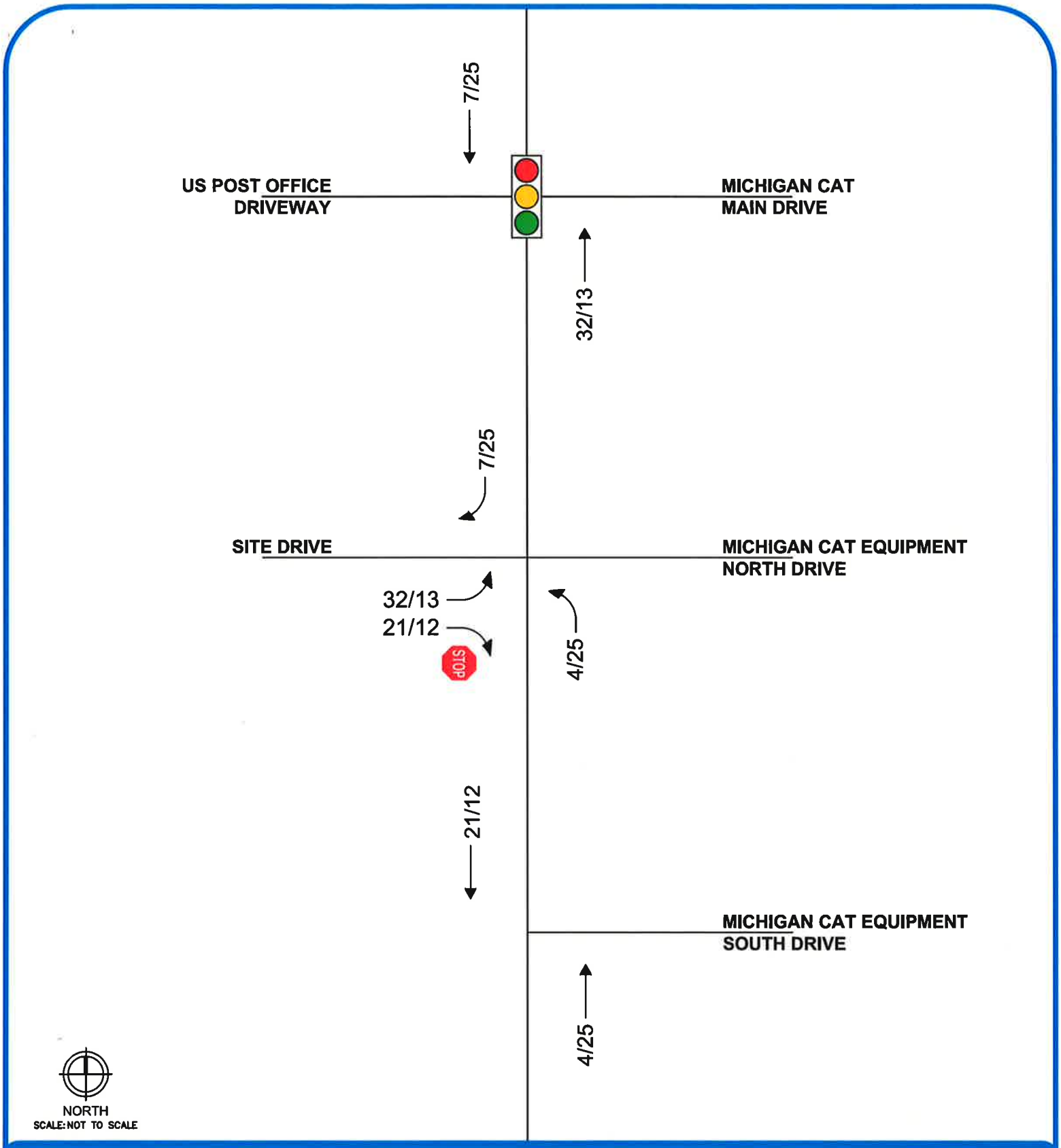

FIGURE 4
SITE-GENERATED TRAFFIC VOLUMES

PULTE GROUP RESIDENTIAL DEVELOPMENT - NOVI, MI

LEGEND

- ROADS
- TRAFFIC VOLUMES (AM/PM)
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION

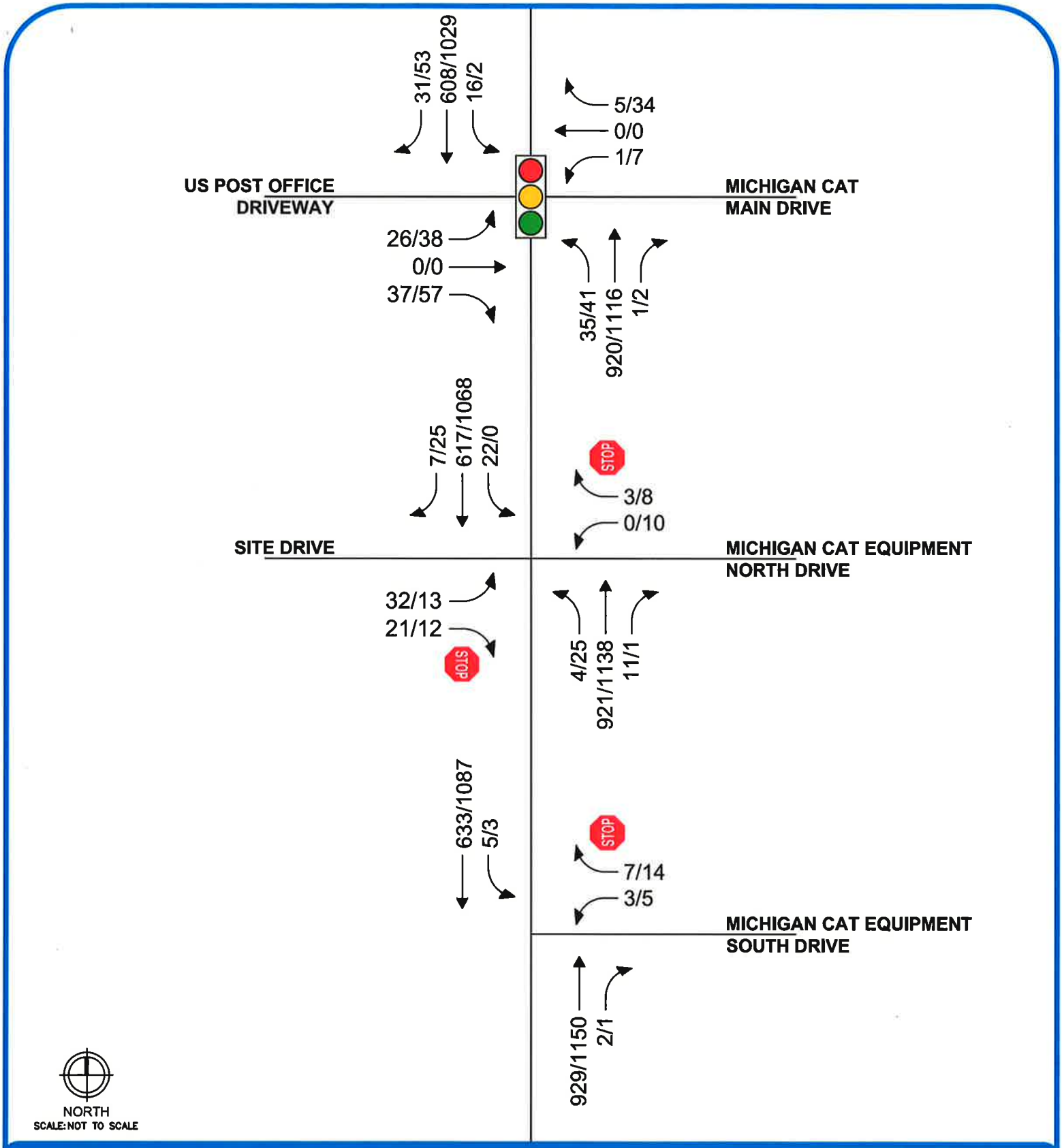

FIGURE 5
FUTURE TRAFFIC VOLUMES

PULTE GROUP RESIDENTIAL DEVELOPMENT - NOVI, MI

LEGEND

- ROADS
- TRAFFIC VOLUMES (AM/PM)
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION

Traffic Data Collection, LLC

tdcounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Fleis & VandenBrink

Project: Novi Pulte Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather:.Clear AM Cldy PM Dry, Temp 10's
Count By: Miovision Video VCU 5DV

File Name : TMC_1 Novi & USPostOffice_12-14-16
Site Code : TMC_1
Start Date : 12/14/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks

	Novi Road Southbound					Michigan CAT Power Systems Driveway Westbound					Novi Road Northbound					US Post Office Driveway Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	8	124	6	0	138	0	0	0	0	0	0	173	4	0	177	1	0	5	0	6	321
07:15 AM	8	114	7	0	129	2	0	0	0	2	2	183	7	0	192	6	0	3	0	9	332
07:30 AM	6	145	3	0	154	1	0	0	0	1	0	196	9	0	205	4	0	13	0	17	377
07:45 AM	5	175	3	0	183	0	0	0	0	0	0	240	7	0	247	8	0	5	0	13	443
Total	27	558	19	0	604	3	0	0	0	3	2	792	27	0	821	19	0	26	0	45	1473
08:00 AM	11	134	7	0	152	1	0	1	0	2	1	203	5	0	209	16	0	6	0	22	385
08:15 AM	7	130	4	0	141	2	0	0	0	2	0	185	10	0	195	5	0	7	0	12	350
08:30 AM	8	135	2	0	145	2	0	0	0	2	0	211	12	0	223	8	0	8	0	16	386
08:45 AM	9	127	2	0	138	0	0	0	0	0	0	227	11	0	238	14	0	6	0	20	396
Total	35	526	15	0	576	5	0	1	0	6	1	826	38	0	865	43	0	27	0	70	1517
**** BREAK ****																					
04:00 PM	11	215	1	0	227	2	0	0	0	2	0	218	13	0	231	17	0	11	0	28	488
04:15 PM	19	234	2	0	255	4	0	1	0	5	0	227	17	0	244	21	0	12	0	33	537
04:30 PM	22	182	2	0	206	4	0	1	0	5	0	272	19	0	291	27	0	14	0	41	543
04:45 PM	17	237	0	0	254	7	0	1	0	8	0	232	17	0	249	16	0	15	0	31	542
Total	69	868	5	0	942	17	0	3	0	20	0	949	66	0	1015	81	0	52	0	133	2110
05:00 PM	9	245	0	0	254	12	0	1	0	13	0	295	9	0	304	14	0	7	0	21	592
05:15 PM	11	247	1	0	259	6	0	2	0	8	1	239	6	0	246	19	0	9	0	28	541
05:30 PM	16	226	1	0	243	9	0	3	0	12	1	284	9	0	294	8	0	7	0	15	564
05:45 PM	7	262	2	0	271	1	0	0	0	1	0	202	4	0	206	4	0	9	0	13	491
Total	43	980	4	0	1027	28	0	6	0	34	2	1020	28	0	1050	45	0	32	0	77	2188
Grand Total	174	2932	43	0	3149	53	0	10	0	63	5	3587	159	0	3751	188	0	137	0	325	7288
Apprch %	5.5	93.1	1.4	0		84.1	0	15.9	0		0.1	95.6	4.2	0		57.8	0	42.2	0		
Total %	2.4	40.2	0.6	0	43.2	0.7	0	0.1	0	0.9	0.1	49.2	2.2	0	51.5	2.6	0	1.9	0	4.5	
Pass Cars	171	2873	38	0	3082	47	0	9	0	56	5	3492	158	0	3655	186	0	135	0	321	7114
% Pass Cars	98.3	98	88.4	0	97.9	88.7	0	90	0	88.9	100	97.4	99.4	0	97.4	98.9	0	98.5	0	98.8	97.6
Single Units	2	37	3	0	42	6	0	1	0	7	0	74	0	0	74	2	0	0	0	2	125
% Single Units	1.1	1.3	7	0	1.3	11.3	0	10	0	11.1	0	2.1	0	0	2	1.1	0	0	0	0.6	1.7
Heavy Trucks	1	22	2	0	25	0	0	0	0	0	0	21	1	0	22	0	0	2	0	2	49
% Heavy Trucks	0.6	0.8	4.7	0	0.8	0	0	0	0	0	0	0.6	0.6	0	0.6	0	0	1.5	0	0.6	0.7

Comments: 4 hour video traffic study conducted during typical weekday (Wednesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Non-signalized driveway intersection. Video SCU camera was located within NW intersection quadrant.

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tdcounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Fleis & VandenBrink

Project: Novi Pulte Traffic Study
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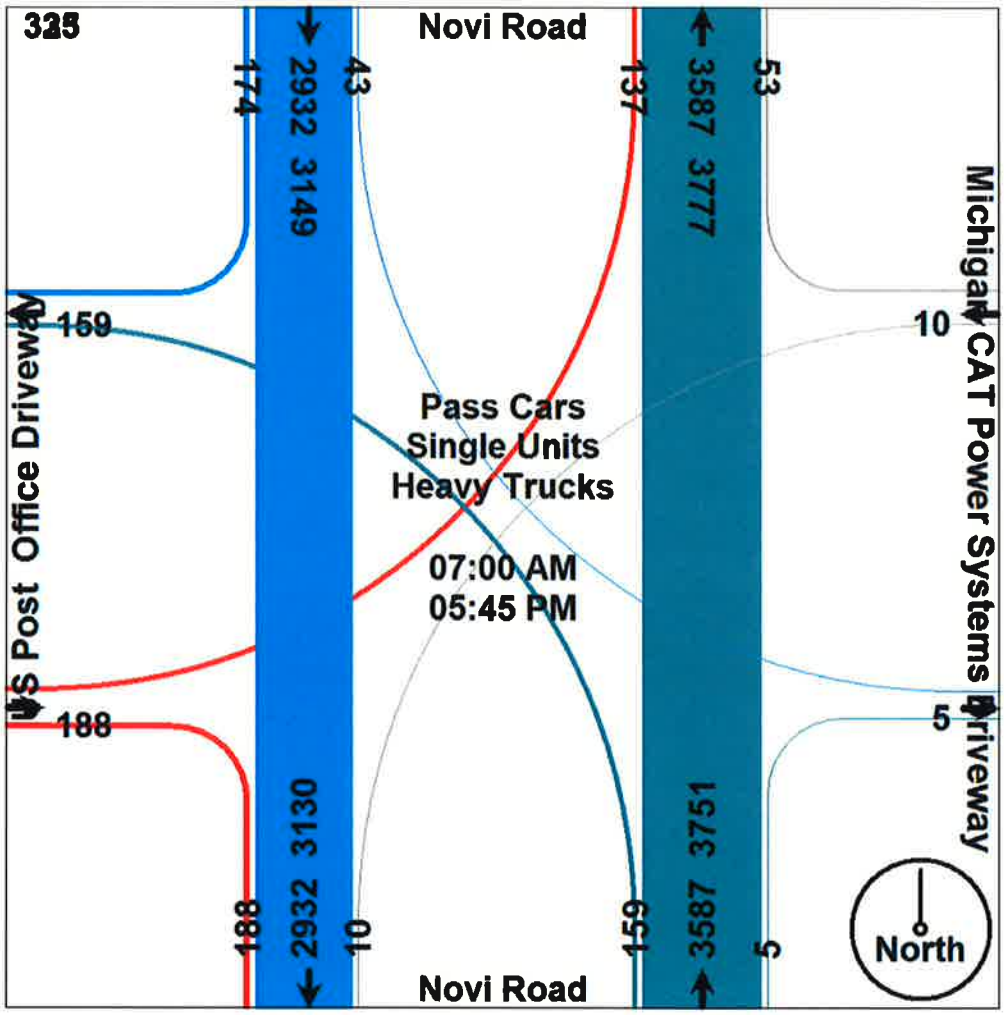
Weather:.Clear AM Cldy PM Dry, Temp 10's
Count By: Miovision Video VCU 5DV

File Name : TMC_1 Novi & USPostOffice_12-14-16
Site Code : TMC_1
Start Date : 12/14/2016
Page No : 2



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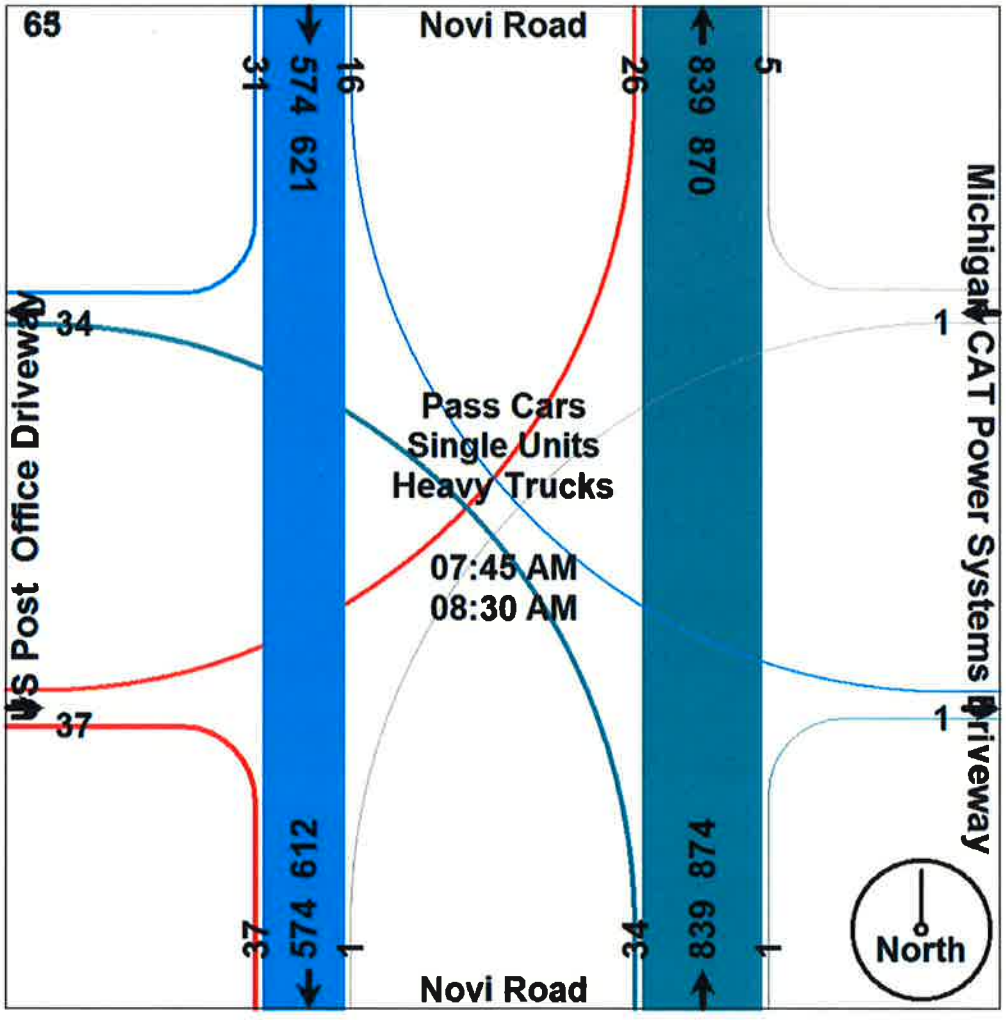
File Name : TMC_1 Novi & USPostOffice_12-14-16
Site Code : TMC_1
Start Date : 12/14/2016
Page No : 3

	Novi Road Southbound				Michigan CAT Power Systems Driveway Westbound				Novi Road Northbound				US Post Office Driveway Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	5	**175**	3	**183**	0	0	0	0	0	**240**	7	**247**	8	0	5	13	**443**
08:00 AM	**11**	134	**7**	152	1	0	**1**	**2**	**1**	203	5	209	**16**	0	6	**22**	385
08:15 AM	7	130	4	141	**2**	0	0	2	0	185	10	195	5	0	7	12	350
08:30 AM	8	135	2	145	2	0	0	2	0	211	**12**	223	8	0	**8**	16	386
Total Volume	31	574	16	621	5	0	1	6	1	839	34	874	37	0	26	63	1564
% App. Total	5	92.4	2.6		83.3	0	16.7		0.1	96	3.9		58.7	0	41.3		
PHF	.705	.820	.571	.848	.625	.000	.250	.750	.250	.874	.708	.885	.578	.000	.813	.716	.883
Pass Cars	30	556	15	601	4	0	1	5	1	812	34	847	36	0	26	62	1515
% Pass Cars	96.8	96.9	93.8	96.8	80.0	0	100	83.3	100	96.8	100	96.9	97.3	0	100	98.4	96.9
Single Units	1	12	1	14	1	0	0	1	0	22	0	22	1	0	0	1	38
% Single Units	3.2	2.1	6.3	2.3	20.0	0	0	16.7	0	2.6	0	2.5	2.7	0	0	1.6	2.4
Heavy Trucks	0	6	0	6	0	0	0	0	0	5	0	5	0	0	0	0	11
% Heavy Trucks	0	1.0	0	1.0	0	0	0	0	0	0.6	0	0.6	0	0	0	0	0.7



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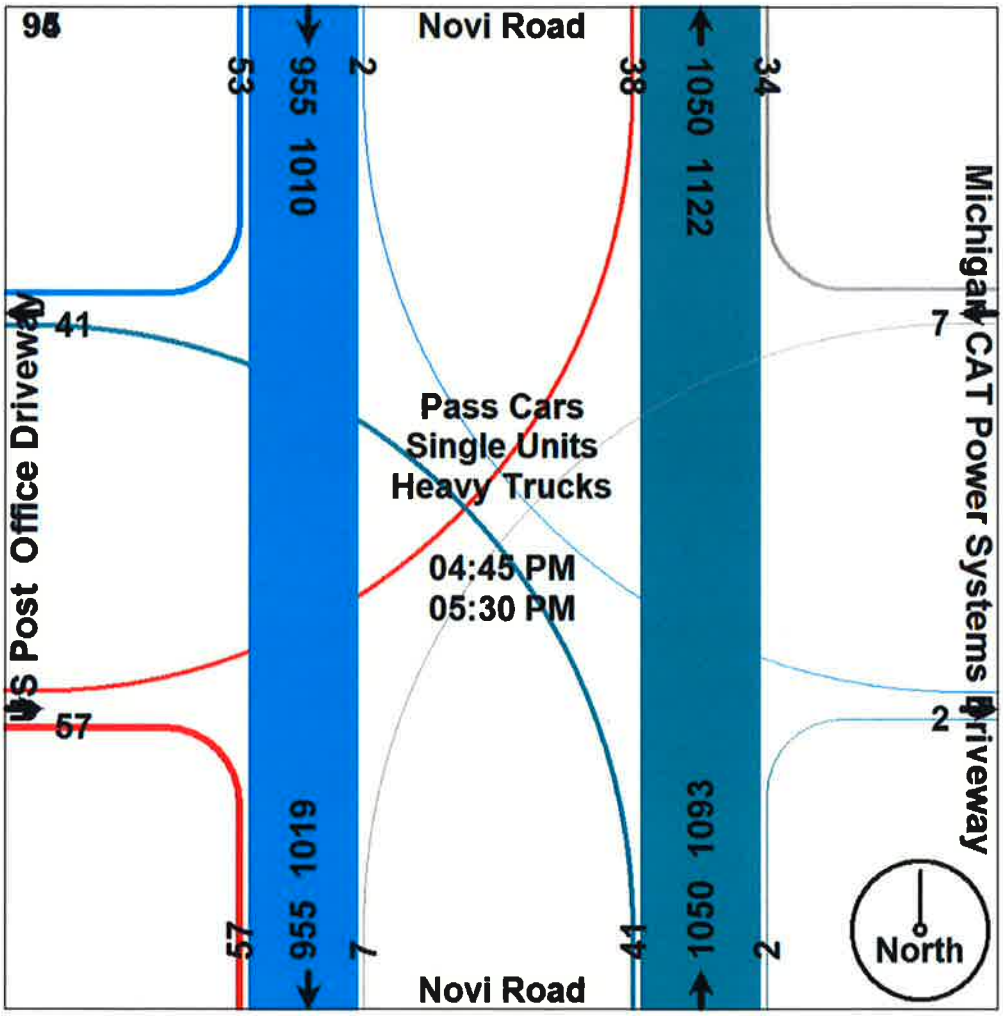
Weather:.Clear AM Cldy PM Dry, Temp 10's
Count By: Miovision Video VCU 5DV

File Name : TMC_1 Novi & USPostOffice_12-14-16
Site Code : TMC_1
Start Date : 12/14/2016
Page No : 4

	Novi Road Southbound				Michigan CAT Power Systems Driveway Westbound				Novi Road Northbound				US Post Office Driveway Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**17**	237	0	254	7	0	1	8	0	232	**17**	249	16	0	**15**	**31**	542
05:00 PM	9	245	0	254	**12**	0	1	**13**	0	**295**	9	**304**	14	0	7	21	**592**
05:15 PM	11	**247**	**1**	**259**	6	0	2	8	**1**	239	6	246	**19**	0	9	28	541
05:30 PM	16	226	1	243	9	0	**3**	12	1	284	9	294	8	0	7	15	564
Total Volume	53	955	2	1010	34	0	7	41	2	1050	41	1093	57	0	38	95	2239
% App. Total	5.2	94.6	0.2		82.9	0	17.1		0.2	96.1	3.8		60	0	40		
PHF	.779	.967	.500	.975	.708	.000	.583	.788	.500	.890	.603	.899	.750	.000	.633	.766	.946
Pass Cars	52	943	1	996	31	0	6	37	2	1030	41	1073	56	0	37	93	2199
% Pass Cars	98.1	98.7	50.0	98.6	91.2	0	85.7	90.2	100	98.1	100	98.2	98.2	0	97.4	97.9	98.2
Single Units	1	9	0	10	3	0	1	4	0	12	0	12	1	0	0	1	27
% Single Units	1.9	0.9	0	1.0	8.8	0	14.3	9.8	0	1.1	0	1.1	1.8	0	0	1.1	1.2
Heavy Trucks	0	3	1	4	0	0	0	0	0	8	0	8	0	0	1	1	13
% Heavy Trucks	0	0.3	50.0	0.4	0	0	0	0	0	0.8	0	0.7	0	0	2.6	1.1	0.6



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Traffic Study Performed For:

Fleis & VandenBrink

Project: Novi Pulte Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather:.Clear AM Cldy PM Dry, Temp 10's
Count By: Miovision Video VCU 5DW

File Name : TMC_2 Novi & CAT North Dw_12-14-16
Site Code : TMC_2
Start Date : 12/14/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks

	Novi Road Southbound					Michigan CAT Construction Equipment North Driveway Westbound					Novi Road Northbound					Storage Driveway Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	123	1	0	125	1	0	0	0	1	2	174	0	0	176	0	0	0	0	0	302
07:15 AM	0	118	1	0	119	1	0	0	0	1	4	194	0	0	198	1	0	0	0	1	319
07:30 AM	0	143	4	0	147	0	0	0	0	0	2	204	1	0	207	0	0	0	0	0	354
07:45 AM	4	179	6	0	189	0	0	0	0	0	4	240	0	0	244	0	0	0	0	0	433
Total	5	563	12	0	580	2	0	0	0	2	12	812	1	0	825	1	0	0	0	1	1408
08:00 AM	0	142	8	0	150	0	0	0	0	0	3	206	0	0	209	0	0	1	0	1	360
08:15 AM	0	132	4	0	136	1	0	0	0	1	3	193	0	0	196	0	0	0	0	0	333
08:30 AM	0	134	4	0	138	2	0	0	0	2	1	218	0	0	219	0	0	0	0	0	359
08:45 AM	1	135	1	0	137	0	0	0	0	0	2	236	0	0	238	0	0	0	0	0	375
Total	1	543	17	0	561	3	0	0	0	3	9	853	0	0	862	0	0	1	0	1	1427
**** BREAK ****																					
04:00 PM	3	223	1	0	227	3	0	3	0	6	0	225	0	0	225	0	0	2	0	2	460
04:15 PM	2	253	1	0	256	0	0	0	0	0	1	245	0	0	246	0	0	1	0	1	503
04:30 PM	1	210	0	0	211	1	0	0	0	1	0	286	1	0	287	0	0	4	0	4	503
04:45 PM	3	251	0	0	254	2	0	1	0	3	0	247	0	0	247	2	0	2	0	4	508
Total	9	937	2	0	948	6	0	4	0	10	1	1003	1	0	1005	2	0	9	0	11	1974
05:00 PM	1	243	0	0	244	3	0	4	0	7	0	301	0	0	301	0	0	2	0	2	554
05:15 PM	0	276	0	0	276	0	0	3	0	3	1	246	0	0	247	0	0	0	0	0	526
05:30 PM	0	242	0	0	242	3	0	2	0	5	0	288	0	0	288	0	0	0	0	0	535
05:45 PM	0	264	0	0	264	0	0	2	0	2	0	208	0	0	208	0	0	0	0	0	474
Total	1	1025	0	0	1026	6	0	11	0	17	1	1043	0	0	1044	0	0	2	0	2	2089
Grand Total	16	3068	31	0	3115	17	0	15	0	32	23	3711	2	0	3736	3	0	12	0	15	6898
Apprch %	0.5	98.5	1	0		53.1	0	46.9	0		0.6	99.3	0.1	0		20	0	80	0		
Total %	0.2	44.5	0.4	0	45.2	0.2	0	0.2	0	0.5	0.3	53.8	0	0	54.2	0	0	0.2	0	0.2	
Pass Cars	14	3013	27	0	3054	12	0	15	0	27	20	3627	2	0	3649	2	0	12	0	14	6744
% Pass Cars	87.5	98.2	87.1	0	98	70.6	0	100	0	84.4	87	97.7	100	0	97.7	66.7	0	100	0	93.3	97.8
Single Units	2	36	2	0	40	2	0	0	0	2	3	64	0	0	67	1	0	0	0	1	110
% Single Units	12.5	1.2	6.5	0	1.3	11.8	0	0	0	6.2	13	1.7	0	0	1.8	33.3	0	0	0	6.7	1.6
Heavy Trucks	0	19	2	0	21	3	0	0	0	3	0	20	0	0	20	0	0	0	0	0	44
% Heavy Trucks	0	0.6	6.5	0	0.7	17.6	0	0	0	9.4	0	0.5	0	0	0.5	0	0	0	0	0	0.6

Comments: 4 hour video traffic study conducted during typical weekday (Wednesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Non-signalized driveway intersection. Video SCU camera was located within SE intersection quadrant.

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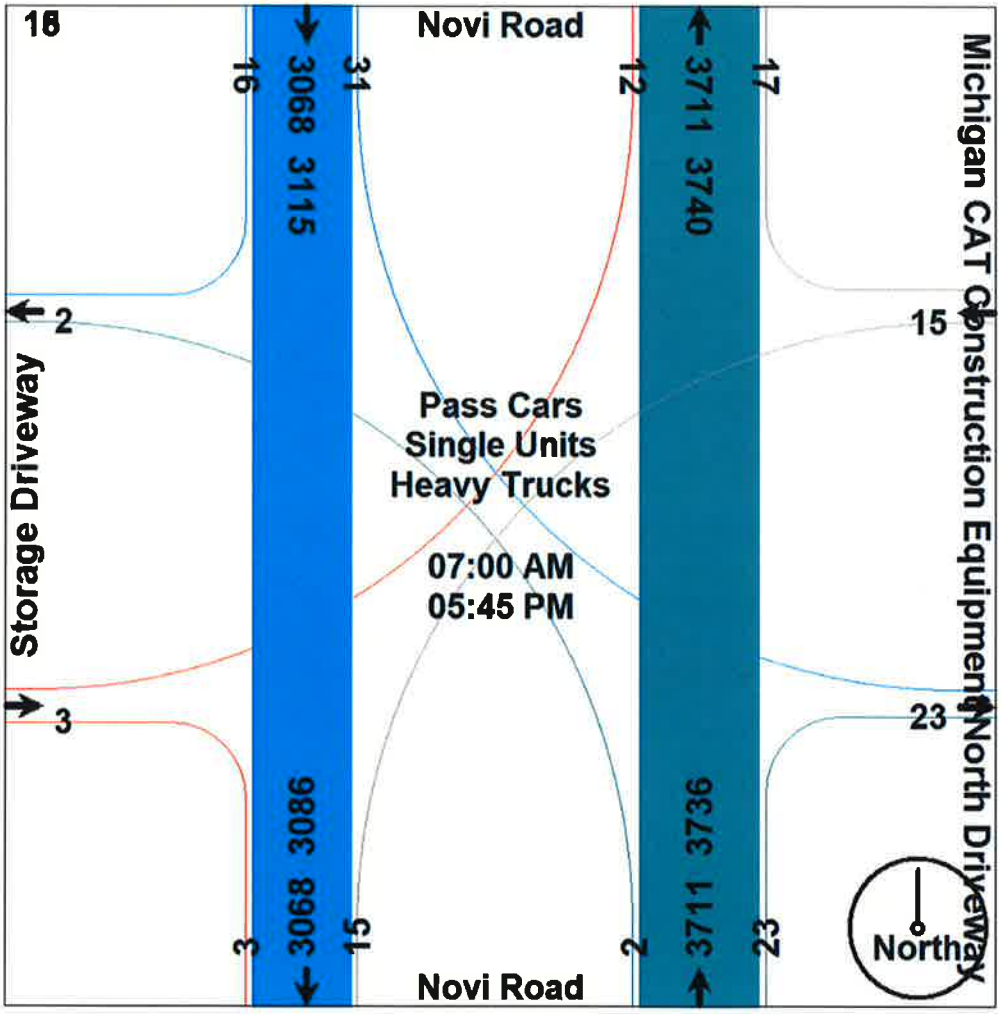
File Name : TMC_2 Novi & CAT North Dw_12-14-16
Site Code : TMC_2
Start Date : 12/14/2016
Page No : 2



Traffic Data Collection, LLC

tdcounts.com

Phone: (586) 786-5407

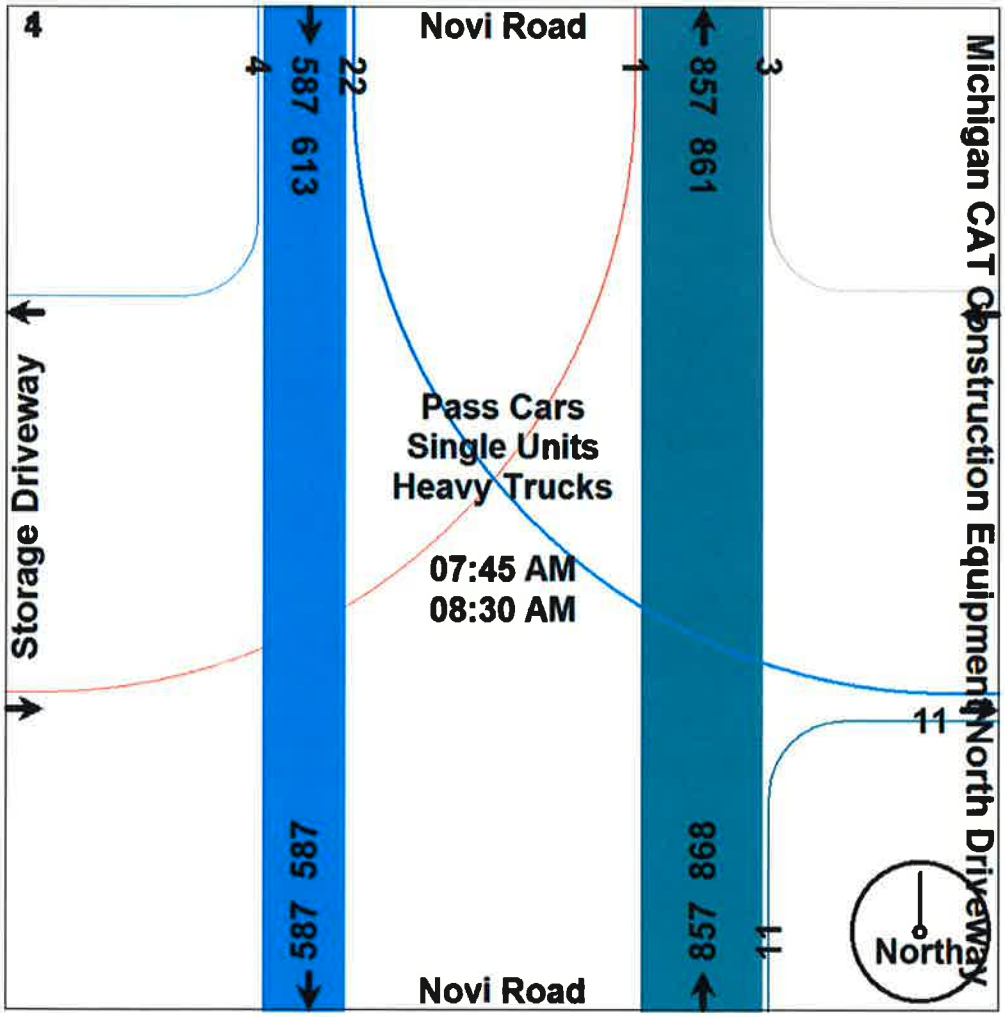
Traffic Study Performed For:

Fleis & VandenBrink

Project: Novi Pulte Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather:.Clear AM Cldy PM Dry, Temp 10's
Count By: Miovision Video VCU 5DW

File Name : TMC_2 Novi & CAT North Dw_12-14-16
Site Code : TMC_2
Start Date : 12/14/2016
Page No : 3

	Novi Road Southbound				Michigan CAT Construction Equipment North Driveway Westbound				Novi Road Northbound				Storage Driveway Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**4**	**179**	6	**189**	0	0	0	0	**4**	**240**	0	**244**	0	0	0	0	**433**
08:00 AM	0	142	**8**	150	0	0	0	0	3	206	0	209	0	0	**1**	**1**	360
08:15 AM	0	132	4	136	1	0	0	1	3	193	0	196	0	0	0	0	333
08:30 AM	0	134	4	138	**2**	0	0	**2**	1	218	0	219	0	0	0	0	359
Total Volume	4	587	22	613	3	0	0	3	11	857	0	868	0	0	1	1	1485
% App. Total	0.7	95.8	3.6		100	0	0		1.3	98.7	0		0	0	100		
PHF	.250	.820	.688	.811	.375	.000	.000	.375	.688	.893	.000	.889	.000	.000	.250	.250	.857
Pass Cars	4	571	19	594	0	0	0	0	10	833	0	843	0	0	1	1	1438
% Pass Cars	100	97.3	86.4	96.9	0	0	0	0	90.9	97.2	0	97.1	0	0	100	100	96.8
Single Units	0	11	2	13	2	0	0	2	1	19	0	20	0	0	0	0	35
% Single Units	0	1.9	9.1	2.1	66.7	0	0	66.7	9.1	2.2	0	2.3	0	0	0	0	2.4
Heavy Trucks	0	5	1	6	1	0	0	1	0	5	0	5	0	0	0	0	12
% Heavy Trucks	0	0.9	4.5	1.0	33.3	0	0	33.3	0	0.6	0	0.6	0	0	0	0	0.8



Traffic Data Collection, LLC

tdcounts.com

Phone: (586) 786-5407

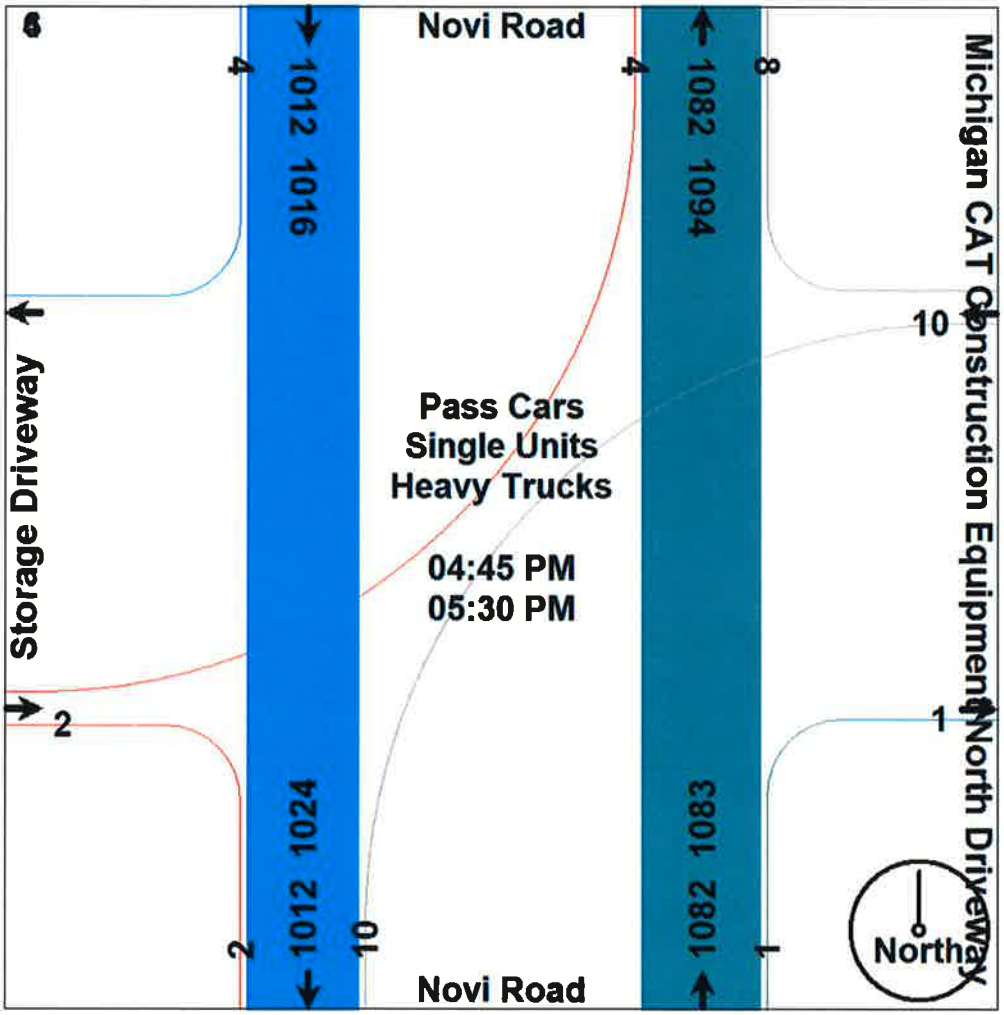
Traffic Study Performed For:

Fleis & VandenBrink

Project: Novi Pulte Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather:.Clear AM Cldy PM Dry, Temp 10's
Count By: Miovision Video VCU 5DW

File Name : TMC_2 Novi & CAT North Dw_12-14-16
Site Code : TMC_2
Start Date : 12/14/2016
Page No : 4

	Novi Road Southbound				Michigan CAT Construction Equipment North Driveway Westbound				Novi Road Northbound				Storage Driveway Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**3**	251	0	254	2	0	1	3	0	247	0	247	**2**	0	**2**	**4**	508
05:00 PM	1	243	0	244	**3**	0	**4**	**7**	0	**301**	0	**301**	0	0	2	2	**554**
05:15 PM	0	**276**	0	**276**	0	0	3	3	**1**	246	0	247	0	0	0	0	526
05:30 PM	0	242	0	242	3	0	2	5	0	288	0	288	0	0	0	0	535
Total Volume	4	1012	0	1016	8	0	10	18	1	1082	0	1083	2	0	4	6	2123
% App. Total	0.4	99.6	0		44.4	0	55.6		0.1	99.9	0		33.3	0	66.7		
PHF	.333	.917	.000	.920	.667	.000	.625	.643	.250	.899	.000	.900	.250	.000	.500	.375	.958
Pass Cars	2	1001	0	1003	8	0	10	18	1	1063	0	1064	1	0	4	5	2090
% Pass Cars	50.0	98.9	0	98.7	100	0	100	100	100	98.2	0	98.2	50.0	0	100	83.3	98.4
Single Units	2	8	0	10	0	0	0	0	0	10	0	10	1	0	0	1	21
% Single Units	50.0	0.8	0	1.0	0	0	0	0	0	0.9	0	0.9	50.0	0	0	16.7	1.0
Heavy Trucks	0	3	0	3	0	0	0	0	0	9	0	9	0	0	0	0	12
% Heavy Trucks	0	0.3	0	0.3	0	0	0	0	0	0.8	0	0.8	0	0	0	0	0.6



Traffic Data Collection, LLC

tdcounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Fleis & VandenBrink

Project: Novi Pulte Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather:.Clear AM Cldy PM Dry, Temp 10's
Count By: Miovision Video VCU 6H3

File Name : TMC_3 Novi & CAT South Dw_12-14-16
Site Code : TMC_3
Start Date : 12/14/2016
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks

	Novi Road Southbound					Michigan CAT Construction Equipment South Driveway Westbound					Novi Road Northbound					NA Eastbound					
Start Time	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	116	2	0	118	3	0	0	0	3	0	185	0	0	185	0	0	0	0	0	306
07:15 AM	0	117	0	0	117	5	0	1	0	6	0	184	0	0	184	0	0	0	0	0	307
07:30 AM	0	143	0	0	143	0	0	0	0	0	0	206	0	0	206	0	0	0	0	0	349
07:45 AM	0	168	2	0	170	2	0	0	0	2	1	252	0	0	253	0	0	0	0	0	425
Total	0	544	4	0	548	10	0	1	0	11	1	827	0	0	828	0	0	0	0	0	1387
08:00 AM	0	138	2	0	140	2	0	1	0	3	0	212	0	0	212	0	0	0	0	0	355
08:15 AM	0	133	1	0	134	3	0	1	0	4	0	198	0	0	198	0	0	0	0	0	336
08:30 AM	0	138	0	0	138	0	0	1	0	1	1	218	0	0	219	0	0	0	0	0	358
08:45 AM	0	138	0	0	138	2	0	2	0	4	0	231	0	0	231	0	0	0	0	0	373
Total	0	547	3	0	550	7	0	5	0	12	1	859	0	0	860	0	0	0	0	0	1422
**** BREAK ****																					
04:00 PM	0	228	1	0	229	1	0	0	0	1	0	233	0	0	233	0	0	0	0	0	463
04:15 PM	0	253	1	0	254	3	0	0	0	3	0	243	0	0	243	0	0	0	0	0	500
04:30 PM	0	206	0	0	206	4	0	0	0	4	1	292	0	0	293	0	0	0	0	0	503
04:45 PM	0	253	3	0	256	2	0	0	0	2	1	243	0	0	244	0	0	0	0	0	502
Total	0	940	5	0	945	10	0	0	0	10	2	1011	0	0	1013	0	0	0	0	0	1968
05:00 PM	0	254	0	0	254	9	0	3	0	12	0	286	0	0	286	0	0	0	0	0	552
05:15 PM	0	270	0	0	270	0	0	1	0	1	0	254	0	0	254	0	0	0	0	0	525
05:30 PM	0	238	0	0	238	3	0	1	0	4	0	286	0	0	286	0	0	0	0	0	528
05:45 PM	0	267	0	0	267	0	0	1	0	1	0	206	0	0	206	0	0	0	0	0	474
Total	0	1029	0	0	1029	12	0	6	0	18	0	1032	0	0	1032	0	0	0	0	0	2079
Grand Total	0	3060	12	0	3072	39	0	12	0	51	4	3729	0	0	3733	0	0	0	0	0	6856
Apprch %	0	99.6	0.4	0		76.5	0	23.5	0		0.1	99.9	0	0		0	0	0	0		
Total %	0	44.6	0.2	0	44.8	0.6	0	0.2	0	0.7	0.1	54.4	0	0	54.4	0	0	0	0	0	
Pass Cars	0	3008	8	0	3016	25	0	9	0	34	4	3650	0	0	3654	0	0	0	0	0	6704
% Pass Cars	0	98.3	66.7	0	98.2	64.1	0	75	0	66.7	100	97.9	0	0	97.9	0	0	0	0	0	97.8
Single Units	0	33	4	0	37	13	0	3	0	16	0	60	0	0	60	0	0	0	0	0	113
% Single Units	0	1.1	33.3	0	1.2	33.3	0	25	0	31.4	0	1.6	0	0	1.6	0	0	0	0	0	1.6
Heavy Trucks	0	19	0	0	19	1	0	0	0	1	0	19	0	0	19	0	0	0	0	0	39
% Heavy Trucks	0	0.6	0	0	0.6	2.6	0	0	0	2	0	0.5	0	0	0.5	0	0	0	0	0	0.6

Comments: 4 hour video traffic study conducted during typical weekday (Wednesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Non-signalized driveway intersection. Video SCU camera was located within NE intersection quadrant.

Traffic Data Collection, LLC

tdcounts.com

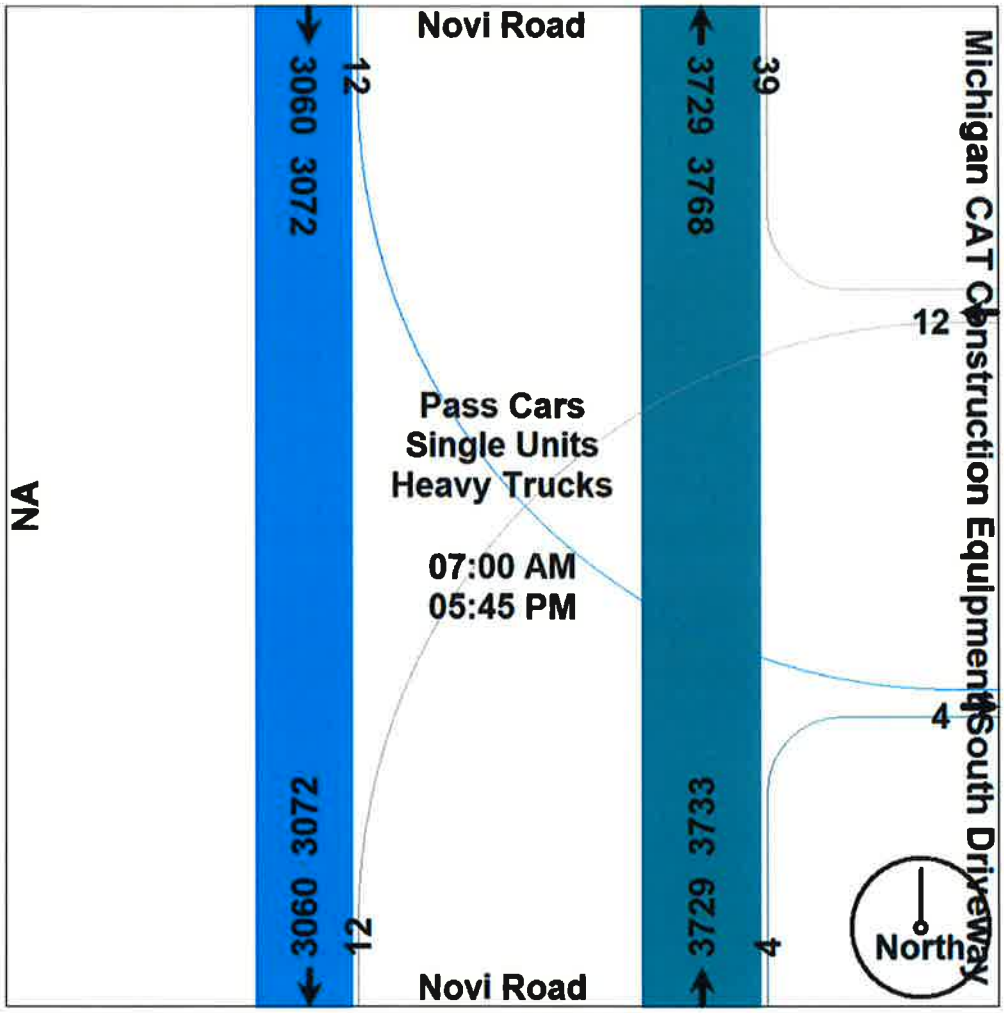
Phone: (586) 786-5407

Traffic Study Performed For:

Fleis & VandenBrink

Project: Novi Pulte Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather:.Clear AM Cldy PM Dry, Temp 10's
Count By: Miovision Video VCU 6H3

File Name : TMC_3 Novi & CAT South Dw_12-14-16
Site Code : TMC_3
Start Date : 12/14/2016
Page No : 2



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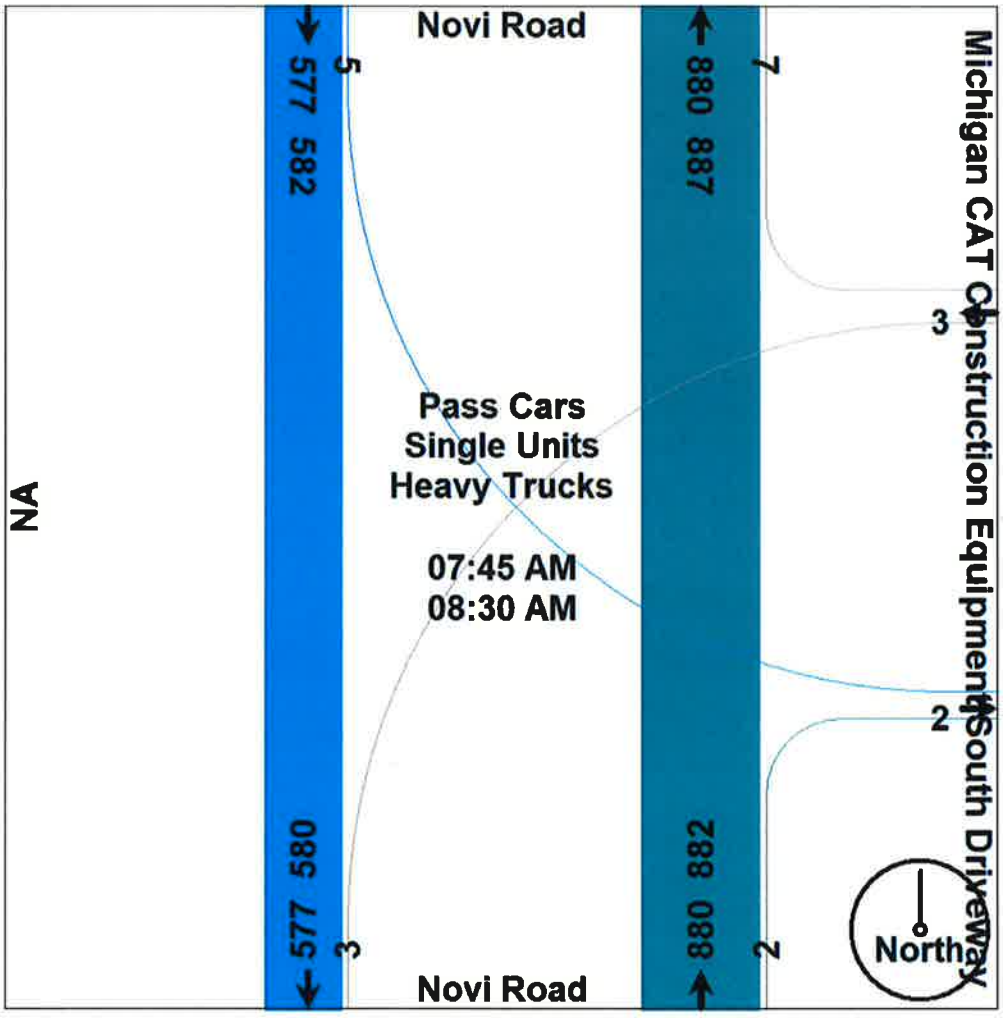
Project: Novi Pulte Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather:.Clear AM Cldy PM Dry, Temp 10's
Count By: Miovision Video VCU 6H3

File Name : TMC_3 Novi & CAT South Dw_12-14-16
Site Code : TMC_3
Start Date : 12/14/2016
Page No : 3

	Novi Road Southbound				Michigan CAT Construction Equipment South Driveway Westbound				Novi Road Northbound				NA Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**168**	**2**	**170**	2	0	0	2	**1**	**252**	0	**253**	0	0	0	0	**425**
08:00 AM	0	138	2	140	2	0	**1**	3	0	212	0	212	0	0	0	0	355
08:15 AM	0	133	1	134	**3**	0	1	**4**	0	198	0	198	0	0	0	0	336
08:30 AM	0	138	0	138	0	0	1	1	1	218	0	219	0	0	0	0	358
Total Volume	0	577	5	582	7	0	3	10	2	880	0	882	0	0	0	0	1474
% App. Total	0	99.1	0.9		70	0	30		0.2	99.8	0		0	0	0		
PHF	.000	.859	.625	.856	.583	.000	.750	.625	.500	.873	.000	.872	.000	.000	.000	.000	.867
Pass Cars	0	562	4	566	5	0	2	7	2	854	0	856	0	0	0	0	1429
% Pass Cars	0	97.4	80.0	97.3	71.4	0	66.7	70.0	100	97.0	0	97.1	0	0	0	0	96.9
Single Units	0	10	1	11	2	0	1	3	0	21	0	21	0	0	0	0	35
% Single Units	0	1.7	20.0	1.9	28.6	0	33.3	30.0	0	2.4	0	2.4	0	0	0	0	2.4
Heavy Trucks	0	5	0	5	0	0	0	0	0	5	0	5	0	0	0	0	10
% Heavy Trucks	0	0.9	0	0.9	0	0	0	0	0	0.6	0	0.6	0	0	0	0	0.7



Traffic Data Collection, LLC

tdcounts.com

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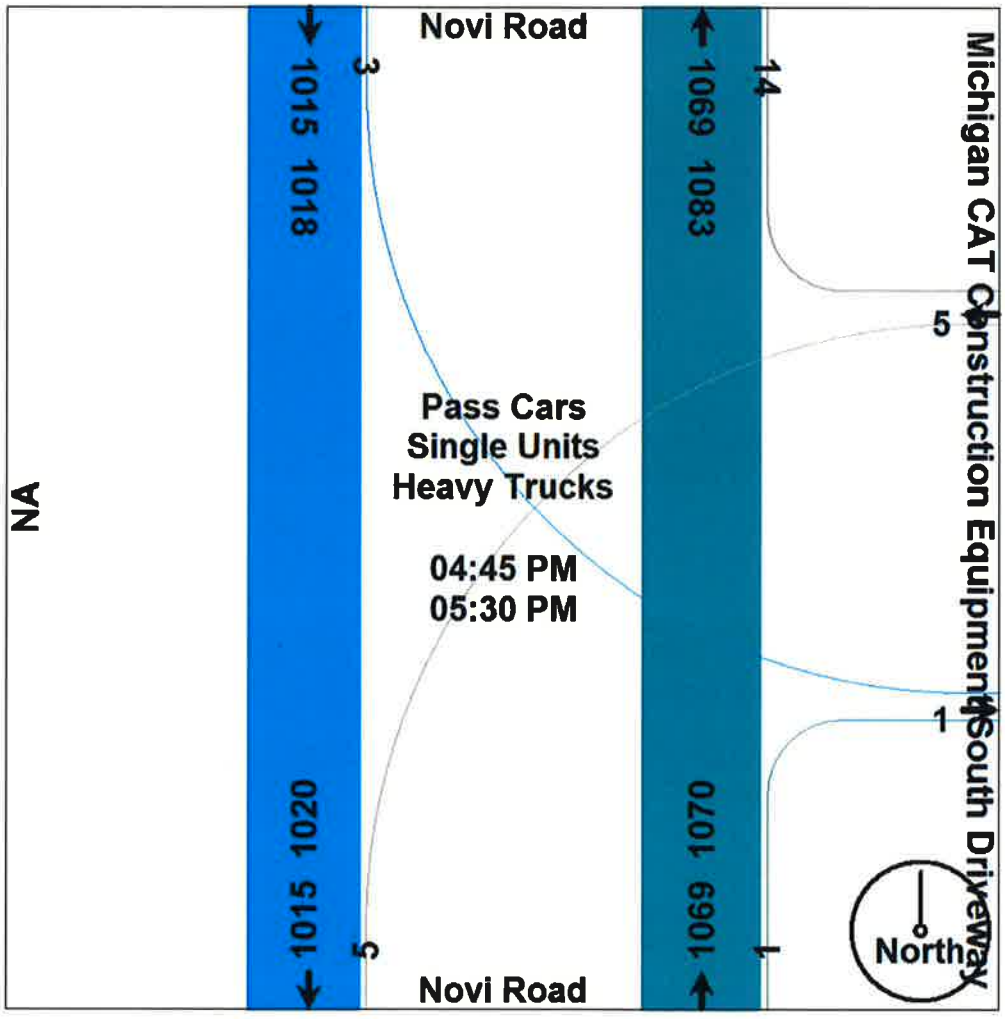
Traffic Study Performed For:

Fleis & VandenBrink

Project: Novi Pulte Traffic Study
Type: 4 Hr. Video Turning Movement Count
Weather:.Clear AM Cldy PM Dry, Temp 10's
Count By: Miovision Video VCU 6H3

File Name : TMC_3 Novi & CAT South Dw_12-14-16
Site Code : TMC_3
Start Date : 12/14/2016
Page No : 4

	Novi Road Southbound				Michigan CAT Construction Equipment South Driveway Westbound				Novi Road Northbound				NA Eastbound				
Start Time	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	253	**3**	256	2	0	0	2	**1**	243	0	244	0	0	0	0	502
05:00 PM	0	254	0	254	**9**	0	**3**	**12**	0	**286**	0	**286**	0	0	0	0	**552**
05:15 PM	0	**270**	0	**270**	0	0	1	1	0	254	0	254	0	0	0	0	525
05:30 PM	0	238	0	238	3	0	1	4	0	286	0	286	0	0	0	0	528
Total Volume	0	1015	3	1018	14	0	5	19	1	1069	0	1070	0	0	0	0	2107
% App. Total	0	99.7	0.3		73.7	0	26.3		0.1	99.9	0		0	0	0		
PHF	.000	.940	.250	.943	.389	.000	.417	.396	.250	.934	.000	.935	.000	.000	.000	.000	.954
Pass Cars	0	1003	2	1005	11	0	5	16	1	1054	0	1055	0	0	0	0	2076
% Pass Cars	0	98.8	66.7	98.7	78.6	0	100	84.2	100	98.6	0	98.6	0	0	0	0	98.5
Single Units	0	9	1	10	3	0	0	3	0	7	0	7	0	0	0	0	20
% Single Units	0	0.9	33.3	1.0	21.4	0	0	15.8	0	0.7	0	0.7	0	0	0	0	0.9
Heavy Trucks	0	3	0	3	0	0	0	0	0	8	0	8	0	0	0	0	11
% Heavy Trucks	0	0.3	0	0.3	0	0	0	0	0	0.7	0	0.7	0	0	0	0	0.5



YOU ARE VIEWING DATA FOR:

City of Novi

45175 W 10 Mile Rd
Novi, MI 48375-3024
http://www.cityofnovi.org

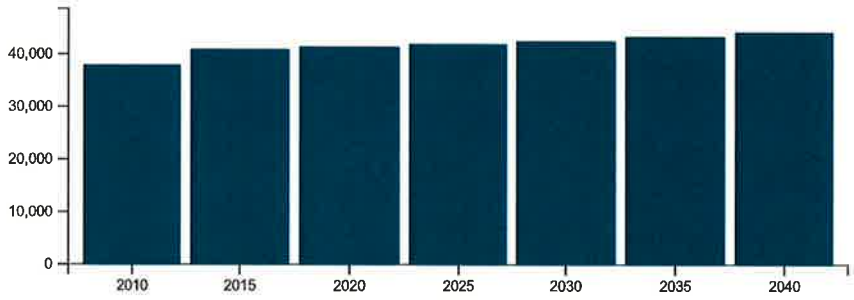
SEMCOG MEMBER

Census 2010 Population: 55,374
Area: 31.2 square miles

Economy & Jobs

Link to American Community Survey (ACS) Profiles: **Select a Year** 2010-2014 ▼ **Economic**

Forecasted Jobs



Source: **SEMCOG 2040 Forecast** produced in 2012.

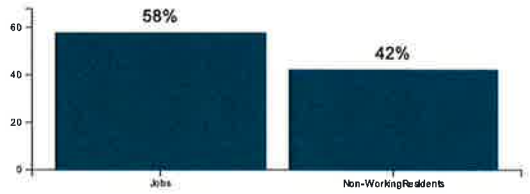
Forecasted Jobs by Industry

Forecasted Jobs By Industry	SEMCOG and ACS 2010	2015	2020	2025	2030	2035	2040	Change 2010 - 2040
Forecasted Jobs By Industry	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**Change 2010 - 2040**
Natural Resources, Mining, & Construction	1,559	1,828	1,904	1,933	1,940	2,009	1,917	358
Manufacturing	1,719	1,807	1,764	1,670	1,639	1,547	1,436	-283
Wholesale Trade, Transportation, Warehousing, & Utilities	4,114	4,268	4,145	4,126	4,064	4,225	4,227	113
Retail Trade	7,823	7,723	7,561	7,569	7,507	7,476	7,413	-410
Knowledge-based Services	6,982	8,035	8,346	8,456	8,398	8,473	8,858	1,876
Services to Households & Firms	3,593	4,064	4,183	4,364	4,697	4,855	4,832	1,239
Private Education & Healthcare	5,342	6,164	6,657	6,914	7,235	7,522	8,026	2,684
Leisure & Hospitality	5,109	5,328	5,133	5,160	5,220	5,473	5,710	601
Government	1,687	1,685	1,726	1,757	1,782	1,801	1,808	121
Total	37,928	40,902	41,419	41,949	42,482	43,381	44,227	6,299

Source: **SEMCOG 2040 Forecast** produced in 2012.
Note: "C" indicates data blocked due to confidentiality concerns of ES-202 files.

Daytime Population

Daytime Population	SEMCOG and ACS 2010
Jobs	37,928
Non-Working Residents	27,701
Age 15 and under	13,391
Not in labor force	12,488
Unemployed	1,822
Daytime Population	65,629



Source: **SEMCOG 2040 Forecast** produced in 2012, **U.S Census Bureau**, and **2010 American Community Survey 5-Year Estimates.**

Note: The number of residents attending school outside Southeast Michigan is not available. Likewise, the number of students commuting into Southeast Michigan to attend school is also not known.

YOU ARE VIEWING DATA FOR:

City of Novi

45175 W 10 Mile Rd
Novi, MI 48375-3024
http://www.cityofnovi.org

SEMCOG MEMBER

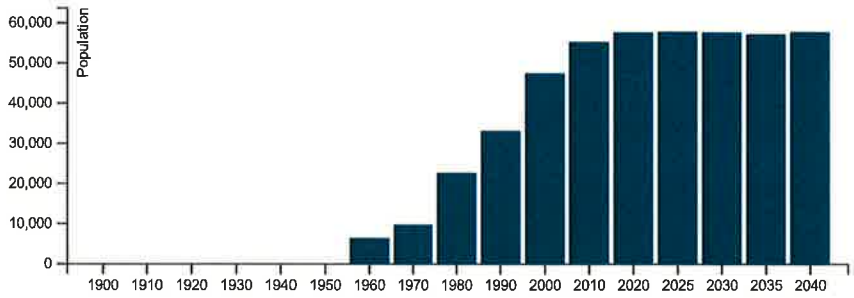
Census 2010 Population: 55,374
Area: 31.2 square miles

Population and Households

Link to American Community Survey (ACS) Profiles: **Select a Year** 2010-2014 ▼ **Social | Demographic**

Population and Household Estimates for Southeast Michigan, August 2016

Population Forecast



Note for City of Novi : Incorporated as of the 1970 Census from Village of Novi. Population numbers prior to 1970 are of the village. The Village of Novi was incorporated in 1958 from the majority of Novi Township. Population numbers not available before 1960 as area was part of Novi Township.

Population and Households

Components of Population Change	Census 2000-2005 Avg.	Change 2000-2010 Avg.	Pct Change 2000-2010	SEMCOG Jul 2016	SEMCOG 2040
Population and Households	Census 2010	Change 2000-2010	Pct Change 2000-2010	SEMCOG Jul 2016	SEMCOG 2040
Total Population	55,374	7,795	16.4%	59,324	57,897
Group Quarters Population	360	93	34.8%	360	407
Household Population	55,014	7,702	16.3%	58,964	57,490
Housing Units	24,286	4,569	23.2%	25,735	-
Households (Occupied Units)	22,317	3,525	18.8%	24,237	24,234
Residential Vacancy Rate	8.1%	3.4%	-	5.8%	-
Average Household Size	2.47	-0.05	-	2.43	2.37

Source: **U.S. Census Bureau** and **SEMCOG 2040 Forecast** produced in 2012.

Components of Population Change

Components of Population Change	2000-2005 Avg.	2006-2010 Avg.
Natural Increase (Births - Deaths)	326	280
Births	586	587
Deaths	260	307
Net Migration (Movement In - Movement Out)	598	355
Population Change (Natural Increase + Net Migration)	924	635

Source: **Michigan Department of Community Health** Vital Statistics **U.S. Census Bureau,** and **SEMCOG.**

Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Table 17-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. . . .

Exhibit 17-2. Level of Service Criteria for TWSC Intersections

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. To remain consistent with the AWSC intersection analysis procedure described later in this chapter, a total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The proposed level of service criteria for TWSC intersections are somewhat different from the criteria used in Chapter 16 for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. . . .

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 2010. Transportation Research Board, National Research Council

Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle for a 15-min analysis period. The criteria are given in Exhibit 16-2. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the *v/c* ratio for the lane group in question.

LOS A describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

Exhibit 16-2. Level-of-Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤10.0
B	> 10.0 and ≤20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	>80.0

LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.

LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Highway Capacity Manual, 2010. Transportation Research Board, National Research Council

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	37	1	0	5	35	889	1	16	605	31
Future Volume (veh/h)	26	0	37	1	0	5	35	889	1	16	605	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1709	2000	1942	1942	2000	1942	1942	2000
Adj Flow Rate, veh/h	36	0	51	1	0	7	39	999	1	19	712	36
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	17	17	17	3	3	3	3	3	3
Cap, veh/h	143	0	82	37	5	60	634	3223	3	504	3046	154
Arrive On Green	0.05	0.00	0.05	0.05	0.00	0.05	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	1403	0	1667	69	105	1219	704	3782	4	556	3574	181
Grp Volume(v), veh/h	36	0	51	8	0	0	39	487	513	19	367	381
Grp Sat Flow(s),veh/h/ln	1403	0	1667	1393	0	0	704	1845	1941	556	1845	1910
Q Serve(g_s), s	0.0	0.0	3.6	0.0	0.0	0.0	1.3	6.4	6.4	0.9	4.4	4.4
Cycle Q Clear(g_c), s	2.2	0.0	3.6	3.6	0.0	0.0	5.7	6.4	6.4	7.2	4.4	4.4
Prop In Lane	1.00		1.00	0.12		0.87	1.00		0.00	1.00		0.09
Lane Grp Cap(c), veh/h	143	0	82	103	0	0	634	1572	1654	504	1572	1628
V/C Ratio(X)	0.25	0.00	0.62	0.08	0.00	0.00	0.06	0.31	0.31	0.04	0.23	0.23
Avail Cap(c_a), veh/h	343	0	319	303	0	0	634	1572	1654	504	1572	1628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.3	0.0	55.9	54.5	0.0	0.0	2.2	1.8	1.8	2.5	1.6	1.6
Incr Delay (d2), s/veh	0.9	0.0	7.4	0.3	0.0	0.0	0.2	0.5	0.5	0.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.8	0.3	0.0	0.0	0.3	3.3	3.5	0.1	2.3	2.4
LnGrp Delay(d),s/veh	56.2	0.0	63.3	54.8	0.0	0.0	2.3	2.3	2.3	2.6	2.0	2.0
LnGrp LOS	E		E	D			A	A	A	A	A	A
Approach Vol, veh/h		87			8			1039			767	
Approach Delay, s/veh		60.4			54.8			2.3			2.0	
Approach LOS		E			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		108.1		11.9		108.1		11.9
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 85		23.0		* 85		23.0
Max Q Clear Time (g_c+I1), s		8.4		5.6		9.2		5.6
Green Ext Time (p_c), s		16.9		0.3		16.9		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	5.0
HCM 2010 LOS	A

Notes

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	1	0	0	0	0	3	0	921	11	22	617	4
Future Vol, veh/h	1	0	0	0	0	3	0	921	11	22	617	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	60	60	60	89	89	89	81	81	81
Heavy Vehicles, %	0	0	0	100	100	100	3	3	3	3	3	3
Mvmt Flow	2	0	0	0	0	5	0	1035	12	27	762	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1336	1866	383	1476	1862	524	767	0	0	1047	0	0
Stage 1	819	819	-	1041	1041	-	-	-	-	-	-	-
Stage 2	517	1047	-	435	821	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	9.5	8.5	8.9	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.5	5.5	-	8.5	7.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	8.5	7.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	4.5	5	4.3	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	114	73	621	36	25	308	836	-	-	654	-	-
Stage 1	340	392	-	122	156	-	-	-	-	-	-	-
Stage 2	515	308	-	371	218	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	109	70	621	35	24	308	836	-	-	654	-	-
Mov Cap-2 Maneuver	109	70	-	35	24	-	-	-	-	-	-	-
Stage 1	340	376	-	122	156	-	-	-	-	-	-	-
Stage 2	507	308	-	356	209	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	38.5	16.9	0	0.4
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	836	-	-	109	308	654	-	-
HCM Lane V/C Ratio	-	-	-	0.015	0.016	0.042	-	-
HCM Control Delay (s)	0	-	-	38.5	16.9	10.7	-	-
HCM Lane LOS	A	-	-	E	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	7	925	2	5	612
Future Vol, veh/h	3	7	925	2	5	612
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	87	87	86	86
Heavy Vehicles, %	30	30	3	3	3	3
Mvmt Flow	5	11	1063	2	6	712

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1431	533	0	0	1066	0
Stage 1	1064	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Critical Hdwy	7.4	7.5	-	-	4.16	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	3.8	3.6	-	-	2.23	-
Pot Cap-1 Maneuver	97	425	-	-	644	-
Stage 1	238	-	-	-	-	-
Stage 2	595	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	96	425	-	-	644	-
Mov Cap-2 Maneuver	188	-	-	-	-	-
Stage 1	238	-	-	-	-	-
Stage 2	589	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 308	644	-
HCM Lane V/C Ratio	-	- 0.052	0.009	-
HCM Control Delay (s)	-	- 17.3	10.6	-
HCM Lane LOS	-	- C	B	-
HCM 95th %tile Q(veh)	-	- 0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	0	57	7	0	34	41	1107	2	2	1008	53
Future Volume (veh/h)	38	0	57	7	0	34	41	1107	2	2	1008	53
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1818	2000	1961	1961	2000	1980	1980	2000
Adj Flow Rate, veh/h	49	0	74	9	0	43	46	1230	2	2	1061	56
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	10	10	10	2	2	2	1	1	1
Cap, veh/h	153	0	115	42	8	70	444	3178	5	403	3028	160
Arrive On Green	0.07	0.00	0.07	0.07	0.00	0.07	0.83	0.83	0.83	0.83	0.83	0.83
Sat Flow, veh/h	1358	0	1667	95	117	1014	502	3816	6	455	3636	192
Grp Volume(v), veh/h	49	0	74	52	0	0	46	600	632	2	549	568
Grp Sat Flow(s),veh/h/ln	1358	0	1667	1226	0	0	502	1863	1960	455	1881	1946
Q Serve(g_s), s	0.0	0.0	5.2	0.3	0.0	0.0	2.9	9.5	9.5	0.1	8.3	8.3
Cycle Q Clear(g_c), s	4.2	0.0	5.2	5.5	0.0	0.0	11.1	9.5	9.5	9.7	8.3	8.3
Prop In Lane	1.00		1.00	0.17		0.83	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	153	0	115	120	0	0	444	1551	1632	403	1567	1621
V/C Ratio(X)	0.32	0.00	0.64	0.43	0.00	0.00	0.10	0.39	0.39	0.00	0.35	0.35
Avail Cap(c_a), veh/h	319	0	319	301	0	0	444	1551	1632	403	1567	1621
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.0	0.0	54.4	53.9	0.0	0.0	3.7	2.5	2.5	3.7	2.4	2.4
Incr Delay (d2), s/veh	1.2	0.0	5.9	2.5	0.0	0.0	0.5	0.7	0.7	0.0	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	2.6	1.8	0.0	0.0	0.5	5.2	5.4	0.0	4.4	4.5
LnGrp Delay(d),s/veh	55.2	0.0	60.3	56.4	0.0	0.0	4.2	3.2	3.2	3.7	3.0	3.0
LnGrp LOS	E		E	E			A	A	A	A	A	A
Approach Vol, veh/h		123			52			1278			1119	
Approach Delay, s/veh		58.3			56.4			3.2			3.0	
Approach LOS		E			E			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		105.7		14.3		105.7		14.3
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 85		23.0		* 85		23.0
Max Q Clear Time (g_c+I1), s		13.1		7.2		11.7		7.5
Green Ext Time (p_c), s		30.1		0.7		30.3		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	6.8
HCM 2010 LOS	A

Notes

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	2	10	0	8	0	1138	1	0	1068	4
Future Vol, veh/h	4	0	2	10	0	8	0	1138	1	0	1068	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	64	64	64	90	90	90	92	92	92
Heavy Vehicles, %	17	17	17	0	0	0	2	2	2	1	1	1
Mvmt Flow	7	0	3	16	0	13	0	1264	1	0	1161	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1795	2429	583	1845	2430	633	1165	0	0	1266	0	0
Stage 1	1163	1163	-	1265	1265	-	-	-	-	-	-	-
Stage 2	632	1266	-	580	1165	-	-	-	-	-	-	-
Critical Hdwy	7.84	6.84	7.24	7.5	6.5	6.9	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.84	5.84	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.84	5.84	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.17	3.47	3.5	4	3.3	2.22	-	-	2.21	-	-
Pot Cap-1 Maneuver	43	26	420	47	32	427	595	-	-	550	-	-
Stage 1	184	238	-	182	243	-	-	-	-	-	-	-
Stage 2	400	211	-	472	271	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	42	26	420	47	32	427	595	-	-	550	-	-
Mov Cap-2 Maneuver	42	26	-	47	32	-	-	-	-	-	-	-
Stage 1	184	238	-	182	243	-	-	-	-	-	-	-
Stage 2	388	211	-	468	271	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	76.6	75.2	0	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	595	-	-	60	78	550	-	-
HCM Lane V/C Ratio	-	-	-	0.167	0.361	-	-	-
HCM Control Delay (s)	0	-	-	76.6	75.2	0	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	1.4	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	14	1125	1	3	1077
Future Vol, veh/h	5	14	1125	1	3	1077
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	94	94	94	94
Heavy Vehicles, %	16	16	1	1	1	1
Mvmt Flow	8	23	1197	1	3	1146

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1776	599	0	0	1198	0
Stage 1	1197	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Critical Hdwy	7.12	7.22	-	-	4.12	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.66	3.46	-	-	2.21	-
Pot Cap-1 Maneuver	63	412	-	-	584	-
Stage 1	222	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	63	412	-	-	584	-
Mov Cap-2 Maneuver	163	-	-	-	-	-
Stage 1	222	-	-	-	-	-
Stage 2	484	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	294	584	-
HCM Lane V/C Ratio	-	-	0.108	0.005	-
HCM Control Delay (s)	-	-	18.7	11.2	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	37	1	0	5	35	889	1	16	605	31
Future Volume (veh/h)	26	0	37	1	0	5	35	889	1	16	605	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1709	2000	1942	1942	2000	1942	1942	2000
Adj Flow Rate, veh/h	36	0	51	1	0	7	39	999	1	19	712	36
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	17	17	17	3	3	3	3	3	3
Cap, veh/h	227	0	110	74	5	83	593	2788	3	477	2634	133
Arrive On Green	0.07	0.00	0.07	0.07	0.00	0.07	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1403	0	1667	98	80	1247	704	3782	4	556	3574	181
Grp Volume(v), veh/h	36	0	51	8	0	0	39	487	513	19	367	381
Grp Sat Flow(s),veh/h/ln	1403	0	1667	1425	0	0	704	1845	1941	556	1845	1910
Q Serve(g_s), s	0.0	0.0	1.8	0.0	0.0	0.0	1.2	5.7	5.7	0.8	3.9	3.9
Cycle Q Clear(g_c), s	1.1	0.0	1.8	1.8	0.0	0.0	5.1	5.7	5.7	6.4	3.9	3.9
Prop In Lane	1.00		1.00	0.12		0.87	1.00		0.00	1.00		0.09
Lane Grp Cap(c), veh/h	227	0	110	162	0	0	593	1360	1431	477	1360	1408
V/C Ratio(X)	0.16	0.00	0.46	0.05	0.00	0.00	0.07	0.36	0.36	0.04	0.27	0.27
Avail Cap(c_a), veh/h	648	0	611	586	0	0	593	1360	1431	477	1360	1408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	27.0	26.3	0.0	0.0	3.4	2.8	2.8	4.0	2.6	2.6
Incr Delay (d2), s/veh	0.3	0.0	3.0	0.1	0.0	0.0	0.2	0.7	0.7	0.2	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.9	0.1	0.0	0.0	0.3	3.1	3.3	0.1	2.1	2.2
LnGrp Delay(d),s/veh	27.0	0.0	30.0	26.4	0.0	0.0	3.6	3.6	3.5	4.1	3.1	3.1
LnGrp LOS	C		C	C			A	A	A	A	A	A
Approach Vol, veh/h		87			8			1039			767	
Approach Delay, s/veh		28.7			26.4			3.5			3.1	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		10.0		50.0		10.0
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 26		22.0		* 26		22.0
Max Q Clear Time (g_c+I1), s		7.7		3.8		8.4		3.8
Green Ext Time (p_c), s		10.4		0.3		10.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	4.6
HCM 2010 LOS	A

Notes

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	1	0	0	0	0	3	0	921	11	22	617	4
Future Vol, veh/h	1	0	0	0	0	3	0	921	11	22	617	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	60	60	60	89	89	89	81	81	81
Heavy Vehicles, %	0	0	0	100	100	100	3	3	3	3	3	3
Mvmt Flow	2	0	0	0	0	5	0	1035	12	27	762	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1336	1866	383	1476	1862	524	767	0	0	1047	0	0
Stage 1	819	819	-	1041	1041	-	-	-	-	-	-	-
Stage 2	517	1047	-	435	821	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	9.5	8.5	8.9	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.5	5.5	-	8.5	7.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	8.5	7.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	4.5	5	4.3	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	114	73	621	36	25	308	836	-	-	654	-	-
Stage 1	340	392	-	122	156	-	-	-	-	-	-	-
Stage 2	515	308	-	371	218	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	109	70	621	35	24	308	836	-	-	654	-	-
Mov Cap-2 Maneuver	109	70	-	35	24	-	-	-	-	-	-	-
Stage 1	340	376	-	122	156	-	-	-	-	-	-	-
Stage 2	507	308	-	356	209	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	38.5	16.9	0	0.4
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	836	-	-	109	308	654	-	-
HCM Lane V/C Ratio	-	-	-	0.015	0.016	0.042	-	-
HCM Control Delay (s)	0	-	-	38.5	16.9	10.7	-	-
HCM Lane LOS	A	-	-	E	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	7	925	2	5	612
Future Vol, veh/h	3	7	925	2	5	612
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	87	87	86	86
Heavy Vehicles, %	30	30	3	3	3	3
Mvmt Flow	5	11	1063	2	6	712

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1431	533	0	0	1066	0
Stage 1	1064	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Critical Hdwy	7.4	7.5	-	-	4.16	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	3.8	3.6	-	-	2.23	-
Pot Cap-1 Maneuver	97	425	-	-	644	-
Stage 1	238	-	-	-	-	-
Stage 2	595	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	96	425	-	-	644	-
Mov Cap-2 Maneuver	188	-	-	-	-	-
Stage 1	238	-	-	-	-	-
Stage 2	589	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	308	644	-
HCM Lane V/C Ratio	-	-	0.052	0.009	-
HCM Control Delay (s)	-	-	17.3	10.6	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	0	57	7	0	34	41	1107	2	2	1008	53
Future Volume (veh/h)	38	0	57	7	0	34	41	1107	2	2	1008	53
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1818	2000	1961	1961	2000	1980	1980	2000
Adj Flow Rate, veh/h	49	0	74	9	0	43	46	1230	2	2	1061	56
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	10	10	10	2	2	2	1	1	1
Cap, veh/h	257	0	141	81	9	93	423	2743	4	386	2614	138
Arrive On Green	0.08	0.00	0.08	0.08	0.00	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1358	0	1667	127	103	1099	502	3816	6	455	3636	192
Grp Volume(v), veh/h	49	0	74	52	0	0	46	600	632	2	549	568
Grp Sat Flow(s),veh/h/ln	1358	0	1667	1330	0	0	502	1863	1960	455	1881	1946
Q Serve(g_s), s	0.0	0.0	2.6	0.0	0.0	0.0	2.4	8.0	8.0	0.1	6.9	7.0
Cycle Q Clear(g_c), s	1.5	0.0	2.6	2.6	0.0	0.0	9.4	8.0	8.0	8.1	6.9	7.0
Prop In Lane	1.00		1.00	0.17		0.83	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	257	0	141	183	0	0	423	1339	1409	386	1352	1399
V/C Ratio(X)	0.19	0.00	0.53	0.28	0.00	0.00	0.11	0.45	0.45	0.01	0.41	0.41
Avail Cap(c_a), veh/h	640	0	611	600	0	0	423	1339	1409	386	1352	1399
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	26.3	26.0	0.0	0.0	5.2	3.5	3.5	5.2	3.3	3.3
Incr Delay (d2), s/veh	0.4	0.0	3.0	0.8	0.0	0.0	0.5	1.1	1.0	0.0	0.9	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(50%),veh/ln	0.8	0.0	1.3	0.9	0.0	0.0	0.4	4.4	4.6	0.0	3.8	4.0
LnGrp Delay(d),s/veh	26.2	0.0	29.3	26.8	0.0	0.0	5.7	4.6	4.5	5.2	4.3	4.2
LnGrp LOS	C		C	C			A	A	A	A	A	A
Approach Vol, veh/h		123			52			1278			1119	
Approach Delay, s/veh		28.1			26.8			4.6			4.2	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		48.9		11.1		48.9		11.1
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 26		22.0		* 26		22.0
Max Q Clear Time (g_c+I1), s		11.4		4.6		10.1		4.6
Green Ext Time (p_c), s		11.5		0.8		12.3		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	6.0
HCM 2010 LOS	A

Notes

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	2	10	0	8	0	1138	1	0	1068	4
Future Vol, veh/h	4	0	2	10	0	8	0	1138	1	0	1068	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	64	64	64	90	90	90	92	92	92
Heavy Vehicles, %	17	17	17	0	0	0	2	2	2	1	1	1
Mvmt Flow	7	0	3	16	0	13	0	1264	1	0	1161	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1795	2429	583	1845	2430	633	1165	0	0	1266	0	0
Stage 1	1163	1163	-	1265	1265	-	-	-	-	-	-	-
Stage 2	632	1266	-	580	1165	-	-	-	-	-	-	-
Critical Hdwy	7.84	6.84	7.24	7.5	6.5	6.9	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.84	5.84	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.84	5.84	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.17	3.47	3.5	4	3.3	2.22	-	-	2.21	-	-
Pot Cap-1 Maneuver	43	26	420	47	32	427	595	-	-	550	-	-
Stage 1	184	238	-	182	243	-	-	-	-	-	-	-
Stage 2	400	211	-	472	271	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	42	26	420	47	32	427	595	-	-	550	-	-
Mov Cap-2 Maneuver	42	26	-	47	32	-	-	-	-	-	-	-
Stage 1	184	238	-	182	243	-	-	-	-	-	-	-
Stage 2	388	211	-	468	271	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	76.6	75.2	0	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	595	-	-	60	78	550	-	-
HCM Lane V/C Ratio	-	-	-	0.167	0.361	-	-	-
HCM Control Delay (s)	0	-	-	76.6	75.2	0	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	1.4	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	14	1125	1	3	1077
Future Vol, veh/h	5	14	1125	1	3	1077
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	94	94	94	94
Heavy Vehicles, %	16	16	1	1	1	1
Mvmt Flow	8	23	1197	1	3	1146

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1776	599	0	0	1198	0
Stage 1	1197	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Critical Hdwy	7.12	7.22	-	-	4.12	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.66	3.46	-	-	2.21	-
Pot Cap-1 Maneuver	63	412	-	-	584	-
Stage 1	222	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	63	412	-	-	584	-
Mov Cap-2 Maneuver	163	-	-	-	-	-
Stage 1	222	-	-	-	-	-
Stage 2	484	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	294	584	-
HCM Lane V/C Ratio	-	-	0.108	0.005	-
HCM Control Delay (s)	-	-	18.7	11.2	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	37	1	0	5	35	844	1	16	575	31
Future Volume (veh/h)	26	0	37	1	0	5	35	844	1	16	575	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1709	2000	1942	1942	2000	1942	1942	2000
Adj Flow Rate, veh/h	36	0	51	1	0	7	39	948	1	19	676	36
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	17	17	17	3	3	3	3	3	3
Cap, veh/h	143	0	82	37	5	60	655	3223	3	528	3037	162
Arrive On Green	0.05	0.00	0.05	0.05	0.00	0.05	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	1403	0	1667	69	105	1219	728	3782	4	583	3563	190
Grp Volume(v), veh/h	36	0	51	8	0	0	39	462	487	19	350	362
Grp Sat Flow(s),veh/h/ln	1403	0	1667	1393	0	0	728	1845	1941	583	1845	1908
Q Serve(g_s), s	0.0	0.0	3.6	0.0	0.0	0.0	1.2	5.9	5.9	0.8	4.1	4.2
Cycle Q Clear(g_c), s	2.2	0.0	3.6	3.6	0.0	0.0	5.4	5.9	5.9	6.7	4.1	4.2
Prop In Lane	1.00		1.00	0.12		0.87	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	143	0	82	103	0	0	655	1572	1654	528	1572	1626
V/C Ratio(X)	0.25	0.00	0.62	0.08	0.00	0.00	0.06	0.29	0.29	0.04	0.22	0.22
Avail Cap(c_a), veh/h	343	0	319	303	0	0	655	1572	1654	528	1572	1626
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.3	0.0	55.9	54.5	0.0	0.0	2.1	1.7	1.7	2.4	1.6	1.6
Incr Delay (d2), s/veh	0.9	0.0	7.4	0.3	0.0	0.0	0.2	0.5	0.5	0.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.8	0.3	0.0	0.0	0.3	3.2	3.3	0.1	2.2	2.3
LnGrp Delay(d),s/veh	56.2	0.0	63.3	54.8	0.0	0.0	2.3	2.2	2.2	2.5	1.9	1.9
LnGrp LOS	E		E	D			A	A	A	A	A	A
Approach Vol, veh/h		87			8			988			731	
Approach Delay, s/veh		60.4			54.8			2.2			2.0	
Approach LOS		E			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		108.1		11.9		108.1		11.9
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 85		23.0		* 85		23.0
Max Q Clear Time (g_c+I1), s		7.9		5.6		8.7		5.6
Green Ext Time (p_c), s		15.3		0.3		15.3		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	5.1
HCM 2010 LOS	A

Notes

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	1	0	0	0	0	3	0	876	11	22	587	4
Future Vol, veh/h	1	0	0	0	0	3	0	876	11	22	587	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	60	60	60	89	89	89	81	81	81
Heavy Vehicles, %	0	0	0	100	100	100	3	3	3	3	3	3
Mvmt Flow	2	0	0	0	0	5	0	984	12	27	725	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1273	1778	365	1407	1774	498	730	0	0	997	0	0
Stage 1	781	781	-	990	990	-	-	-	-	-	-	-
Stage 2	492	997	-	417	784	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	9.5	8.5	8.9	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.5	5.5	-	8.5	7.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	8.5	7.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	4.5	5	4.3	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	126	83	638	41	29	324	863	-	-	684	-	-
Stage 1	358	408	-	135	168	-	-	-	-	-	-	-
Stage 2	532	325	-	384	231	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	120	80	638	40	28	324	863	-	-	684	-	-
Mov Cap-2 Maneuver	120	80	-	40	28	-	-	-	-	-	-	-
Stage 1	358	392	-	135	168	-	-	-	-	-	-	-
Stage 2	524	325	-	369	222	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	35.4	16.3	0	0.4
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	863	-	-	120	324	684	-	-
HCM Lane V/C Ratio	-	-	-	0.014	0.015	0.04	-	-
HCM Control Delay (s)	0	-	-	35.4	16.3	10.5	-	-
HCM Lane LOS	A	-	-	E	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	7	880	2	5	582
Future Vol, veh/h	3	7	880	2	5	582
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	87	87	86	86
Heavy Vehicles, %	30	30	3	3	3	3
Mvmt Flow	5	11	1011	2	6	677

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1363	507	0	0	1014	0
Stage 1	1013	-	-	-	-	-
Stage 2	350	-	-	-	-	-
Critical Hdwy	7.4	7.5	-	-	4.16	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	3.8	3.6	-	-	2.23	-
Pot Cap-1 Maneuver	108	443	-	-	674	-
Stage 1	255	-	-	-	-	-
Stage 2	608	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	107	443	-	-	674	-
Mov Cap-2 Maneuver	202	-	-	-	-	-
Stage 1	255	-	-	-	-	-
Stage 2	603	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.6	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 326	674	-
HCM Lane V/C Ratio	-	- 0.049	0.009	-
HCM Control Delay (s)	-	- 16.6	10.4	-
HCM Lane LOS	-	- C	B	-
HCM 95th %tile Q(veh)	-	- 0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	0	57	7	0	34	41	1051	2	2	955	53
Future Volume (veh/h)	38	0	57	7	0	34	41	1051	2	2	955	53
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1818	2000	1961	1961	2000	1980	1980	2000
Adj Flow Rate, veh/h	49	0	74	9	0	43	46	1168	2	2	1005	56
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	10	10	10	2	2	2	1	1	1
Cap, veh/h	153	0	115	42	8	70	467	3178	5	426	3018	168
Arrive On Green	0.07	0.00	0.07	0.07	0.00	0.07	0.83	0.83	0.83	0.83	0.83	0.83
Sat Flow, veh/h	1358	0	1667	95	117	1014	530	3816	7	482	3624	202
Grp Volume(v), veh/h	49	0	74	52	0	0	46	570	600	2	522	539
Grp Sat Flow(s),veh/h/ln	1358	0	1667	1226	0	0	530	1863	1960	482	1881	1945
Q Serve(g_s), s	0.0	0.0	5.2	0.3	0.0	0.0	2.6	8.9	8.9	0.1	7.7	7.7
Cycle Q Clear(g_c), s	4.2	0.0	5.2	5.5	0.0	0.0	10.3	8.9	8.9	9.0	7.7	7.7
Prop In Lane	1.00		1.00	0.17		0.83	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	153	0	115	120	0	0	467	1551	1632	426	1567	1619
V/C Ratio(X)	0.32	0.00	0.64	0.43	0.00	0.00	0.10	0.37	0.37	0.00	0.33	0.33
Avail Cap(c_a), veh/h	319	0	319	301	0	0	467	1551	1632	426	1567	1619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.0	0.0	54.4	53.9	0.0	0.0	3.5	2.4	2.4	3.5	2.3	2.3
Incr Delay (d2), s/veh	1.2	0.0	5.9	2.5	0.0	0.0	0.4	0.7	0.6	0.0	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	2.6	1.8	0.0	0.0	0.4	4.7	5.0	0.0	4.2	4.3
LnGrp Delay(d),s/veh	55.2	0.0	60.3	56.4	0.0	0.0	3.9	3.1	3.1	3.5	2.9	2.9
LnGrp LOS	E		E	E			A	A	A	A	A	A
Approach Vol, veh/h		123			52			1216			1063	
Approach Delay, s/veh		58.3			56.4			3.1			2.9	
Approach LOS		E			E			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		105.7		14.3		105.7		14.3
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 85		23.0		* 85		23.0
Max Q Clear Time (g_c+I1), s		12.3		7.2		11.0		7.5
Green Ext Time (p_c), s		27.1		0.7		27.2		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	6.9
HCM 2010 LOS	A

Notes

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	4	0	2	10	0	8	0	1082	1	0	1015	4
Future Vol, veh/h	4	0	2	10	0	8	0	1082	1	0	1015	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	64	64	64	90	90	90	92	92	92
Heavy Vehicles, %	17	17	17	0	0	0	2	2	2	1	1	1
Mvmt Flow	7	0	3	16	0	13	0	1202	1	0	1103	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1706	2308	554	1755	2311	602	1108	0	0	1203	0	0
Stage 1	1105	1105	-	1203	1203	-	-	-	-	-	-	-
Stage 2	601	1203	-	552	1108	-	-	-	-	-	-	-
Critical Hdwy	7.84	6.84	7.24	7.5	6.5	6.9	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.84	5.84	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.84	5.84	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.17	3.47	3.5	4	3.3	2.22	-	-	2.21	-	-
Pot Cap-1 Maneuver	50	31	439	55	39	448	626	-	-	581	-	-
Stage 1	200	255	-	199	260	-	-	-	-	-	-	-
Stage 2	419	227	-	491	288	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	49	31	439	55	39	448	626	-	-	581	-	-
Mov Cap-2 Maneuver	49	31	-	55	39	-	-	-	-	-	-	-
Stage 1	200	255	-	199	260	-	-	-	-	-	-	-
Stage 2	407	227	-	487	288	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	64.8	62.2	0	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	626	-	-	70	90	581	-	-
HCM Lane V/C Ratio	-	-	-	0.143	0.313	-	-	-
HCM Control Delay (s)	0	-	-	64.8	62.2	0	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	1.2	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	14	1069	1	3	1024
Future Vol, veh/h	5	14	1069	1	3	1024
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	94	94	94	94
Heavy Vehicles, %	16	16	1	1	1	1
Mvmt Flow	8	23	1137	1	3	1089

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1689	569	0	0	1138	0
Stage 1	1138	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Critical Hdwy	7.12	7.22	-	-	4.12	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.66	3.46	-	-	2.21	-
Pot Cap-1 Maneuver	73	431	-	-	615	-
Stage 1	240	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	73	431	-	-	615	-
Mov Cap-2 Maneuver	176	-	-	-	-	-
Stage 1	240	-	-	-	-	-
Stage 2	501	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	312	615	-
HCM Lane V/C Ratio	-	-	0.101	0.005	-
HCM Control Delay (s)	-	-	17.8	10.9	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	37	1	0	5	35	844	1	16	575	31
Future Volume (veh/h)	26	0	37	1	0	5	35	844	1	16	575	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1709	2000	1942	1942	2000	1942	1942	2000
Adj Flow Rate, veh/h	36	0	51	1	0	7	39	948	1	19	676	36
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	17	17	17	3	3	3	3	3	3
Cap, veh/h	227	0	110	74	5	83	612	2788	3	498	2627	140
Arrive On Green	0.07	0.00	0.07	0.07	0.00	0.07	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1403	0	1667	98	80	1247	728	3782	4	583	3563	190
Grp Volume(v), veh/h	36	0	51	8	0	0	39	462	487	19	350	362
Grp Sat Flow(s),veh/h/ln	1403	0	1667	1425	0	0	728	1845	1941	583	1845	1908
Q Serve(g_s), s	0.0	0.0	1.8	0.0	0.0	0.0	1.1	5.3	5.3	0.7	3.7	3.7
Cycle Q Clear(g_c), s	1.1	0.0	1.8	1.8	0.0	0.0	4.8	5.3	5.3	6.0	3.7	3.7
Prop In Lane	1.00		1.00	0.12		0.87	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	227	0	110	162	0	0	612	1360	1431	498	1360	1407
V/C Ratio(X)	0.16	0.00	0.46	0.05	0.00	0.00	0.06	0.34	0.34	0.04	0.26	0.26
Avail Cap(c_a), veh/h	648	0	611	586	0	0	612	1360	1431	498	1360	1407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	27.0	26.3	0.0	0.0	3.3	2.8	2.8	3.8	2.6	2.6
Incr Delay (d2), s/veh	0.3	0.0	3.0	0.1	0.0	0.0	0.2	0.7	0.6	0.1	0.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.9	0.1	0.0	0.0	0.3	2.8	3.0	0.1	2.0	2.1
LnGrp Delay(d),s/veh	27.0	0.0	30.0	26.4	0.0	0.0	3.5	3.4	3.4	4.0	3.0	3.0
LnGrp LOS	C		C	C			A	A	A	A	A	A
Approach Vol, veh/h		87			8			988			731	
Approach Delay, s/veh		28.7			26.4			3.4			3.0	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		10.0		50.0		10.0
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 26		22.0		* 26		22.0
Max Q Clear Time (g_c+I1), s		7.3		3.8		8.0		3.8
Green Ext Time (p_c), s		10.0		0.3		9.8		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	4.6
HCM 2010 LOS	A

Notes

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	1	0	0	0	0	3	0	876	11	22	587	4
Future Vol, veh/h	1	0	0	0	0	3	0	876	11	22	587	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	60	60	60	89	89	89	81	81	81
Heavy Vehicles, %	0	0	0	100	100	100	3	3	3	3	3	3
Mvmt Flow	2	0	0	0	0	5	0	984	12	27	725	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1273	1778	365	1407	1774	498	730	0	0	997	0	0
Stage 1	781	781	-	990	990	-	-	-	-	-	-	-
Stage 2	492	997	-	417	784	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	9.5	8.5	8.9	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.5	5.5	-	8.5	7.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	8.5	7.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	4.5	5	4.3	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	126	83	638	41	29	324	863	-	-	684	-	-
Stage 1	358	408	-	135	168	-	-	-	-	-	-	-
Stage 2	532	325	-	384	231	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	120	80	638	40	28	324	863	-	-	684	-	-
Mov Cap-2 Maneuver	120	80	-	40	28	-	-	-	-	-	-	-
Stage 1	358	392	-	135	168	-	-	-	-	-	-	-
Stage 2	524	325	-	369	222	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	35.4	16.3	0	0.4
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	863	-	-	120	324	684	-	-
HCM Lane V/C Ratio	-	-	-	0.014	0.015	0.04	-	-
HCM Control Delay (s)	0	-	-	35.4	16.3	10.5	-	-
HCM Lane LOS	A	-	-	E	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.1	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	7	880	2	5	582
Future Vol, veh/h	3	7	880	2	5	582
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	87	87	86	86
Heavy Vehicles, %	30	30	3	3	3	3
Mvmt Flow	5	11	1011	2	6	677

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1363	507	0	0	1014	0
Stage 1	1013	-	-	-	-	-
Stage 2	350	-	-	-	-	-
Critical Hdwy	7.4	7.5	-	-	4.16	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	3.8	3.6	-	-	2.23	-
Pot Cap-1 Maneuver	108	443	-	-	674	-
Stage 1	255	-	-	-	-	-
Stage 2	608	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	107	443	-	-	674	-
Mov Cap-2 Maneuver	202	-	-	-	-	-
Stage 1	255	-	-	-	-	-
Stage 2	603	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.6	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	326	674	-
HCM Lane V/C Ratio	-	-	0.049	0.009	-
HCM Control Delay (s)	-	-	16.6	10.4	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	0	57	7	0	34	41	1051	2	2	955	53
Future Volume (veh/h)	38	0	57	7	0	34	41	1051	2	2	955	53
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1818	2000	1961	1961	2000	1980	1980	2000
Adj Flow Rate, veh/h	49	0	74	9	0	43	46	1168	2	2	1005	56
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	10	10	10	2	2	2	1	1	1
Cap, veh/h	257	0	141	81	9	93	444	2743	5	407	2605	145
Arrive On Green	0.08	0.00	0.08	0.08	0.00	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1358	0	1667	127	103	1099	530	3816	7	482	3624	202
Grp Volume(v), veh/h	49	0	74	52	0	0	46	570	600	2	522	539
Grp Sat Flow(s),veh/h/ln	1358	0	1667	1330	0	0	530	1863	1960	482	1881	1945
Q Serve(g_s), s	0.0	0.0	2.6	0.0	0.0	0.0	2.2	7.4	7.4	0.1	6.5	6.5
Cycle Q Clear(g_c), s	1.5	0.0	2.6	2.6	0.0	0.0	8.7	7.4	7.4	7.5	6.5	6.5
Prop In Lane	1.00		1.00	0.17		0.83	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	257	0	141	183	0	0	444	1339	1409	407	1352	1398
V/C Ratio(X)	0.19	0.00	0.53	0.28	0.00	0.00	0.10	0.43	0.43	0.00	0.39	0.39
Avail Cap(c_a), veh/h	640	0	611	600	0	0	444	1339	1409	407	1352	1398
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	26.3	26.0	0.0	0.0	5.0	3.4	3.4	4.9	3.3	3.3
Incr Delay (d2), s/veh	0.4	0.0	3.0	0.8	0.0	0.0	0.5	1.0	0.9	0.0	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.3	0.9	0.0	0.0	0.4	4.0	4.2	0.0	3.6	3.8
LnGrp Delay(d),s/veh	26.2	0.0	29.3	26.8	0.0	0.0	5.4	4.4	4.4	5.0	4.1	4.1
LnGrp LOS	C		C	C			A	A	A	A	A	A
Approach Vol, veh/h		123			52			1216			1063	
Approach Delay, s/veh		28.1			26.8			4.4			4.1	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		48.9		11.1		48.9		11.1
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 26		22.0		* 26		22.0
Max Q Clear Time (g_c+I1), s		10.7		4.6		9.5		4.6
Green Ext Time (p_c), s		11.5		0.8		12.1		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	5.9
HCM 2010 LOS	A

Notes

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	4	0	2	10	0	8	0	1082	1	0	1015	4
Future Vol, veh/h	4	0	2	10	0	8	0	1082	1	0	1015	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	64	64	64	90	90	90	92	92	92
Heavy Vehicles, %	17	17	17	0	0	0	2	2	2	1	1	1
Mvmt Flow	7	0	3	16	0	13	0	1202	1	0	1103	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1706	2308	554	1755	2311	602	1108	0	0	1203	0	0
Stage 1	1105	1105	-	1203	1203	-	-	-	-	-	-	-
Stage 2	601	1203	-	552	1108	-	-	-	-	-	-	-
Critical Hdwy	7.84	6.84	7.24	7.5	6.5	6.9	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.84	5.84	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.84	5.84	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.17	3.47	3.5	4	3.3	2.22	-	-	2.21	-	-
Pot Cap-1 Maneuver	50	31	439	55	39	448	626	-	-	581	-	-
Stage 1	200	255	-	199	260	-	-	-	-	-	-	-
Stage 2	419	227	-	491	288	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	49	31	439	55	39	448	626	-	-	581	-	-
Mov Cap-2 Maneuver	49	31	-	55	39	-	-	-	-	-	-	-
Stage 1	200	255	-	199	260	-	-	-	-	-	-	-
Stage 2	407	227	-	487	288	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	64.8	62.2	0	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	626	-	-	70	90	581	-	-
HCM Lane V/C Ratio	-	-	-	0.143	0.313	-	-	-
HCM Control Delay (s)	0	-	-	64.8	62.2	0	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	1.2	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	14	1069	1	3	1024
Future Vol, veh/h	5	14	1069	1	3	1024
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	94	94	94	94
Heavy Vehicles, %	16	16	1	1	1	1
Mvmt Flow	8	23	1137	1	3	1089

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1689	569	0	0	1138	0
Stage 1	1138	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Critical Hdwy	7.82	7.22	-	-	4.12	-
Critical Hdwy Stg 1	6.82	-	-	-	-	-
Critical Hdwy Stg 2	6.82	-	-	-	-	-
Follow-up Hdwy	3.66	3.46	-	-	2.21	-
Pot Cap-1 Maneuver	53	431	-	-	615	-
Stage 1	192	-	-	-	-	-
Stage 2	452	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	53	431	-	-	615	-
Mov Cap-2 Maneuver	142	-	-	-	-	-
Stage 1	192	-	-	-	-	-
Stage 2	450	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 281	615	-
HCM Lane V/C Ratio	-	- 0.113	0.005	-
HCM Control Delay (s)	-	- 19.4	10.9	-
HCM Lane LOS	-	- C	B	-
HCM 95th %tile Q(veh)	-	- 0.4	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	37	1	0	5	35	920	1	16	608	31
Future Volume (veh/h)	26	0	37	1	0	5	35	920	1	16	608	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1709	2000	1942	1942	2000	1942	1942	2000
Adj Flow Rate, veh/h	36	0	51	1	0	7	39	1034	1	19	715	36
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	17	17	17	3	3	3	3	3	3
Cap, veh/h	143	0	82	37	5	60	632	3223	3	488	3047	153
Arrive On Green	0.05	0.00	0.05	0.05	0.00	0.05	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	1403	0	1667	69	105	1219	702	3782	4	538	3575	180
Grp Volume(v), veh/h	36	0	51	8	0	0	39	504	531	19	369	382
Grp Sat Flow(s),veh/h/ln	1403	0	1667	1393	0	0	702	1845	1941	538	1845	1910
Q Serve(g_s), s	0.0	0.0	3.6	0.0	0.0	0.0	1.3	6.7	6.7	0.9	4.4	4.4
Cycle Q Clear(g_c), s	2.2	0.0	3.6	3.6	0.0	0.0	5.7	6.7	6.7	7.6	4.4	4.4
Prop In Lane	1.00		1.00	0.12		0.87	1.00		0.00	1.00		0.09
Lane Grp Cap(c), veh/h	143	0	82	103	0	0	632	1572	1654	488	1572	1628
V/C Ratio(X)	0.25	0.00	0.62	0.08	0.00	0.00	0.06	0.32	0.32	0.04	0.23	0.23
Avail Cap(c_a), veh/h	343	0	319	303	0	0	632	1572	1654	488	1572	1628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.3	0.0	55.9	54.5	0.0	0.0	2.2	1.8	1.8	2.6	1.6	1.6
Incr Delay (d2), s/veh	0.9	0.0	7.4	0.3	0.0	0.0	0.2	0.5	0.5	0.1	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.8	0.3	0.0	0.0	0.3	3.6	3.8	0.2	2.3	2.5
LnGrp Delay(d),s/veh	56.2	0.0	63.3	54.8	0.0	0.0	2.4	2.3	2.3	2.7	2.0	2.0
LnGrp LOS	E		E	D			A	A	A	A	A	A
Approach Vol, veh/h		87			8			1074			770	
Approach Delay, s/veh		60.4			54.8			2.3			2.0	
Approach LOS		E			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		108.1		11.9		108.1		11.9
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 85		23.0		* 85		23.0
Max Q Clear Time (g_c+I1), s		8.7		5.6		9.6		5.6
Green Ext Time (p_c), s		17.6		0.3		17.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	5.0
HCM 2010 LOS	A

Notes

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	0	21	0	0	3	4	921	11	22	617	7
Future Vol, veh/h	32	0	21	0	0	3	4	921	11	22	617	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	60	60	60	89	89	89	81	81	81
Heavy Vehicles, %	2	2	2	100	100	100	3	3	3	3	3	3
Mvmt Flow	35	0	23	0	0	5	4	1035	12	27	762	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1346	1876	385	1485	1875	524	770	0	0	1047	0	0
Stage 1	820	820	-	1050	1050	-	-	-	-	-	-	-
Stage 2	526	1056	-	435	825	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	9.5	8.5	8.9	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.54	5.54	-	8.5	7.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	8.5	7.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	4.5	5	4.3	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	110	71	613	35	24	308	834	-	-	654	-	-
Stage 1	335	387	-	120	154	-	-	-	-	-	-	-
Stage 2	503	300	-	371	217	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	104	68	613	33	23	308	834	-	-	654	-	-
Mov Cap-2 Maneuver	104	68	-	33	23	-	-	-	-	-	-	-
Stage 1	333	371	-	119	153	-	-	-	-	-	-	-
Stage 2	492	299	-	342	208	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	41.4	16.9	0	0.4
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	834	-	-	155	308	654	-	-
HCM Lane V/C Ratio	0.005	-	-	0.372	0.016	0.042	-	-
HCM Control Delay (s)	9.3	-	-	41.4	16.9	10.7	-	-
HCM Lane LOS	A	-	-	E	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.6	0	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	7	929	2	5	633
Future Vol, veh/h	3	7	929	2	5	633
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	87	87	86	86
Heavy Vehicles, %	30	30	3	3	3	3
Mvmt Flow	5	11	1068	2	6	736

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1449	535	0	0	1070	0
Stage 1	1069	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Critical Hdwy	7.4	7.5	-	-	4.16	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	3.8	3.6	-	-	2.23	-
Pot Cap-1 Maneuver	94	424	-	-	641	-
Stage 1	236	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	93	424	-	-	641	-
Mov Cap-2 Maneuver	186	-	-	-	-	-
Stage 1	236	-	-	-	-	-
Stage 2	580	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	306	641	-
HCM Lane V/C Ratio	-	-	0.052	0.009	-
HCM Control Delay (s)	-	-	17.4	10.7	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	0	57	7	0	34	41	1116	2	2	1029	53
Future Volume (veh/h)	38	0	57	7	0	34	41	1116	2	2	1029	53
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1818	2000	1961	1961	2000	1980	1980	2000
Adj Flow Rate, veh/h	49	0	74	9	0	43	46	1240	2	2	1083	56
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	10	10	10	2	2	2	1	1	1
Cap, veh/h	153	0	115	42	8	70	435	3178	5	399	3031	157
Arrive On Green	0.07	0.00	0.07	0.07	0.00	0.07	0.83	0.83	0.83	0.83	0.83	0.83
Sat Flow, veh/h	1358	0	1667	95	117	1014	492	3816	6	451	3640	188
Grp Volume(v), veh/h	49	0	74	52	0	0	46	605	637	2	560	579
Grp Sat Flow(s),veh/h/ln	1358	0	1667	1226	0	0	492	1863	1960	451	1881	1947
Q Serve(g_s), s	0.0	0.0	5.2	0.3	0.0	0.0	2.9	9.7	9.7	0.1	8.5	8.5
Cycle Q Clear(g_c), s	4.2	0.0	5.2	5.5	0.0	0.0	11.5	9.7	9.7	9.8	8.5	8.5
Prop In Lane	1.00		1.00	0.17		0.83	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	153	0	115	120	0	0	435	1551	1632	399	1567	1621
V/C Ratio(X)	0.32	0.00	0.64	0.43	0.00	0.00	0.11	0.39	0.39	0.01	0.36	0.36
Avail Cap(c_a), veh/h	319	0	319	301	0	0	435	1551	1632	399	1567	1621
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.0	0.0	54.4	53.9	0.0	0.0	3.8	2.5	2.5	3.7	2.4	2.4
Incr Delay (d2), s/veh	1.2	0.0	5.9	2.5	0.0	0.0	0.5	0.7	0.7	0.0	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	2.6	1.8	0.0	0.0	0.5	5.2	5.4	0.0	4.6	4.8
LnGrp Delay(d),s/veh	55.2	0.0	60.3	56.4	0.0	0.0	4.2	3.2	3.2	3.7	3.0	3.0
LnGrp LOS	E		E	E			A	A	A	A	A	A
Approach Vol, veh/h		123			52			1288			1141	
Approach Delay, s/veh		58.3			56.4			3.2			3.0	
Approach LOS		E			E			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		105.7		14.3		105.7		14.3
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 85		23.0		* 85		23.0
Max Q Clear Time (g_c+I1), s		13.5		7.2		11.8		7.5
Green Ext Time (p_c), s		30.9		0.7		31.2		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	6.8
HCM 2010 LOS	A

Notes

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	0	12	10	0	8	25	1138	1	0	1068	25
Future Vol, veh/h	13	0	12	10	0	8	25	1138	1	0	1068	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	64	64	64	90	90	90	92	92	92
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	1	1	1
Mvmt Flow	14	0	13	16	0	13	28	1264	1	0	1161	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1862	2495	594	1901	2509	633	1188	0	0	1266	0	0
Stage 1	1174	1174	-	1321	1321	-	-	-	-	-	-	-
Stage 2	688	1321	-	580	1188	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.5	6.5	6.9	4.14	-	-	4.12	-	-
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	3.52	4.02	3.32	3.5	4	3.3	2.22	-	-	2.21	-	-
Pot Cap-1 Maneuver	45	29	448	43	29	427	583	-	-	550	-	-
Stage 1	204	264	-	168	228	-	-	-	-	-	-	-
Stage 2	403	224	-	472	264	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	42	28	448	40	28	427	583	-	-	550	-	-
Mov Cap-2 Maneuver	42	28	-	40	28	-	-	-	-	-	-	-
Stage 1	194	264	-	160	217	-	-	-	-	-	-	-
Stage 2	372	213	-	458	264	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	79.5	93.1	0.2	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	583	-	-	74	67	550	-	-
HCM Lane V/C Ratio	0.048	-	-	0.367	0.42	-	-	-
HCM Control Delay (s)	11.5	-	-	79.5	93.1	0	-	-
HCM Lane LOS	B	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.4	1.6	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	14	1150	1	3	1087
Future Vol, veh/h	5	14	1150	1	3	1087
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	94	94	94	94
Heavy Vehicles, %	16	16	1	1	1	1
Mvmt Flow	8	23	1223	1	3	1156

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1809	612	0	0	1224	0
Stage 1	1224	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Critical Hdwy	7.12	7.22	-	-	4.12	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.66	3.46	-	-	2.21	-
Pot Cap-1 Maneuver	60	403	-	-	571	-
Stage 1	215	-	-	-	-	-
Stage 2	483	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	60	403	-	-	571	-
Mov Cap-2 Maneuver	158	-	-	-	-	-
Stage 1	215	-	-	-	-	-
Stage 2	480	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	286	571	-
HCM Lane V/C Ratio	-	-	0.111	0.006	-
HCM Control Delay (s)	-	-	19.1	11.3	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	37	1	0	5	35	920	1	16	608	31
Future Volume (veh/h)	26	0	37	1	0	5	35	920	1	16	608	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1709	2000	1942	1942	2000	1942	1942	2000
Adj Flow Rate, veh/h	36	0	51	1	0	7	39	1034	1	19	715	36
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	17	17	17	3	3	3	3	3	3
Cap, veh/h	227	0	110	74	5	83	591	2788	3	463	2635	133
Arrive On Green	0.07	0.00	0.07	0.07	0.00	0.07	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1403	0	1667	98	80	1247	702	3782	4	538	3575	180
Grp Volume(v), veh/h	36	0	51	8	0	0	39	504	531	19	369	382
Grp Sat Flow(s),veh/h/ln	1403	0	1667	1425	0	0	702	1845	1941	538	1845	1910
Q Serve(g_s), s	0.0	0.0	1.8	0.0	0.0	0.0	1.2	5.9	5.9	0.8	3.9	3.9
Cycle Q Clear(g_c), s	1.1	0.0	1.8	1.8	0.0	0.0	5.1	5.9	5.9	6.7	3.9	3.9
Prop In Lane	1.00		1.00	0.12		0.87	1.00		0.00	1.00		0.09
Lane Grp Cap(c), veh/h	227	0	110	162	0	0	591	1360	1431	463	1360	1408
V/C Ratio(X)	0.16	0.00	0.46	0.05	0.00	0.00	0.07	0.37	0.37	0.04	0.27	0.27
Avail Cap(c_a), veh/h	648	0	611	586	0	0	591	1360	1431	463	1360	1408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	27.0	26.3	0.0	0.0	3.4	2.9	2.9	4.1	2.6	2.6
Incr Delay (d2), s/veh	0.3	0.0	3.0	0.1	0.0	0.0	0.2	0.8	0.7	0.2	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.9	0.1	0.0	0.0	0.3	3.2	3.4	0.1	2.1	2.2
LnGrp Delay(d),s/veh	27.0	0.0	30.0	26.4	0.0	0.0	3.6	3.6	3.6	4.2	3.1	3.1
LnGrp LOS	C		C	C			A	A	A	A	A	A
Approach Vol, veh/h		87			8			1074			770	
Approach Delay, s/veh		28.7			26.4			3.6			3.1	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		10.0		50.0		10.0
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 26		22.0		* 26		22.0
Max Q Clear Time (g_c+I1), s		7.9		3.8		8.7		3.8
Green Ext Time (p_c), s		10.6		0.3		10.3		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	4.6
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	0	57	7	0	34	41	1116	2	2	1029	53
Future Volume (veh/h)	38	0	57	7	0	34	41	1116	2	2	1029	53
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	2000	2000	1818	2000	1961	1961	2000	1980	1980	2000
Adj Flow Rate, veh/h	49	0	74	9	0	43	46	1240	2	2	1083	56
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	10	10	10	2	2	2	1	1	1
Cap, veh/h	257	0	141	81	9	93	415	2744	4	383	2617	135
Arrive On Green	0.08	0.00	0.08	0.08	0.00	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1358	0	1667	127	103	1099	492	3816	6	451	3640	188
Grp Volume(v), veh/h	49	0	74	52	0	0	46	605	637	2	560	579
Grp Sat Flow(s),veh/h/ln	1358	0	1667	1330	0	0	492	1863	1960	451	1881	1947
Q Serve(g_s), s	0.0	0.0	2.6	0.0	0.0	0.0	2.5	8.1	8.1	0.1	7.1	7.1
Cycle Q Clear(g_c), s	1.5	0.0	2.6	2.6	0.0	0.0	9.6	8.1	8.1	8.2	7.1	7.1
Prop In Lane	1.00		1.00	0.17		0.83	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	257	0	141	183	0	0	415	1339	1409	383	1352	1400
V/C Ratio(X)	0.19	0.00	0.53	0.28	0.00	0.00	0.11	0.45	0.45	0.01	0.41	0.41
Avail Cap(c_a), veh/h	640	0	611	600	0	0	415	1339	1409	383	1352	1400
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	26.3	26.0	0.0	0.0	5.3	3.5	3.5	5.2	3.4	3.4
Incr Delay (d2), s/veh	0.4	0.0	3.0	0.8	0.0	0.0	0.5	1.1	1.0	0.0	0.9	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(50%),veh/ln	0.8	0.0	1.3	0.9	0.0	0.0	0.4	4.4	4.7	0.0	3.9	4.1
LnGrp Delay(d),s/veh	26.2	0.0	29.3	26.8	0.0	0.0	5.8	4.6	4.6	5.2	4.3	4.3
LnGrp LOS	C		C	C			A	A	A	A	A	A
Approach Vol, veh/h		123			52			1288			1141	
Approach Delay, s/veh		28.1			26.8			4.6			4.3	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		48.9		11.1		48.9		11.1
Change Period (Y+Rc), s		* 5.8		6.0		* 5.8		6.0
Max Green Setting (Gmax), s		* 26		22.0		* 26		22.0
Max Q Clear Time (g_c+I1), s		11.6		4.6		10.2		4.6
Green Ext Time (p_c), s		11.5		0.8		12.4		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	6.0
HCM 2010 LOS	A

Notes

NOVI ROAD & SITE DRIVE RT LANE WARRANT

WARRANTS FOR RIGHT TURN DECELERATION LANE OR TAPER

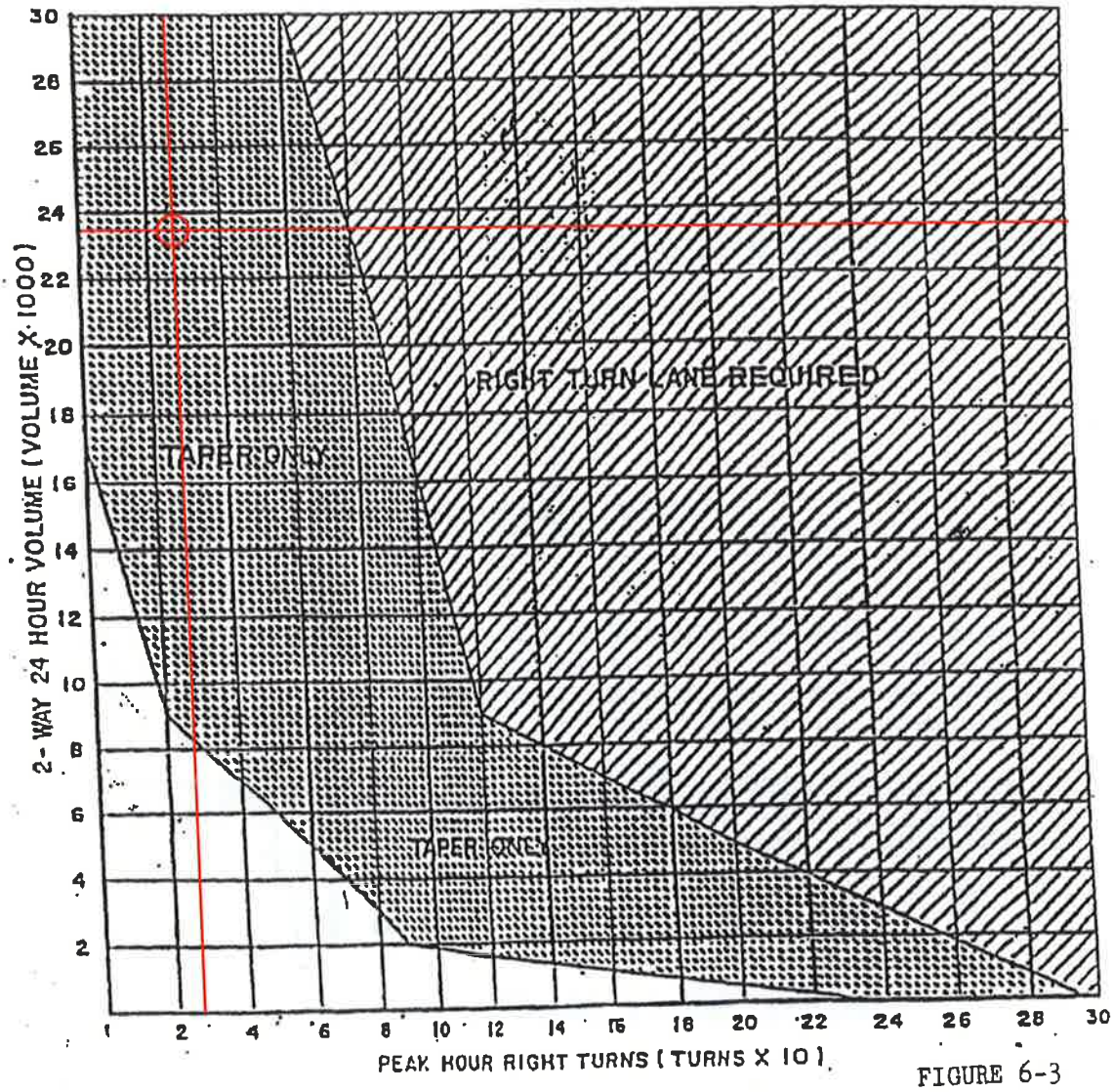


FIGURE 6-3

2012 ADT = 20,692
+ 1% per year to 2021 = 22,631
+ 808 new daily trips
= 23,439 2021 two-way 24 hour volume

AM: 7
PM: 25

RT DECELERATION TAPER REQUIRED

PLANNING COMMISSION MEETING MINUTES FROM PUBLIC HEARING
MAY 10, 2017

REGULAR MEETING - PLANNING COMMISSION

CITY OF NOVI

May 10, 2017

Proceedings taken in the matter of the PLANNING COMMISSION, at City of Novi, 45175 West Ten Mile Road, Novi, Michigan, on Wednesday, May 10, 2017

BOARD MEMBERS

Mark Pehrson, Chairperson

Robert Giacopetti

Michael Lynch

John Avdoulos

David Greco

Tony Anthony

ALSO PRESENT: Sri Komaragiri, City Planner

Rick Meader, Landscape Architect, Thomas Schultz, City Attorney, Kirsten Mellem, City Planner, Darcie Reichiten, Engineer

Certified Shorthand Reporter: Jennifer L. Wall

Novi, Michigan.

Wednesday, May 10, 2017

7:00 p.m.

** ** **

CHAIRPERSON PEHRSON: I'd like to call to order the May 10 regular meeting of the Planning Commission.

Sri, can you call the roll, please.

MS. KOMARAGIRI: Good evening. Member Anthony?

MR. ANTHONY: Here.

MS. KOMARAGIRI: Member Avdoulos?

MR. AVDOULOS: Here.

MS. KOMARAGIRI: Member Giacopetti?

MR. GIACOPETTI: Here.

MS. KOMARAGIRI: Member Greco?

MR. GRECO: Here.

MS. KOMARAGIRI: Member Lynch?

MR. LYNCH: Here.

MS. KOMARAGIRI: Chair Pehrson?

CHAIRPERSON PEHRSON: Here.

MS. KOMARAGIRI: Member Zuchlewski?

CHAIRPERSON PEHRSON: Absent, excused because he's not here.

If we could stand for the Pledge of Allegiance.

(Pledge recited.)

CHAIRPERSON PEHRSON: Look for a motion to approve the agenda.

MR. LYNCH: Motion to approve.

MR. ANTHONY: Second.

CHAIRPERSON PEHRSON: We have a motion and a second. All those in favor say aye.

THE BOARD: Aye.

CHAIRPERSON PEHRSON: None opposed. We have an agenda.

Comes to our first audience participation. We have four public hearings on tonight's agenda. If there is anyone in the audience that wishes to address the Planning Commission on some other matter, at this point, please step forward.

Seeing no one, we will close the first audience participation.

I don't believe we have any correspondence.

MR. GRECO: No correspondence other than related to the public hearings.

CHAIRPERSON PEHRSON: Committee reports? City planner reports? Sri. Good evening.

MS. KOMARAGIRI: Barbara is at a planning conference in New York this week. She will be back on Monday. We didn't have anything.

CHAIRPERSON PEHRSON: Thank you.

That brings us to our first public hearing, Princeton Park, JSP17-01, zoning map amendment 18.717. It's a public hearing at the request of Pulte Homes for the Planning Commission's recommendation to City Council for a planned rezoning overlay associated with the zoning map amendment in the OS1 office service to RM2 high density multi-family residential. Subject property

is approximately 24 acres and is located west of Novi Road north of Ten Mile in Section 22. The applicant is proposing a development of 125 unit multi-family attached condominiums with frontage and access to Novi Road.

Kirsten, Sri?

MS. KOMARAGIRI: Thank you. I'm sorry. It didn't show up on the screen. There it is.

The applicant is requesting a zoning map amendment utilizing the planned rezoning overlay option to rezone the subject property to RM-2 in order to propose a 125 unit attached single family development.

The subject property is located west of Novi Road, north of Ten Mile in Section 22.

It is zoned OS-1, office service and is being used as vacant storage lot as a long-standing legal non-confirming use.

All properties east of Novi Road across the subject property are zoned

and developed as I1 and I2 industrial users. They are master planned for industrial uses as well. Properties to the north are zoned OS-1. The post office is located on the property directly north of the subject property.

The other property abutting on the north is owned by the city. The remaining property has an existing wireless tower located. The future uses of these properties are very unlikely to change.

The property on the south is currently vacant and can be developed with the existing allowed office uses, or may be rezoned to master plan commercial uses.

The property to the west is zoned R4 and is currently developed as single family detached housing.

The property contains few regulated woodlands and a large portion of wetlands with an open body of water to the south, which is proposed to be preserved.

The plan was presented to

master planning and zoning committee on March 28 of 2017. The change from office to residential use received fairly good comments from the committee with a note to work with the staff on other plans. Plan review letters summarized the recommendations provided at the meeting.

The applicant is proposing 125 three-bedroom multi family units for sale residential development with frontage and access to Novi Road. The PRO concept plan shows two detention ponds on either side of the proposed entrance boulevard.

The detention ponds also serve as screening from Novi Road frontage. The concept plan also includes pocket parks and pedestrian walks spread throughout the development for active and passive recreation.

All proposed internal roads are private. This is not a gated community. The applicant is proposing to complete the construction in two phases. The concept

plan -- as part of the subject requirements, the applicant has provided a traffic impact study, a rezoning narrative and a land use narrative prepared by CIP Planning along with the site plans which are included in your packet.

The applicant is proposing a maximum density of 6.4 dwelling units per acre. The applicant initially proposed a zoning change to RN-1 with allowable maximum density of 5.4. Density deviations cannot be granted as part of PRO process, so the applicant has changed the request to RN-2, which allows the proposed density of (unintelligible).

Staff believes that RM1 will be more appropriate to the low rise housing style the applicant is proposing and will be more compatible with the surroundings. We think it would create a more logical transition between the non-residential district, the major thoroughfare and a single family development to the west. Staff

requests the applicant to reconsider and revise the density to meet the RM1 requirements. The proposed use, even though not supported by master plan, is partly justified by the proximity to the Town Center. As one of the public benefits, the applicant is proposing pedestrian enhancements along Novi Road to increase pedestrian connectivity to the residential development to Novi Town Center. Without a proper visual and pedestrian connection to Town Center, the development will be compatible with surrounding existing using along Novi Road. The applicant is suggested to initiate discussions with Road Commission of Oakland County who has jurisdiction over Novi Road prior to PRO approval to estimate the feasibility of that benefit.

Planning is not recommending approval for many reasons listed in the letter. Planning recommends the applicant to reconsider the proposed public benefits to serve the intent of the ordinance. Also

recommends some changes to the proposed layout, which we believe will result in slightly lower density and keep it within RM1 and eliminate a couple planning deviations.

The applicant is proposing private drives, public water and sewer and two above ground storm water detention ponds on the site. The proposed density may require additional contractual sewer capacity down the street of Eight Mile Road, as the density increases results in high sanitary sewer discharge.

Engineering supports the two deviations identified in the letter, one for not providing a stub street to adjacent properties and two to reduce the distance between the sidewalk and the road. Engineering recommends approval.

The conceptual landscape plans have a number of landscape deviations proposed, some of which are supported and some are not. The applicant agreed to revise the plans to eliminate two of those

deviations. The others include deviations to street trees, berm requirements and sub canopy tree requirements as listed in the motion sheet.

The basic concept and layout indicate that there is sufficient room provided to meet some of the city requirements. Landscape recommends approval with comments we addressed at the time of preliminary site plan.

A minimum 0.09 acre of wetland impacts are proposed. Wetlands are recommending approval, noting that a wetland minor use permit and authorizations to encroach into wetlands buffers would be required at the time of preliminary site plan.

There are 262 regulated trees on the site, of which 54 trees, about 20 percent of the total, are proposed to be removed. Woodlands are recommending approval noting that a woodland permit would be required at the time of preliminary site

plan.

The city's traffic consultant has reviewed the rezoning traffic impact study, and notes that additional information is required to determine the impacts of the proposed rezoning as compared to existing land use. Additional improvement along Novi Road are warranted. The review states that there were no background developments identified near the study area, which needs revising the study with the possible development within the radius of the future residential developments onto Novi Road. The applicant has agreed to revise the plan to meet the code and is not requesting the two deviations identified by traffic in the review letter. Traffic recommends approval.

Facade couldn't make a proper determination of compliance with facade ordinance, due to insufficient (unintelligible) but the applicant agreed to comply with requirements at the time of preliminary site plan. Scaled elevations are

typically required with PRO. If deviations are not identified at the time fo PRO approval, the applicant has to comply with the requirements at the time of preliminary site plan. Facade notes that the applicant shall meet the minimum 30% brick on all facade and maximum asphalt requirements.

The site plan proposes secondary emergency access with turf pavers instead of the preferred asphalt paving. Fire requested the applicant to design the path with landscaping and/or signage and to mow and keep it clear at all times for the safety of the fire trucks. Fire requested original comments to be addressed with the revised submitted. Fire recommends approval.

Planning Commission is asked tonight to hold a public hearing and make recommendation on proposed PRO and concept plan to City Council. The applicant, Joe Skore, from Pulte Homes is here with his engineer, Bill Anderson, and they would like to make a small presentation on the project

and the public benefits.

We have a traffic consultant, Sterling Frazier, and wetland consultants Pete Hill and Matt Carmer, along with staff to answer any questions you may have for us. Thank you for your time.

CHAIRPERSON PEHRSON: Thank you. Do you wish to address the Planning Commission. If we could, could we get the maps on the screen in front of us. We have got nothing.

MR. SKORE: Good evening. My name is Joe Skore. I am the director of land for Pulte Homes of Michigan.

We are very excited about this project. We feel that it will be a high quality, highly successful community, much like our latest grand opening in the City of Novi, our Overland community, which he opened probably two or three months ago. It was a fantastic grand opening. We are thrilled with the start.

Little bit of history on this

project. We have been working with staff on this proposal for probably six or seven months. We have revised the plan, you know, two or three times in accordance with staff's review, their comments, their suggestions. Changes have been positive overall. We do meet with the master plan zoning committee in late March. We got some great feedback. And overall, again, that was another positive meeting.

We met with -- I think this is important. We met with the residents of the neighboring subdivision, Churchill Crossing subdivision, which is the residential community just to the west. It's contiguous to this property. We initially met with the HOA board, and then subsequent to that we attended their annual meeting, did a presentation, got great feedback, a lot of great questions. And we feel -- I think there is a few members of the community here tonight. We feel that we walked away and we feel the residents overall liked the

development and supported the development.

With that, I am going let the project engineer get into, you know, the site details. Thank you.

MR. ANDERSON: Good evening. My name is Bill Anderson. I'm with Atwell. I kind of want to walk through our thought process on this. As you can tell, we have already renamed the project, Emerson Park. It was submitted as Princeton Park. There was a lot of discussion with your team and ours to change that and we have. Again, we are excited tonight. We are looking at a 125 unit townhome development on 24 acres.

To bring you in a little bit, there is our site on Novi Road, south of Grand River, about a half mile from your downtown core there. We have adjacent residential to the west, some industrial that is the CAT dealership is across the street from us on Novi, you know where that is. We are somewhere mid-point between Ten and Grand River there, our site.

Next screen, please. There is our parcel as it sits today. Again, it's vehicle RV storage. There is some tires. It's kind of a -- somewhat blighted. It's been there for quite sometime. We are excited about doing some redevelopment opportunity on that. You will note there is a pretty significant wetland pond on the complex along the south perimeter of the south third, has that steep slope and wetland there, so that's the parcel that we are talking about.

Next slide. As we looked at the zoning, again it's currently it's an office zoning, with an eye towards community office, which is a little more smaller scale office with multiple uses. That is where your master plan wanted to go with this. We looked into it -- go to the next slide, please.

So we saw your master plan with the community office, and we looked at your master plan. Your master plan talks

about a couple things that was important, relevant to us. There is a real desire in the city for a full range of housing options, for all residents. That was pretty clear. There is an over-saturation of your office inventory currently in the city, that was interesting. I will talk a little bit more about that later. We talked about strategic residential locations. The ability to consider those. A unique location may be transitional parcel, an isolated site, may be proximity to downtown, so there was a real point to consider strategic residential locations. Promote economic development is important to the master plan. Preservation of natural features, that's a continued theme in the city here, of course. And then talk about pedestrian enhancement along Novi Road.

Our project team -- we actually consulted with a third-party planning consultant, who knows the city pretty well, CIB planning and talked about the viability for this townhouse development

in this area. And what we've concluded, kind of a couple of points, the proposal is really a small department from the community office. And we know your staff supports -- your staff supports the attached residential, and so does our team obviously as well. And it's a small departure from the community office designation in your master plan.

Again, there is competing office districts in this area. We actually -- after our first meeting with the city, we reached out to the retail development community and brokers to see if there was a mixed use component that might make sense on this site, maybe some retail up front.

Again, we are right next to the post office, so maybe something up front. We actually got no interest back on that. I think we have actually got some communications from some local brokers provided that to your staff, so we did explore the opportunity of an office retail

component on this project.

This product actually talked -- if you go back, please, for a second. The missing middle housing. That's really a gap that you guys have identified in your master plan, for the millennials, the young families, and our product here is really going to speak to that. Proximity to downtown, again, we are close there. I think we do a great job, this project will do a great job playing off that. Preservation and natural features, I will talk about that. We have support from your natural features consultant for this. And it's really an isolated, kind of a mid block office parcel, and an isolated parcel, I will talk about that.

Then ultimately a transitional piece. We got a lot of residential single family homes to our west, and there is really a low scale, but industrial retail use on Novi Road. So this piece offers a little bit of transition.

Going through again, there is competing office districts here. When you see our site there, the townhome center has office opportunities, you guys have city west opportunities that's on Grand River between Taft and Beck, and then there is office opportunities, quite honestly, better, less risky opportunities east along Grand River. And there is really identified -- your master plan said it, our market research has it, it's a little bit of oversaturation of office in the city, from an inventory perspective. And again, this is really an isolated mid block piece.

Next slide, please. There is our piece down there, our site. Again, looking further, we are less than a half mile from Main Street, which is about a six minute walk, which makes it an interesting residential opportunity. Again, strategic residential opportunities are something you specifically identified in your master plan that you guys would look at. And when I look

at where the downtown is, where I look at our residential neighbors, I think this hits the target of that particular identification there.

Next slide, please.

Preservation of natural features. A little bit more of the parcel. There is kind of a flat area in the blue there, a minimal slope change, but there is really 40 feet across this site. We got steep slopes, and a large wetland complex on the southern third of the site. Again, nice but challenging. We went out and qualified the trees and on those slopes in the south central and the southwest is our quality trees. There is not a lot of trees on the site, but the quality ones are located along that south ridge. And then there is quite a bit of topo even to our west. We really think the residential development allowed better flexibility to deal with the topography than an office use does. So even from the site itself, its narrow structure and what we are up against

with the trees and the slopes, we think the residential use addresses that better.

Next slide, please. Again, residential transition. And really I have called it an isolated office. When you look at it, there is our piece, again, the city owns -- our neighbor -- there is a small US post office right off Novi. But behind that, about two-thirds of our site, there is city property and also there is a flag lot, there is a cell tower. So there is a lot of greenery, about half of that is wetland, but a lot of natural features right there. We think it's probably going to be there for sometime to the north.

To the south of us is a large -- they share that beautiful wetland complex and pond, that wraps around the south, really impinges any significant development to the south. So it really isolates this 24-acre parcel, not good for office, real good for residential.

And again, we also have that

strong connection to the existing homes and residential to the west. So, you know, given what I have to the north and the south, and our neighbors to the west, we really think this is a decent housing opportunity, and again, the missing middle is kind of our product here. And being transitional to the industrial townhome, some density makes sense and certainly the proximity to the downtown makes sense.

So a little bit about the plan itself. I will dive in a little bit. Again, we are looking at an exclusive multi-family attached residential community. We have 125 units on 24 acres, about 5.2 units, though not a high density development. We have a grand boulevard entrance with our pond futures, coming off Novi Road, as you see there. We have a pedestrian connection, which will also provide emergency access along the southern pond, and a nice scenic outlook. We are looking at a nice gazebo over that pond feature that we are going to

dress up Novi Road. We got three pocket parks and play structure mingled into the plan, bicycle parking. Large buffers. We got some really large buffers. Our closest unit is 150 at least to the right-of-way on Novi Road, so we are really set off Novi Road with the layout of this development.

And then we have a great vegetation buffer to the west. The only real neighbors we have is the residents to the west. And we have a nice vegetation buffer, and we're going to put quite a bit of lush landscape along that west line as well. And then all of our units on this plan back up to open space.

There is a little illustration of kind of what our vision was originally, coming off Novi Road that wetland pond, a little gazebo up there on Novi Road really pulls attention to that feature.

Next slide. Little bit of our entryway, coming in.

Next one, please. Thanks. As

far as the -- I will just touch on these a little, the PRO and community benefits. Again, redevelopment potential of the property. We really think this is a great asset given it's location. And we want to put it to work and I think the residential use will do that.

We are increasing the buffers to the west. Your office service, the way it's zoned today, it's a 20-foot setback to the west really are the only neighbors to the west. We are proposing 82 feet minimum to our western residential neighbors. Strategic residential location. I think I have talked about that. I think that's a real benefit here.

Alternative housing, again, the townhouse product for that missing middle, that the city you guys have identified in your master plan, we agree, there is not enough of it. We really think this product hits that arc. We are going to talk about the product for a minute, shortly.

Site amenities. I have talked about it, we got three pocket parks, a play structure, a lot of pedestrian walkways throughout the development. It almost has a single family -- we got sidewalks both sides on our ring road, a lot of site amenities in the development. Adding residential to the downtown area, and we talked a lot about this, and I know you heard staff kind of talk about maybe a little bit less density. We really think the way to go is the density of this location. We meet all your building setbacks. The scale of our buildings are nice. It's only a two story product. We think this is the place to add density. You have a lot of economic investment in your core downtown area, the way to the successful downtown is getting bodies there. We are right down the street. We think this is a perfect add to your townhome area. And as part of our PRO, our benefit, we are talking about pedestrian enhancement on Novi Road. That was suggested during staff meetings as

well. We are proposing $90,000 investment of different amenities along Novi Road. Obviously it's subject to Road Commission approval, but the next slide talks about a couple things we will do, that we could propose along Novi Road.

That's a Google shot of your Main Street, which is again just a half mile from our site. You got tree planter boxes. You got tree plantings. And there is -- it's kind of hard to see, you've got light fixtures there. We look at a combination of maybe extending those streetlight fixtures, some tree planters along Novi Road, still extending that pedestrian feel along Novi Road from Main Street. And again, it's about 1,700 feet from Main Street, our site is.

Just a little bit about our townhome product. It's a two story product, which I think is a good scale. Again, it's not a highrise. Certainly, I think it's a good scale to what's out there, both the industrial retail on Novi Road is lower scale

and certainly the residents. Our units are about 1,850 feet square feet units all three bedroom, that provide flexibility of use for the millennials and the young families that we really think we are going to attract here. Two and a half bathrooms, every unit has a two car garage and it's maintenance free living. We are going to have professional landscaping, snow removal, lawn care, all those things. That's kind of where we are at with the elevations.

Certainly as we come to the site plan, we will provide some more of that stuff, but that's the flavor of the townhomes. It's a great seller. I know Pulte does a lot of testing of their product and feedback. It's been successful in the midwest and the northeast, and we are excited for this location here.

Think that's it, and we are both available for any questions you or the public may have. Thank you.

CHAIRPERSON PEHRSON: Thank you.

Appreciate it. This is a public hearing. If there is anyone in the audience that wishes to address the Planning Commission on this matter, please step forward.

State your name and address, please.

AUDIENCE PARTICIPANT: My name (unintelligible) Arora. We are on the west side right behind you, where you're planning to build. We have recently had a lot of break-ins into our subdivision, Churchill Crossing. And I think that even though -- I mean, I like the residential more than the commericial but I think this definitely exposes us to more break-ins because we are getting more access to people. So how would you respond to the safety that you --

CHAIRPERSON PEHRSON: Ma'am, we don't ask -- just ask us the questions. We will transpose.

AUDIENCE PARTICIPANT: I think our biggest certain is the safety. There will be more exposure to our subdivision. So

how would you respond to that?

CHAIRPERSON PEHRSON: We will address that in our conversation.

AUDIENCE PARTICIPANT: What about the traffic? Because I have seen lately, it used to take five minutes to make it to the highway, and over the years, I think it takes me about a half hour because it's just too many people and lot of congestion on the road. Just to get to the highway it's like an additional 15, 20 minutes, even though it's about a mile and a half from where we live, so that is another concern that I have. The number of people involved on the road.

CHAIRPERSON PEHRSON: Okay. Did you get her name?

THE REPORTER: No.

CHAIRPERSON PEHRSON: Can we have your name.

AUDIENCE PARTICIPANT: Last name Arora, A-r-o-r-a. Thank you.

CHAIRPERSON PEHRSON: Please state your name and address.

AUDIENCE PARTICIPANT: Sure. Good evening. My name is Chris Knoll. My address is 24492 Cavendish Avenue East. Like her, my property backs to what is currently, and what I believe to be long-term protected wetlands. My primary concern has to do with my property value declining as a result of the view being degraded. The primary reason we purchased the property we are in had to do with that view. So we looked at what we thought was protected wetlands, and we are attracted to Novi, based on that particular parcel, which is now granted, 82 feet, is -- you know, better than 20 feet, but right now I think those few cars and things that are parked back there, it's quiet, and it's very far in the distance. I can barely see it through the tree, now I am going to be looking at stacks of buildings. So, that's my concern.

CHAIRPERSON PEHRSON: Thank you. Anyone else?

MR. ANDERSON: My name is Daljee

Arora. I have a few concerns. I am excited to see a new subdivision is coming, but at the same time my concerns are, one, the value of the house, that my friend said, because of the -- and losing the privacy of our -- the condos coming in will impact the house value that's there. As you know, as a real estate agent, if you don't find a house that's solely (unintelligible) you go one mile around the area, some comparison can be done. I don't know how it's going to impact the value. So that's the one thing.

Privacy, I think the opening of the housing security, we don't know -- now we go freely and play out there, kids play out there. What going to happen, worry about somebody watching us, and what they will be doing. Traffic on the road, on Novi Road, getting congested right now, it's beautiful, you go out, talking about 125 new houses and condos there, husband and wife, kids, three people per house, you know, 475 cars extra on Novi Road.

What happens to the pollution, what happened to the green that we are thinking of. Even though we are expecting if something happened there, we are hoping at least on the other side a lot of trees will be planted, to make it more dense and right now, looks like once this is built, things will be clean, but then they will be exposed to that area. So that's another concern. Pollution, of course, there will be more, 475 cars, the pollution will be there.

Preservation, I think preservation is already there, it's already declared as a wetland. So I don't see that as a concern. Yeah. The value is most important. Somebody would come and say 100K or something, whatnot, but I think that values is the concern and the privacy and the pollution. Thank you.

CHAIRPERSON PEHRSON: Thank you, sir. Anyone else?

AUDIENCE PARTICIPANT: Good evening. I am Soma Suryadevara, 24656

Patrick (ph) Drive. I also live on the west subdivision neighboring to the (unintelligible). The concerns I have our homes are valued right now at 500K plus. Now we are going to get a subdivision next to us which is 340K. So our value is going to come down. That's one concern. The second one was when Pulte Homes came to our homeowners association annual meeting, there was a proposal to connect with the back of our park to our south, northeast side of the subdivision. So I don't know if that is still on or if it's not. If it's on, then that's going to invade our privacy. Because that's not really connecting the (unintelligible). That is a commercial zoning right now, and the city wants those last. Those are my concerns. Thank you.

CHAIRPERSON PEHRSON: Thank you, sir. Anyone else? Seeing no one in the audience, I think we have some correspondence.

MR. GRECO: We do have some

correspondence. The first is from a Dr. G, I'm not sure, Khan, 24468 Cavendish Avenue. Objects to the project because of the privacy, and anticipates lower values of his or her home. Would encourage planting of trees to provide privacy to the existing homes.

The next correspondence we have is another objection. This is from Adam Erickson and Elaine Palvos. Concerned with the property values, due to the elimination of natural view in the back and concern with security and noise with the neighbors, proposed neighbors.

And then another objection by (unintelligible), also objects. Because the residents of Churchill Crossing will lose privacy, loss of vegetation, diminished home values, increased traffic, loss of security, due to direct access from behind homes from Novi Road to Churchill Crossing. That concludes the correspondence.

CHAIRPERSON PEHRSON: Thank you.

With that information, we will close the public hearing on this matter, turn it over to the Planning Commission for their consideration. Who would like to start.

Member Anthony.

MR. ANTHONY: Great. First I want to start with staff. In the letter from Atwell to city staff. At one point when they're talking about public benefits, public benefits for rezoning, their item two. Increased buffers to the west.

The development proposes an approximately 160 feet setback to the nearest residential unit to the west, and natural wetlands and trees along the property line are being preserved to the greatest possible extent. So let's examine that for a moment.

So when they're saying the 160 feet, is that simply an argument of from the back of someone's home building to building, as opposed to the setback?

MS. KOMARAGIRI: Yes.

MR. ANTHONY: For this, our

property setbacks are traditionally 75 feet?

MS. KOMARAGIRI: Yes. On all sides.

MR. ANTHONY: Currently what is proposed for those setbacks?

MS. KOMARAGIRI: They are in compliance with setbacks on the west on the south and in the front, but they're asking for a deviation for setbacks on the north. They're proposing 35 when 75 is required.

MR. ANTHONY: Let's set the north aside. I will come back to the north. Let's finish with the argument with the west and the buffer, the connection to Churchill Crossing.

So let's first look at the wetlands. One concern was that the size of the wetlands and would this development reduce the size of the wetlands. And if I recall in the past being back there myself, they're actually posted by the DEQ. So perhaps if we have our wetland consultant, I can direct questions some on that.

MR. HILL: I'm Pete Hill with ETC.

MR. ANTHONY: Thanks Pete. So when we talk about wetlands, let's make a distinction between the state designated wetland and the city designated wetland.

Just for my benefit we can go through later in a detailed explanation of what the difference is there.

The wetland behind Churchill Crossing or between this property. I believe correctly I thought it was a state hosted wetland size, is that correct or incorrect?

MR. HILL: That is correct. There is also -- on the Churchill Crossing property, there are areas of wetland mitigation that would, I believe, have signage in terms of, you know, a sign saying this is a wetland conservation easement and it was constructed. I think one of the residents talked about he may back up to one of those areas, which are adjacent to a wetland that runs, you know, north/south,

along the western edge of the subject property.

MR. ANTHONY: Since that was an abatement for a state regulated wetland, it would still fall underneath being a state regulated wetland necessary for the abatement -- (inaudible).

MR. HILL: That's correct.

MR. ANTHONY: So the distance, when we look at the Churchill Crossing back property line, and the beginning property line of the proposed development, what's the dimension of that wetland, how far does it go over, for instance, into the new proposed property boundary?

MR. HILL: I don't have a good answer standing here. One of the figures that was previously -- I think that one -- if we can find a scale -- well, is that an 80-foot setback?

MR. SKORE: It's 20 to 25 feet.

MR. ANTHONY: Here I'll tell you really where my line of questioning is going

now that we have the picture up there.

So often when we draw those lines, we can sit in front of the computer with a cad program, that does measurements, and kind of eyeball where that wetland line is. But it really requires a wetland survey to go and flag and to survey that line in order to know precisely where it is.

Is that line depicted accurately or is that line further to the west, which, if so, would provide the residents with an even greater buffer.

MR. HILL: As part of our current review of the plan, the wetland was flagged by the applicant's wetland consultant and part of our review included seeing whether or not we agreed with that line on the ground and we did.

MR. ANTHONY: You do, okay. Now, is there a requirement with the distance that the building can be or is it that landscaping can be from the wetland line in order that the activity does not damage the wetland?

MR. HILL: The city does have a 25-foot wetland and water course setback ordinance -- setback requirement.

And the applicant is meeting that by protecting the 25-foot setback from the wetland in question.

But in terms of -- yeah, I will leave it at that. The 25-foot setback --

MR. ANTHONY: So in meeting their 75 foot setback requirement, they also end up meeting their 25-foot wetland setback requirement, is that -- am I understanding that correctly?

MR. HILL: I believe so. Yes, no construction is proposed within the 25-foot wetland setback.

MR. ANTHONY: Okay. That's good on the wetland. Thank you.

Now I am going to come back to the landscape. Of the problems with the landscaping, it's really nice in the spring and summer when all those bushes are full

with those leaves. But when the trees drop their leaves and when the bushes drop their leaves, you see right through it, you feel those buildings right in your backyard.

Is there a way to modify that landscaping that becomes more four season landscaping or some of the features that maintains privacy and indirectly security?

MR. MEADER: I am quite sure there was a good mix of evergreens as well as deciduous trees along -- also there is a pretty tall berm that they're leaving, so, you know, it's not going to be like a forest there, but they do have it pretty densely landscaped along that edge with a mix of trees.

So I was comfortable with what they were providing.

MR. ANTHONY: All right. Let me move over to the northern boundary, where they want to reduce that setback.

So the property to the north, is that owned by the city other than

obviously the post office isn't.

MS. KOMARAGIRI: Not exactly. The front part is owned by the post office, the back is owned by property which has a wireless tower on it. And like this one --

MR. ANTHONY: The part that's back towards Churchill Crossing, the portion that is owned by the city.

MS. KOMARAGIRI: That's owned by the wireless.

MR. ANTHONY: By the wireless, okay.

MS. KOMARAGIRI: This is the one that's owned by the city.

MR. ANTHONY: So the wireless, they're using it for the tower, it's unlikely that other uses would come in there.

MS. KOMARAGIRI: That's our understanding.

MR. ANTHONY: And the city, what's the plan the city has with that portion? Are they going to leave that green space?

MS. KOMARAGIRI: As of now, the city doesn't have any plans. We checked with our parks department to see if they had any. As of now, I think the city has the property to protect the buffers and nature features. We can't speak of future.

MR. ANTHONY: All right. Let me go to another item now that -- we will look at screening and landscaping.

This is for the developer. So in hiring CBI, planning, which I like that you hired them to take a look at this. If we also look at the city's argument, and why this could be residential, you might actually want to go to the podium. I will ask you direct questions, they will want it all on the record.

So, when initially looking at this property, we are looking at rezoning an area that's commercial or that's targeted for office space, dead smack right in the middle, a line right through it is coming in high density residential. Initially when you look

at it, intuitively asks the question why.

So now when we dig into asking the question why, the argument becomes that the reason why, is your proximity limit to the downtown and that we are further facilitating a walkable community and integrating the community.

And, you know, even have your consultant say one of the key benefits of your development is the neighborhood connector path to the sidewalks. It goes onto how you will connect this with the downtown.

We look at what the city put together, addressing their non-motorized improvements and we have a mention of 90,000. Then we also go into the woodlands and trying to preserve the woodlands. The problem I have then is if I go along with the logic of the reason you can rezone this office space to residential is that it creates connective lines that are walkable, consistent with our non-motorized master plan, to the downtown

area, you should see that. Yet when I look at the basic plan, I don't see anything. I saw some pictures today.

So, I don't really know what the development would bring to help that connection other than what we talked about today, just didn't see it in the actual material that we looked at today.

MR. ANDERSON: Again, our intent is to make an investment of that Novi Road corridor there, between the Main Street and our development. And some of the elements we are talking about is maybe extending that Main Street streetlight element on Novi Road, maybe some planter boxes consistent the Main Street, some of that hard scape that kind of extends that Main Street down to our property. That's something we will be working on as we dwell into the detail on that, and we are committing a dollar value of doing that. It's really enhancing -- there is already nice sidewalks there. If we did nothing, there is great pedestrian capability

from the site to your corridor, sidewalks both sides. We are going to enhance that pedestrian experience and look to visually pull that Main Street down either by streetlights, some planters, those types of elements within the right-of-way down to our site.

And again, you guys own -- the city owns the property adjacent to us and quite a bit of property just to the north of us. Maybe some of that enhancement could go towards right -- your entryway as well.

MR. ANTHONY: Good. Thank you. And with -- you know, with this development, so it's getting on board with the rezoning for me, for the residential. The argument being that it's going to connect with our downtown, which I like that argument. I just don't have enough stuff here to look at to say in certainty that it's not going to change, you know, after I express the votes. I feel like I don't have enough.

And the other part is I

remember when I was looking by my own house in Novi, being a Novi resident, looking at Churchill Crossing, and I remember looking at the zoning and looking at those homes, and those lots that were along that wetland, which is why I know that the signs are there. I looked at the zoning and I saw that the zoning was office and I thought, well, you know, that won't be too bad because office will be like the type of like physical therapy, small medical office when you look, what's right through there. So not nearly that density.

So I could relate with the feeling. So with that, that's where I would also feel like I need more certainty on the vegetation really providing a four season screening. I am just trying to look at what's in front of me and what's concrete, so that when I give a vote that I am confident that what's concrete would go through, and we have had good discussion, I just don't see the concreteness. I don't know if I made up

a word.

CHAIRPERSON PEHRSON: I think you did.

MR. ANDERSON: To the neighbors, this is a two-scale townhome development. It's not the mid rise. It's really not a high density. It's 5.25.4. I hear what might be allowed, but you guys are approving this density, and it's 5.2. It's really the two scale unit is really consistent, so that you have that smaller scale backing up to the single family home from upscale one. There is existing vegetation. We are going to supplement significantly more vegetation there, and whatever we can do to augment that even beyond what we have, we are willing to do that. Because we really only have six or seven neighbors and they're probably all here tonight that are immediately impacted.

Again, I guess to the point of you want to see it, all I can say is, if you sit back, it's the site of the proximity to the Main Street. Your downtown core is right

there. It's a great Novi Road, it ties right there. It's physically less than a half a mile away. That's what's going to make this a successful use for that. And given what I have on each side of me, it really is not a good office use. It is a great strategic residential use.

MR. ANTHONY: I like the concept of supporting our downtown, it needs the density. I almost bought one of the lots you guys lived in, so I know exactly the view that you're looking at and the expectation to change it. So that's why I want to make sure that with this change, that -- you know, that those citizens, those homes are well taken care of. Thank you.

CHAIRPERSON PEHRSON: Thank you, Member Anthony. Anyone else? Member Greco.

MR. GRECO: Through the Chair, Sri, was there additional information -- I notice the thing is not making a recommendation. Is there additional information that we would be waiting for from

the applicant or some questions to be answered?

MS. KOMARAGIRI: There was a few clarifications. I think we are on board, we support the use to be changed to residential. We just -- the kind of housing they're proposing, low rise, low residential meets well with the RM1 requirements. The RM2 is mostly for high rise, high density, tall apartment style buildings.

So to keep with our -- so we think RM1 would be a better fit, so for them to achieve that, they have to bring the density from 6.425.4, which is the maximum allowed for the RM1.

They are also asking for a deviation for a number of rooms. The maximum allowed is 4.3, they're proposing 500.

So I think a few -- there is some concerns within the property with regard to the placement of houses, like the variance for houses according to the storm water retention pond, we think they are too close,

it may not be safe for people on the patio. And when we asked, they revised the plan a little bit to meet the requirements for the distance between the buildings, which made the central courtyard smaller, and there was proposed from east to west in the center courtyard, which is no longer being proposed now, so we just think that if they can reduce the density a little bit, the deviations can be reduced a little bit and it will fit well with the zoning map as well.

When you look at the zoning map, we recently approved the (unintelligible), which we chose to rezone from OS1 to RM1 as well, similar concepts, similar style. Going in that line, we think that RM1 would look -- better transition on the zoning map, next to OS1 and (inaudible).

MR. GRECO: Thank you.

CHAIRPERSON PEHRSON: If I might, compliments what Member Anthony said. I appreciate the dollar value that you threw out there to add the hard scape for whatever

amenities along Novi Road. I would like to see a little bit more detail of that. I don't know what $90,000 buys you as far as trees, planters, lights. I would like to see some more detail relative to that as well.

Member Greco.

MR. GIACOPETTI: Before you make a motion, I'm struggling with understanding what the city's plans are for the adjoining real estate, and would influence my decision. There is a post office, but what I would call a postage stamp parcel that's completely blocked by other properties or for -- it's more like a pan handle. But to me, what -- I am warming to this development. I think it looks like a great plan, but it works when I think we have more comfort knowing what's going to be -- what the potential is for what's going to be surrounding it. And I'm frustrated with the city's lack of -- I guess, lack of plan for this property if there is one. If there isn't, should it be sold. I mean, is it property that should be

sold, is it property that should be developed into a park. Again, I feel awful for the developer because it's not -- they're kind of caught between a rock and a hard place, you know, parcels that we don't know what we are going to do with.

So, I mean, I don't know who the best individual would be to address those concerns. If it's someone from the parks department, or maybe we can make a recommendation. I mean, it seems -- there is some really changed parcels there. And what's going to happen to them. And there is a traffic light in front of the post office, it would be nice if that tied into the development, frankly, so we wouldn't need another entrance. That to me would make it feel like it didn't come up on Novi Road, if this development was set further back, it would feel like much, much, much more of a transition from the Church Crossing into this development.

But I like where this project

is heading. I like that it's adding some dense housing options closer to the downtown. I think the developer may have a lot -- a few adjustments since we first saw this plan.

But I do agree with the other members, I think there is some more work to be done. I want to see some more tangible plans from my case, the city, but also in terms of what $90,000 buys us in terms of creating a pedestrian corridor, preferably not something that, you know, is good for five years, but, you know --

MR. SCHULTZ: I was going to -- Sri was talking, but she didn't have a chance to look it up, but I was able to look it up on the city map, so that post office area, it's obviously not owned by the city, but the blue next to that, that is city owned. The other flag. So Novi with the skinny flag pole, that is owned by the cell wireless company, then the piece up above is city property.

So certainly if you're looking

for information at the next meeting, what the city has planned for that -- there may not be anything, matter of fault for the city, just maybe -- I think it was acquired as part of some right-of-way project or something.

CHAIRPERSON PEHRSON: At least we could have knowledge of what it is.

Member Greco.

MR. GRECO: In the matter of Princeton Park, JSP17-10, and zoning map amendment 18.707 motion to postpone making a recommendation on the proposed PRO and concept plan to allow the applicant time to consider further modifications to the concept plan as discussed in the review letters, or provide additional use of open space on the site, prior to consideration by the City Council to rezone subject property from OS1, office service to RM2, high density multi-family residential, with the planned rezoning overlay, and for the city to consider the information that's been requested by the commission and mentioned and

address the issues by Member Anthony, Chair Pehrson and Member Giacopetti and for the reasons set forth in the motion sheet.

MR. LYNCH: Second.

CHAIRPERSON PEHRSON: We have a motion by Member Greco, second by Member Lynch. Any other comments? Member Avdoulos.

MR. AVDOULOS: To the applicant, what is -- what is the density now that you have on the site? The RM1 is 5.4, is that correct, Sri? RM1 is 5.4?

MS. KOMARAGIRI: Yes.

MR. AVDOULOS: Then currently --

MS. KOMARAGIRI: They are proposing 6.4 now.

MR. ANDERSON: 6.4 on that. It's 5.2. Part of the problem -- we have a three and a half acre wetland and you guys use net density for your calculation, so on a net basis, we are over your RM1. We actually -- initially, the first three submittals were looking at RM1 and we talked to Sri probably three weeks ago, and kind of at the

suggestion of staff went to RM2, which allowed the higher density, never really changing our plan.

MR. AVDOULOS: So keeping the same amount of units?

MR. ANDERSON: Yes. Our building setbacks are all right there. We are not trying to jam buildings close. We meet all your building setbacks. It's pretty low scale building, so from a density perspective, you guys have a pretty complex room count issue. That's really it. We are looking at a three room unit for each of the units, so --

MR. AVDOULOS: If you followed that, what would it reduce your unit count to?

MR. ANDERSON: I honestly don't know because I'm 60 bedrooms off from your chart. I think I have 423 rooms.

MR. AVDOULOS: About 20 units.

MR. ANDERSON: It's a significant problem. And again, we have talked that the

density -- I mean, does that feel right. I think it feels right, given the location for it. I have too many rooms in this development. I can't just eliminate closets because you guys determine a bedroom is a room is a room. Our buyers like these rooms, again, they're 1,850 square feet, but there is a lot rooms in there -- you guys have a room chart, that sets the density. I am really stuck in a box here on how to get that issue. I really am.

MR. AVDOULOS: Okay. Then the -- I know a number was thrown out there. Are these ranging in the 340 range?

MR. SKORE: Yes, in terms of a price point, you know, it's a little difficult to say because we offer upgrades and options and premiums. But if I had to guess sitting here today, this is obviously, you know, well into the future. If I had to guess, at that time, these will most likely sell for a range, between again, all end, options premium, 350 to $400,000. I could be

conservative with that number though, too.

MR. AVDOULOS: That's all I have. Thank you.

CHAIRPERSON PEHRSON: Member Giacopetti.

MR. GIACOPETTI: Concerning the motion to postpone, I had a question for the applicant.

In terms of the discussions with the Oakland County Road Commission and putting some meat around this -- the walkways, how long will that take you to put together? I mean, we need to postpone this like until the next meeting?

MR. ANDERSON: I was going to say probably within the next 30 days we ought to get their attention and take a look at things and see what we can do and certainly talk to your staff about it.

MR. GIACOPETTI: Thank you.

CHAIRPERSON PEHRSON: Sri, can you call the roll.

MS. KOMARAGIRI: Member Anthony?

MR. ANTHONY: Yes.

MS. KOMARAGIRI: Member Avdoulos?

MR. AVDOULOS: Yes.

MS. KOMARAGIRI: Member Giacopetti?

MR. GIACOPETTI: Yes.

MS. KOMARAGIRI: Member Greco?

MR. GRECO: Yes.

MS. KOMARAGIRI: Member Lynch?

MR. LYNCH: Yes.

MS. KOMARAGIRI: Chair Pehrson?

CHAIRPERSON PEHRSON: Yes.

MS. KOMARAGIRI: Motion passes six to zero.

CHAIRPERSON PEHRSON: Thank you, gentlemen, appreciate it.

Next on the agenda is Hino Motors, USA FKA, JSP 17-02. This is a public hearing at the request of D & G Investment, preliminary site lane, land bank parking, non-minor wetland permit, woodland permit, storm water management plan approval.

The subject property is

STATE OF MICHIGAN)
) ss.
COUNTY OF OAKLAND)

I, Jennifer L. Wall, Notary Public within and for the County of Oakland, State of Michigan, do hereby certify that this meeting was taken before me in the above entitled matter was by me duly sworn at the aforementioned time and place; that the testimony given was stenographically recorded in the presence of myself and afterward transcribed by computer under my personal supervision, and that said testimony is a full, true and correct transcript.

I further certify that I am not connected by blood or marriage with any of the parties or their attorneys, and that I am not an employee of either of them, nor financially interested in the action.

IN WITNESS THEREOF, I have hereunto set my hand at the City of Walled Lake, County of Oakland, State of Michigan.

6-5-17

Date

Jennifer L. Wall CSR-4183
Oakland County, Michigan
My Commission Expires 11/12/22