

# MASTER PLAN AND ZONING COMMITTEE City of Novi Planning Commission February 17, 2016 at 5:00 p.m. Novi Civic Center – Police Training Center 45175 W. Ten Mile, Novi, MI 48375 (248) 347-0475

Members: Giacopetti, Lynch, Pehrson

**Staff Support:** Barb McBeth, Sri Komaragiri, Kirsten Mellem, Christopher

Gruba

**Consultant Support**: Rod Arroyo, Jill Bahm and Joe Tangari from Clearzoning Inc.

1. Roll Call

- 2. Approval of Agenda
- 3. Audience Participation and Correspondence
  - i. Garfield Wetlands Restoration Area A Presentation by Karl F. Migrin

#### 4. Discussion Items

- A. Master Plan for Land Use Review 2015
  - ii. The Residential Density Map
  - iii. Briefly Review the Chapters Completed to Date
  - iv. Review Existing Conditions Assessment of the Grand River Corridor
- B. <u>Mercato: A Planned Rezoning Overlay Concept Plan (Requesting Zoning Change from RA to R-1</u>
- C. <u>Possible Planned Rezoning Overlay Requests</u>
- 5. Adjourn

## AUDIENCE PARTICIPATION Garfield Wetlands Restoration Area A Presentation by Karl F. Migrin

A Presentation by Karl F. Migrin









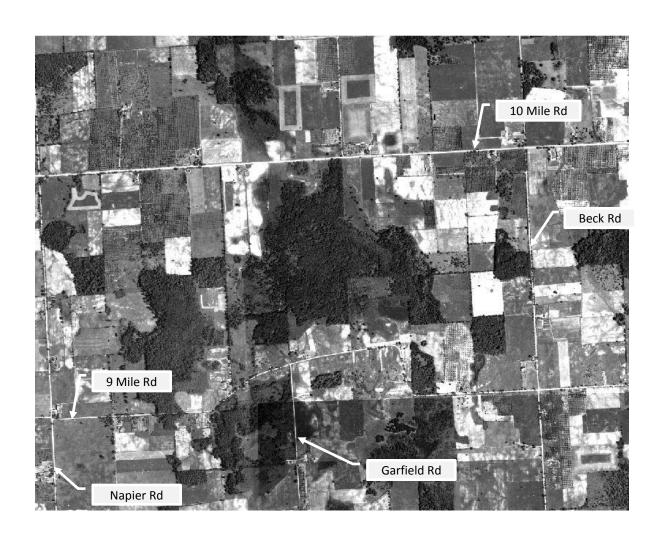
Image Locations: Southwest Novi Sections 29,30,31,32





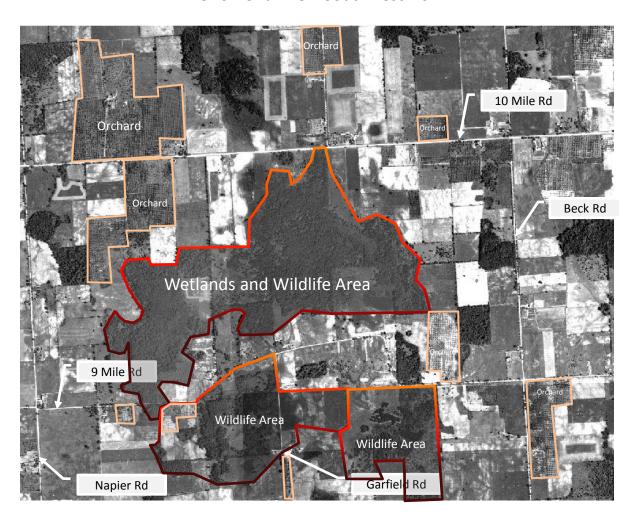


1940 Aerial View Southwest Novi



#### Southwest Area Filled With Orchards and Wildlife

1940 Aerial View Southwest Novi

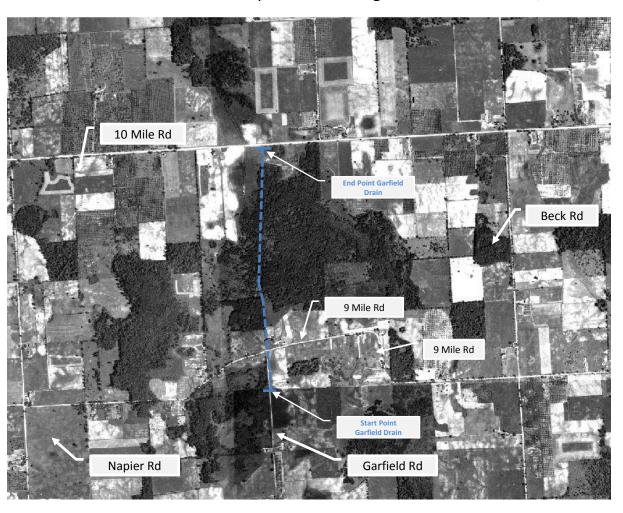


# Garfield Wetlands Restoration Area History and Purpose

- Prior to 1957 wetlands were abundant in this area of the city
- Garfield Drain was constructed in 1957 for the sole purpose of draining these wetlands
- Soil was excavated to an average depth of 3.58 feet
- Total length of drain was 5,725 feet and was completed in 1957 for \$20,781.57
- Jurisdiction of drain transferred to City of Novi on December 1, 1986

Approximate Location of Garfield Drain - 1940 Aerial View Overlay

Constructed in 1957 For Purpose of Draining Wetlands - Cost \$20,781



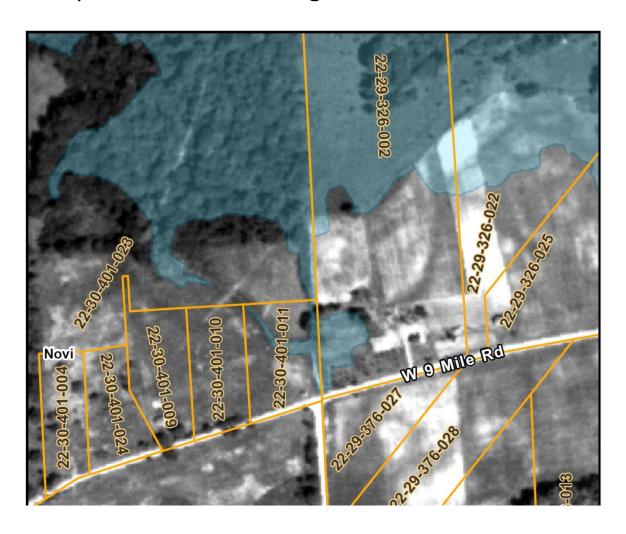
1940 Aerial View Intersection Nine Mile Rd & Garfield Rd



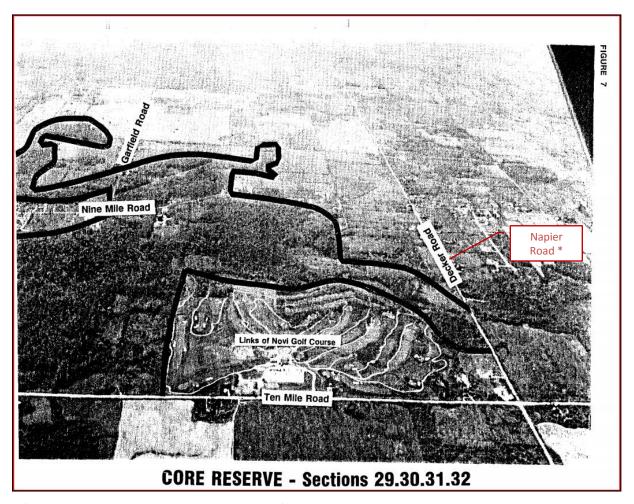
1940 Close Up of Stream (Unknown Name) Prior to Garfield Drain Being Built



1940 Close Up of Stream Showing Parcel Numbers and Flood Plain



# Garfield Wetlands Restoration Area Core Wildlife Reserve



<sup>\*</sup>incorrectly labeled in the 1993 Novi Wildlife Habitat Plan. Should be labeled as Napier Road.

Excerpt From City of Novi Wildlife Habitat Plan Dated June 1993

 Section 29, 30, 31, 32: Core Reserve (>750 acres), south of Ten Mile Road, east of Napier Road, west of Beck Road, north of Eight Mile Road • Type A habitat with high diversity and quality due to its large size and isolated interior. Because of the low juxtaposition and interspersion of habitat requirements, i.e., limiting factors for interior sensitive species, the stability of the area is moderate. There is a possible linkage north to Section 19 and power line linkage to Section 20 is a significant wildlife movement corridor. This Core Reserve area could not sustain intensive human intrusion without some loss to diversity and quality. Intensive intrusion or development in this area would reduce the chances of the presence of interior sensitive species.

Some of the Wildlife Recently Photographed in my Backyard















Core Wildlife Reserve Showing Proposed (PRO) Development Overlay



Developmental Impact on Quaternary Geology\*



\*Quaternary Geology- Pink (sand and gravel) Green (medium texture till)

Reference State of Michigan Website: http://www.michigan.gov/documents/deq/1982\_Quaternary\_Geology\_Map\_301467\_7.pdf

Developmental Impact on Woodlands



Developmental Impact on Wetland (Hydric) Soils



Developmental Impact on National Wetland Inventory (NWI)



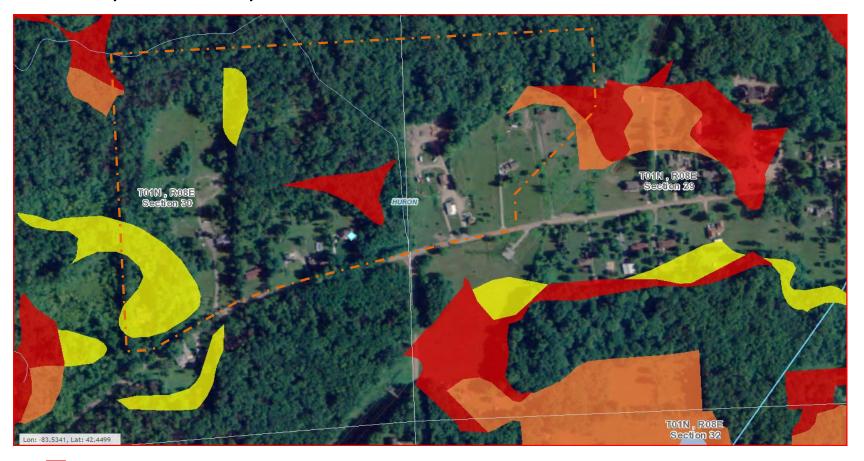
#### Developmental Impact on Part 303\* Final Wetlands Inventory

\* Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended •



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

Developmental Impact on Potential Wetlands Restoration Efforts



- Highest Potential Hydric and Presettlement Wetland Overlay
- High Potential Hydric Soils Only
- Moderate Potential Presettlement Wetlands

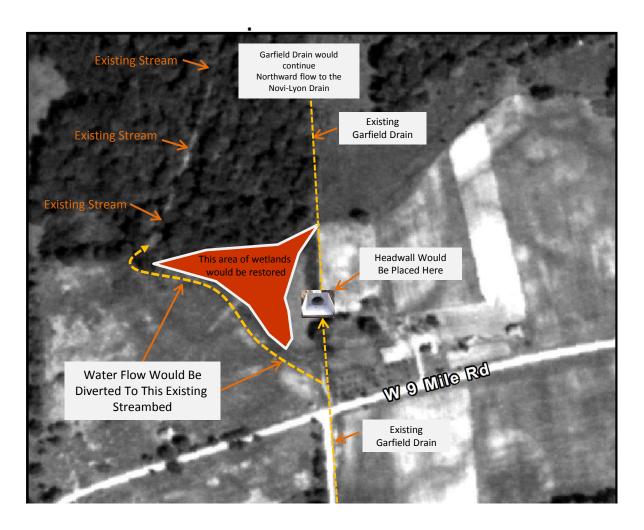
# Garfield Wetlands Restoration Area How Do We Make Things Right

- Strategically place a 24 inch cement or sandbag headwall within the Garfield Drain
- Headwall would divert water flow to Hydric and Presettlement Wetland areas (Pre 1957)
- Headwall would allow continued flow North to existing wetlands
- Elevation of headwall would reestablish wetlands without affecting local septic fields or basements

2008 Aerial View Showing Wetlands Areas And Proposed Location of 24 Inch Cement Headwall Set to 954 Feet Elevation



Effective Wetlands Area Restored After Installation of Headwall



# Garfield Wetlands Restoration Area How Much Will It Cost

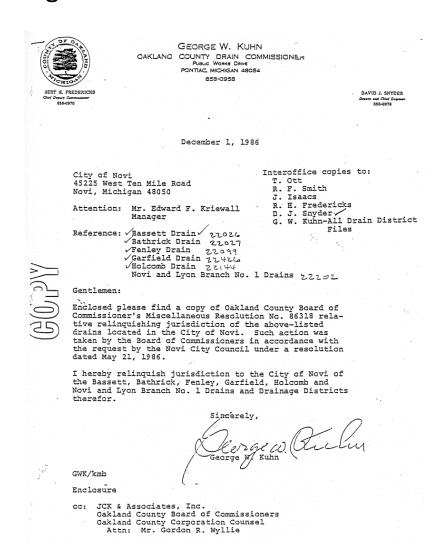
- 24 inch cement headwall \$800
- 20 feet 24 inch metal pipe \$780
- Stone aggregate backfill 25 Cubic Yards \$975

## Notes:

- 36 inch C.M.P.- Corrugated Metal Pipe set at an elevation of 954 feet
- Headwall with C.M.P. opening set to an elevation of 954 feet
- Since jurisdiction of Garfield Drain has been transferred to the City of Novi the Public Services department could provide all necessary labor and equipment
- Oakland County Water Resources Commission (WRC)
   office could not provide any evidence that a public
   hearing was held prior to construction of the Garfield
   Drain in 1957

- Oakland County Drain Commissioner letter dated December 1, 1986 with enclosures
- Historical Novi Newspaper "Letters to the Editor" concerning construction of Garfield Drain
- Email correspondence to Michigan DEQ,
   Clearzoning, and the City of Novi
- All base layer maps shown in this presentation are available either at Oakland County or State of Michigan websites

Letter Transferring Jurisdiction of the Garfield Drain to City of Novi



#### Attachment to Jurisdiction Transfer Letter

## GARFIELD DRAIN (22426)

S/N:

089

Location:

Sections 29, 30, 31 and 32 in the City of Novi.

Description:

The Garfield Drain has its outlet in the upper terminus of the Novi-Lyon Drain in the E. 1/2 of the N.E. 1/4 of Section 30 in the City of Novi. From its outlet, the drain extends southerly in the E. 1/2 of section 30 to Nine Mile Road and Garfield Road; thence continuing southerly on the east side of Garfield Road to its upper terminus approximately 1000 feet south of Nine Mile Road. The drain was constructed in open ditch and is a total of

5300 feet in length.

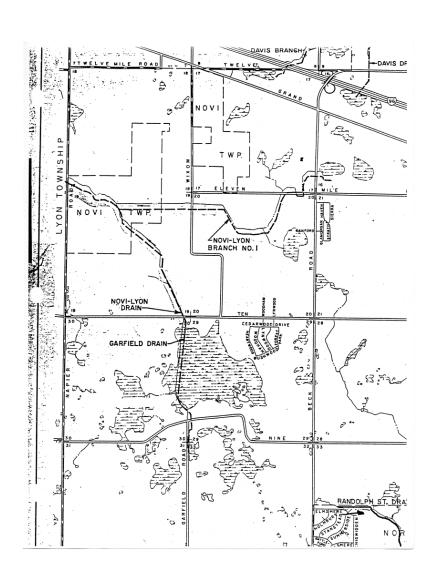
Year Built:

1957

Investment:

\$20,781.57

Attachment to Jurisdiction Transfer Letter



### Novi News Public Notice for Construction of the Garfield Drain As Published April 25, 1957

#### NOTICE OF LETTING OF DRAIN CONTRACT AND REVIEW OF APPORTIONMENTS

NOTICE IS HEREBY GIVEN, That I, Daniel W. Barry, County Drain Commissioner of the County of Oakland, State of Michigan, will, on the 10th day of May A.D. 1957, at No. 1 Lafayette Street, Pontiac, Michigan in the City of Pontiac, in said County of Oakland, proceed to receive sealed bids until 2:00 o'clock in the afternoon of that day, when bids will be opened and publicly announced for the construction of a certain Drain known and designated as "Garfield Drain", located and established in the Township of Novi in said County.

Said drain is divided into one section having the average depth and width as set forth: All stations are 100 feet apart.

Section No. one beginning at station number 0-385 at the lower end of said drain and extending to staof said drain and extending to said tion number 53+40, a distance of 5725 feet, and having an average depth of 3.58 feet, and a width of bottom 4 feet and 3 feet.

In the construction of said drain the following quantities and character of tile or pipe will be required and contracts let for same:

5100 cu. yds. Excavating 40 feet of 18"x29" C.M.P. arch 40 feet of 36" C.M.P. 48 feet of 36" C.M.P. 48 feet of 42" C.M.P.

30 feet of 48" C.M.P.

4 Headwalls Clearing, Grubbing and Bull dozing

Said job will be let in one section in accordance with the diagram now on file with the other papers pertaining to said Drain, in the office of the County Drain Commissioner of the County of Onkland to which reference may be had by all parties interested, and bids will be made and received accordingly. Contracts will be made with the lowest responsible bidder giving adequate security for the performance of the work, in the sum then and there to be fixed by me, reserving to myself the right to reject any and all bids, and to adjourn such

#### LEGAL NOTICE

letting to such time and place as I shall publicly announce.

The date for the completion of such contract, and the terms of payment therefor shall and will be announced at the time and place of letting. Any person desiring to bid on the above mentioned work will be required to deposit with the County Drain Commissioner a certified check or its equivalent to the amount of 5% of bid price as a guarantee that he will enter into contract and furnish the required bond as prescribed by law. The checks of all unsuccessful bidders will be returned after contracts are awarded. The payments for the above mentioned work will be made as follows: Drain orders dated July 1, 1958, July 1, 1959 and July 1

NOTICE IS FURTHER HEREBY GIVEN, that an Wednesday the 22nd day of May, 1957, at Drain Commissioner's Office, No. 1 Lafayette St., in the City of Pontiac, County of Oakland, or at such other time and place thereafter, to which I, the County Drain Commissioner aforesaid, may adjourn the same, the apportionment for benefits and the lands comprised within the "Garfield drain special assessment district" and the apportionments thereof will be subject to review for one day from nine o'clock in the forenoon until five o'clock in the afternoon. At said review the computation of costs for said Drain will also be open for inspection by any parties interested.

The following is a description of the several tracts or parcels of land constituting the Special Assessment District of said Drain, viz:

Sec. 29, Novi Twp.
The S 900 ft. of W1/2 of NE1/4 NW 44 except: N 1550 ft. of E. 660 ft. N 430 ft. of E. 500 ft. of W12 of N 500 ft. of W. 150 ft. of E12 of N 500 ft. of E.150 ft. of W12 of N 360 ft. of W. 510 ft. W 15 of SE 14 S 1860 ft. of W. 330 ft. of E15 of

```
Sec. 30
NE % except N 360 ft. of E 80 ft.
     S 1530 ft. of E 530 ft. of NW14
S 1070 ft. of W. 245 ft. of E. 775
    E. ½ of SW¼ exc. the N. 850 ft. of W. 300 ft. N 440 ft. of S. 1860 ft. of E. 750 ft. of W. ½ of SW ¼
     01 W. 12 Of SW 14
N. 320 ft. of S. 1420 ft. of E. 420
ft. of W. 14 of SW 14
N 740 ft. of S. 1100 ft. of E. 750
ft. of W. 14 of SW 14
S. 360 ft. of E. 1030 ft. of W. 14 of
     SE1/4
     Sec. 31
    N. 12 of NW14
N. 300 ft. of E. 770 ft. of SE14
     Sec. 32
    N 300 ft. of W. 2000 ft. of SW1/4
NW1/4 of NE1/4
     N. 620 ft. of W. 160 ft. of NE1/4
    Novi Township - At Large
    Oakland County - At Large
    Now, Therefore, All unknown and
 non-resident persons, owners and
persons interested in the above des-
cribed lands, and you Frazer Sta-
man, Supervisor of Novi Township,
Robert O. Felt, Chairman, County
 Road Commission and Lynn D. Al-
 len, County Clerk are hereby notified
 that at the time and place afore-
 said, or at such other time and
 place thereafter to which said let-
 ting may be adjourned, I shall pro-
ceed to receive bids for the con-
struction of said "Garfield Drain",
 in the manner hereinbefore stated;
and also, that at such time and
 place as stated aforesaid from nine
 o'clock in the forenoon until five
o'clock in the Identification that in o'clock in the afternoon, the apportionment for benefits and the lands comprised within the Garfield Drain Special Assessment Districts will be subject to review.
  And You and Each of You, Owners
and persons interested in the afore-
said lands, are hereby cited to ap-
pear at the time and place of such
reviewing of apportionments as
aforesaid, and be heard with re-
spect to such special assessments
and your interests in relation there-
to, if you so desire.
Dated this 12th day
of April, A.D., 1957
            DANIEL W. BARRY
            County Drain Commissioner
           County of Oakland
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### Novi News Letter to the Editor Dated January 30,1958

NOVI NEWS JANUARY 30, 1958

#### Readers Speak Up:

# CLAIMS DRAIN WASTES WATER

To the Editor:

I own a few acres in the swamp between Nine and 10 Mile road which is now getting drained by the Garfield Drain. There's roughly 1½ square miles of swamp. I bought the land because of the swamp, and had a spot about 50'x300' deepened for a pond. I think the land looks more interesting with water around.

Now I'm getting taxed \$90 or so a year for alterations to my property against my wishes. I should have had better opportunity to defend myself. (I'm speaking of the right and wrong of it, and I don't know what the law says.)

When Detroit Edison wants to tap land for their high wires, they pay a couple of calls and pay a price too. The bureaucrats didn't think it was necessary to get approval from taxpayers — a good example of private vs. socialistic enterprise.

Remember Michigan's forests? They were cut and burned away, and even some of the soil was destroyed. Now water is getting to be another critical resource, for when population increases, water decreases.

People in Michigan have so much water they have lost sight of its value. With the western states planning to go to Canada or the Great Lakes for water in the near future, Michigan is in a favorable situation for dealing with them. Why don't we conserve our water in the meantime?

The word "drain sounds beneficial and good, but I think draining can be bad. Water is a valuable commodity and should not be wasted at the whim of anyone. Any temporary value from altering the watershed should not be considered. Industry is going to be regulated as to the use of water; why not the individual whose collective use of it amounts to much more? Perhaps there are points in law that should be re-written concerning drainage.

Water in high places like this swamp is especially valuable. If left alone, it soaks the ground and maintains the water table — which is necessary to feed springs and wells for miles around. If people in Northville realized that this swamp helps fill "Northville Silver Spring" they would be interested.

Are we going to be a future China — a grand past but no present or future, because of our disregard for conservation?

Then, too, our subdivision lots are too big, and everyone wants to have a big lawn. Wouldn't it be nice to have a "God's country" in your own backyard, with all the wild life it gathers, instead of the racket of machinery and the useless work that a lawn takes? You'd be a conservationist instead of a waster.

I won't be surprised to get another whopper of a tax bill in some not too distant time, for drawing water from Lake Huron after we speed this water into Lake Erie.

The Chicago water "steal", whereby Chicago wants to tap the Great Lakes, is not so bad. The place to stop the "steal" is right here at home.

The Garlield Drain project should be left standing where it is. It would be much more sensible and profitable.

Charles J. Oramo 49000 Nine Mile

### Novi News Letter to the Editor Dated February 6, 1958

11-THE NOVI NEWS Thursday, February 6, 1958

#### Readers Speak Up:

### CALLS GARFIELD DRAIN PLAN OK

To the Editor:

In response to the letter written in last week's Record, I, as an interested party in the Garfield Drain, would like to take this opportunity

to express my feelings.

We, too, own a few acres in this swamp area, which we bought with the idea of making a permanent home for our family six years ago. We had dreams of a small garden on our cleared land and long hours of enjoying the wildlife in our own woods, but these castles in the air crumbled about our feet our first spring in "God's Country". We found that most of our clear land lav under water and if we wanted to plant we would have to join "China" in the raising of rice, as we knew of nothing else that would grow under water. Our beautiful woods was impassable unless equipped with hip boots or a canoe. Our wonderful country air, as the summer progressed and the water became polluted, was more foul-smelling and far unhealthier than any city factory and machinery air could possibly get in that short period of time. Of course there were some nice days, those when the wind blew quite strongly. Our levely modern plumbing inside, just would not function, "Too much water already under the ground, no place for anymore," our septic tank cleaner kent telling us year after year.

We still had hores that maybe the following springs would not be such wet ones. We also discovered a constant musical tone that accompanied our rising water, MOSQUITOS, thousands of them humming day and night, our days were generally spent inside.

Then we discovered that a drainage system had been attempted some 20 years before and had been tried off and on a number of times but never was completed because of objections raised. We then entered a plea for help and for four years attempted to get some results.

Two petitions were circulated in a 6-month period, all signed and sealed according to law. A Public notice then appeared in this paper stating that anyone contesting the drain had a period of time to protest in letter or person to the Drain Commission, this notice appeared for a number of weeks. Finally a letter to all parties affected, was sent out by the Drain Commission to allow any protests to be brought before probate court within a 10-day period. Nothing was protested legally. The drain was then a reality.

We too, won't be surprised to get another tax bill (much larger than some of our neighbors) in some not too distant time, but we will pay, and pay gladly if we feel we are gaining improvement.

I would like to add that money had to be given before any work or attempt to drain was even started, as a retainer fee. This, I might say, was handled by two parties alone never asking or expecting any help

from others.

I feel a great sense of elation everytime I look at this big ditch with its ugly black swamp-water becoming more and more of a reality every day and hope, that some day soon "God's Country" will be just a little bit sweeter out here because of the Garfield Drain.

Another Taxpayer

### Novi News Letter to the Editor Dated March 13, 1958

NAVI NEWS MARCH 13, 1958

#### ONE POOR FISH TO ANOTHER

To the editor:

tween Father and Son Pike was unfriendly neighborhood." overheard recently.

quiet waters was a lot of life. But long run. then ominous signs began to appear. Some things that looked like moving stumps began putting obstructions in our way. Sometimes they built a roof over the water and went over it, back and forth, And every time they did anything, they muddied our water. I've talked to a friend of mine who knows what's going on. He said they're building a drain — the Garfield Drain."

all of us are going to lose our News which was delivered free last homes. We Pikes in the first place. week to all residents on the mail Then all the rest of the people we routes in the township. It seems to know. The Perches, Sunfishes, Blue- me however, that we have not had gills, the Trouts, Carps, Bullheads chough discussions on the advant-

the Muskrats and Coons, must go are yet undecided on the issue. too. And where would the pheasant So far as I know, there is no recfly to for safety? Even the little ord of an entire township that has Mosquito family that has provided incorporated as a village. This prous with music, from cradle songs cedure is usually taken by people to concerts, seems to be especially that live in the more heavily pophated by these stump-looking mon- ulated areas of a township, because

"I don't know exactly, but my Farmington township has had friend says they are building a city several public discussions on these in the country for the people that issues in the past, and I am enclosdon't like to live in the city! They ing a clipping from The Farmingare going to fill the space with ton Enterprise of December 19th,

houses after they get rid of the water."

"But why do these people hate water when they are 98 percent water themselves?

"I'd like to know too. But it looks like we'll have to submit to this aggression, and swim for our The following conversation be-lives. C'mon, son, let's leave this

I too was very disappointed about "Many years ago, when this this project going through. I take swamp was formed as a lake it it to be a big and useless expense was a nice place to live, and in the and no benefit to anyone in the

> Charles J. Oramo 49000 Nine Mile

"Holy smoke! That means that the fine election issue of The Novi I would like to compliment you on ages and pitfalls of incorporation. "And it means that our friends, and I believe a great many people

they want certain restrictions or services that the rest of the people "But why do they want to des- in the township either don't need, or are not willing to pay for.

#### Letter Mailed to Michigan DEQ Concerning Wetlands Map Labeling Error

October 3, 2015

STATE OF MICHIGAN
Attn: Department of Environmental Quality (DEQ)

Dear DEQ,

While performing some research into the history of the Garfield Drain that is located in Novi, Michigan, I discovered an error in one of your mapping databases. I discovered this error while using the Wetlands Map Viewer and searching by my home address which is 49450 W 9 Mile Rd, Novi, Michigan 48374. The following images were captured from this search and I have identified the erroneous information showing on the base layer of your drawing.

I have also included the approximate start and stop points of the Garfield Drain which I noted while examining the construction drawings for this drain at the Oakland County Water Resources Commission (WRC) office on September 18, 2015. You can confirm this information by either examining these drawings yourself at the WRC, or by using the legal description used for the construction of the drain in 1957. I have also attached the legal notice for construction of the Garfield Drain as it appeared in the Novi News newspaper on April 25, 1957.

Please correct the information showing in your database. If you have any questions feel free to contact me.

Sincerely,

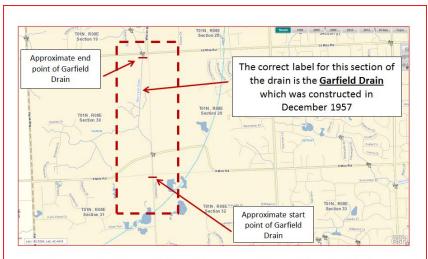
Karl F Migrin

Karl F Migrin 49450 W 9 Mile Rd Novi, Michigan 48374 Telephone: 248-344-9946 Email: kmigrin@twmi.rr.com

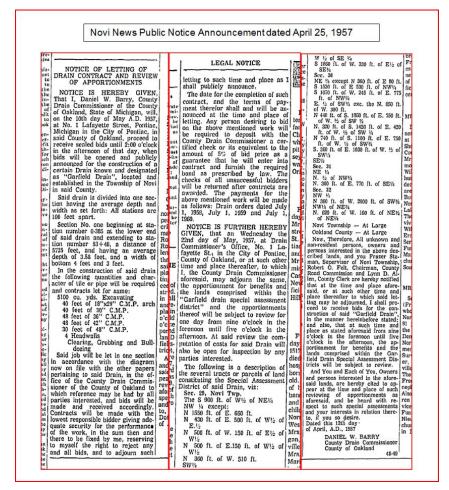


Reference: http://www.mcgi.state.mi.us/wetlands/mapBasic.aspx?x=83.53431701660156&v=42.45288848876953

#### Letter Mailed to Michigan DEQ Concerning Wetlands Map Labeling Error



The Oakland County Michigan Water Resources Commissioner's (WRC) Office has the construction drawings on file from 1957 when the contract to build the Garfield Drain was issued. The legal description for construction of this drain is noted in the following pages. I discovered this label error after examining the construction drawings at the WRC office on September 18, 2015. Please note that this drain is the "Garfield Drain" and not the "John Garfield Drain" which is located in another section of Oakland County.



## Email Response Received From Michigan DEQ

#### Karl Migrin

Hartz, Andrew (DEQ) <HARTZA@michigan.gov> Tuesday, November 10, 2015 12:59 PM

Fizzell, Chad (DEQ); Jones, Jeremy (DEQ)

RE: your letter of 10/3/15 to the DEQ-Wetlands map viewer errors Garfield Drain Future Land Use Map.odf

Thank you for the additional information. Map gurus are copied on this note should you ever have any additional suggested changes....Andy

District Supervisor Water Resource Unit Water Resources Division Michigan Department of Environmental Quality (DEQ) 27700 Donald Court Warren MI 48092-2793 586-753-3867-Direct line

From: Karl Migrin [mailto:kmigrin@twmi.rr.com] Sent: Tuesday, November 10, 2015 9:20 AM

To: Hartz, Andrew (DEQ)

Hartza@Michigan.gov

Subject: RE: your letter of 10/3/15 to the DEQ-Wetlands map viewer errors

Thank you Andy for forwarding this information to the master map makers in Lansing. Hopefully they will correct the base layer to show the proper legal name and location of this Garfield Drain since many communities use this information in developing their Master Plans. During a Master Plan Open House recently held at the City of Novi offices on October 28, 2015, the Garfield Drain has now been mislabeled as the "Novi Lyon Ditch." This is just one example of how the accuracy of the information portraved in the Wetland Map Viewer is important in future land development decisions. I have attached this additional information for you use and possible action.

Thank you again for forwarding this information to Lansing. If I can be of any additional assistance please let me know.

Karl F Migrin 49450 W 9 Mile Rd Novi, Michigan 48374-3300 Telephone: 248-344-9946 Email: kmigrin@twmi.rr.com

From: Hartz, Andrew (DEQ) [mailto:HARTZA@michigan.gov] Sent: Monday, November 09, 2015 11:23 AM

To: kmigrin@twmi.rr.com

Cc: Fizzell, Chad (DEQ); Jones, Jeremy (DEQ)

Subject: your letter of 10/3/15 to the DEQ-Wetlands map viewer errors

Mr. Migrin,

Thank you for your letter of October 3, 2015 regarding possible errors in the data associated with our Wetlands Map Viewer. I am forwarding your letter to DEQ staff in Lansing that oversee this data. Thank you for taking the time to write us ....Andy

Andrew J. Hartz District Supervisor Water Resource Unit Water Resources Division Michigan Department of Environmental Quality (DEQ) 27700 Donald Court Warren MI 48092-2793 586-753-3867-Direct line Hartza@Michigan.gov

### Reference Material

### Email Message Sent to Clearzoning and the City of Novi

#### Karl Migrin

From: Karl Migrin < kmigrin@twmi.rr.com>
Sent: Tuesday, November 10, 2015 9:33 AM

To: 'info@dearzoning.com'
Cc: 'bm cbeth@cityo fnovi.org'

Subject: City of Novi Future Land Use Map Correction

Attachments: Garfield Drain Future Land Use Map.pdf, Garfield Drain Label Correction.pdf

Attached is information which outlines an error in your Future Land Use map that was recently presented at the City of Novi Master Plan Open House on October 28, 2015. The State of Michigan has been contacted about correcting the information shown in their Wetland Map Viewer base layer map and the DEQ staff in Lansing is now reviewing this information.

If you have any questions feel free to contact me. Thank you!

Karl F Migrin 49450 W 9 Mile Rd

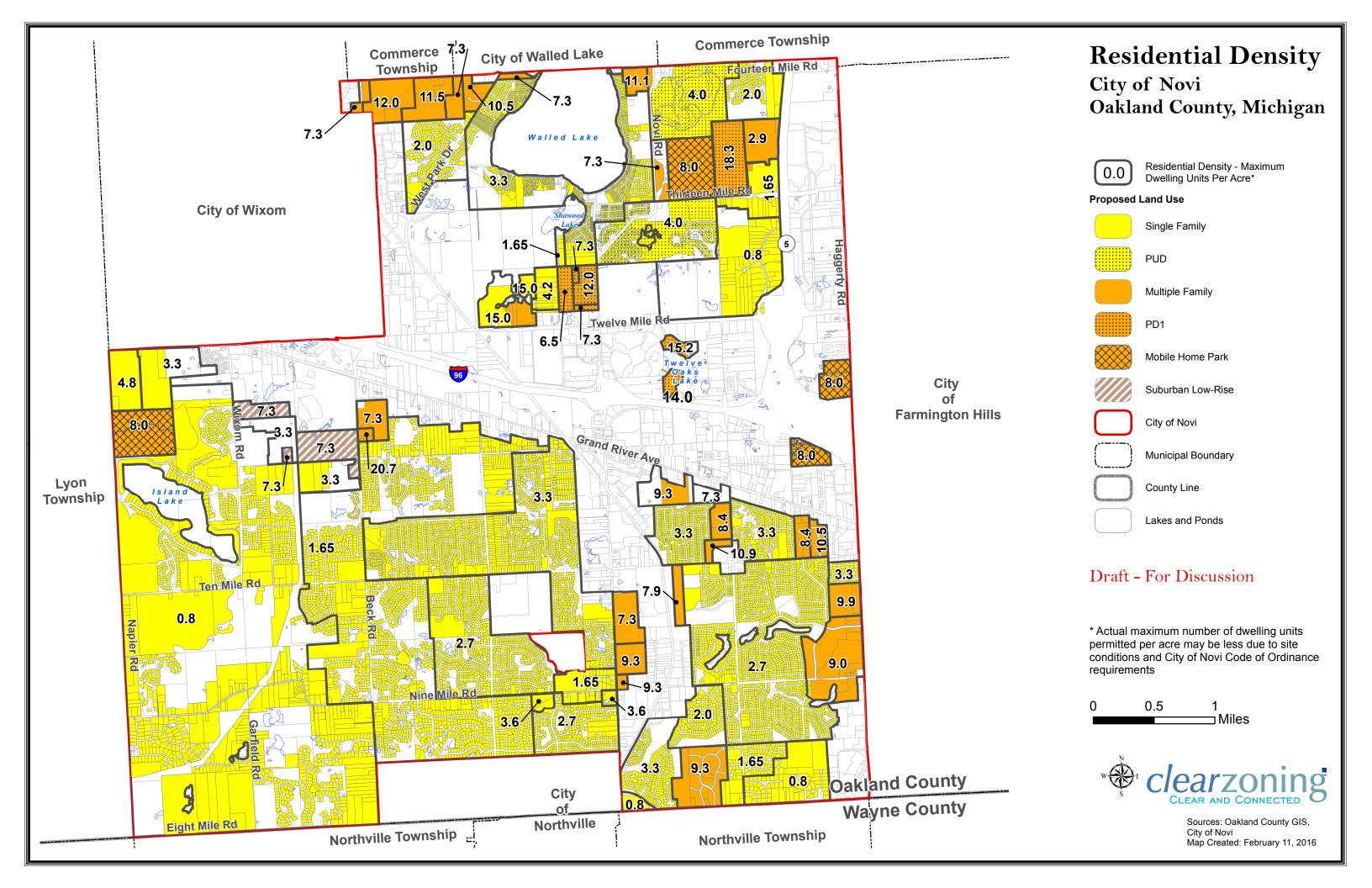
Novi, Michigan 48374-3300 Telephone: 248-344-9946 Email: kmigrin@twmi.rr.com

### Questions

- Karl F Migrin
   49450 W 9 Mile Rd
   Novi, Michigan 48374-3300
- Email: kmigrin@twmi.rr.com
- This presentation is also available as a Microsoft PowerPoint presentation. If you would like a copy just let me know.
- Thank you for your interest in improving this Southwestern section of the City of Novi

#### A. Master Plan for Land Use Review 2015

i. The Residential Density Map



- A. Master Plan for Land Use Review 2015
- ii. Briefly Review the Chapters Completed to Date



# City of Novi 2016 Master Plan Update

















Adopted DATE







## Acknowledgements

#### City Council

Bob Gatt, Mayor

David Staudt, Mayor Pro-Tem

Brian Burke, Council Member

Laura Marie Casey, Council Member

Gwen Markham, Council Member

Andrew Mutch, Council Member

Wayne Wrobel, Council Member

#### City Administration

Peter E. Auger, City Manager

Victor Cardenas, Assistant City Manager

Maryanne Cornelius, City Clerk

#### Planning Commission

Mark Pehrson, Chair

David Greco, Vice Chair

Michael Lynch, Secretary

Tony Anthony

David Baratta

Robert Giacopetti

Ted Zuchlewski

### Planning Commission Master Plan & Zoning

#### Committee Members

Michael Lynch, Chair

Mark Pehrson

Robert Giacopetti

#### Community Development Staff

Charles Boulard, Community Development Director

Barbara McBeth, AICP, Deputy Community Development Director

Sri Ravali Komaragiri, Planner

Christopher Gruba, Planner

Kirsten Mellem, Planner

Rick Meader, Landscape Architect

Brian Coburn, P.E., Engineering Senior Manager

Jeremy J. Miller, E.I.T., Staff Engineer

#### Planning Consultant Team

Clearzoning, Inc.

The Chesapeake Group

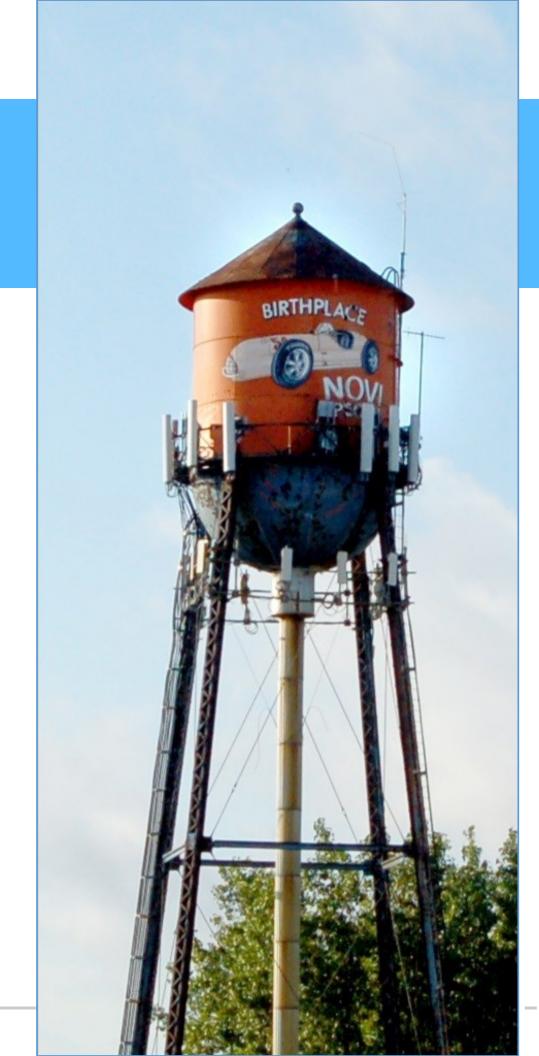
Grissim Metz Andriese Associates

#### Geographic Information System

Keri Blough, Geospatial Applications Services Manager

#### City of Novi Citizens

All of those who participated in the Master Plan review process.



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"Observe always that everything is the result of change, and get used to thinking that there is nothing Nature loves so well as to change existing forms and make new ones of them."

- Marcus Aurelius, emperor of Rome (121-180 AD)

### Introduction







# The City of Novi is a thriving community in southeast Michigan.

Incorporated in 1969, the City has historic roots as far back as the early 1800's when it was settled as a farming community. It remained relatively rural until the mid-1900's as new transportation networks in the region knitted the then-Village of Novi into the fabric of metropolitan Detroit. When the village became a city in 1969, the population was roughly 9,600. From the 1970's to today, one new subdivision after another made Novi into one of the most popular suburbs in the region with a 2010 population of 55,374. This Master Plan Update reinforces the City's commitment to keep Novi thriving into the future.









Despite challenging economic conditions in the late 2000's that extended into the 2010's for many communities in Michigan, Novi continues to grow in terms of population and business growth. Residents enjoy excellent schools and a diverse housing stock that includes everything from apartments to luxury homes. Its location is one of the City's biggest strengths, both from the standpoint of residents as well as businesses. Easy freeway access with interchanges on Interstates 96, 275, and 696, along with connections to state highway M-5, give the City convenient access to Lansing, Detroit, and Ann Arbor as well as Detroit Metropolitan Airport.

The access afforded by the interstates has allowed the City of Novi to attract and retain significant regional commercial development, including a destination retail cluster and a regional convention center. These developments are less than two miles apart and attract thousands of people throughout the year. The City's freeway access also attracts numerous businesses, including industrial and technology businesses, making the area an important employment center in the region.

The City also maintains a diverse park system that includes a growing trail network along with active and passive recreation opportunities. From its access to 670-acre Walled Lake at the City's north end and community sports fields at the City's south end, residents can enjoy a variety of water and field sports. Playgrounds and nature areas can also be found in the City.

Maintaining and enhancing these strengths will be important to continue the City's success into the future. This 2015 Master Plan Update will explore the City's strengths and weaknesses as well as seek opportunities to enhance the quality of life for its residents.

#### What is a Master Plan?

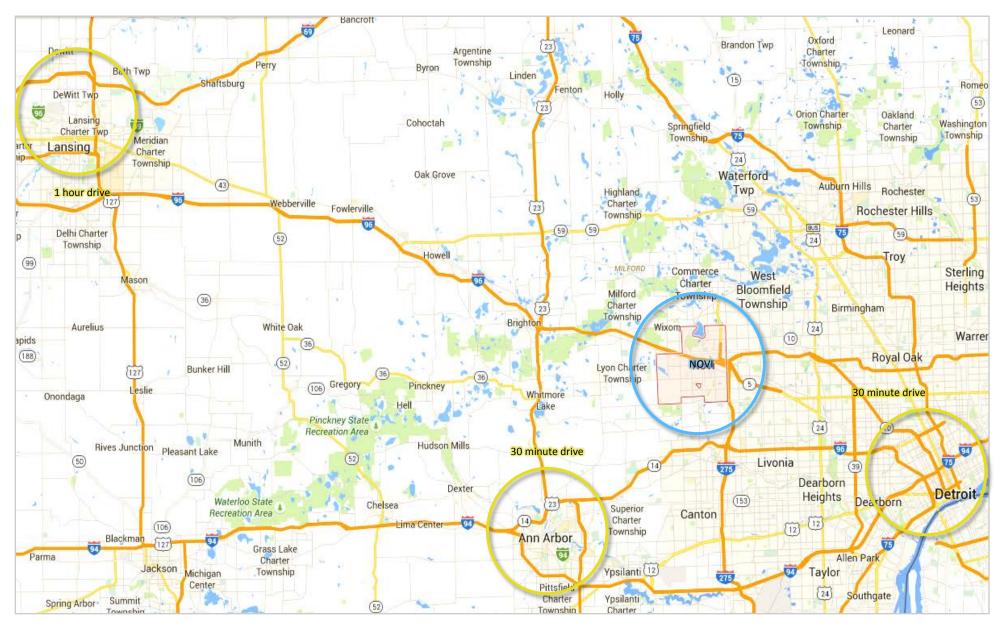
Master Plan is a community's long-range guide for the future. It is similar to a business plan, in which a business identifies its resources and strategies for success, without mandating rigid procedures that may prove to be unrealistic or outdated when faced with internal and external changes.

Community Master Plans illustrate the vision for the future and contain guiding principles that help a community create land development policies and make land use decisions. In Michigan, the value of the Master Plan is recognized as an important community document, which is why the state requires the Master Plan be reviewed every five years. This review allows communities to check in on their progress and ensure the vision and guiding principles are still relevant.

Combined with the expertise of City staff and the knowledge of its officials, public input is a key part of the Master Plan process, as well as its implementation. The Master Plan process typically starts with staff and officials building the foundation of the plan – understanding existing conditions and land use patterns as well as forecasts for growth. Sharing this information with residents and business owners allows them to provide input about how these factors impact their lives and businesses. The remaining part of the planning process involves building consensus about where the community wants to go and creating a strategy for how to get there.

Photos around the City. Images at left, starting from the top: 12 Oaks Mall, the Suburban Collection Showplace, and Providence Park Hospital.

## Existing Conditions



Location Map—Novi's location on I-96 and I-275 makes transportation convenient for residents and businesses. Detroit Metropolitan Airport is also only 30 minutes away.

The City of Novi has seen dramatic population growth since its incorporation as a City in 1969 when the population was 9,668.

Between 1970 and 1980, the population of the City more than doubled in size, growing to 22,525 by 1980. The population doubled again by 2000 when the population grew to 47,386. While the population growth has slowed in the past ten years, the City still saw an increase of almost 10% with a 2010 population of 55,374. As would be expected, similar to population growth, the housing stock grew at the same rapid pace, with only about 30% of the City's housing built prior to 1980 and 24% built between 2000-2009.

#### Population & Households

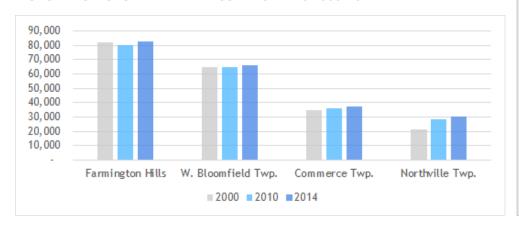
The growth of the City of Novi is consistent with growth in the region. Most nearby communities have seen an increase in population since 2000, although only in Wixom and Lyon Township (both west of the City along I-96) has the population increased more than in Novi (by 12.5% and 19%, respectively). Only one nearby community, Livonia (located to the City's southeast along 1-275 in Wayne County), experienced a decline in population between 2000-2010 (a loss of about one and one-half percent).

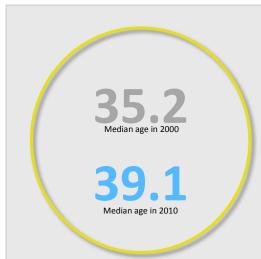
With a population of 60,000, the City of Novi is comparable in size to other Oakland County communities of Farmington Hills (2014 pop estimate: 82,897), West Bloomfield (2014 pop estimate: 66,179), Rochester Hills (2014 pop estimate: 73,556), Royal Oak (2014 pop estimate: 59,016), and Southfield (2014 pop estimate: 75,768).

With the popularity of the Novi school system, the City has attracted many families over the years. In 2000, the population had roughly the same number of children under four years of age (about seven percent) as adults over 65 (about eight percent). The largest age bracket was people aged 35 to 64 years (about 43%). In 2010, the population has aged, with now twice as many residents over 65 (11%) as children under four (just under six percent). The 35 to 64 age group has remained constant. The median age of Novi residents in 2000 was 35.2; in 2010, the median age increased to 39.1. The population of the City's population is expected to continue to age, similar to other communities in the region and state. The Southeast Michigan Council of Governments (SEMCOG), the sevencounty regional planning agency, projects that by 2040, given current trends, the population will stabilize at around 57,837 people, but 25% of the residents will be over 65 years of age.

Additional changes in the population involve the number of residents per household. In 2000, there were 2.52 people per household – and 18,726 households total. That number has declined to 2.47 in 2010, while the number of households grew to 22,317 (which explains why the overall population increased). In 2014, the number of households is estimated to have grown to 24,680, while the number of people per household dropped to 2.44. While the number of people per household in 2010 is fairly consistent with communities in the area, it is lower than nearby Commerce, Lyon, and West Bloomfield Townships (2.71, 2.7, and 2.66 respectively), but higher than Farmington Hills (2.36), Northville (2.29), Walled Lake (2.09), and Wixom (2.36).

#### POPULATION GROWTH NEARBY COMMUNITIES 2000-2014





#### Impacts of an Aging Population.

In the United States, the population is living longer, while birth rates have been declining, leading to an overall aging of the population. There is some evidence to suggest the birth rate may be on the increase again as the economy improves; however, the birth rate has not changed enough to change the aging trend at this point.

Suburban communities around the country will be facing similar shifts in their populations and many will also be faced with a housing stock and transportation network that is not well suited for their future older adults. Many residents who moved to the City for a single-family home on an ample lot may find that maintaining such homes is too labor- and time-intensive. Suburban land use pattern of separating single-family neighborhoods from commercial activities means driving for most, if not all, daily needs.

With traffic congestion frequently mentioned as one of the frustrations of living and working in the City, this may be even more difficult for an aging population. Further, according to the National Highway Traffic Safety Administration, the majority of older drivers will outlive their ability to drive by about 7 to 10 years. This means that the demands for alternative forms of transportation and land use patterns are likely to rise.

#### **Education and Income**

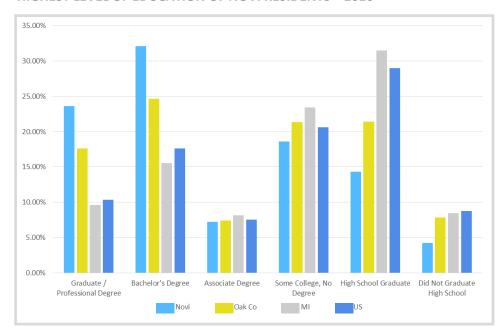
Despite the recession, between the 2000 and 2010 US Census, the City's median household income rose from \$71,918 to \$80,151 (about 11.5%), compared to the Michigan median household income of \$48,519. On a per capita basis, income levels have grown from \$35,992 to \$42,456 (18%). While the income levels did increase during the recession, they did not keep pace with the rate of inflation, which grew at 20.8% between 2000-2010.

The high level of educational attainment of Novi's residents may explain the higher than average income levels. In 2010, 95.8% of the City's residents completed high school. Compared to nearby communities, most are close to the City's level, but only Northville Township (96%) exceeds Novi. Over half (55.7%) of Novi residents are college graduates – an increase of 13.4% since 2000.

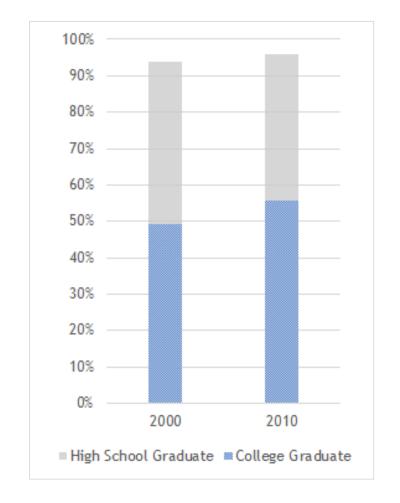
The growth of college graduates in the region is significant over the decade between 2000-2010. Neighboring communities saw the number of college graduates rise from between 7.3% (Farmington Hills) to almost 24% (Lyon Township). In 2010, approximately 23.6% of Novi residents held a graduate degree, compared to 17.6% of Oakland County residents and 9.6% of all Michigan residents. The US average is 10.3%.

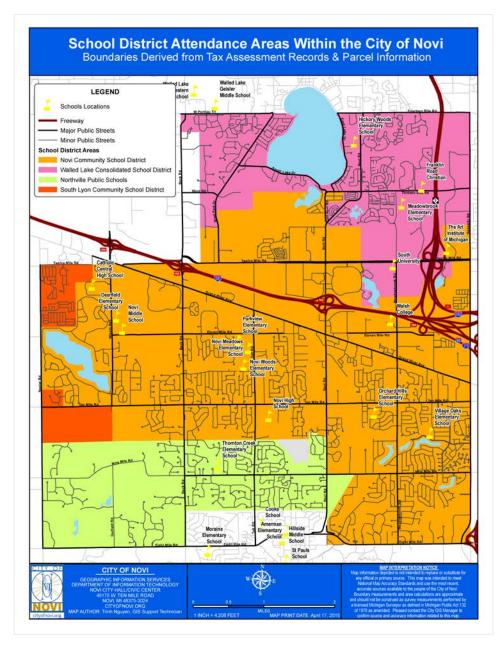
Contributing to the education of Novi residents are the four award -winning public school districts that serve the City: Novi Community Schools, Northville Public Schools, South Lyon Community Schools, and Walled Lake Consolidated Schools. Additionally, Novi Christian, Franklin Road Christian Schools, and Detroit Catholic Central High School offer private school options in the area. Locally, Wash College and South University contribute to post-secondary education, while within less than an hour's drive from the City of Novi are the University of Michigan, Michigan State University, Wayne State University, and Eastern Michigan University.

#### HIGHEST LEVEL OF EDUCATION OF NOVI RESIDENTS—2010



#### **EDUCATIONAL ATTAINMENT OF NOVI RESIDENTS—2010**





CHANGE IN PER CAPITA & HOUSEHOLD INCOME: 2000-2010

Median per capita income in 2000

42

Median per capita income in 2010

\$71,918
Median household income in 2000
\$80,151
Median household income in 2010

Source: US Census

#### Housing

In terms of housing, in 2010, the City of Novi had 24,164 housing units. Of those, about 50% were single-family detached homes. Apartments comprise 34% of the housing types, with townhomes (11%) and mobile homes (five percent) make up the rest of the housing stock. This is fairly consistent with the composition of the housing types in 2000. Home ownership declined between 2000-2010 from 71% to 66%. This may be related to the recession as well as the aging population.

Diversity of housing types is important for a balanced community; while families with children may prefer a single-family detached home in a neighborhood, young professionals and empty-nesters may seek a smaller home with lower maintenance.

While the recession took a toll on housing values between roughly 2007 and 2012, it appears that between 2000-2010, the median housing value increased from \$236,300 to \$259,656 – a change of over nine percent. The Consumer Price Index (CPI) for the Detroit-Ann Arbor-Flint region increased by 20.8% during this time period, meaning that housing values did not keep up with inflation between 2000-2010.

Rents have increased as well, from \$818 in 2000 to \$944 in 2010, or over 15%. While the City of Novi's median housing value is higher than nearby Commerce Township (\$229,300), Farmington Hills (\$238,300), Livonia (\$182,700), Lyon Township (\$242,400), Walled Lake (\$143,700), and Wixom (\$216,500), it is lower than Northville Township (\$350,300) and West Bloomfield Township (\$291,200). Rental rates are higher in Commerce Township (\$1,205), Lyon Township (\$953), Northville Township (\$991), and West Bloomfield Township (\$1,425).

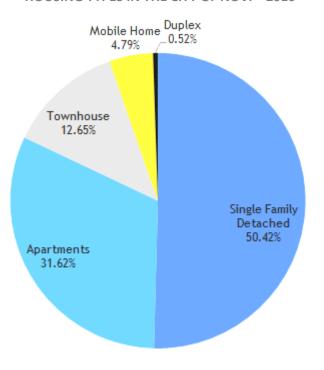
NOVI CHANGES IN MEDIAN HOME VALUE & RENT: 2000-2010



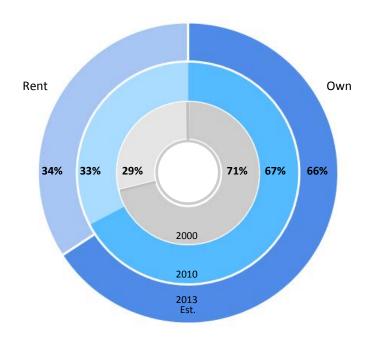
\$236,300
Median home value in 2000
\$259,656
Median home value in 2010

\$818 Median rent in 2000 \$944 Median rent in 2010

#### HOUSING TYPES IN THE CITY OF NOVI—2010



#### HOME OWNERSHIP IN THE CITY OF NOVI—2010



#### Value of Housing

In 2012, SEMCOG prepared a regional housing study that noted, "Population, economic, and building trends in the last 10 years have dramatically altered Southeast Michigan's housing needs. Although the region has lost more than 125,000 residents since 2000, more than 108,000 new housing units have been added. This mismatch of housing supply and demand is one of the region's core challenges impacting sustainability and quality of life." The report stresses the importance of key regional and local policies that support variety in housing, affordability, and transit.

The report found that housing is the largest land use throughout the region, "comprising 45 percent of the land in Southeast Michigan's seven counties." This represents an important resource in the region, but it is important to note that Michigan's population is not expanding rapidly (Michigan is the only state that lost population in the 2010 Census). The report's critical point is that because "the vast majority of this housing is immobile (fixed in a specific geographic location), durable (most of our housing stock, when maintained at a decent level, can last 100 years or more), and expensive (by and large the greatest expense for a family), it must be a community and a region's priority to ensure that this housing stock is well maintained, as well as located and constructed to meet the needs of its residents. Unlike many regions across the country that are developing sustainability strategies to manage growth, sustainability in Southeast Michigan will depend on how well our communities manage infrastructure, neighborhoods, and housing that were built to serve a much larger population."

#### **Employment**

The recession hit Michigan hard; in 2010, the unemployment for the state was 11%. In Novi, the unemployment rate was lower - 6.5% - but it was still a large increase from 2000, when the unemployment rate was a low 1.7%. City records indicate the unemployment rate in 2013 was down to 4.2%.

The 2010 US Census reports that the top industries for employment in 2010 were retail trade (20%), knowledge-based services (18%), private education and healthcare (14%), and leisure and hospitality (13%). According to the City's economic development office, in February 2015, St. John Health/Providence Park Hospital was the City's largest employer, with 1,560 jobs. The Novi Community Schools are the second largest employer, with 950 jobs. With 834 employees, Fox Run Retirement Community is the third largest employer.

Commuting is a fact of life for most Novi residents. SEMCOG has mapped US Census data that shows how many people commute into and out of Novi for employment. Based on 2006-2010 estimates, the City has 26,928 residents who leave the City for employment, while 4,905 people lived and worked in the City. The top five cities to which Novi residents commute are Farmington Hills, Detroit, Southfield, Livonia, and Dearborn.

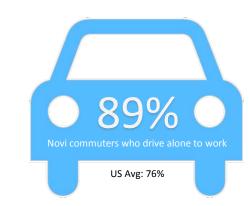
Novi also is an employment center in the area, with 34,013 people commuting the City. The top five areas in which these workers live are Livonia, Farmington Hills, Detroit, and Commerce Township. Interestingly, the fourth highest area from which people come is "out of the region," which means outside the seven county area covered by SEMCOG.

#### **TOP THREE NOVI EMPLOYERS—2015**

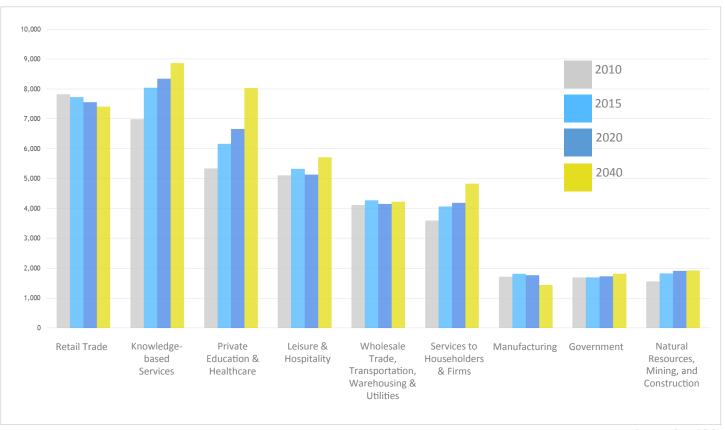
Employer	Jobs
St. John Health/Providence Park Hospital	1,560
Novi Community Schools	950
Fox Run Retirement Community	834

Source: City of Novi





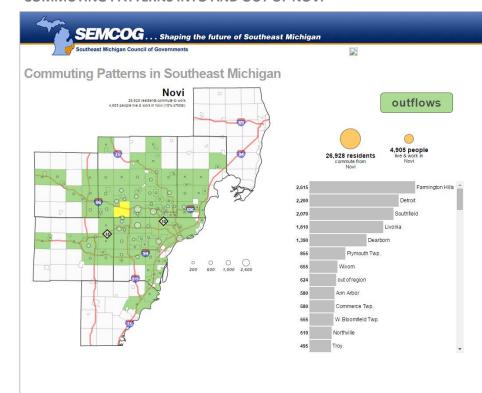
#### CURRENT & FORECASTED INDUSTRY TRENDS IN NOVI BY NUMBER OF JOBS: 2010-2040

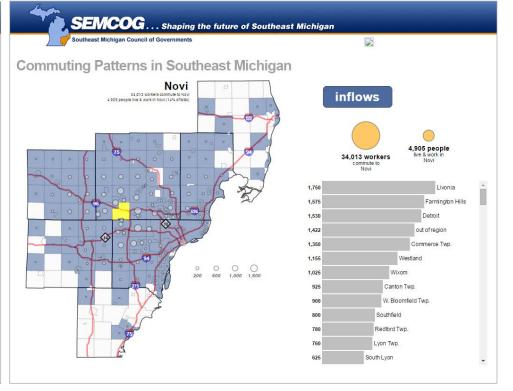


The graph at left illustrates current and forecasted industry trends in Novi by number of jobs; this information will be discussed further in the market assessment chapter.

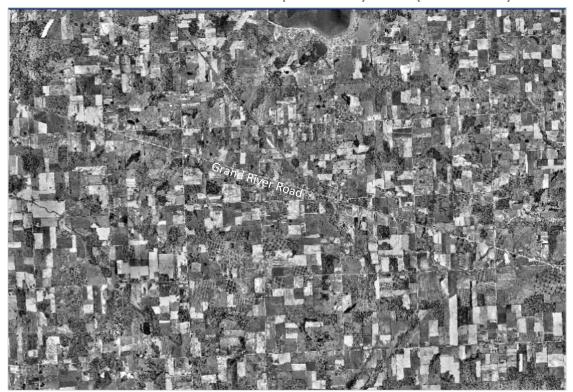
Source: SEMCOG

#### **COMMUTING PATTERNS INTO AND OUT OF NOVI**

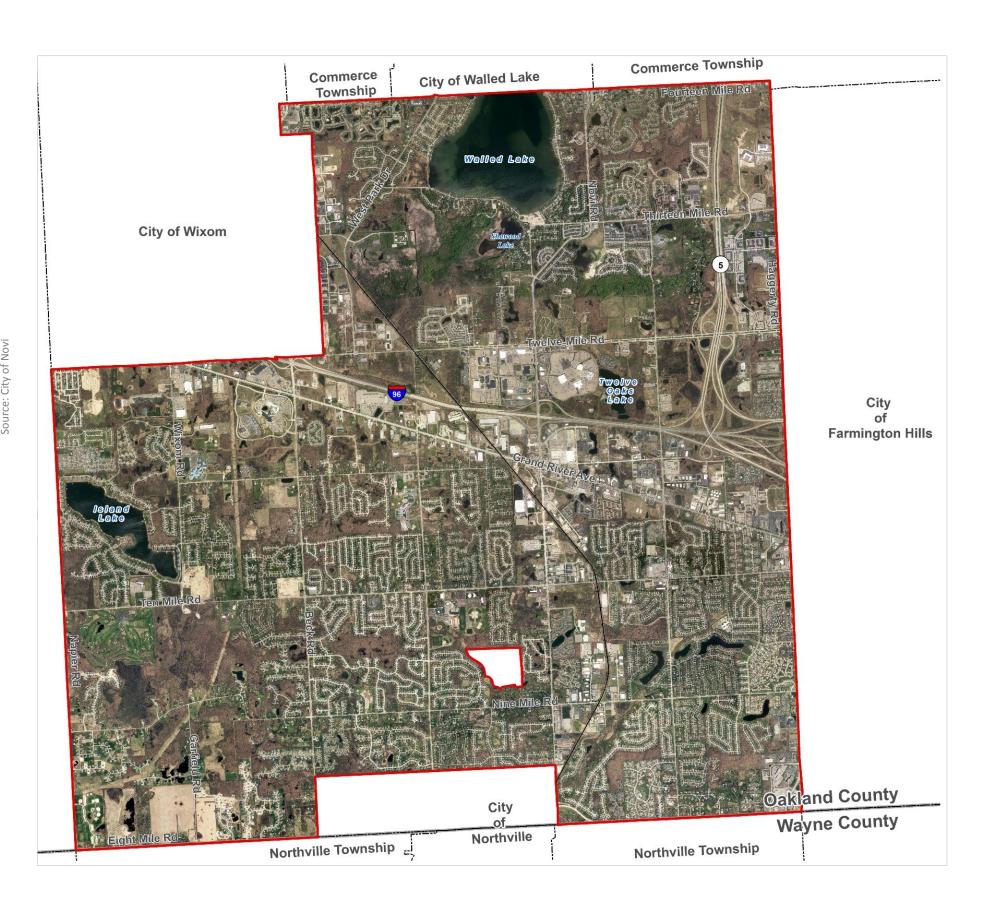




#### CITY OF NOVI—AERIAL IMAGES FROM 1949 (BELOW LEFT) & 2012 (BELOW RIGHT)



These aerial images, provided by the City of Novi, illustrate the change in land development in the City between 1949 (above) and 2012 (right). During this time, Novi was transformed from a farming community to a thriving suburb, with access to a regional transportation network that in 1949 only consisted of Grand River Road and the railroad (now operated by CSX Transportation, Inc.).



#### Land Use

The City of Novi is comprised of 21,116 acres. In the 2010 Master Plan, single-family residential was the largest land use in the City, with 24% so developed; 20% of the City's land area was vacant. By 2013, the amount of vacant land dropped to 13%, while single family residential land use has grown to 27%. The next two largest land uses are recreation/conservation and road rights-of-way; both comprised 11% in 2003 and increased to 14% and 13%, respectively, in 2013.

Other land uses, including commercial/office, industrial, and multiple family residential grew by about one percent.

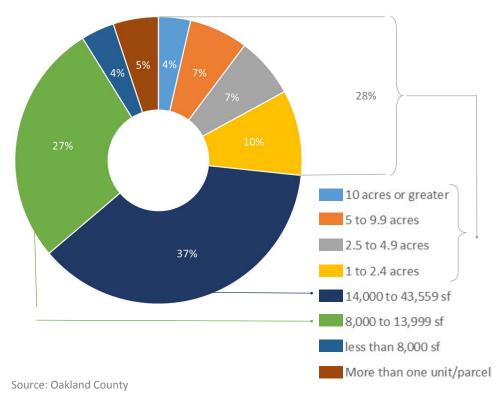
The City's largest land use, single family homes, can also be understood in terms of the variety of lot sizes that comprise the single family land use. Of the 5,378 acres of single family land, about 37% (1,996 acres) contain lots from 14,000 square feet to just under one acre. While 27% of single family land is made up of lots between 8,000 and 13,999 sf, another 28% is made up of lots larger than one acre in size.

As would be expected in a growing community, the amount of vacant land is decreasing. In 2001, the City had 22% of vacant land. By 2009, that number dropped to 12.9%. In 2013, the City had 2,371 vacant acres, or just about 12%. Not all vacant land has the potential for development, however, due to wetlands, woodlands, topography, and other concerns.

For mapping purposes, the City of Novi consolidates some of its land use categories into broader categories. The map above shows commercial and industrial uses concentrated along Grand River Avenue, Novi Road, 12 Mile Road, and the I-96 and I-275 freeways. There are small pockets of commercial and public/institutional land uses dotted within areas that are primarily single family residential. From this map, it is clear why traffic on and around those commercial corridors tends to be heavy.

On page 14 is the composite future land use map for Novi, including the border areas in adjacent communities, prepared by Oakland County Planning & Economic Development Services (PEDS). Along the northern border of the City (Pontiac Trail Road) in Commerce Township, Walled Lake, and Wixom, the planned land uses vary widely. In Wixom, at the City's northwestern edge, the future land uses are primarily commercial and industrial. Farmington Hills, along the City's eastern border designates areas

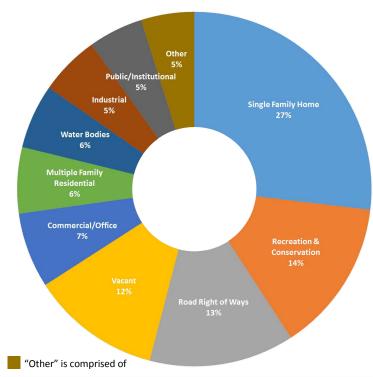
#### SINGLE FAMILY RESIDENTIAL LAND AREA BY LOT SIZE—2013



north of I-696 as a mix of residential and commercial, while south of I-696, along I-275, the area is designated as commercial and industrial. Community land use plans in the communities adjacent to the City's west (Lyon Township) and south (Northville Township—not illustrated on this Oakland County Map, but highlighted separately) designate those areas mainly as single family residential. Future land use will be discussed in greater detail in the chapters ahead.

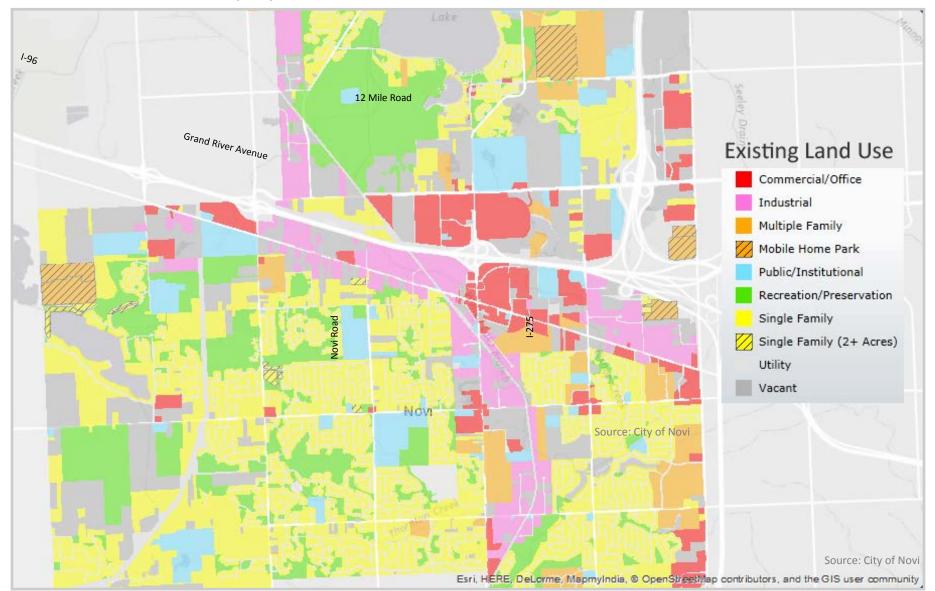
The maps on the following pages illustrate other factors that impact land use development, including the Zoning Map, publicly owned lands and the City's non-motorized transportation map. Natural features, including regulated wetlands, regulated woodlands, floodplains map, and maps will be discussed in more detail in the next chapter, Environment & Open Space.

#### **2013 LAND USE BY CATEGORY**

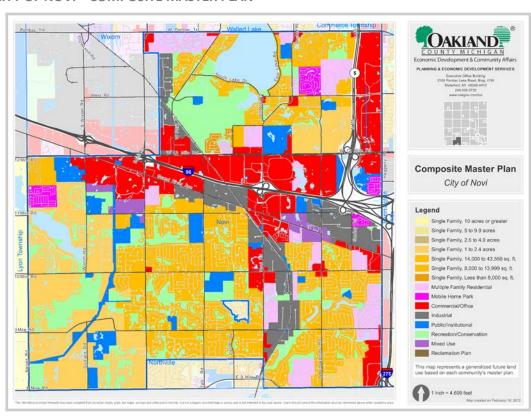


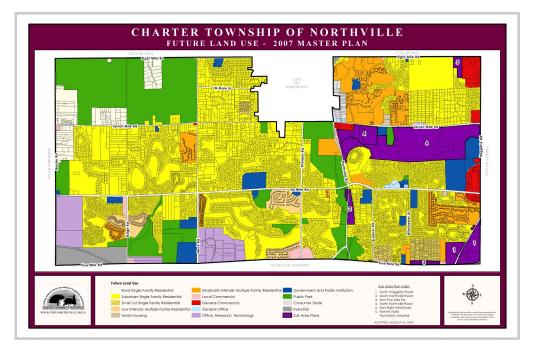
- Transportation, Utility, and Communication (2%)
- Mobile Home Park (1%)
- Extractive (less than 1%)
- Railroad Right of Ways (less than 1%)

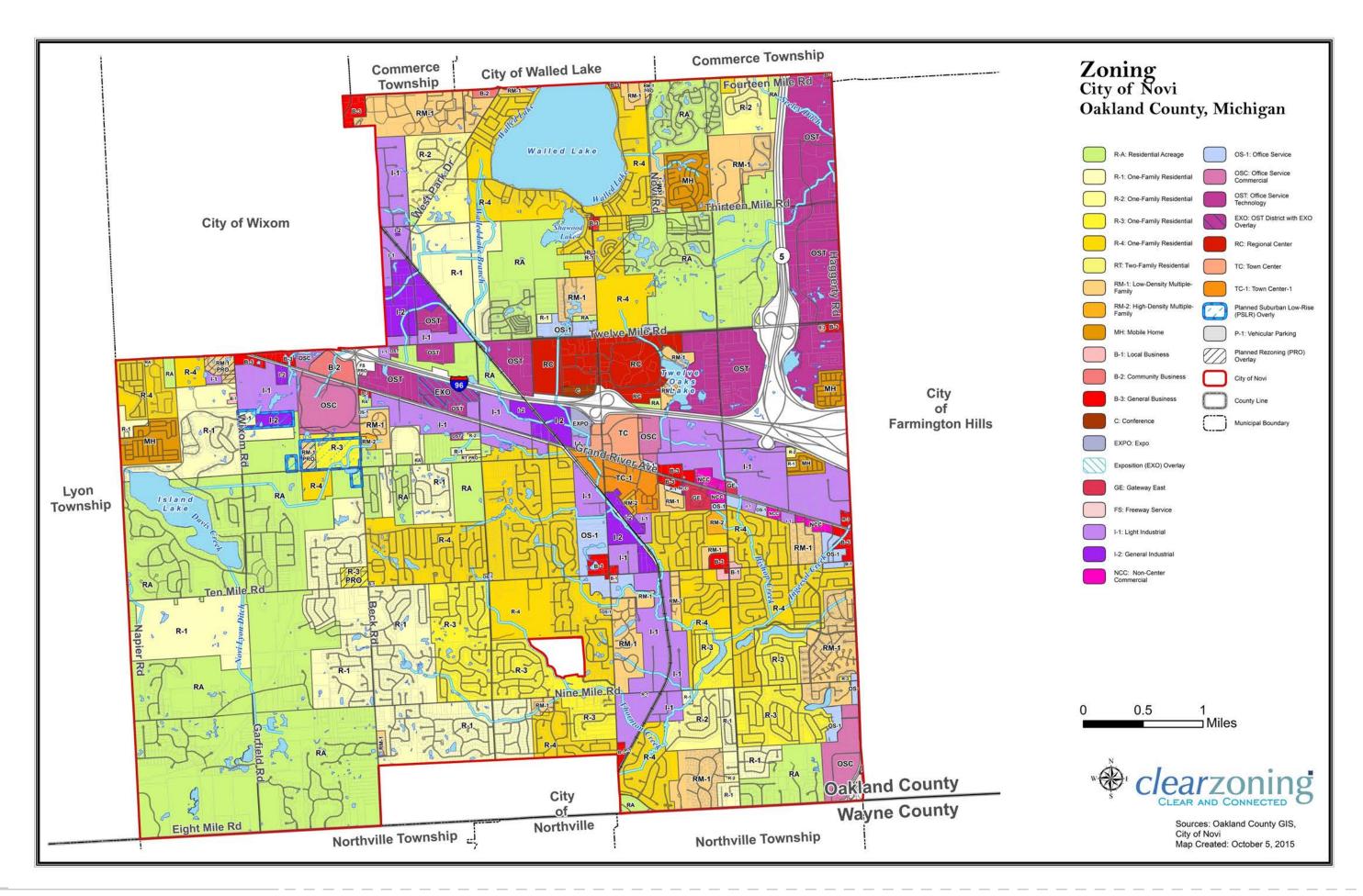
#### CITY OF NOVI—EXISTING LAND USE (2014)



#### CITY OF NOVI—COMPOSITE MASTER PLAN



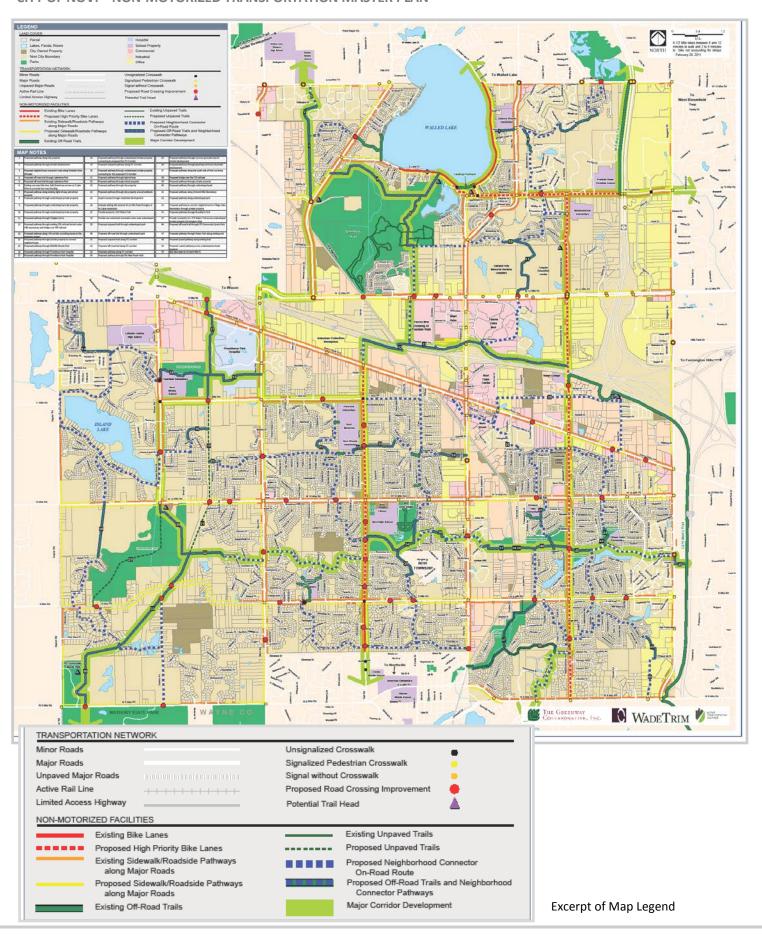




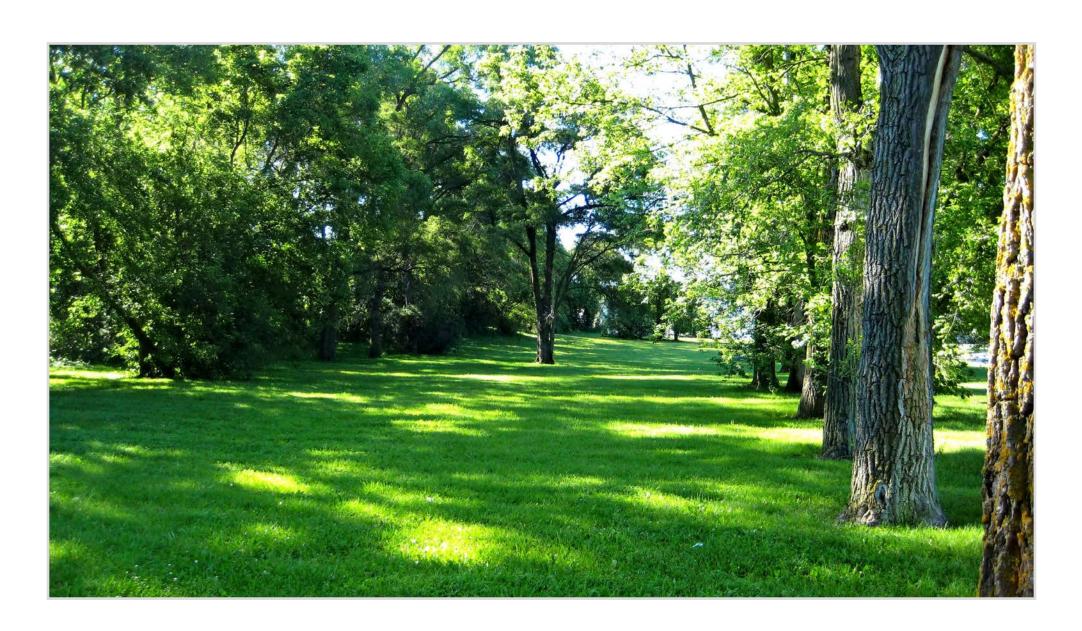
#### CITY OF NOVI—PUBLICLY OWNED LANDS

## Walled Lake Geisler Middle School **Publicly Owned Lands and City of Novi Facility Operations** State of Michigan United States Postal Service Recycling City of Detroit Oakland County School Districts Tax Parcels Police Station Hospital Library lce Arena School MILES 1 inch = 1,501 feet Map Print Date: October 2, 2013

#### CITY OF NOVI—NON-MOTORIZED TRANSPORTATION MASTER PLAN



## **Environment & Open Space**



People often think of sustainability in terms of energy conservation and recycling, but community sustainability involves a broader perspective.

A community is comprised of both the natural environment such as wetlands, woodlands, and watercourses as well as the built environment that includes buildings, roads, and sidewalk. A Master Land Use Plan looks at developed and undeveloped lands individually but also envisions a comprehensive, integrated approach to preservation, conservation, and development. This approach recognizes environmental, social, and economic benefits that result in healthy and sustainable communities.

#### **Environment & Open Space**

In 2000, the City of Novi prepared an extensive study of natural features. This study inventoried the City's natural resources, including soils, groundwater, topography, watersheds, drains, streams, flood prone areas, woodlands, wetlands, and wildlife habitats. Such features contribute greatly to the character of a community, and they can be used to enhance development and improve the quality of life. Mapping for these natural features including environmental threats that can have a negative effect on the overall natural ecosystem has been updated in 2015 and is summarized below (where updated data is available).

#### Soils

Novi has a wide variety of soil types that can be grouped into four categories. The most predominant soil types are the Marlette and Capac sandy loams, whose maximum slopes do not exceed 12%. These soils depicted on **Soils Map ENV1** are located in their greatest quantities between Eleven and Twelve Mile Road (Sections 13-18), and between Nine Mile Road, Eleven Mile Road, Beck Road, and Novi Road (Sections 21, 22, 27, and 28). While both Marlette and Capac soils present severe restrictions for local streets and roads, due to the low strength of these soils, there are also severe restrictions for building any type of structure on Capac soils. A "severe" limitation may require special studies of the area to determine the feasibility of the development.

The Glynwood and Blount loams are located in areas where the slopes do not exceed 6%. They are located in the southern part of the city. Both soils have severe restrictions for constructing local roads and streets. Blount soils severely restrict the building of structures due to wetness. A "moderate" limitation is one in which specialized design, planning, and/or engineering work would be required in order to make the site usable for structures or roadways.

Oshtemo-Boyer loamy sands are predominantly on the north side of 10 Mile Road, between Meadowbrook and Haggerty Roads and west of Beck. This soil has only a slight limitation for constructing either structures or roadways, and therefore

makes it more conducive to supporting new development than the soil types discussed above.

There are several classifications of muck in Novi that may be found scattered around the entire City. There are some large areas of Houghton and Adrian soils south of Ten Mile Road near Garfield. Another large area is bound by Twelve Mile, West Road, the railroad tracks and Walled Lake. Thomas muck can be found along Novi Lyon Drain and in small areas of Sections 16, 21, 22, and 27. All of these associations are similar because they are very low strength soils, with frequent ponding, so these soils are unable to easily support a foundation or a road. Therefore, they pose a severe limitation to supporting any type of development (structures, roads, etc.).

#### **Surficial Geology**

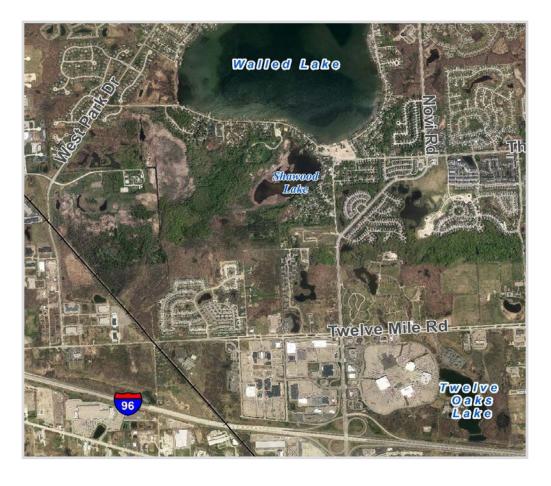
Knowing about the surficial geology and groundwater flow within the City helps with an understanding of how materials in one area can migrate and affect the groundwater in other areas over time.

The majority of the City is composed of end moraines of medium-textured till as depicted on the **Surface Geology Map ENV2**, which is material that was deposited by the glaciers as they retreated from the area. These end moraines are located near the western border of the city, south of 11 Mile Road; the western border between approximately 11 Mile and 13 Mile Road, and a wide band extending north and slightly east from the border with Northville to the northeast corner of the city. A band of medium-textured glacial till is located from Walled Lake nearly due south to Nine Mile. These medium-textured tills have a wide variety of topographic relief and drainage characteristics.

The remainder of the city is composed of glacial outwash sand and gravel and postglacial alluvium. Given the larger size of these materials, liquids can pass through them at a faster rate than the other surface materials. Therefore, these areas may be the quickest to provide groundwater recharge and the transfer of surface contaminants.



The City's soils and surficial geology attracted the cement industry many years ago and some still remain operational today. The aerial image below illustrates the impact of soil conditions and land ownership on development between 12 Mile Road and Walled Lake.





The residential community of Island Lake, on the City's west side, was created as result of sand and gravel mining activity that ended in the 1990's.



Walled Lake is located in northern Novi and offers passive and recreational opportunities. It is also part of the Middle Rouge Watershed.

#### Topography

Novi has a varied topography, with some areas of the city being nearly level while others have some steep slopes. As the **Topography Map ENV3** indicates, one of the lowest elevations is 826 feet, off of Novi Road near the border between the cities of Northville and Novi. The elevation generally increases to the northwest, with one of the highest elevations being 1,010 feet, located on the northeastern side of Walled Lake in Section 2.

Smaller areas with significant topographic relief are between Nine Mile Road and Ten Mile Road, just west of Napier Road, and along Nine Mile Road between Taft Road and Novi Road. Large areas which have a relatively level surface, and which may be better suited for development, can be found in the southern part of Novi, south of Eleven Mile Road. Steeper slopes can be found in the northeast corner of the City, north of Twelve Mile Road and east of Walled Lake.

The hilly areas in Novi help to form the character of the city, by providing aesthetic views and variation in the land surface. Significant topographic relief can pose a challenge for construction activities, due to the grading and engineering work that would be necessary. Consequently, areas with steeper slopes and topographic relief may best serve as open space. This can be accomplished with good site planning and efforts to limit mass grading.

#### Surface Water and Groundwater Resources

The City of Novi is primarily served by surface water from the City of Detroit Water System. According to the City of Novi, the City purchased 1,842,752,472 gallons of treated water from the Detroit Water and Sewerage Department (DWSD) in 2014 to serve approximately 14,200 customer accounts on the Novi water distribution system. DWSD withdraws source water from the Detroit River and Lake Huron. There are two intakes in the Detroit River: one near Belle Isle, and one at the south near Lake Erie. A third intake is located at the south end of Lake Huron.

There are two groundwater aquifers serving areas of the community that are not served by DWSD. A 1987 study on the City's aquifers found that the two underground resources were

able to yield several millions of gallons of water per day. The shallower of the two aquifers extends to approximately 100 feet below ground surface, and is the primary water source for individual private wells. The deeper aquifer, approximately 270 feet below ground surface, is within a gravel bed that underlies most of Novi. This deeper aquifer provides water for the municipal well systems. As development continues in Novi, construction activities must be carefully monitored so as not to negatively impact the artesian pressures and possibly cause dewatering of the wells.

#### Watersheds, Streams, and Drains

A watershed is defined as the land area that contributes stormwater drainage to a specific waterway. As rain falls and snow melts, water travels across the land into soil, wetlands, creeks, streams, rivers and eventually the sea. Where water interacts with the built environment, there is a potential for contamination that impact humans as well as wildlife.

The City of Novi is located within the Rouge River Watershed and the Huron River Watershed. The majority of the City of Novi is within the Rouge River watershed, with small areas along the City's western and northern boundaries located within the Huron River watershed. The subwatersheds for these rivers are shown on the Subwatershed Map ENV4. The City of Novi contributes approximately 13,795 acres of drainage area to the Middle Branch tributary of the Rouge River and 1,435 acres of drainage to the Upper Branch tributary of the Rouge River. The majority land in the City of Novi is a part of the Middle Rouge River subwatershed, which has an outlet above the Johnson Drain located in the City of Northville north of 7 Mile Road. The eastern portion of the City contributes stormwater drainage to the Upper Rouge River watershed, while the southeast corner of Novi has the Belle Branch of the Rouge. The watershed for Davis Creek, a tributary of the Huron River, is located along the far western boundary of the city. The City of Novi contributes approximately 4,725 acres of drainage area to the Huron River Watershed, which includes the Nevi-Lyon Drain and its tributaries



There are five county drains that remain in the jurisdiction of the Oakland County Drain Commissioner. These include the Davis Drain, Novi-Lyon Drain, Randolph Drain, Seeley Drain, and Townline Drain.

#### Floodplain Areas

An integral component of the natural systems are floodplains which includes the waterway and the land adjacent to watercourses that experiences occasional or periodic flooding. The **Special Flood Hazard Areas Map ENV5**, depicts the area of the floodplain which indicates the flood-prone areas in the city within the 100- year flood plain. These are the areas that have a 1 percent chance of being flooded within any given year. These are low-lying areas that are scattered throughout the city, with the majority of the flood prone areas located east of Taft Road, along the Walled Lake Branch of the Middle Rouge River and its tributaries including MillerCreek, Thornton Creek, Ingersol Creek, Bishop Creek, and Munro Creek. Knowing the extent of flood-prone areas is critical when planning for a community.

While floodplains can serve as a great viewshed for development or provide an aesthetic area for parkland or open space, development should be severely limited within the floodplain. The City of Novi is a participant in the National Flood Insurance Program, which means that the City has to maintain the minimum floodplain protection requirements in

order to remain in the program. The City of Novi also requires a Local Floodplain Use Permit application and process to protect the floodplains and help ensure that new development meets the federal, state, and local requirements regarding floodplains.

Uses that have a greater potential for contaminating a site, such as industrial facilities, should be located away from the flood prone areas. Due to the potential impact of individual sites on the floodplains, it is critical that site plan review procedures include appropriate standards to minimize the impact of these uses on the environment.

#### **Environmental Conditions**

It is important to identify the location of contaminated sites since they can be a source of pollution to a site and surrounding natural system areas and may impact future development activities. Toxic liquids from a polluted site have the potential to infiltrate to the groundwater and contaminate water downstream, thereby impacting other sites and communities.

Based on the Michigan Department of Environmental Quality (MDEQ) Recognized Environmental Conditions Map ENV6, the majority of the contaminated sites are concentrated in the eastern portion of Novi and along the Grand River Corridor. Historically, these areas have received the most intensive development and have some of the oldest uses in the City. Consequently, these areas likely have the greatest environmental impact within the city. The location of known contaminated sites in the City is indicated on the map using data collected by MDEQ on a variety of databases from the federal and state government.

As the map indicates, there are many sites that are located in close proximity to waterways and flood zones, particularly those sites located off of Grand River and Novi Roads. Toxic materials used at these sites could easily contaminate the watercourse, spreading the contamination downstream and thereby impacting other sites and wells.

Consideration should be made for how abandoned and existing uses can be improved in order to reduce the likelihood that they will either contaminate or further contaminate the area. High standards must be implemented in order to ensure that future developments are doing what is necessary to reduce the risk of pollution.

#### Woodlands

Woodland areas provide many benefits wherever they are located in the City. Areas of woodlands ameliorate the extremes of climate, providing heat during the coldest months while cooling the warmest months. They reduce wind velocity and reduce the evaporation of soil moisture thereby reducing soil erosion and runoff. They provide important wildlife habitat for a variety of mammals, reptiles, amphibians, insects, and birds in addition to smaller organisms such as insects and fungi, 90 percent of which have not yet been discovered. Woodland areas are critical for groundwater recharge areas and watershed protection, aid in visual and audio screening, and provide air and noise pollution filtration. Woodland areas are a resource for plant communities from forbes and wildflowers to all types of successional forest species. Furthermore, woodlands offer a variety of seasonal aesthetic beauties.

For natural woodland areas the greatest threat is destruction followed by degradation or fragmentation. Reducing natural woodland into smaller and more isolated units destroys the habitat of many species, modifies habitat of others and creates new habitat for some species. Reduced area of woodlands allows undesirable species to take over the woodland species and weaken the basic diversity of species, both plants and wildlife that contribute to the particular type of forest ecosystem.

In addition, this effects the woodlands in its ability to regenerate and continue succession. High quality woodland areas need to be buffered from adjacent activity. It is important to maintain large areas of contiguous woodlands with no or little fragmentation.

An inventory of existing woodlands is one effort in protecting one of the most valuable natural resources within the City of Novi. An inventory of woodland areas depicted on the **Woodlands and Tree Canopy Coverage Map ENV7**, totaled 4,872 acres of tree canopy. This is equivalent to 24% of the total area in the City of Novi under tree canopy coverage.

The preservation of woodlands as part of any development is vital to maintaining the natural community character. The City of Novi maintains a Regulated Woodland Map that serves as a general guide toward environmentally sound and responsible land development. Recently, City staff have completed an extensive assessment of the woodlands, revised the map based on woodland status updates, and accordingly made amendments to the woodlands ordinance.

#### Wetlands

Wetlands are transitional areas between the aquatic ecosystems and the surrounding upland areas. They are low areas which are intermittently covered with shallow water and underlined by saturated soils. Vegetation which is adapted to wet soil conditions, fluctuation in water levels and periodic flooding can be found in wetlands.

Wetlands provide many important functions. They may serve as a storm water holding area to reduce flooding; provide for the settling of sediments and pollutants from surface water runoff; reduce streambank erosion caused by storm water runoff; and provide habitat for fish and wildlife. Wetlands protect basic watershed quality as well as local property owners.

As the City continues to grow and develop, continued protection of this resource is needed. Thus far the City of Novi has invested considerable effort to help provide guidance regarding these natural resources. Guidance is provided by the City of Novi wetland ordinance. The City also has a regulatory map of existing wetlands which depicts the regulated wetlands within the city and has aided many development projects. Close to 2,000 acres, as displayed on Wetlands and Vacant Land Map ENV8, are available in the City that offer opportunities for development projects without impacting wetlands and thus avoiding costly wetland mitigation requirements. Wetlands and watercourses within the community are also regulated by the State under the Natural Resources and Environmental Protection Act. Regionally, Novi has been an active participant in watershed planning and local long range planning for many of the natural resources involved within its borders and beyond.

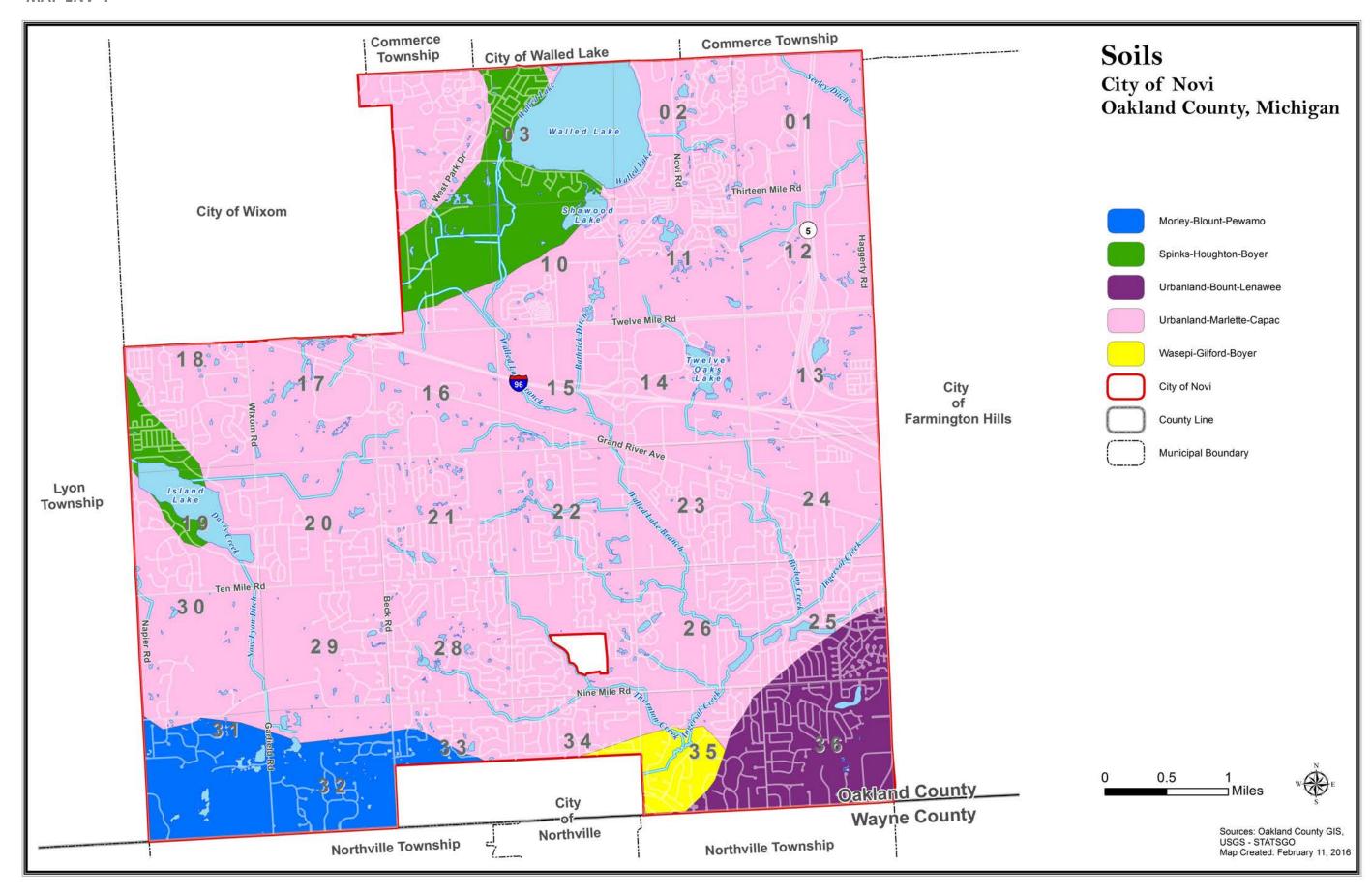
#### Green Infrastructure

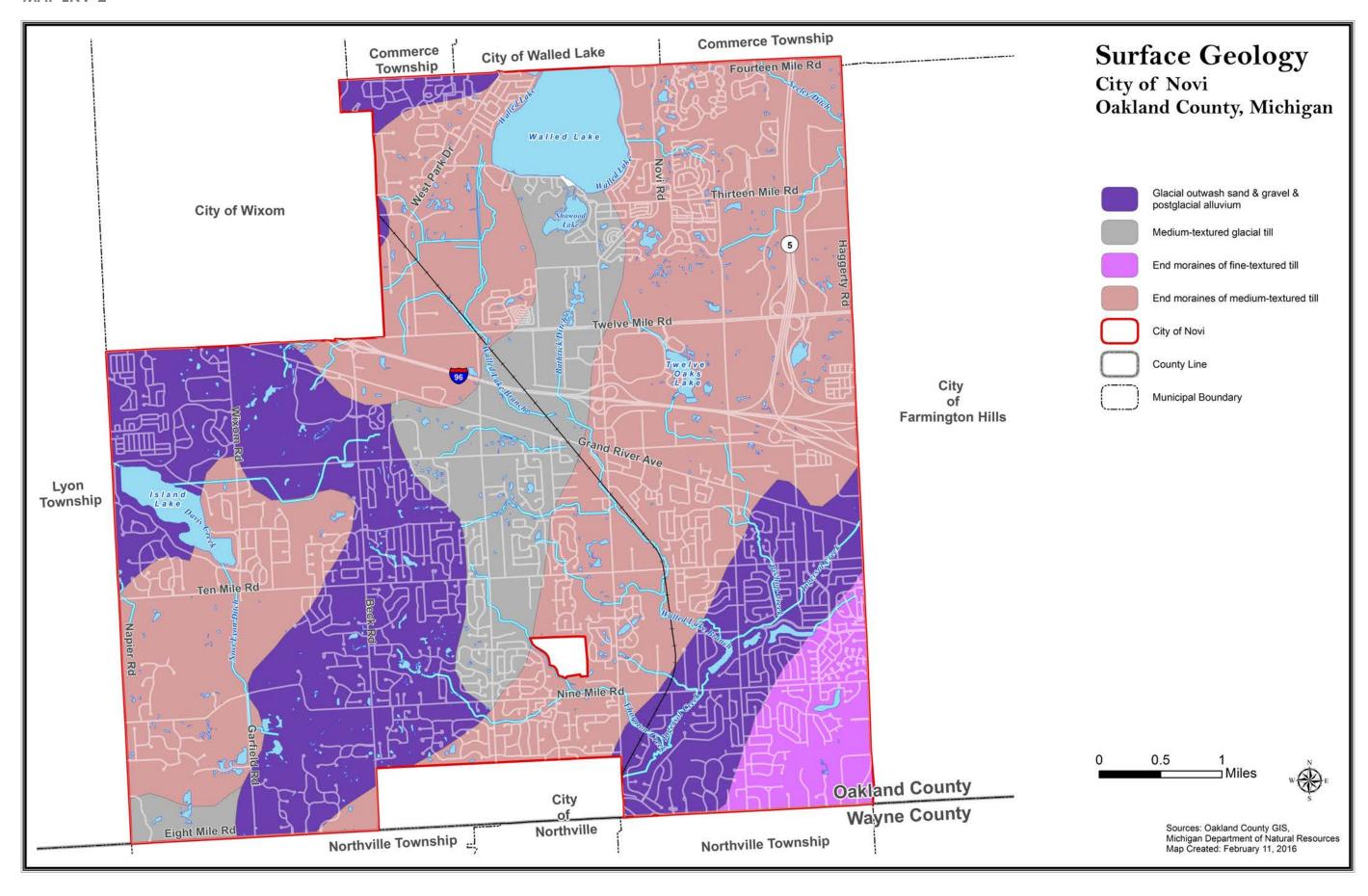
Similar to woodlands, the fragmentation of natural resources and degradation of the wildlife movement corridors continue to be the two most prevalent concerns. Reducing wildlife areas into smaller and more isolated units destroys the habitat of many species, modifies habitat of others and creates new habitat for some species. These species are often undesirable species that prey or colonize the more diverse desirable species. It is important to maintain a diversity of species in sufficiently large and undisturbed areas of natural habitat areas.. These areas need to be buffered, interconnected by corridors, and allowed to interact with surrounding habitats.

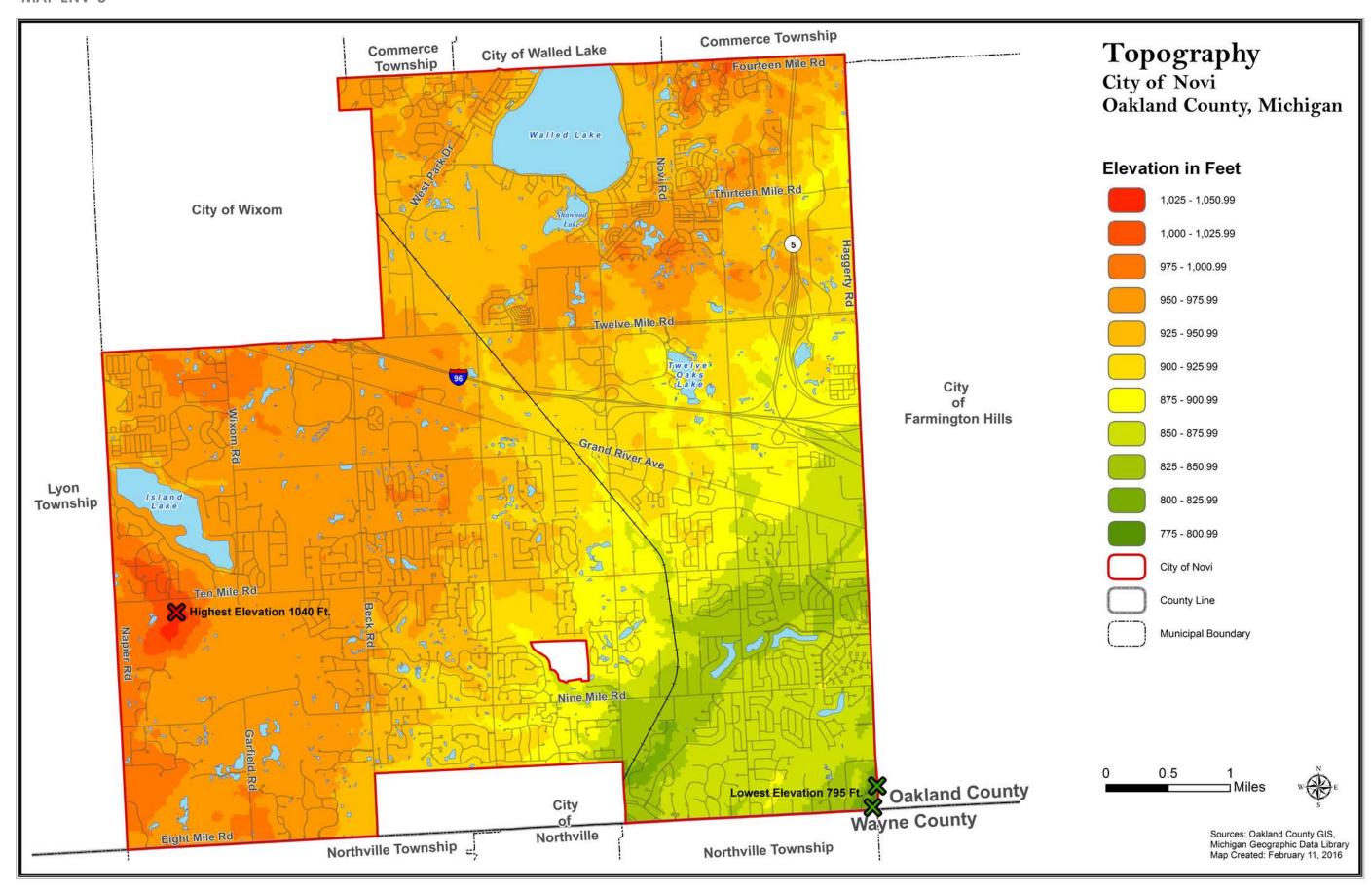
In reviewing the **Green Infrastructure Map ENV9**, there are essential components including hubs, sites, and links that have been saved and are important to the City from a wildlife habitat perspective. These include both hub areas in Section 9, 10 and 29, 30, 31 and many east to west connection linkage areas such as through the center of Sections 21, 22, 27, and 28. Consideration of the interconnectedness of woodland, wetland, and habitat areas need to all be an integral part of any decisions to remove woodland areas. Previous recommendations from the Wildlife Habitat Study recommended no Joss of core habitat areas and minimal impacts on valuable habitats and wildlife movement corridors. Restoration within any disturbed areas or edges of habitat areas is essential. Areas most susceptible to development pressures are found within Section 9, 10, and 29, 30, 31, 32 and also Section 12 (west side), 17, 20, and 1.

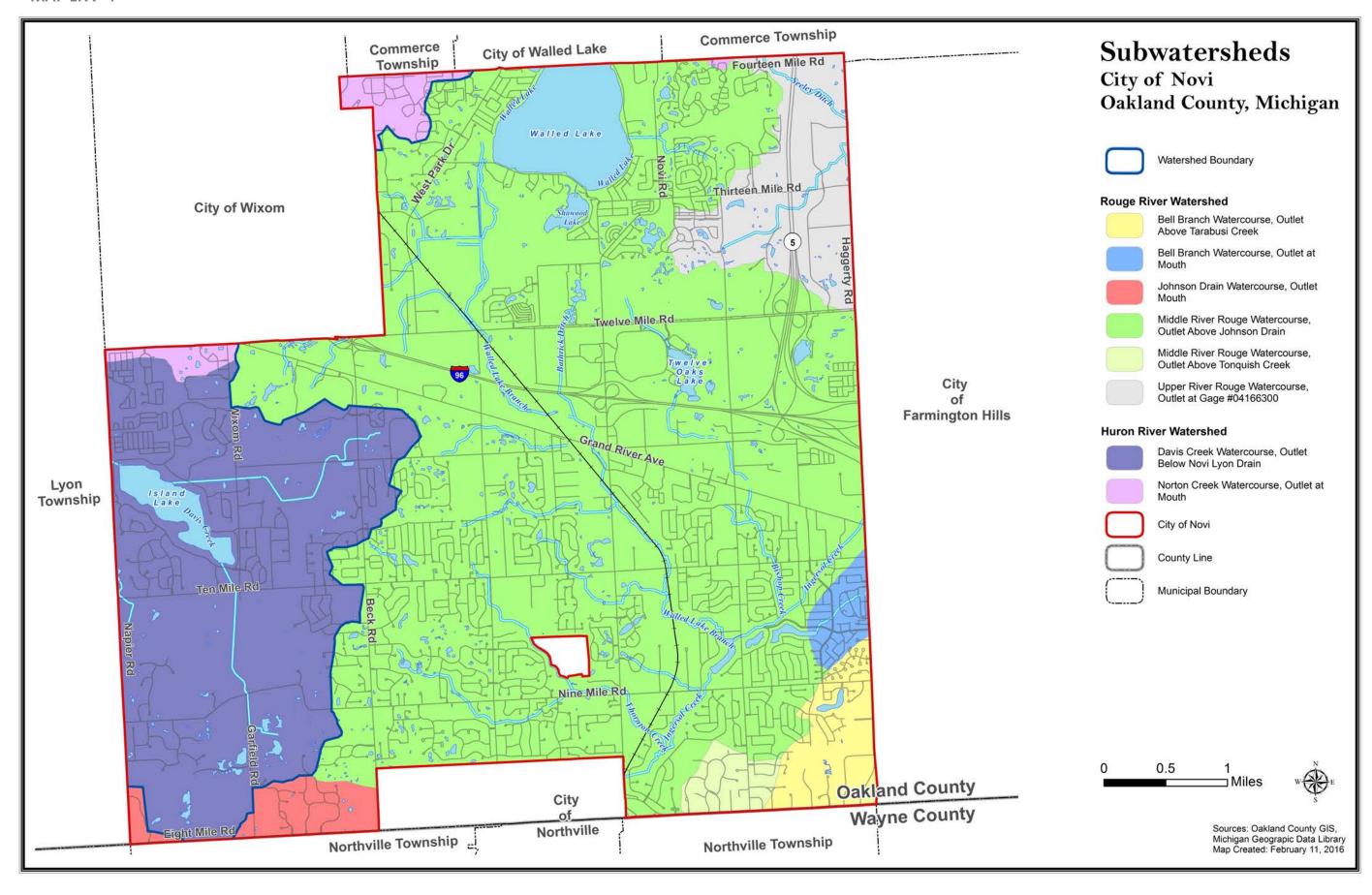


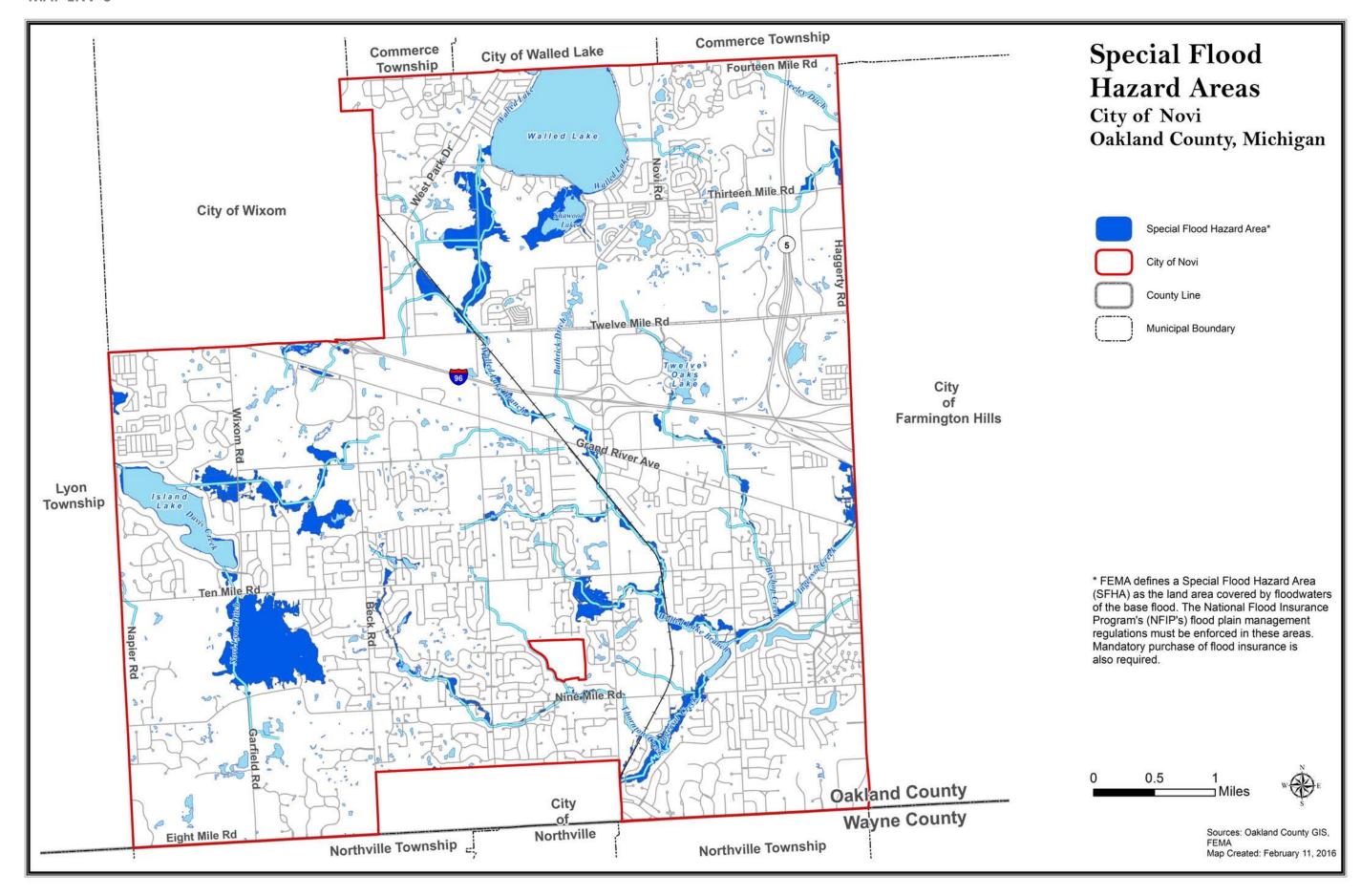


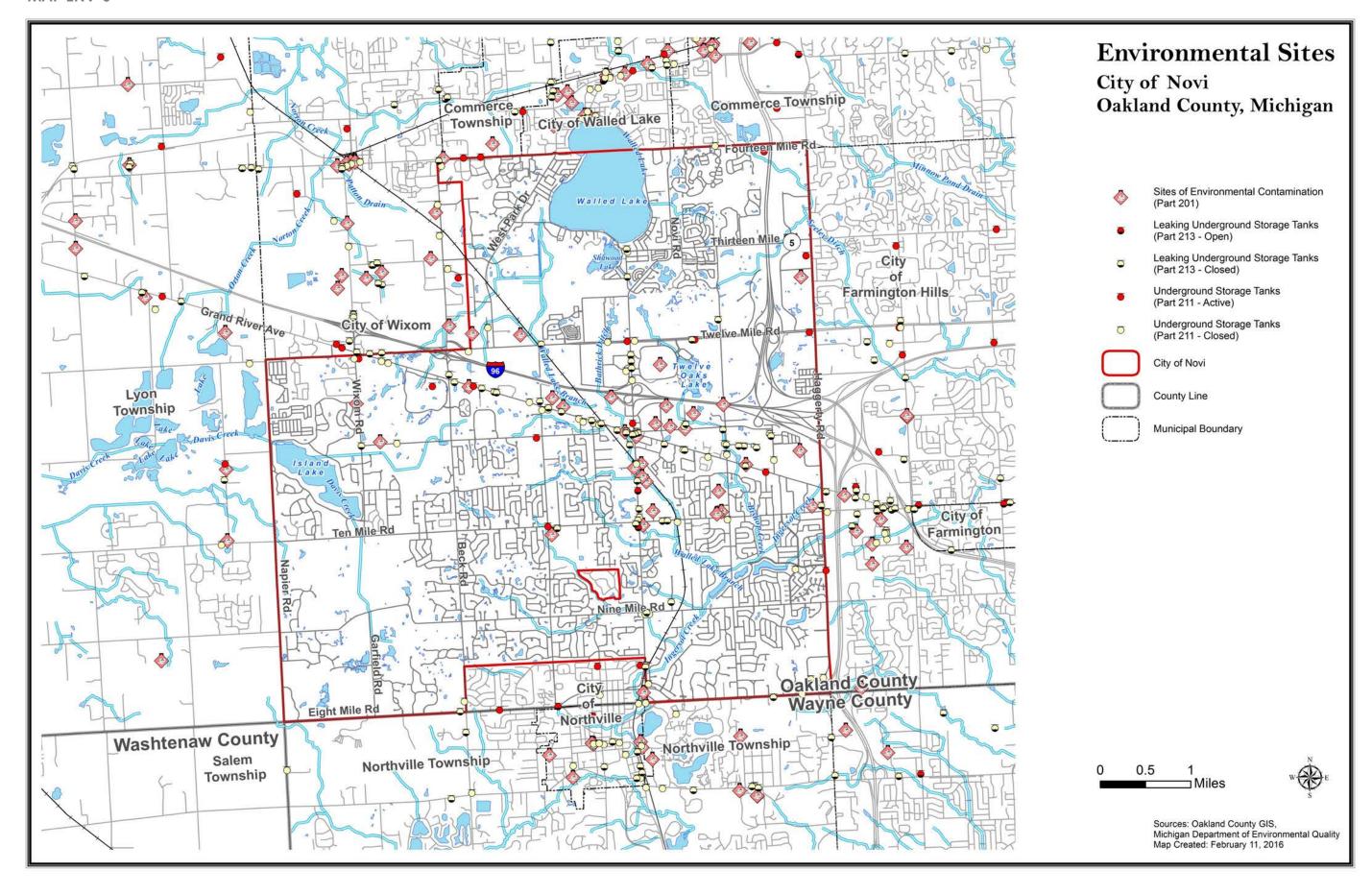


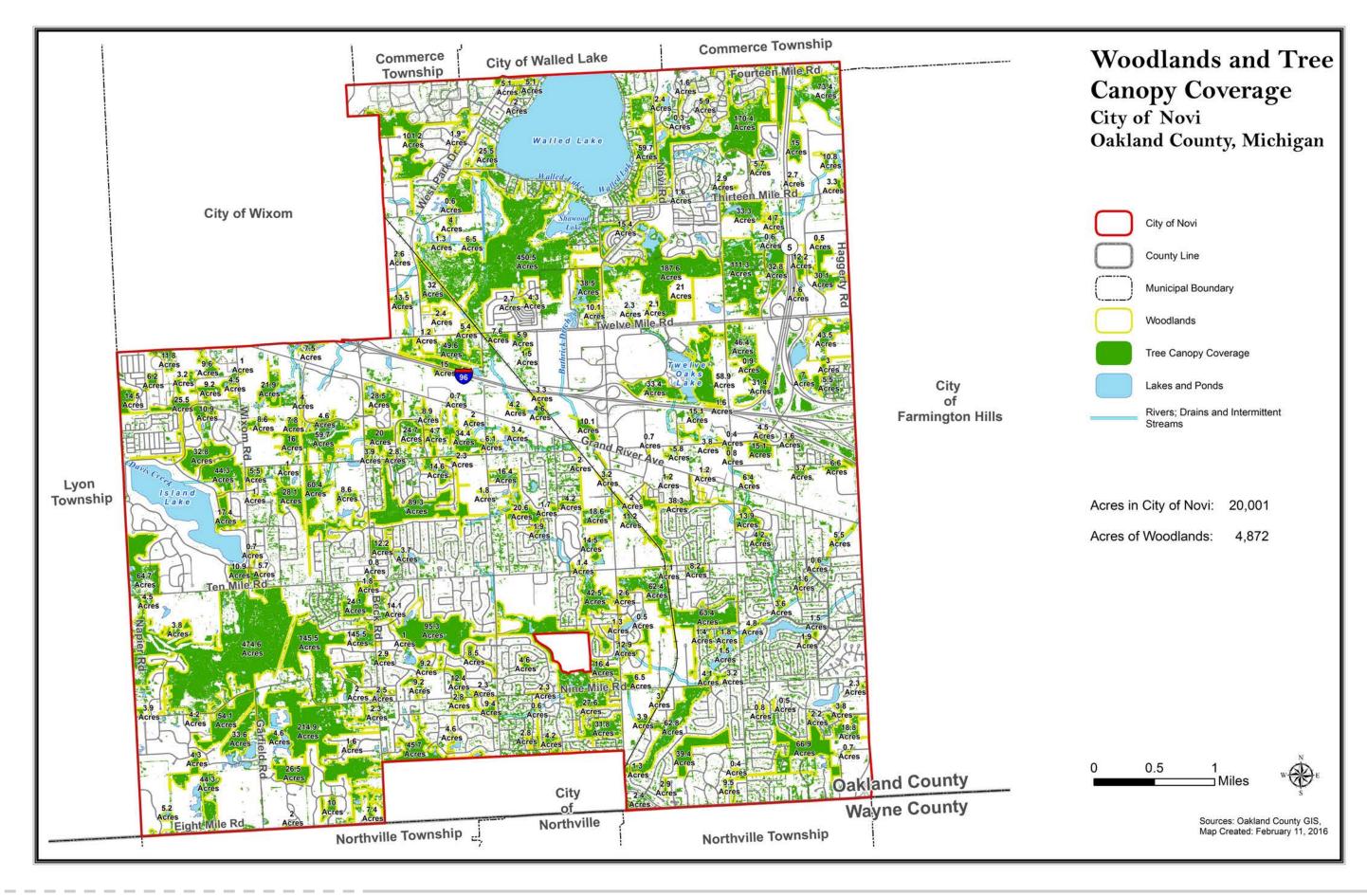


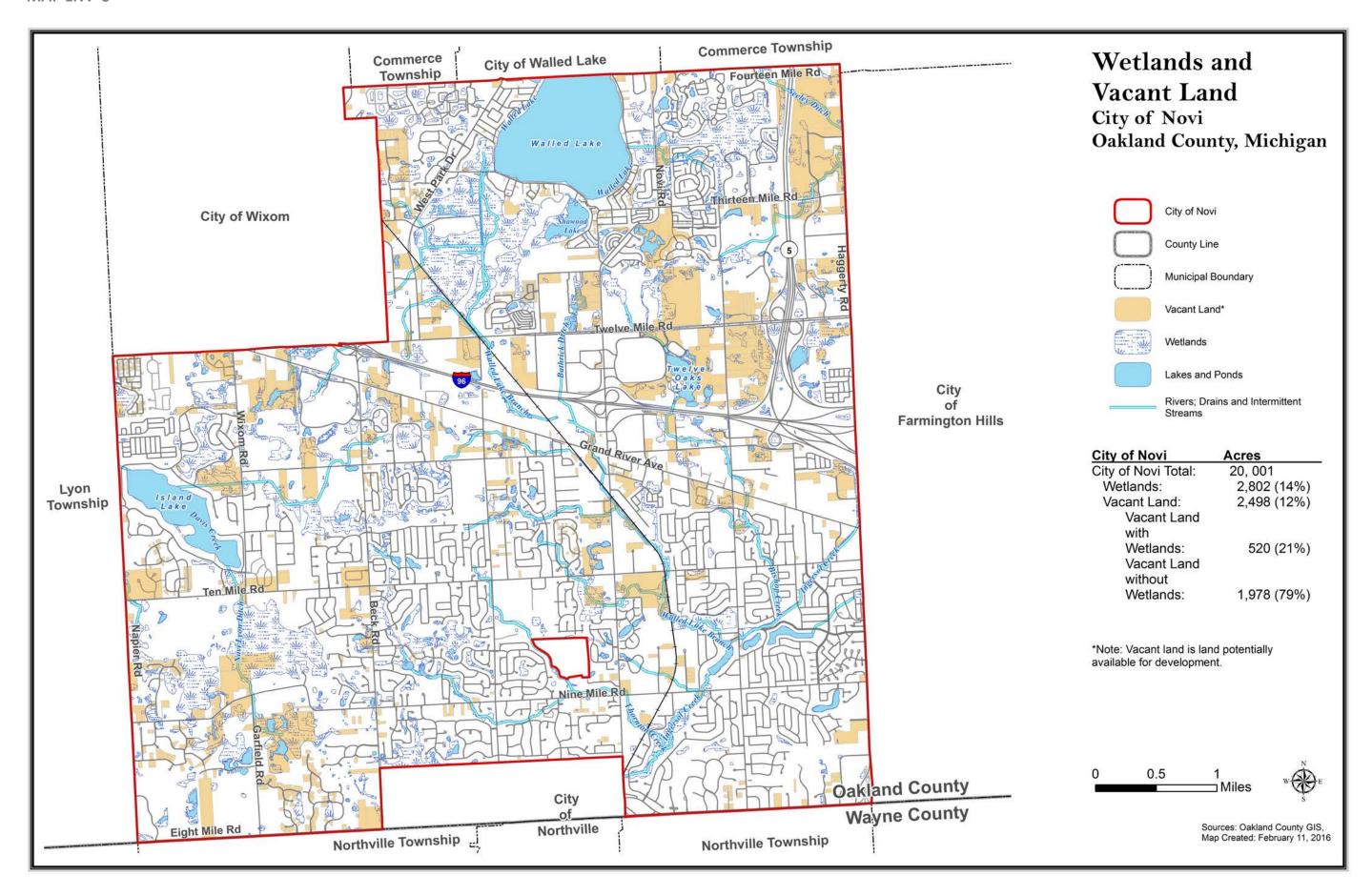


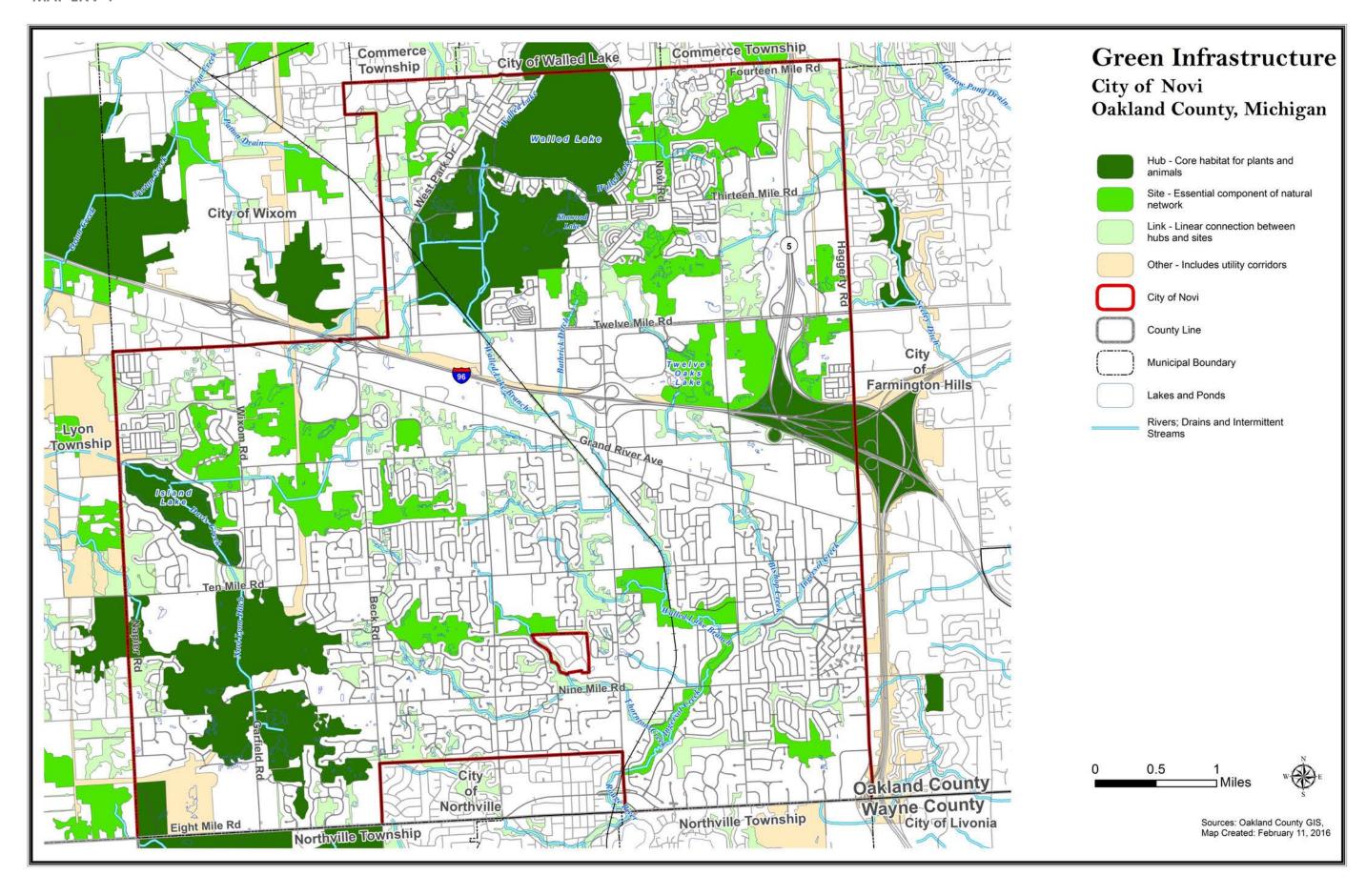












## Market Assessment







Theater).







Photos of businesses and employment centers around the City. Clockwise from top left: Hyatt Hotel at the Suburban Showplace, the interior of 12 Oaks Mall (photo by 12 Oaks Mall), West Oaks Shopping Center (photo by West Oaks), Novi Town Center (photo by Novi Town Center), Providence Park Hospital, and the Emagine Theater at the Fountain Walk shopping center (photo by Emagine

Novi is recognized as one of a handful of successful regional areas in southeast Michigan.

The Novi Road/I-96 interchange is a destination shopping area that includes 12 Oaks Mall along with other "bigbox" retail shopping, dining, and entertainment opportunities.

Beyond these retail goods and services, however, the City is an employment hub for a wide variety of industries, including financial services, health care, and manufacturing. This diverse economy makes the City an attractive place to live, as well. While the City is known for its large homes in single family neighborhoods, it also offers many opportunities for smaller-scale dwellings, including condominiums and apartments.

The challenge for the City moving forward is to recognize how the population and economy are changing and to set economic policies that continue to make the city an attractive and vibrant place to work, live, shop, and explore.

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The City of Novi has many successful retail centers that serve both a local population, as shown in the example above, and as regional destinations.

The market assessment developed for the City of Novi is based on information gathered through a variety of means including:

- A review of secondary information, Independent research and proprietary computer modeling.
- Interviews with stakeholders.
- A survey of residents of the Novi area.
- A survey of area businesses.

The assessment summary includes salient information on national and local factors that impact the future, property trends, demographics, current and future housing, and the economy as well as related opportunities associated with each.

#### Context

There are demographic and other changes within the United States and Michigan that impact the current and future opportunities for the City of Novi. These issues are highlighted in the Existing Conditions chapter, and include the following:

- Birth rates have fallen to the lowest level in the history of the country. Fertility rates are at the lowest or near lowest level in history as well.
- The marriage rates continue to decline and are also at the lowest level in the country's history.
- The average age of residents continues to increase. "Baby Boomers" are seeking different housing options, shopping experiences and environments than those associated with past generations of seniors.
- Manufacturing is changing significantly through changing technology, technology application and the introduction of new materials. Manufacturing changes will impact retail and related space in significant ways in the future.
- More buying will be based on "on demand" production methods In the short-term, countering the previous two factors is the trend among major box stores and others to fulfill online orders from stores versus warehouses.
- Higher education costs continue to rise.
- The two fastest growing components of the population the Baby Boomer and younger adult households - are increasingly seeking and participating in passive and other recreational activity and new forms of entertainment.
- The young adult population relocates and shifts employment at a faster pace than any previous generation.
- Growing household income differences will further market segmentation.



Changes in manufacturing technology, including 3D printing, shown above, are changing employment opportunities, products, and product delivery. Photo by Subhashish Panigrahi, Wikimedia Commons.

## Changes in manufacturing and technology within the United States and Michigan

- Manufacturing is changing significantly through innovative technology and technological applications.
- Internet sales will continue to grow at a rapid pace.
- Additive manufacturing, or 3D printing, has applications in both manufacturing of wholesale parts as well as retail goods. The additive manufacturing process will diminish the need for inventory storage on-site at retail operations.
- On-demand production will change the basic retail fabric.

Manufacturing and technology. Technological advances are dramatically changing the way goods are processed and assembled. One newer revolution is additive manufacturing (3D printing). This breakthrough production technology enables functional end-products or product feathers to be grown from materials such as conductive inks and metal powders in a layer-wise manner. The approach is inherently more efficient and flexible than subtractive manufacturing methods; the benefits are compelling in terms of reduced manufacturing and material costs, reduced process time, reduced environmental impact and improved product performance.

Another new technology that is replacing twentieth century manufacturing tool and die methodologies is a high-volume process for manufacturing superhydrophobic (SHP) nanostructured surfaces to enhance water repellency, boiling heat transfer and condensation heat transfer. The image transfer can be achieved via plastic injection molding, stamping, forging, dyecasting and pressing. Hydrophobic or water repelling surfaces are increasingly important in applications to reduce corrosion, drag, biofouling and other undesirable effects of water exposure.

European companies are leading the way in manufacturing of metal powder bed fusion systems used in dental copings. A coping is the metal structure for dental crowns and bridges. Acetabular (hip) cups have been manufactured using electron beam melting powder bed fusion systems. These are standard, off-the-shelf products that come in a range of sizes. More than 30,000 of these parts have been implanted into patients.

Other companies are focused on the accessibility and rapid adoption of desktop 3D printers. There are now significant collections of downloadable digital designs for making physical objects. The app numbers are expected to grow exponentially. Products and apps are increasingly used by professionals, including engineers, designers, and architects, and by manufacturers, entrepreneurs and individuals, including for personal applications.

**Retail.** The face of retail is changing. The National Retail Federation predicts that in 2016, retail sales will grow by 3.1% overall, with online sales projected to grow 6-9%. The growth rate is expected to exceed the 10-year average of 2.7% growth. The International Data Corporation (IDC) estimates that 3.2 billion people, or 44% of the world's population, will have access to the Internet in 2016. Retailing Today, an online resource for the retail trade, discusses the impact of technology on the form of retail. They project that smart mobile devices will increasingly enable consumers to shop online anywhere and anytime.<sup>2</sup>

Other technological innovations such as electronic payment, rapid delivery by drone, and virtual reality enhancements such as virtual showrooms and 3D display of merchandise will continue to change the shopping experience and drive future expansion and growth.

<sup>1</sup>https://nrf.com/news/nrf-forecasts-retail-sales-grow-31-percent-2016 <sup>2</sup>ttp://www.retailingtoday.com/article/online-retail-growth-focus-new-index



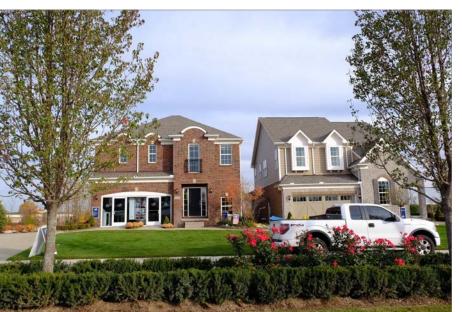
#### **Local factors impacting Novi**

- The school district associated with Novi has maintained an excellent reputation.
- The number and value of residential sales in Novi has increased since the peak of the Great Recession.
- Manufacturing and related industrial space vacancy rates for the highest quality space have been low and continue to be low.
- There is a diversity of industrial activity that has both national and international linkages.
- The City has one of the most unique event operations in the entire country, drawing large numbers of people to Novi. It is one of if not the largest financially successful event centers in the country and is owned and operated by the private sector.
- Area medical institutions have grown and are likely to continue to grow.

#### **Current & Future Housing**

#### General findings:

- An increasing share of the City's residents and larger market want a different housing pattern in future.
- It is estimated that 50% to 60% of the new units would be oriented toward capturing active adults.
- New smaller units, both rental and ownership, would be upscale, market rate housing.







Novi has a variety of housing options, although the majority are detached single family homes.

Novi has grown in the past and continues to see substantial housing unit growth. According to published information from the Southeast Michigan Council of Governments (SEMCOG), the number of permits issued for new housing in Novi since the 2010 Census exceeds 1,400. For the four years prior to the last census, including the peak of the Great Recession, only 717 permits were issued.

There are certain demographic factors mentioned earlier in this plan that impact housing:

- The average age of primary income earners in the City is just over 50.
- As much as one-half of all current Novi residents are likely to move in the next five years because of many personal, employment and other factors. More than a quarter of the households likely to move would seek smaller units than those that they currently occupy in Novi
- 30% of households has at least one person employed in the City of Novi which is a substantial proportion of those employed and atypical of the majority of region's communities.
- Only 1% of those who do work in Novi bike or walk to work

Based on historical permit patterns and the residential survey findings, between 2,450 and 2,750 new households in new housing units would be marketable between 2016-2025. It is noted that there is a high probability that many of the new units could be absorbed by the local population currently residing within the City. The following table provides the composition of new units relative to the current housing stock in Novi:

Composition of New Units Relative to Current Novi Housing Stock				
Size of Unit Relative to Typical Novi Housing	Conservative Projection 2016-2025 (units)	Optimistic Projection 2016-2025 (units)		
Smaller than typical	710	798		
Larger than typical	620	696		
Average	782	877		
Market Uncertain	338	379		
Total	2,450	2,750		



Photo by Marius Iordache

The following provides a breakdown of the general size of unit and the income range of the market by age cluster.

- 65 years of age and older active adults Virtually all households in this group generally desire smaller units than typically found in Novi at the present time. Walkability is the key to capturing the market segment.
- 2. **55 to 64 of years of age and older active adults** Six out of ten in this group generally desires smaller units than typical of Novi at the present time, many of which would be single-family units with small or zero lots. Potentially 25% of the market would be non-single-family units. Walkability is the key to capturing the market segment.
- 3. **45 to 54 years of age cluster** (empty and approaching empty nesters) 60% of all units would be as described above with other units of similar scale to that found in Novi at present. Income levels for the market segment are higher than those 55 or older, ranging from \$100,000 to \$200,000. Walkability is a key to capturing the market segment.
- 4. **25 to 44 years of age cluster** 80% of all units would be at the same scale or larger than the current units in Novi. The remainder would prefer large/larger units than traditional in Novi.
- 5. **25 years of age or younger cluster** About one-third of the households in this cluster would seek small/smaller units with walkability being a consideration.

#### Cottage Court



Example of "cottage court" housing units.

An increasing share of the City's residents and larger market want a different housing pattern in future. It is estimated that 50% to 60% of the new units would be oriented toward capturing active adults. Creating the desired active adult housing would facilitate the purchase of existing homes by young families and help maintain the quality of the school system. With relatively high incomes for the potential segments of the market that could be captured or held in Novi, the new smaller units, both rental and ownership, would be upscale, market rate housing. The example shown above of a "cottage court" development illustrates how smaller units, clustered together, could potentially be added throughout the City.

#### **Current & Future Overall Economy**

Cluster analyses were performed to identify economic gaps which could be served by Novi. The analyses were performed at both the zip code and county levels. In addition, an analysis of evolving research & development activity was also performed to identify opportunities. These clusters contain businesses that generally do similar things and are interconnected in some way. Identifying gaps involves assessing the number of jobs in the region and anticipated growth rates. Locational, workforce, and wage demands are then factored into the analysis. In the City of Novi, there is a potential for growth within the following industry clusters. It is noted that several clusters involve substantial creativity whether industrial, manufacturing, or art and culture:

- Contractor Cluster (such as Residential Remodelers, Framing Contractors, Finish Carpentry Contractors, etc.)
- **F.I.R.E. Cluster** (such as Real Estate Credit, Securities Brokerage, Insurance Agencies and Brokerages, Consumer Lending)
- Services Cluster (such as Interior Design Services, Graphic Design Services, Janitorial Services, General Automotive Repair, Environmental Consulting Services, Child Day Care Services, Automotive Repair, etc.)
- Education/Training (such as Cosmetology and Barber Schools, Fine Arts Schools, Language Schools, etc.)
- Health & Fitness (such as Medical Labs, Home Health Care Services, Fitness/Recreational Sports Centers, etc.)
- Food/Beverage Manufacturing Cluster (Food Theme) (such as Commercial Bakeries, Breweries, etc.)
- General Manufacturing Cluster (Creative Theme) (such as Textile and Fabric Finishing Mills, Prefabricated Metal Building and Component Manufacturing, Fabricated Structural Metal Manufacturing, etc.)
- Food Wholesaling Cluster (Food Theme) (such as Packaged Frozen Food Merchant Wholesalers, Dairy Product (except Dried or Canned) Merchant Wholesalers, etc.)
- Arts & Entertainment Cluster (Creative Theme) (such as Theater and Dance Companies, Sports Teams, etc.)

**Projected Future Non-Retail Goods and Related Service Space: 743,000-834,000 sf.** Based on the anticipated employment growth associated with the growth in new households, which is projected to range from 2,750 to 3,090 by 2025. This may be broken down as follows:

Projected Future Non-Retail Goods and Related Service Space 2015-2025				
Related Developable Space (square feet)	Model A (Lower Household Growth)	Model B (Greater Household Growth)		
2015-2020				
Service	117,600	132,000		
Manufacturing	205,800	231,000		
Other office	73,500	82,500		
Total 2015 to 2020	396,900 sf	445,500 sf		
2020-2025				
Service	102,400	115,200		
Manufacturing	179,200	201,600		
Other office	64,000	72,000		
Total 2020 to 2025	345,600	388,800		
Total: 2015-2025	742,500 sf	834,300 sf		

#### **Commercial Demand & Entertainment Spending**

#### Retail Goods & Related Services

Potential demand for additional retail goods and related services space was analyzed in this study. The forecasting of retail goods and related services space is based on the objective of meeting the needs of the current and future residents of Novi. The forecasting of retail goods and related services space concluded:

- Residents of Novi generate about \$1.7 billion in retail goods and related services sales in 2015. These sales are sufficient to support roughly 5.5 million square feet of space. The sales and supportable space are associated with many locations both within and outside of the Novi, surrounding areas, county, region and beyond.
  - ♦ These sales are sufficient to support roughly 5.5 million square feet of space.
  - The sales and supportable space are associated with many locations both within and outside of the Novi, surrounding areas, county, region and beyond.
- As households increase new demand for goods and services is created. By 2025, the community can support about 590,000 additional square feet of retail goods space at any and all locations. Capturing the newly generated demand would provide the opportunity for infill concentrations and filling of vacancies.
- Residents of the immediate areas around Novi associated with the identified primary zip codes generate about \$590 million in retail goods and related services sales in 2015.
  - ♦ These sales are sufficient to support roughly 1.9 million square feet of space.
  - The sales and supportable space are associated with many locations both within and outside of the Novi, surrounding areas, county, region and beyond.
  - By 2025, the surrounding areas can support about 200,000 additional square feet of retail goods space at any and all locations.

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- Novi is a regional hub for retail activity. It is dominant both in the county and is recognized as one of a handful of regional areas. Total regional demand for retail goods and related services is estimated at \$48.9 billion supporting 152.8 million square feet of space at any and all locations both within and outside of the region in 2015.
- Increases in online shopping, changes in household characteristics, changes in on demand production and other factors, mean that the total supportable space associated with retail is not expected to increase in the future within the region and will likely decline. Attracting a greater share of regional dollars in Novi than at present would be difficult for other than retail blended with entertainment venues.

Retail Sales and Supportable Space Generated by Residents of Novi at any and all Locations						
Category	2015 Sales	2015 Space (Square Feet)	2025 Sales	2025 Space (Square Feet)	2015-2025 Sales Growth	2015-2025 Space Growth (Square Feet)
Food	\$251,695,000	400,378	\$278,540,000	443,080	\$26,845,000	42,703
Eat/Drink	205,033,000	488,174	226,901,000	540,240	21,868,000	52,067
General Merchandise	275,286,000	1,633,897	304,647,000	1,808,162	29,361,000	174,263
Furniture	30,183,000	69,470	33,402,000	76,879	3,219,000	7,410
Transportation & Utilities	260,021,000	852,183	287,754,000	943,075	27,733,000	90,891
Drugstore	127,842,000	125,335	141,477,000	138,703	13,635,000	13,368
Apparel	65,743,000	182,408	72,754,000	201,860	7,012,000	19,454
Hardware	151,433,000	617,085	167,584,000	682,900	16,151,000	65,816
Vehicle Service	194,799,000	474,235	215,575,000	524,814	20,776,000	50,579
Miscellaneous	172,596,000	689,270	191,004,000	762,782	18,408,000	73,512
Total	\$1,734,631,000	5,532,435 sf	\$1,919,638,000	6,122,495 sf	\$185,008,000	590,063 sf

Retail Sales and Supportable Space Generated by Residents of Areas Immediately Surrounding Novi at any and all Locations						
	2015 Sales	2015 Space (Square Feet)	2025 Sales	2025 Space (Square Feet)	2015-2025 Sales Growth	2015-2025 Space Growth (Square Feet)
Total	\$589,806,000	1,881,124 sf	\$652,337,000	2,080,565 sf	\$62,533,000	199,445 sf







Photos above from the Novi Town Center (left), 12 Oaks (center), and West Oaks II (right)

## 2015 Regional Supportable Square Footage of Retail Goods & Related Services Space

Category       2015 Space (sq. ft.)         Food       11,054,210         Eat/Drink       13,478,245         General Merchandise       45,111,013         Furniture       1,918,010         Transportation & Utilities       23,528,356         Drugstore       3,460,449         Apparel       5,036,137         Hardware       17,037,435         Vehicle Service       13,093,376         Miscellaneous       19,030,351         Total       152,747,582	Jei vices space			
Eat/Drink       13,478,245         General Merchandise       45,111,013         Furniture       1,918,010         Transportation & Utilities       23,528,356         Drugstore       3,460,449         Apparel       5,036,137         Hardware       17,037,435         Vehicle Service       13,093,376         Miscellaneous       19,030,351	Category	2015 Space (sq. ft.)		
General Merchandise       45,111,013         Furniture       1,918,010         Transportation & Utilities       23,528,356         Drugstore       3,460,449         Apparel       5,036,137         Hardware       17,037,435         Vehicle Service       13,093,376         Miscellaneous       19,030,351	Food	11,054,210		
Furniture       1,918,010         Transportation & Utilities       23,528,356         Drugstore       3,460,449         Apparel       5,036,137         Hardware       17,037,435         Vehicle Service       13,093,376         Miscellaneous       19,030,351	Eat/Drink	13,478,245		
Transportation & Utilities       23,528,356         Drugstore       3,460,449         Apparel       5,036,137         Hardware       17,037,435         Vehicle Service       13,093,376         Miscellaneous       19,030,351	General Merchandise	45,111,013		
Drugstore       3,460,449         Apparel       5,036,137         Hardware       17,037,435         Vehicle Service       13,093,376         Miscellaneous       19,030,351	Furniture	1,918,010		
Apparel       5,036,137         Hardware       17,037,435         Vehicle Service       13,093,376         Miscellaneous       19,030,351	Transportation & Utilities	23,528,356		
Hardware       17,037,435         Vehicle Service       13,093,376         Miscellaneous       19,030,351	Drugstore	3,460,449		
Vehicle Service 13,093,376 Miscellaneous 19,030,351	Apparel	5,036,137		
Miscellaneous 19,030,351	Hardware	17,037,435		
	Vehicle Service	13,093,376		
Total 152,747,582	Miscellaneous	19,030,351		
	Total	152,747,582		

#### **Entertainment**

- Total entertainment dollars spent by Novi residents at any and all locations is estimated at \$45.2 million in 2015. The dollars spent is expected to grow by \$4.7 million by 2020. More than 90% of all entertainment dollars spent by residents go to entities located outside of Novi at present. While unlikely to capture the majority of the dollars exported, doubling or tripling current local spending represents an achievable objective.
- Additional opportunity is particularly strong for food service activity often blended with entertainment. The average Novi household spends between \$4,100 and \$4,500 annually on entertainment.
- There are clear gaps in the range of entertainment activity found in Novi. These gaps include collections of regular performance theater and show activity, regular comedy and other club activity, and small music and food option operations along with concentrations of food services under one roof.

Total Household Spending on Entertainment by Novi Residents					
Year	Primary Market	Secondary Market			
2015	\$125,990,000	\$42,839,000			
2020	\$132,709,000	\$45,097,000			
2025	\$139,428,000	\$47,381,000			

#### **Economic Opportunity Policy Issues**

There are four potential objectives that that could be accomplished through the pursuit of the economic opportunities for Novi:

- 1. Hold current residents within Novi as they age, both Baby Boomers and young adults who grew up in the community.
- 2. Continue to provide for activity that meets the needs of current and future residents to the extent possible.
- 3. Capture growth opportunities that will enhance short and long -term viability of the community.
- 4. Mitigate traffic and transportation impacts associated with the capture of the economic opportunities by mitigating commuting and providing alternative transportation options for internal and external commuting.

## To achieve these objectives, land use/development pattern should provide:

- Active adult housing concentrations that are walkable and have a range of services composed of single-family structures.
- Active adult housing concentrations that are walkable and have a range of services composed of mixed structures.
- Creation of a marketing effort based on attracting "creative clusters" composed of high quality space.
- Creation of concentrations of office space blended with residential.
- Expansion of entertainment activity and options.
- Maintaining high standards for development in business parks some of which has been accomplished in areas of Novi.

#### Sample Images of Walkable Communities



Image of "Buckhead Atlanta" by OlliverMcMillan



Rockville, Md., Federal Realty Investment Trust/Courtesy of WDG Architecture



Dodson Place in Geneva, IL. by Shodeen Residential

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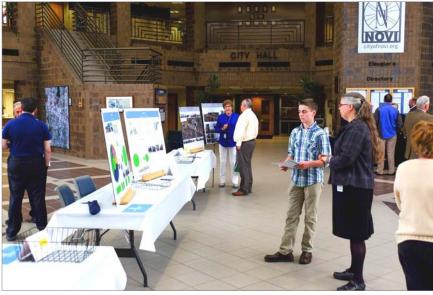
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## Goals & Objectives









# Goals describe the community's vision for the future.

Objectives describe how the community can achieve the goals. This Master Plan Update considered goals and objectives from the previous Master Plan, in conjunction with public input and current demographic and economic data to refine goals and objectives for the future.

The goals and objectives that follow are generally consistent with those from the previous Master Plan, but are presented in an organized fashion that allows for easier reading and cross referencing. Action items will be presented in the Implementation Chapter, at the end of this Plan.

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#### 2016 Master Plan Goals

- Quality and Variety of Housing. The City of Novi is known for
  its high-quality residential neighborhoods and should strive
  to ensure the availability of a wide range of attractive
  housing choices that are protected from noise, traffic, and
  other impacts of non-residential development. Encourage
  the development of neighborhood open space and
  neighborhood commercial goods and services to minimize
  motorized travel.
- 2. Community identity. The City's identity is largely based on its high-quality residential neighborhoods and schools, destination retail and convention space, and its parks. The City should supplement that identity by enhancing the preservation of the City's historic resources and expansion of its cultural opportunities. New development of land should continue to be of high-quality design and materials.
- 3. **Environmental stewardship**. The City of Novi is significantly enhanced by the preservation of natural resources in both residential and non-residential areas. Maintain public and private stewardship of the natural environment through the preservation of open space, protection of woodlands and wetlands, and utilization of low-impact development techniques.
- 4. Infrastructure. Invest wisely into the ongoing maintenance and improvements to existing infrastructure, including utilities and the transportation network. Ensure that new development minimizes the demands placed on the City's existing infrastructure. Support the City's entire transportation network through the development and enhancement of non-motorized transportation facilities and amenities.
- 5. Economic development. The City's developed land, infrastructure, and natural resources are interconnected and collectively impact the daily lives of the City's residents and business owners. The City should strive to maintain the balance between the economy, the environment, and the community to ensure sustainable development that meets the needs of today while ensuring the needs of future generations can be met.

#### **Objectives**

In many cases, the objectives align with more than one goal. In the Implementation chapter, these alignments are provided as cross-references.

#### General Goal: Quality and Variety of Housing

- Southwest Quadrant. Maintain the semi-rural character of the southwest quadrant of the City that is created by low-density residential development and undeveloped land.
- Twelve Mile-Napier-Wixom Roads Study Area. Develop the
  Twelve Mile, Napier, and Wixom Roads Study Area with a mix
  of residential, educational, and commercial uses in an
  aesthetically pleasing manner that is compatible with
  neighboring land uses and complements the natural
  environment.
- 3. **Provide residential developments that support healthy lifestyles.** Ensure the provision of neighborhood open space within residential developments
- 4. **Safe housing and neighborhoods.** Enhance the City of Novi's identity as an attractive community in which to live by maintaining structurally safe and attractive housing choices and safe neighborhoods.
- 5. Maintain existing housing stock and related infrastructure.
- 6. **Provide a wide range of housing options.** Attract new residents to the City by providing a full range of quality housing opportunities that meet the housing needs of all demographic groups including but not limited to singles, couples, first time home buyers, families and the elderly.

#### General Goal: Economic Development / Community Identity

- 7. **I-96/Novi Road Study Area**. Develop the I-96/Novi Road Study Area in manner that reflects the importance of this important gateway to the City in terms of its location, visibility, and economic generator. Mitigate impacts to the City's infrastructure
- 8. **Grand River/Beck Road**. Develop the Grand River Avenue and Beck Road Study Area in a manner that supports and complements neighboring areas

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#### **General Goal: Community Identity**

- Maintain quality architecture and design throughout the City. Set high standards and promote good examples for use of public property through the City's actions
- 10. Create a stronger cultural presence and identity for the City by preserving historic structures and creating gathering places for residents and community activity.

#### General Goal: Environmental Stewardship

- 11. Protect and maintain the City's woodlands, wetlands, water features, and open space.
- 12. Increase recreation opportunities in the City.
- 13. Encourage energy efficient and environmentally sustainable development through raising awareness and standards that support best practices.

#### General Goal: Infrastructure

- 14. Provide and maintain adequate water and sewer service for the City's needs.
- 15. Provide and maintain adequate transportation facilities for the City's needs. Address vehicular and non-motorized transportation facilities

#### General Goal: Economic Development

16. Retain and support the growth of existing businesses and attract new businesses to the City of Novi.

#### General Goal: Economic Development / Community Identity

17. Compatible Development. Ensure compatibility between residential and non-residential developments.

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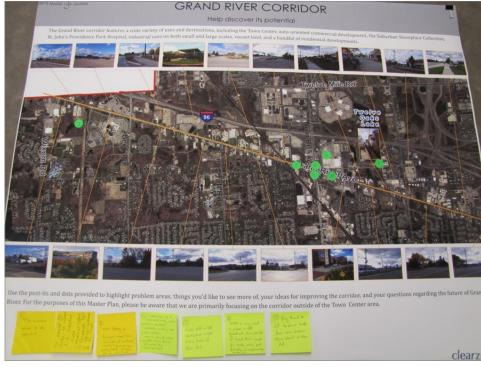
#### **Public Input**

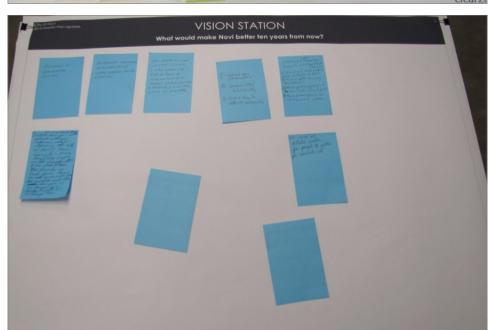
An open house was held on October 21, 2015. Several stations were featured, allowing participants to focus in on specific areas, including understanding existing conditions and demographics, future land use, and the Grand River Corridor. A "visioning" station allowed participants the opportunity to respond to 1) What three things do you value about Novi? and 2) What would make Novi better ten years from now? Comments collected during this open house are provided in the Appendix. A sampling of the feedback is presented below:

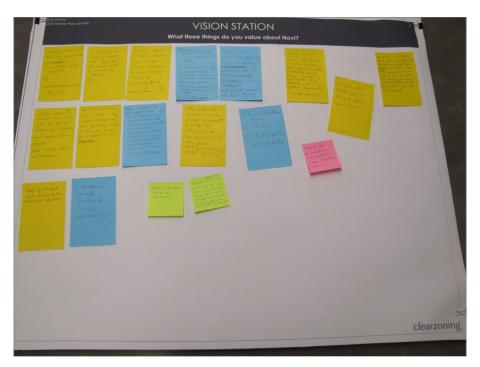
- Millennial group under-represented in Novi because there is nothing here for them. Live in Novi, Ann Arbor, Grand Rapids, or even Detroit and they will not choose Novi. How do you attract the generation that makes cities vibrant?
- When I retire, where can I move to in Novi that allows me to walk or ride a bike a mile or two and access activities and shopping as Ann Arbor or Northville or Plymouth offers?
- Healthy food and green space are listed as top priorities yet no agricultural zoning or interest mentioned.
- Midrange housing stock for Millennials and young families. The
  more they can be mixed into existing developments, the
  better. Let's think about near senior centers, walkable
  destinations. Should our subdivision ordinances reflect a
  component of a duplex or other small attached units within
  single family plans?
- Would like to see bike lanes in the Grand River corridor or something that helps separate walking traffic a little better from possible future cycling use.
- Do similar things like outdoor open shopping experience like Partridge Creek in the east side or in Rochester Hills.
- Houses should be by more popular areas. I think that younger generations want to live near the city or in the city with the most big, modern houses. Also, they want to live with people their age. (13 years old, grade 9).

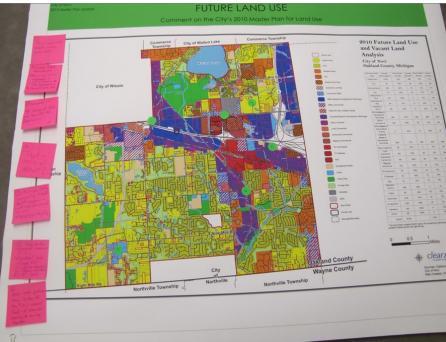
- They should build more places that go with each other, like: Novi high and Novi Public Library, so we can act as a community. Joining together is being a community and we need to do that. 13 years old, 9th grade J
- A recreation center similar to Livonia's (multi-level).
- Parks, green spaces add to the community.

- Grand River corridor- could offer opportunity to an aging population, younger folks just out of college and be
- An area to live in Novi where I can walk or ride a bike a
  mile or two and access entertainment and shopping while
  still living in a home suitable living for people with special
  needs. Exciting idea.









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## Future Land Use Plan











The Future Land Use Map divides the City into categories of land use based on various studies, demographics information, and community input.

The following pages describe the land use categories designated on the Future Land Use Map.

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#### **Future Land Use Descriptions**

The only land use description proposed to be modified in this Master Plan Update is for the

#### **Single-Family Residential**

This land use is designated for single-family detached residential. The recommended density or the number of dwellings per acre varies throughout the City. Higher density residential land use is designated in areas that transition to commercial or light industrial developments. Refer to the Residential Density Map for specific density recommendations.

#### **Mobile Home Residential**

This land use is designated for housing within a manufactured housing community, created according to the regulations in the Mobile Home Commission Act. Housing in these areas is manufactured in a factory, brought to the site, and in most cases placed on property leased from a park operator.

#### **Multiple-Family Residential**

This land use is designated for multiple-family residential dwellings in a variety of settings, ranging from two-family dwellings to low-rise and high-rise apartment complexes. Refer to the Residential Density Map for specific density recommendations.

#### Suburban Low Rise

This land use is designated for suburban low rise uses including attached single family residential, multiple family residential, institutional and office uses when developed under a set of use and design guidelines to keep the residential character of the area and minimize the effect that the transitional uses would have on nearby single family residential properties.

#### **Community Office**

This land use is designated for small and medium scale office uses that primarily serve the residents of the City. The area may also include facilities for human care and indoor or out door recreation.

#### Office Commercial

This land use is designated for a variety of medium-scale and large scale general and medical office buildings or complexes with limited personal service and retail uses. The area may also include facilities for human care, hotels, motels, higher education and indoor or outdoor recreation.

#### Office, Research, Development and Technology

This land is designated for a variety of medium-scale and large scale general and medical office buildings or complexes and research, development and technology facilities, with or without related manufacturing or warehouse facilities. The area may also include facilities for office, research and development support services, human care, hotels, motels, higher education and indoor or outdoor recreation.

## Office, Research, Development and Technology with Retail Service Overlay—Proposed change to Showplace West Mixed Use

Current description: This land use is designated with an Office, Research, Development and Technology designation and an additional Retail Services Overlay designation to include additional retail service uses that serve employees and visitors to an office use area, including but not limited to fuel stations, car washes, restaurants (including drive-through) and convenience stores in Office Research, Development and Technology use areas if and when the Zoning Ordinance is modified to permit additional retail services in the OST, Planned Office Service Technology zoning district. This use designation would encourage the development of a limited amount of retail services to serve the employees and visitors of Office, Research, Development and Technology use areas if and when the Zoning Ordinance is modified to permit additional retail services in the OST, Planned Office Service Technology zoning district.

Proposed change: This land use is designated to accommodate a mix of uses in a dense walkable setting. It is anticipated that this area will attract young professional and empty nesters looking for more dense housing options along with vibrant retail, restaurant, entertainment, and office uses. Typical building heights will range from two to five stories. Additional building height, up to ten stories, is envisioned along the I-96 frontage. This may require structured parking and enhanced pedestrian linkages will be important. A system of local and collector streets will be established to connect sites and provide additional parking. Ground floor retail, restaurant, and entertainment uses are envisioned throughout the area, and should be included in structured parking to maintain an interesting, continuous street life for pedestrians.

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#### **Local Commercial**

This land use is designated for convenience shopping for residents within nearby neighborhoods. It includes retail, personal service establishments, and small offices.

#### **Community Commercial**

This land use is designated for comparison-shopping needs of a larger population base. They are along major thoroughfares and roadway intersections.

#### **Town Center Commercial**

This land use is designated for pedestrian oriented, community focal point area with a variety of uses including retail, commercial, office, residential, civic uses, and open spaces with an urban character.

#### **Town Center Gateway**

This land use is designated for mixed-use development that provides an appropriate transition and a sense of arrival into the Town Center Commercial land use. These uses include a mixture of moderate density residential, commercial, and office. A detailed description of development criteria can be found in the Gateway Ordinance.

#### **Regional Commercial**

This land use is designated for higher intensity commercial uses that serve not only the comparison shopping needs of the entire community, but cater to a regional market as well.

#### PD2

This land use is designated with a Regional Commercial designation and the additional PD2 designation to direct development to use the Zoning Ordinance's Planned Development Option. This Option provides greater site plan design flexibility for key properties.

#### Industrial, Research, Development and Technology

This land is designated for a variety of office, research and development, light industrial and warehousing uses. These uses may range from a single use site to a large mixed use complex. The area may also include facilities for office, research, development and manufacturing support services, higher education and indoor recreation.

#### **Heavy Industrial**

This land use is designated for manufacturing, assembly and fabrication operations, often on a relatively large scale.

#### **Environmental Areas**

This land use is designated for regulated wetlands of 5 acres of more that are likely to pose constraints for development.

#### **Public**

This land use is designated for government buildings, fire stations, public utility uses such as the wastewater treatment plant, and water storage facility. If the area ceases to be considered for public uses, residential uses are appropriate if the area is assigned a density on the Master Plan's Residential Density Patterns Map.

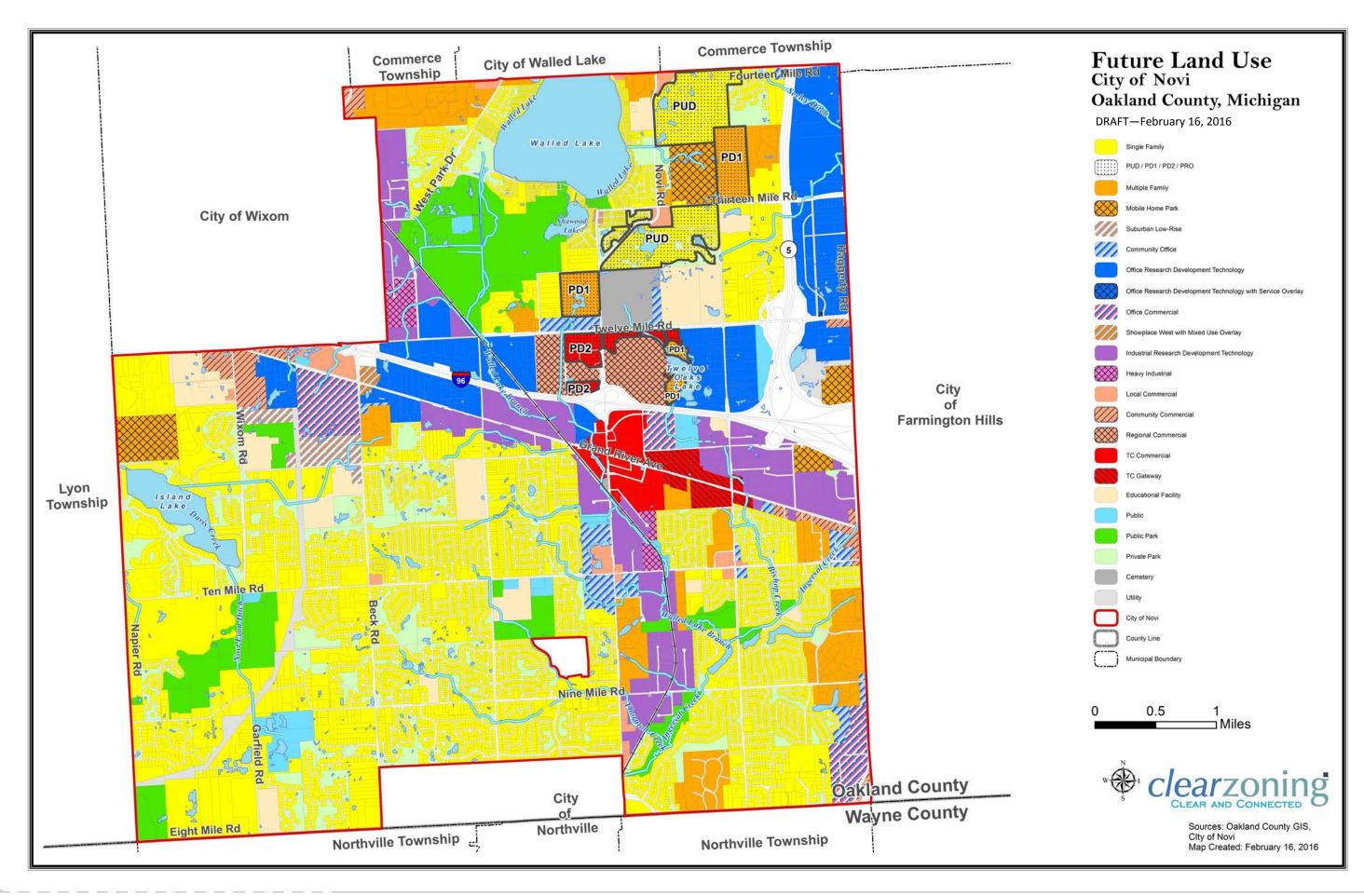
#### **Educational Facilities/Property**

This land use is designated for private and public educational facilities. If the area ceases to be considered for educational facility uses, residential uses are appropriate if the area is assigned a density on the Master Plan's Residential Density Patterns Map.

#### Public and Private Parks and Open Space

This land is designated for public and private parks and open space. If the area ceases to be considered for public and private park or open space uses, residential uses are appropriate if the area is assigned a density on the Master Plan's Residential Density Patterns Map.

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Review Existing Conditions Assessment of the Grand River Corridor

## **Grand River Corridor**













Grand River Avenue is one of the most influential and historic thoroughfares in southern Michigan.

Grand River has roots dating back to Native American days when it was used as a travel route between the Straits of Detroit and Lake Michigan. There are only a handful of routes still active today that can claim service to people on foot and horseback as well as in covered wagons and early automobiles.

As it runs through the City of Novi, Grand River was the initial thoroughfare of commerce, transporting people as well as goods through the City and beyond. While many industrial and manufacturing businesses still exist in the corridor, more recent development includes destinations for the region, such as Providence Park Health System and the Suburban Collection Showplace. Opportunities exist to enhance the corridor's function and its appearance, resulting in a roadway that creates a community identity for the City of Novi.

Photos in the Grand River Corridor. Clockwise from top left: industrial building near the railroad; vacant property; shopping at Meadowbrook and Grand River; the Suburban Collection Showplace; a restaurant with outdoor seating between Haggerty and Meadowbrook; Providence Park Hospital.



## CORRIDOR LAND USE

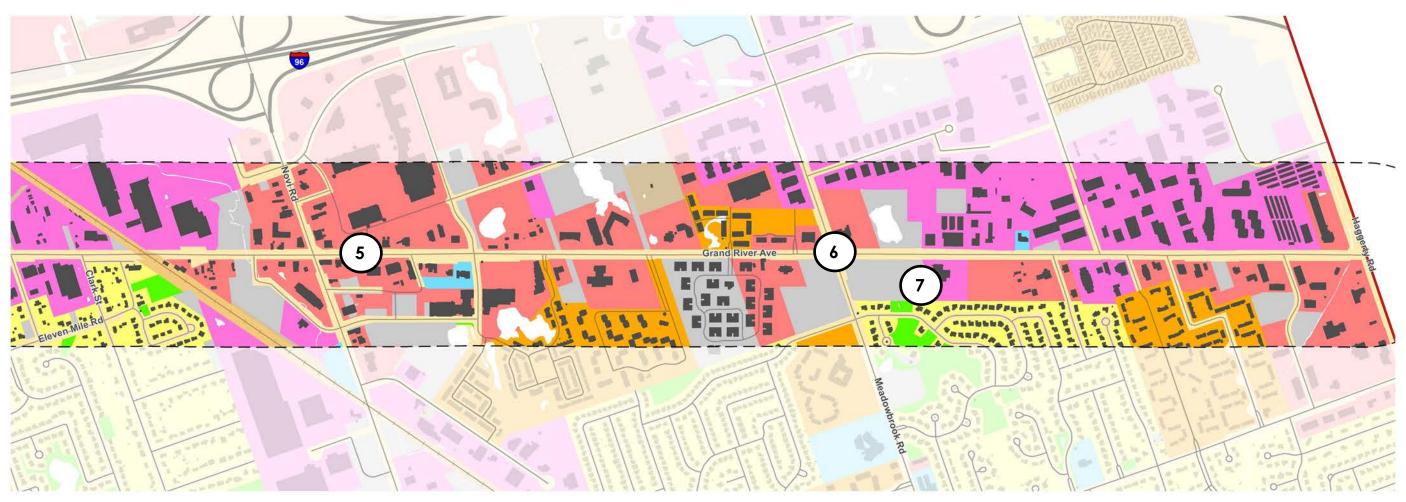
#### LEGEND



### **Existing Conditions Analysis**

### Wixom Road to Taft Road

- Land use patterns tend to be less dense than the eastern segment of the corridor; newer development tends to feature large setbacks from the road.
- Proximity of interstate highway changes provide regional access for this segment of the corridor. Newer land uses in this segment tend to serve a regional population.
- Considerable vacant land provide opportunities for development; underutilized parcels exist, but may not be redeveloped as easily as vacant land.
- There are not many housing developments in this portion of the corridor. Single family developments exist to the south. There are opportunities to add denser housing types in this area.





## Taft Road to Haggerty Road



**Denser development.** Land use patterns tend to be denser with smaller buildings than in the western segment.



**Local market.** Land uses in this are tend to target a local market. There is limited interstate access in this corridor.



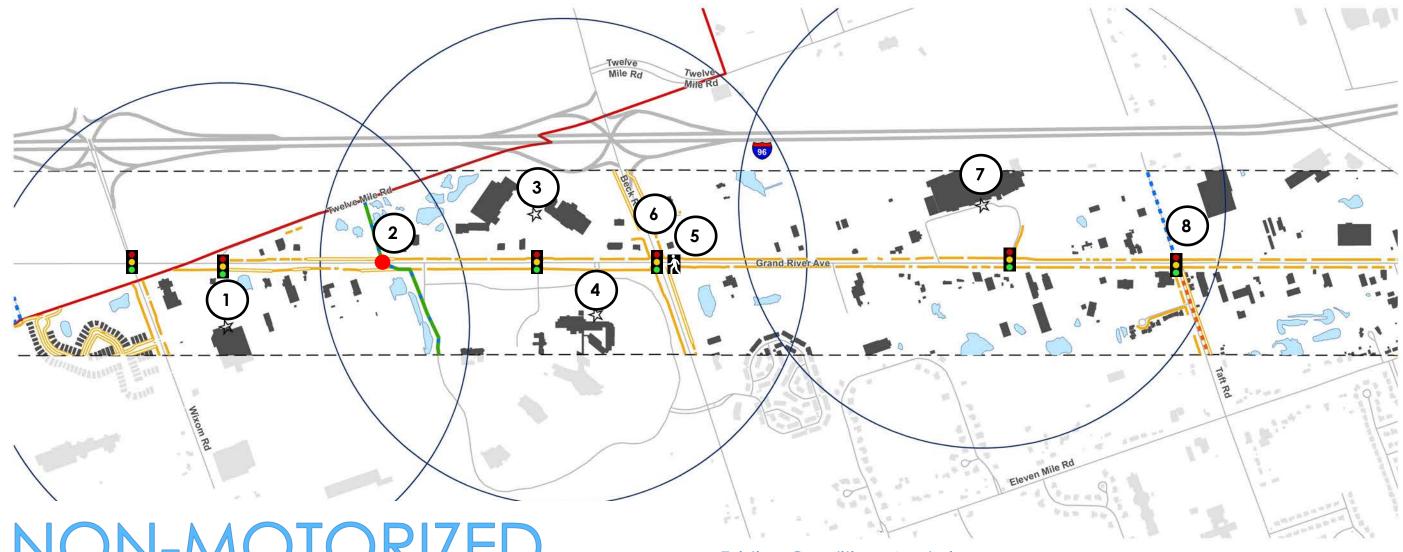
**New development.** Some vacant parcels could offer development opportunities. Development is more likely to occur on vacant parcels before redevelopment of underutilized or obsolete parcels.





2012 Existing Land Use in the Grand River Corridor					
Land Use	Acres	% of Acres in Corridor			
Industrial	358.0	28.1%			
Commercial / Office	338.7	26.6%			
Vacant	196.5	15.4%			
Road Right-of-Way	143.3	11.2%			
Single Family	58.6	4.6%			
Public / Institutional	58.3	4.6%			
Multiple Family	56.2	4.4%			
Water	34.8	2.7%			
Transportation / Utility / Communication / Railroad	21.5	1.7%			
Recreation / Conservation	5.6	0.4%			
Agriculture	3.8	0.3%			
Total	1,275.3	100.0%			

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# NON-MOTORIZED TRANSPORTATION

**Existing Conditions Analysis** 

#### Wixom Road to Taft Road

Wixom Road and Grand River Shopping Center

Residential Population Density: 1,203 persons per square mile within ½ mile Working/Daytime Population Density: 1,951 persons per square mile within ½ mile



Potential pedestrian enhancements. Mid-block crossing, off-road trails, and neighborhood connectors as identified in the City of Novi Non-Motorized Plan. Neighborhood connector routes are characterized with traffic calming, public art, rain gardens, and historic feature elements that can be linked with Grand River corridor.



Providence Park Hospital and Grand River Shopping Center (considered one activity center due to close

**Residential Population Density**: 624 persons per square mile within ½ mile Working/Daytime Population Density: 675 persons per square mile within ½ mile

#### **LEGEND**



Pedestrian Crosswalks

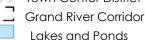
Signal

**Activity Center** 

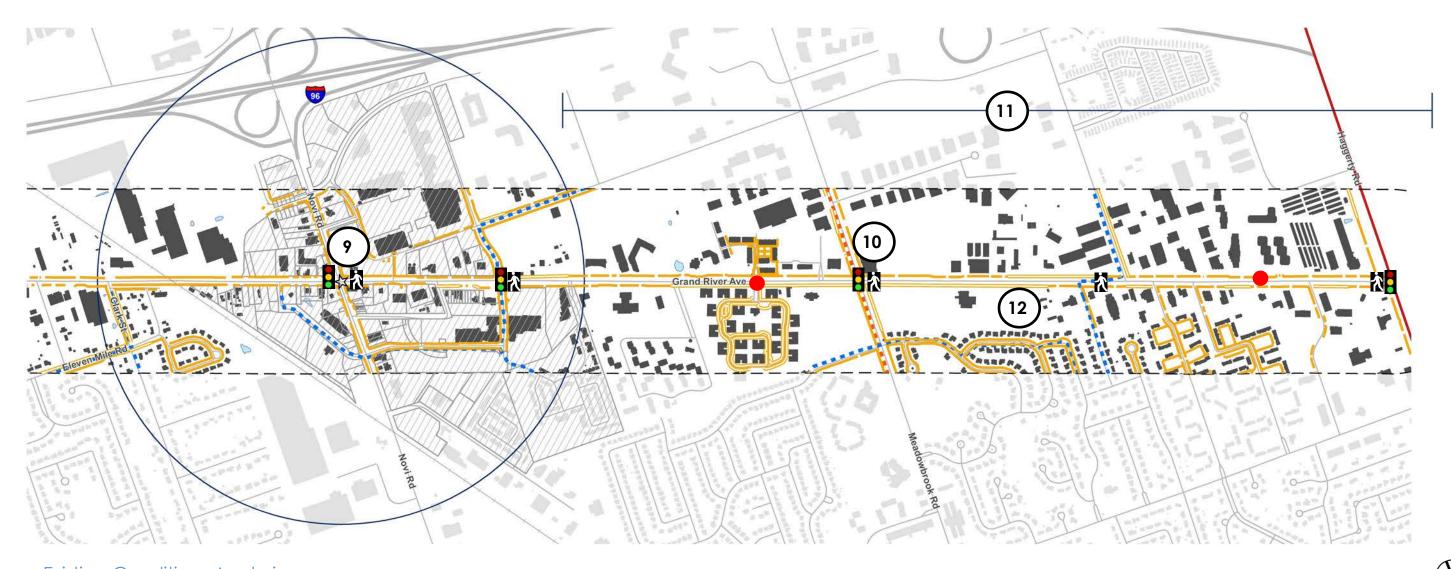
Sidewalks Proposed Road Crossing

Proposed Bike Lanes

Proposed Off Road Trails/ **Neighborhood Connectors**  Proposed Neighborhood Connector On Road Route Proposed Sidewalk/Roadside Pathways Town Center District



1/2 Mile Walking Radius



## Existing Conditions Analysis

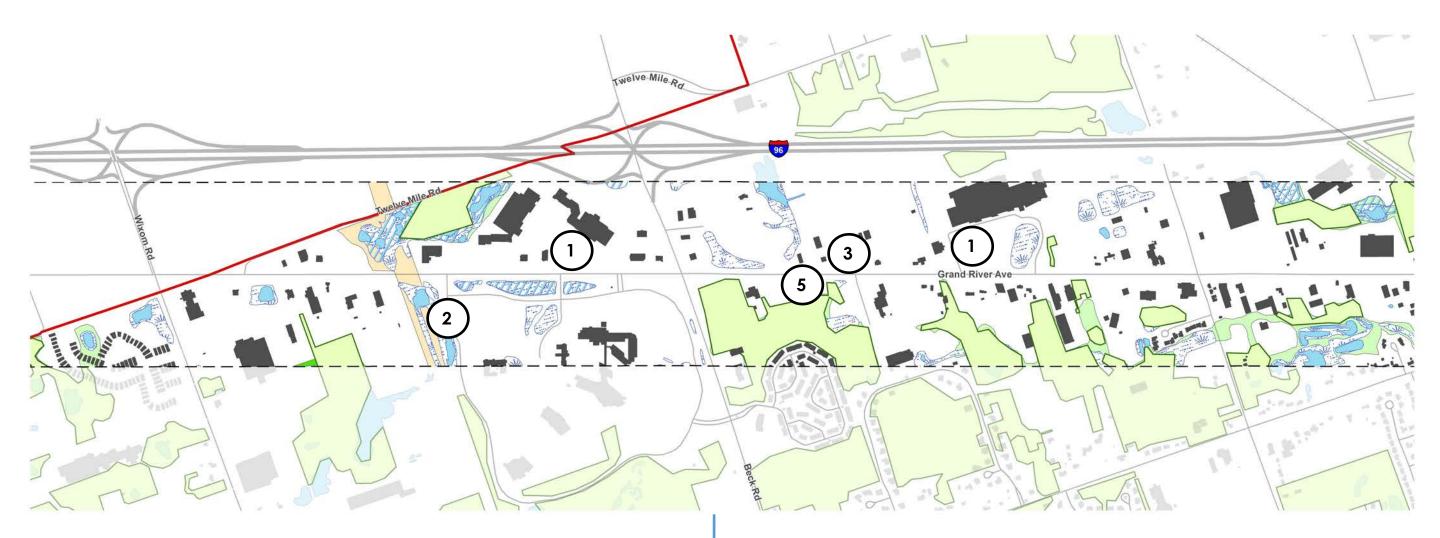
### Taft Road to Haggerty Road

- Non-Motorized Opportunity. Beck Road that runs north and south and connects with Grand River identified as a major non-motorized corridor development in the City of Novi Non-Motorized Plan.
- Regional Trail Connection. One proposed north-south regional trail connection known as the "ITC Trail" is identified crossing Grand River at Beck Road
- Suburban Showplace
  Residential Population Density: 1,220 persons per square mile within ½ mile
  Working/Daytime Population Density: 1,135 persons per square mile within ½ mile
- Non-Motorized Opportunity. Taft Road that runs north and south and connects with Grand River identified as a major non-motorized corridor development in the City of Novi Non-Motorized Plan

- 7 Town Center District
  Residential Population Density: 2,053 persons per square mile within ½ mile
  Working/Daytime Population Density: 3,827 persons per square mile within ½ mile
- Non-Motorized Opportunity. Meadowbrook Road that runs north and south and connects with Grand River identified as a major non-motorized corridor development in the City of Novi Non-Motorized Plan
- East of Town Center to Haggerty Road (city limits)
  Residential Population Density: 2,295 persons per square mile within ½ mile
  Working/Daytime Population Density: 3,599 persons per square mile within ½ mile
- Sidewalk Gaps. A total of 1.1 mile of sidewalk gap exists east of Town Center

Sources: Oakland County GIS, City of Novi, SEMCOG Map Created: February 10, 2016

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## NATURAL FEATURES

Grand River Corridor Hub– Core Habitat for Plants and Animals Lakes and Ponds Site-Essential component of natural network Woodlands Link–Linear connection between hubs and sites Wetlands Other-Includes utility corridors Special Flood Hazard Areas

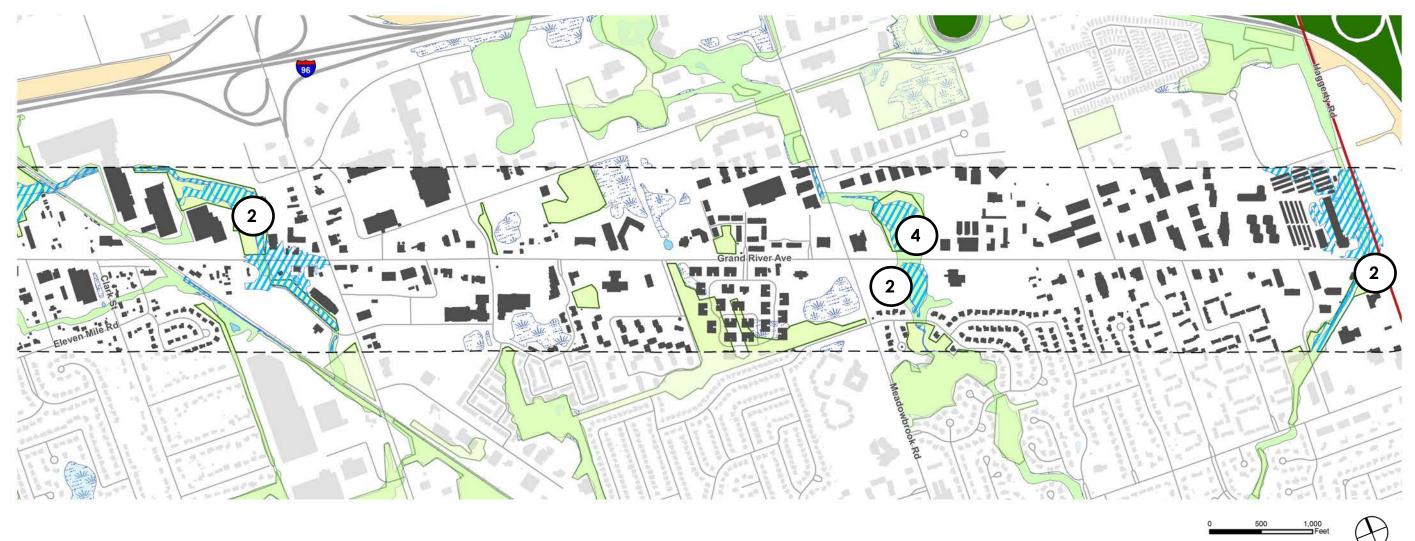
**Existing Conditions Analysis** 

Wixom Road to Taft Road

Wixom Road to Taft Road A vast amount of open space is impervious parking lot negatively impacting watershed management

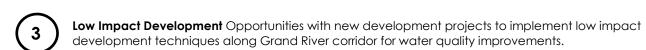


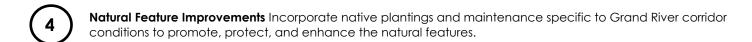
Potential Green Infrastructure Corridors Identified as north south green infrastructure corridors with opportunities to protect and preserve existing natural features

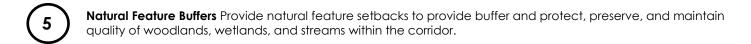


### **Existing Conditions Analysis**

## Taft Road to Haggerty Road

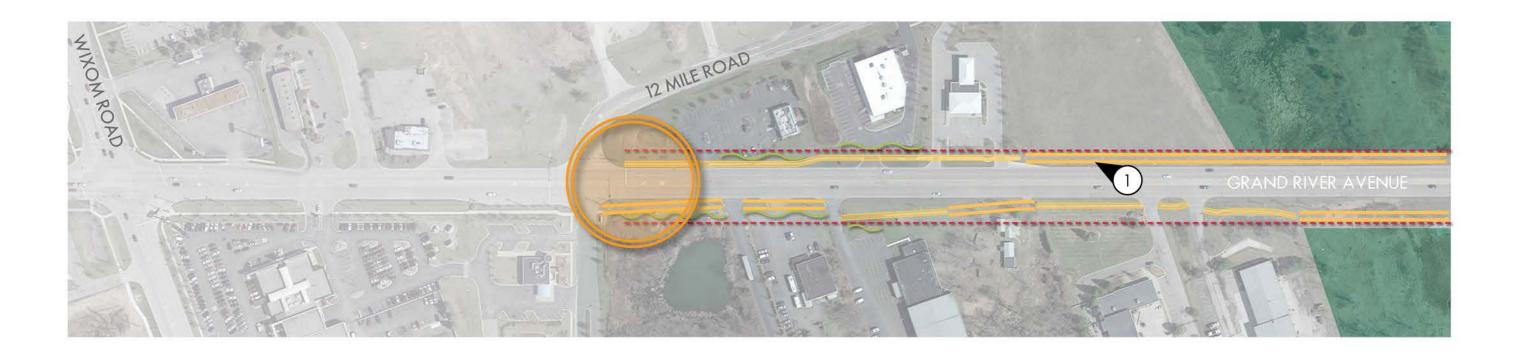






Sources: Oakland County GIS, City of Novi, SEMCOG Map Created: February 10, 2016

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## CORRIDOR LANDSCAPE

Existing Conditions Analysis
Wixom Road to Beck Road



Lack of spatial definition along corridor



2 Existing wetland/woodland edges offer opportunities



3 Lack of street trees to define corridor edge



4 Preserve areas with existing parklike character



#### ANALYSIS

The existing corridor lacks the following:

- An identity and a positive municipal image
- Gateways and portals at city limits
- Amenities promoting a unique corridor character
- Places for people and consistent pedestrian connectivity
- Spatial definition
- Street trees and landscape plantings
- Unified parking lot/service area screening

### LEGEND



- Grand River Corridor Right of Way
- Novi Town Center Boundary (NIC)
- Pedestrian Circulation Existing

- Gateway Opportunity

- Pedestrian Circulation Opportunity



- Existing Tree Locations
- Visual Screening Needed
- Natural Areas / Enhancement Opportunity

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## CORRIDOR LANDSCAPE

Existing Conditions Analysis
Beck Road to Taft Road



5 Need for screening of existing parking lots and service areas



6 Lack of street trees to define the pedestrian corridor and buffer traffic lanes



7 Trees located within utility easements will require specific mature heights



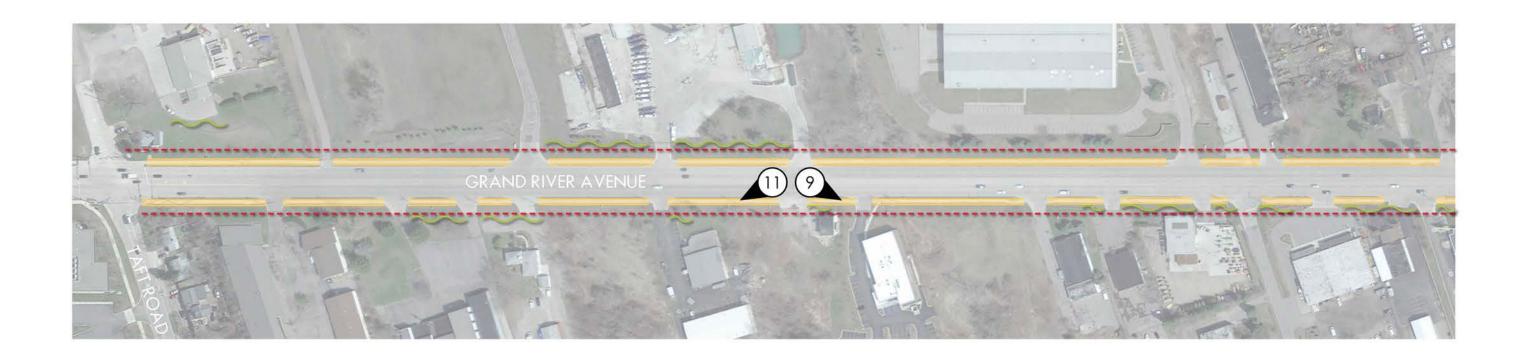
8 Areas lacking quality image need to be addressed



### LEGEND

- Grand River Corridor Right of Way - Novi Town Center Boundary (NIC)

- Gateway Opportunity
- Pedestrian Circulation Existing
- Pedestrian Circulation Opportunity
- Existing Tree Locations
  - Visual Screening Needed
  - Natural Areas / Enhancement Opportunity



## CORRIDOR LANDSCAPE

Existing Conditions Analysis
Taft Road to Novi Road



9 The corridor lacks unifying characteristics



10 The corridor lacks amenities such as pedestrian lighting



1 | Large trees significantly buffer adjacent non-retail uses



12 The bridge offers gateway opportunities and needs enhancement



### LEGEND

- Grand River Corridor Right of Way

- Novi Town Center Boundary (NIC)

- Gateway Opportunity

- Pedestrian Circulation - Existing

- Pedestrian Circulation - Opportunity

Existing Tree LocationsVisual Screening Needed

- Natural Areas / Enhancement Opportunity



## CORRIDOR LANDSCAPE

Existing Conditions Analysis

Novi Road to Meadowbrook Road



13 The width of pavement visually dominates the scale



14 Lack of street trees to help separate pedestrians from traffic lanes



15 Areas of the corridor lack defined edges/boundaries



16 Lack of street trees to define human scale



### LEGEND

\*\*\*\*\*\*\*\*\*\*

- Grand River Corridor Right of Way
- Novi Town Center Boundary (NIC)

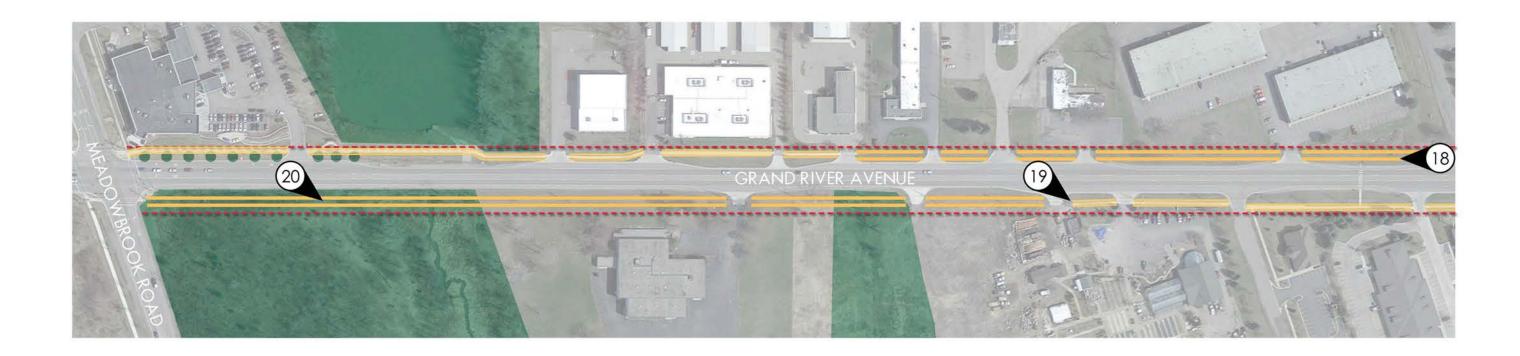


- Gateway Opportunity
- Pedestrian Circulation Existing
- Pedestrian Circulation Opportunity





- Natural Areas / Enhancement Opportunity



## CORRIDOR LANDSCAPE

Existing Conditions Analysis

Meadowbrook Road to Haggerty Road



17 Lack of a significant identity and gateway image



18 A singular tree illustrates the importance of trees defining human scale and street character



19 Need for screening of service areas and parking lots



20 Opportunities to enhance and engage natural edges are present in many locations









### LEGEND







- Novi Town Center Boundary (NIC)



- Pedestrian Circulation - Existing

- Pedestrian Circulation - Opportunity

- Existing Tree Locations

- Visual Screening Needed

- Natural Areas / Enhancement Opportunity

#### **MEMORANDUM**



**TO**: MASTER PLANNING AND ZONING COMMITTEE

**THRU:** BARBARA MCBETH, *AICP*, DEPUTY DIRECTOR COMMUNITY

**DEVELOPMENT** 

FROM: SRI RAVALI KOMARAGIRI, PLANNER

SUBJECT: MERCATO: PLANNED REZONING CONCEPT PLAN APPLICATION

**DATE**: FEBRUARY 05, 2016

The applicant Odawa development, LLC is requesting a Zoning Map amendment for a 50.51-acre property located on the north side of Nine Mile Road, east of Napier Road (Section 30). The applicant has presented a request to rezone from RA (Residential Acreage) to R-1 (One-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 40-unit single-family site condominium. The request is being presented to the Master Plan and Zoning Committee, as the request is not consistent with the recommended maximum density permitted on the Future Land Use Plan.

The PRO Concept Plan shows two on-site detention ponds in the northeast corner of the site and on the eastern side. One boulevard access point is proposed off of Nine Mile Road. An emergency access road is proposed off of the proposed cul-de-sac to Nine Mile Road. The concept plan indicates that this will be a gated community.

The applicant is requesting an increase of 0.23 Dwelling Units per acre (about 28 percent more) than the maximum allowed density for RA (0.8 DUA). Even though it is less than the maximum allowed for R-1 (1.65 DUA), the proposed concept plan is impacting the existing natural features (wetlands, woodlands and floodplain) to achieve the proposed density. During staff's discussions with the applicant, it was suggested that the applicant further articulate why the Residential Unit Development (RUD) or another residential development option was not being sought instead of requesting the change in zoning

Staff reviewed the proposal two times at different levels of detail. The applicant was provided initial input at the Pre-application meeting that was held on September 24, 2016. The applicant revised the plans based on the comments provided and submitted a PRO Concept Plan for review.

Staff is requesting the Committee to consider the applicant's request, review staff and consultants review letter and provide input to direct staff with further reviews. The review letters from the recent Concept Plan review are attached to this memo.

MAPS

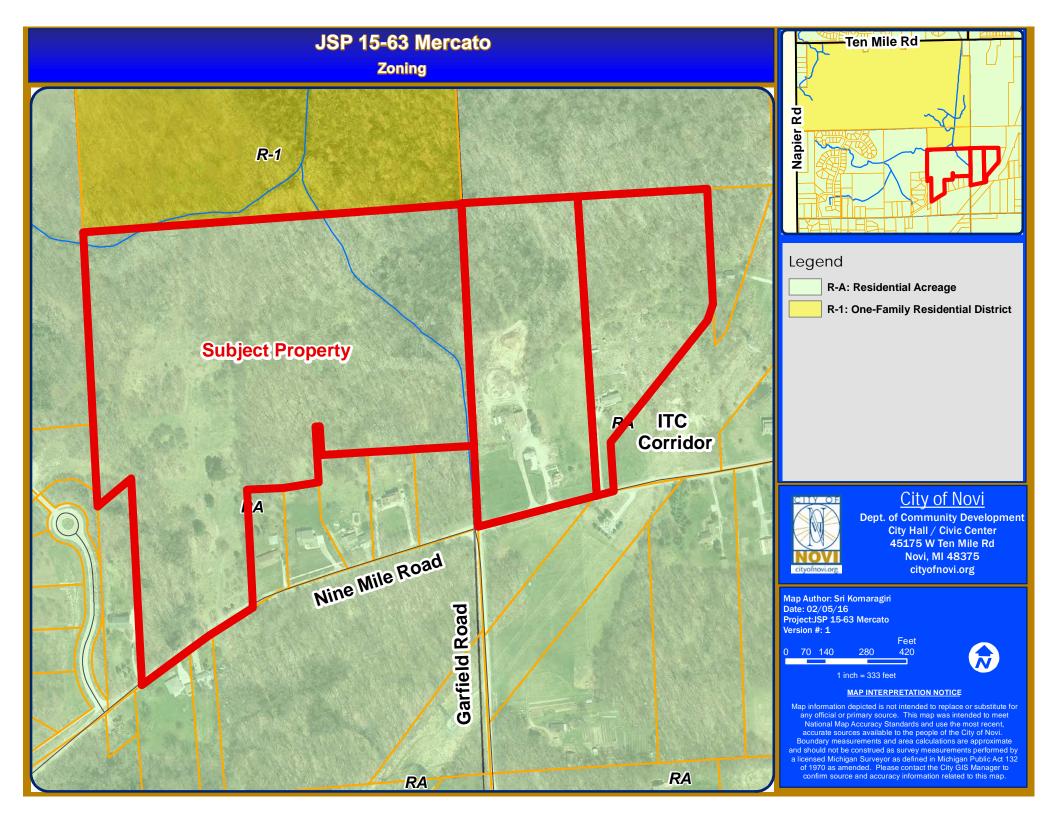
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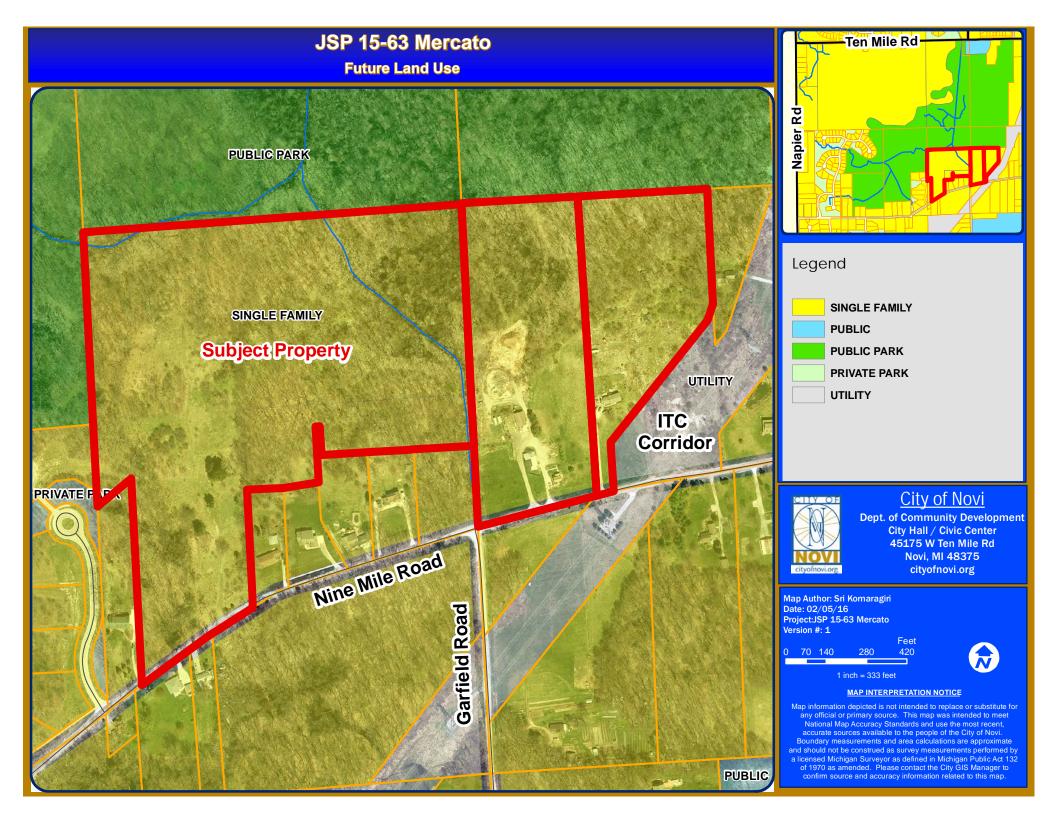
Zoning

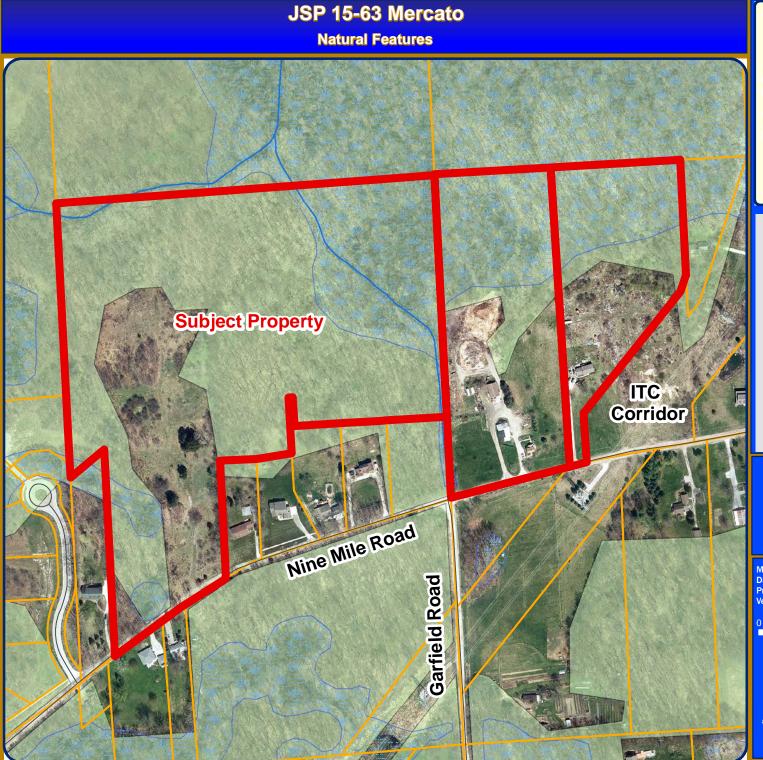
**Future Land Use** 

**Natural Features** 











# Legend



Wetlands

Woodlands



# 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: 02/05/16 Project:JSP 15-63 Mercato Version #: 1

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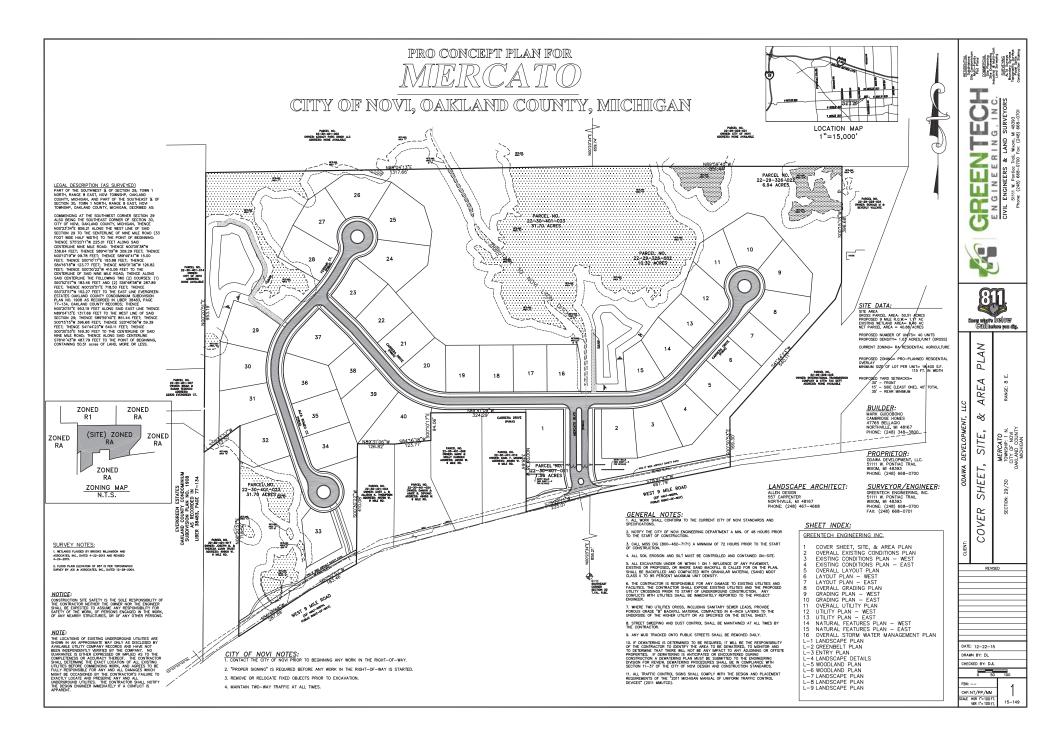


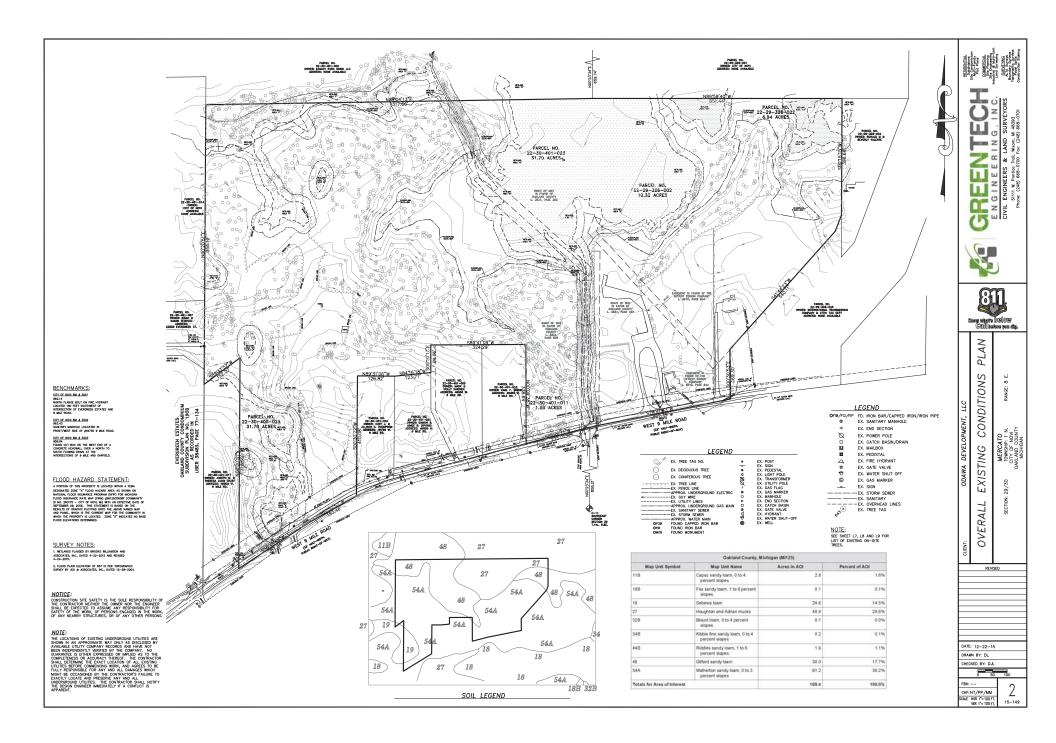
1 inch = 333 feet

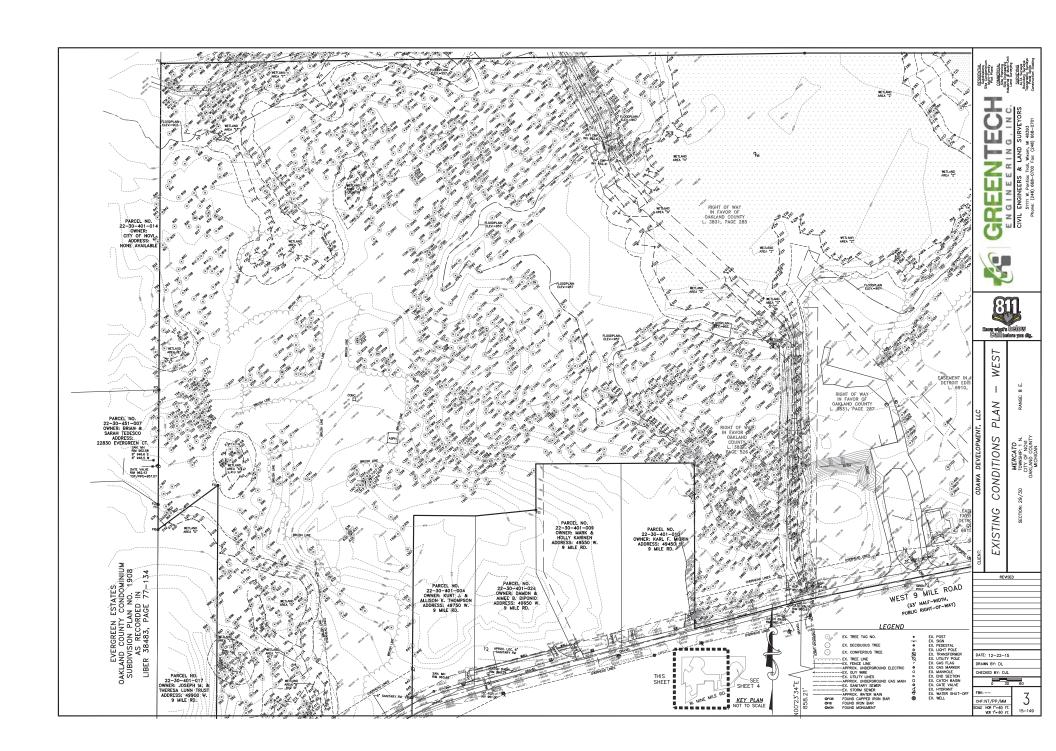
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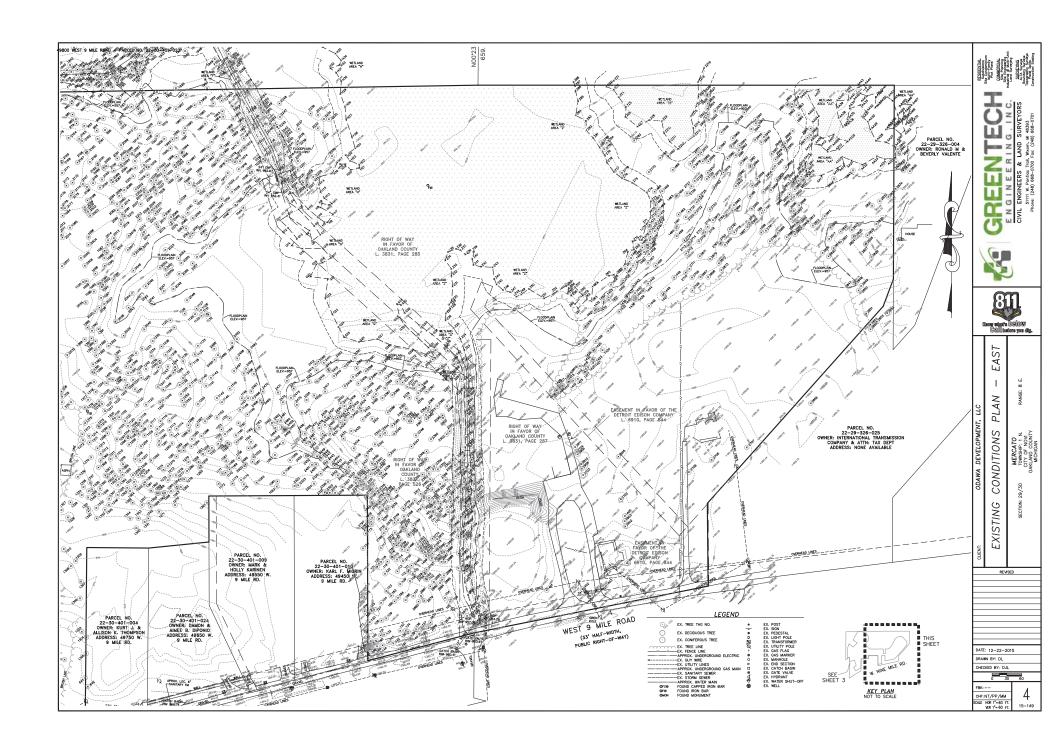
Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent, accurate sources available to the people of the City of Novi. Boundary measurements and area calculations are approximate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

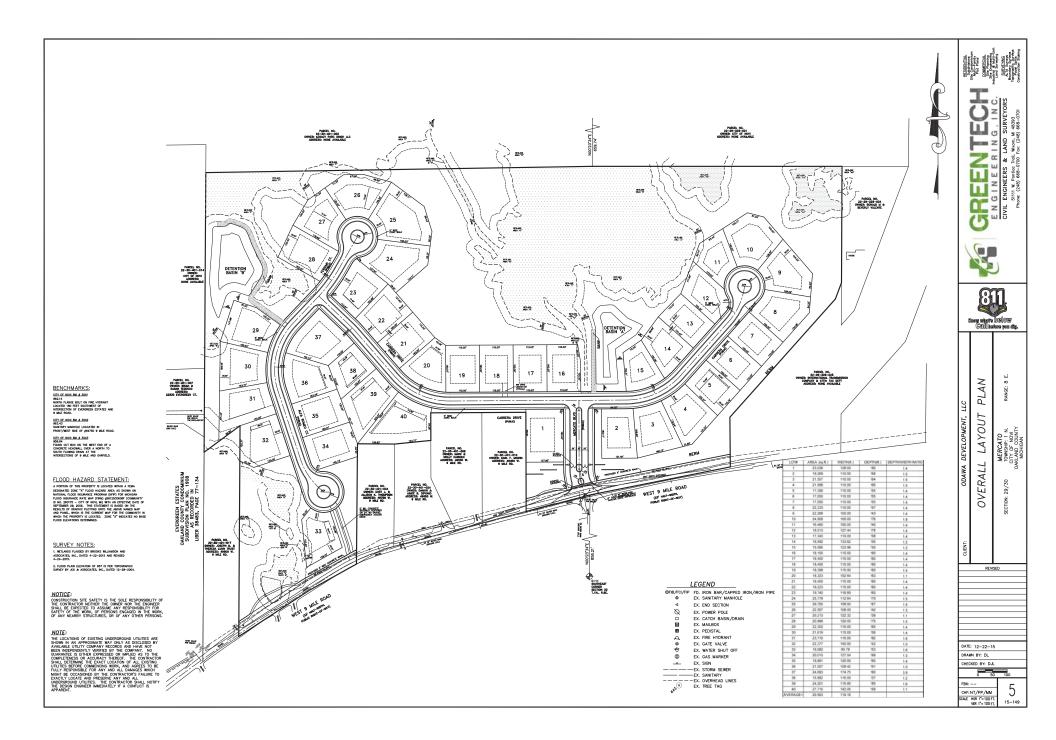
# PLANNED REZONING OVERLAY CONCEPT PLAN

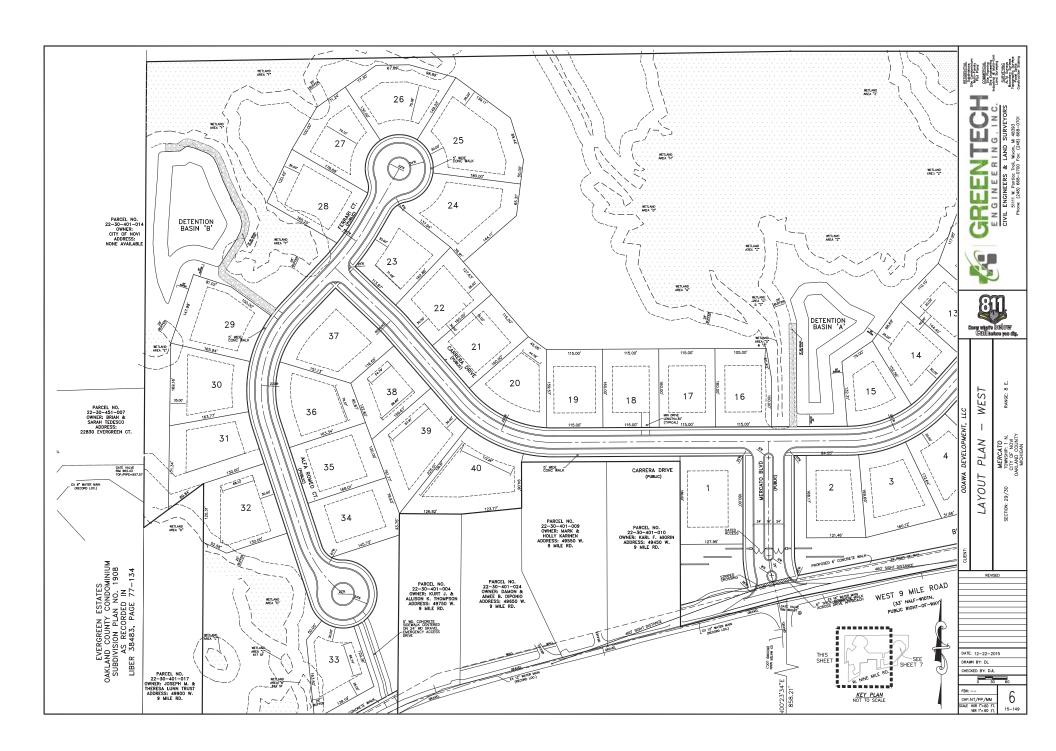


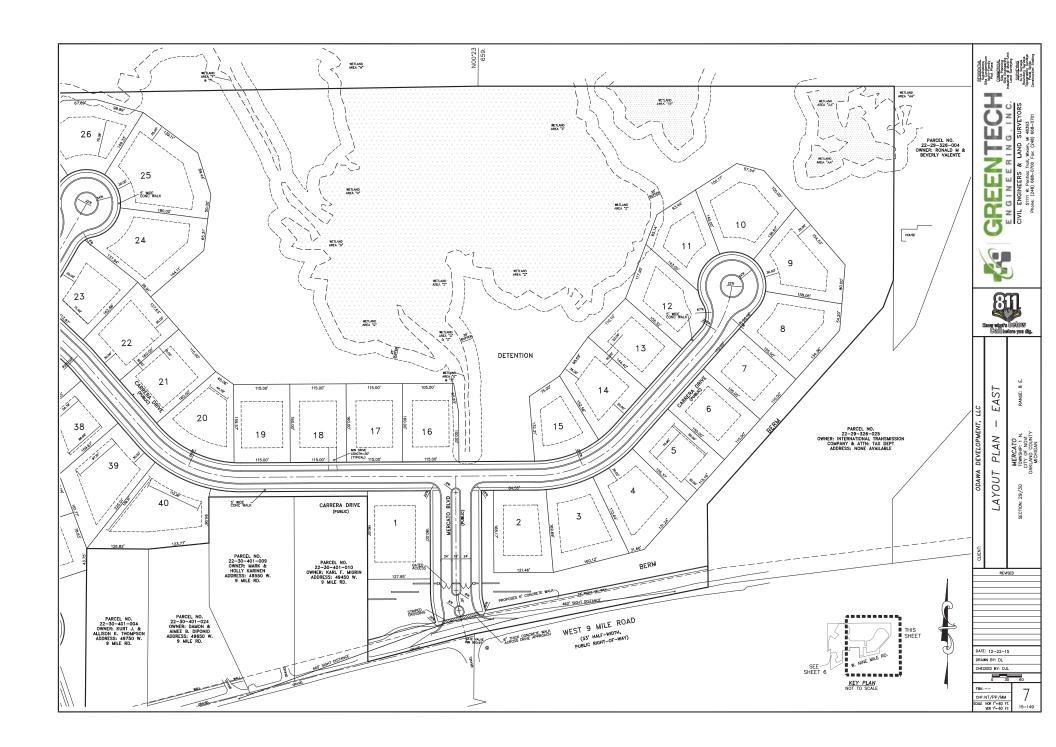


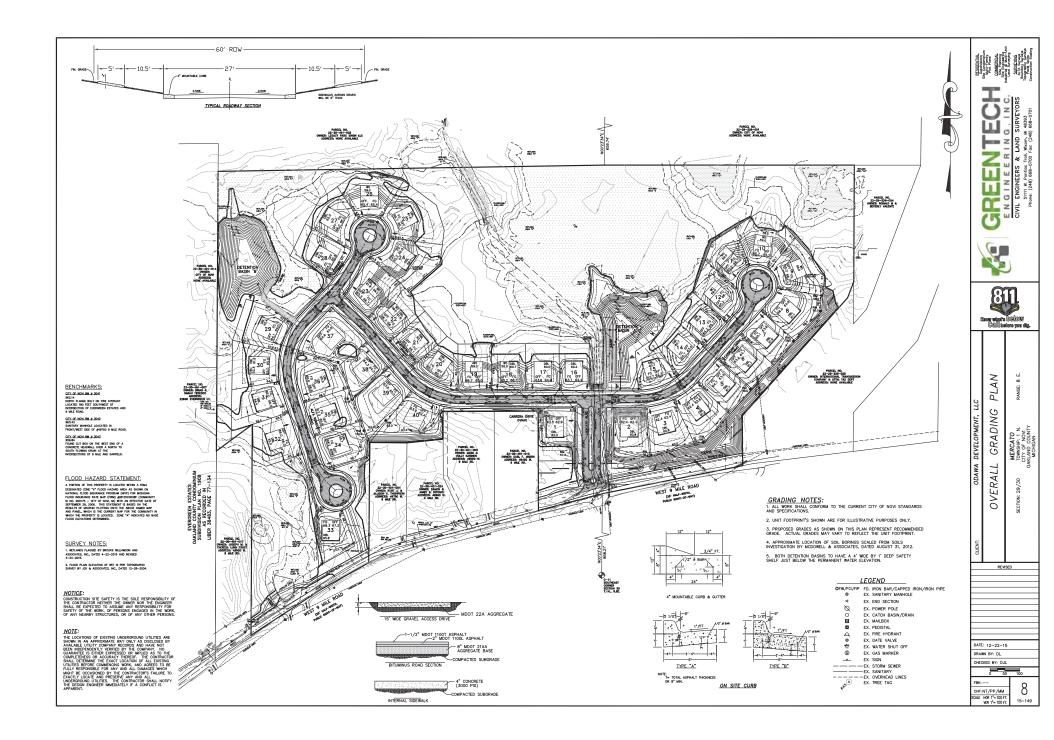


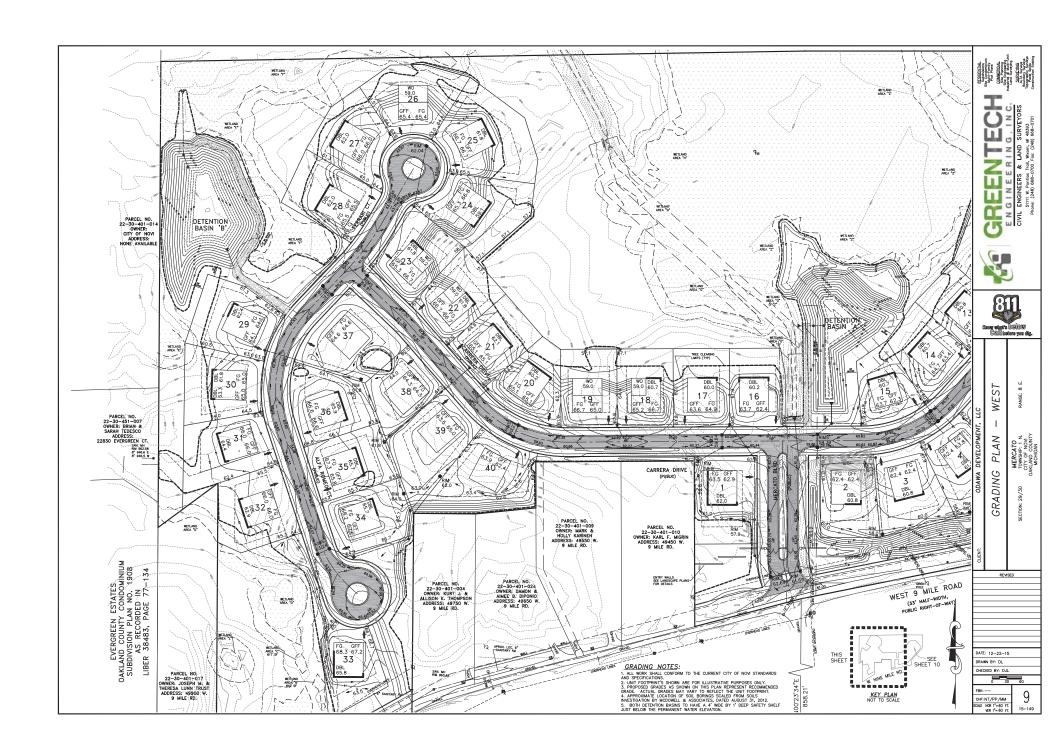


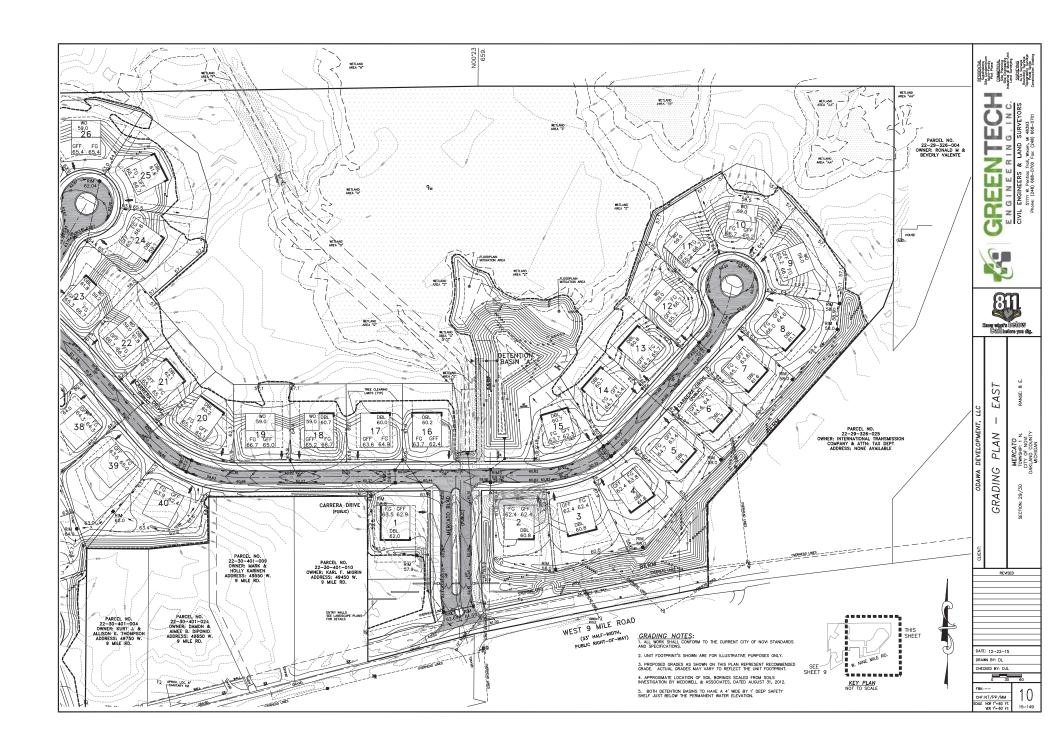


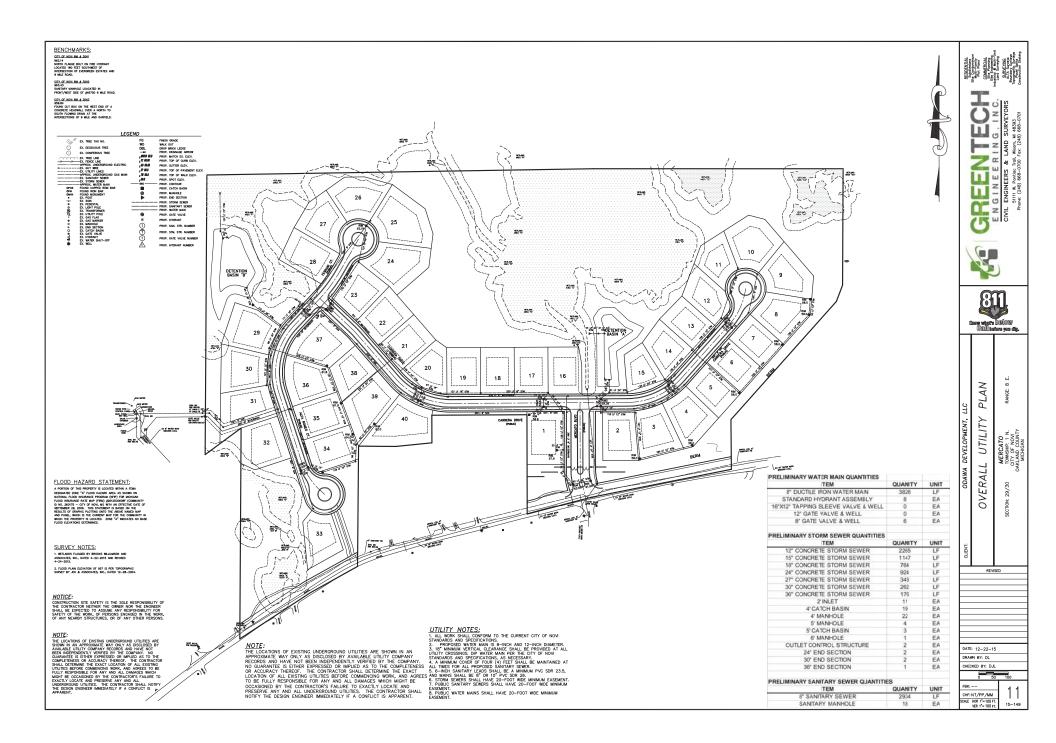


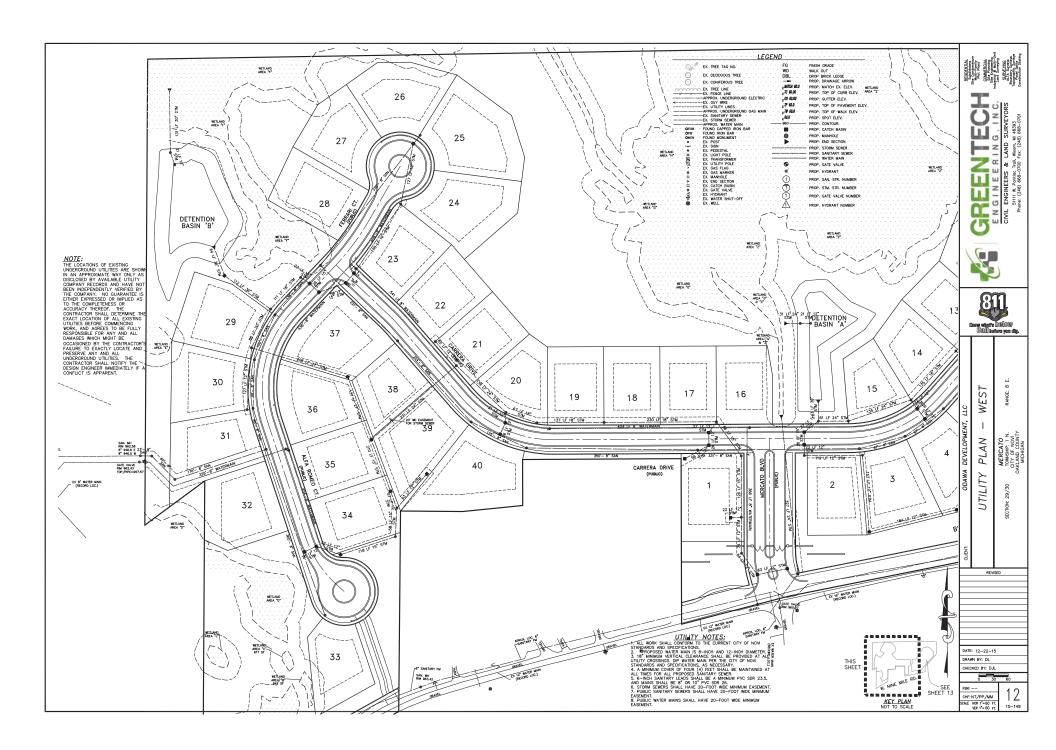


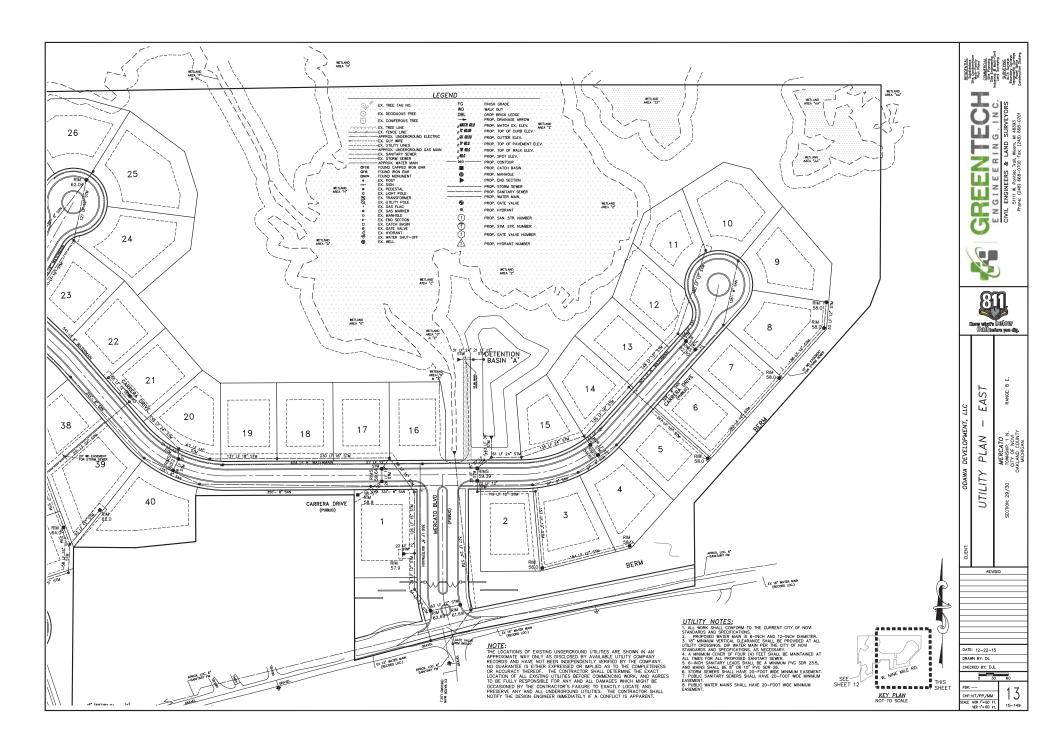


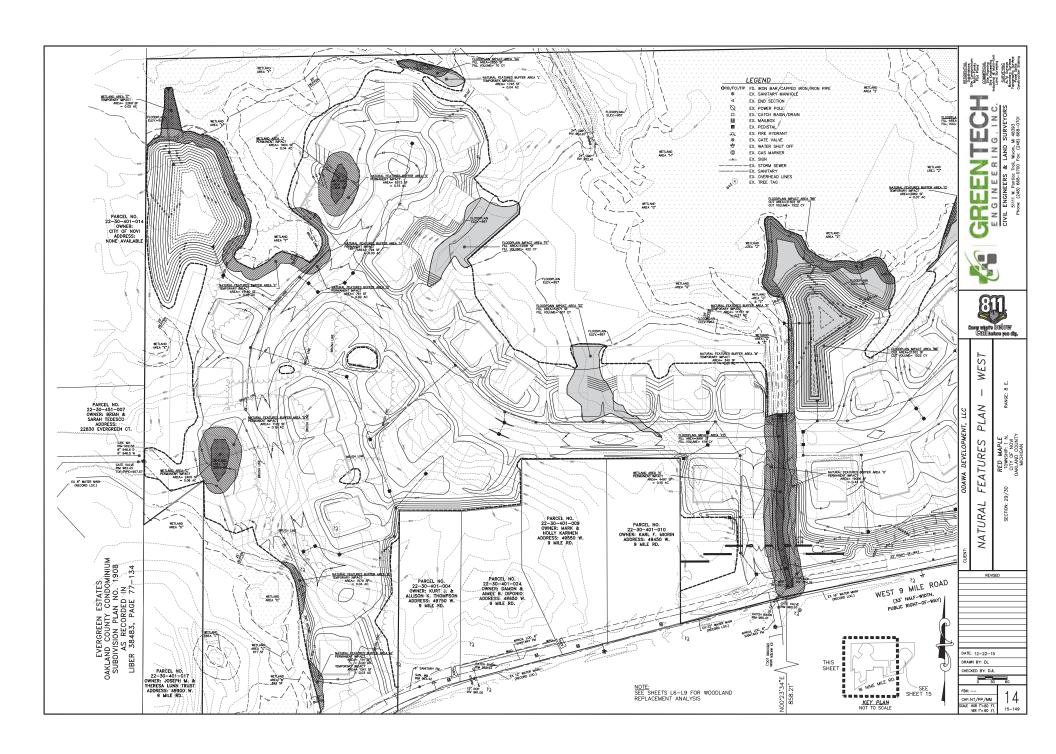


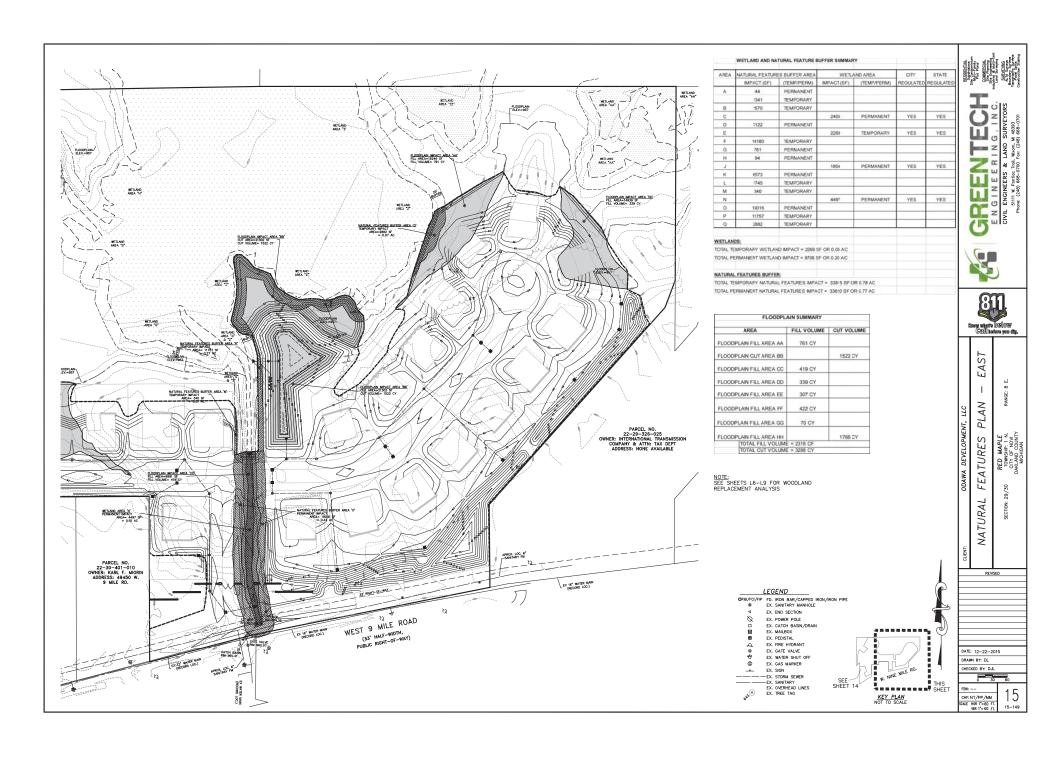


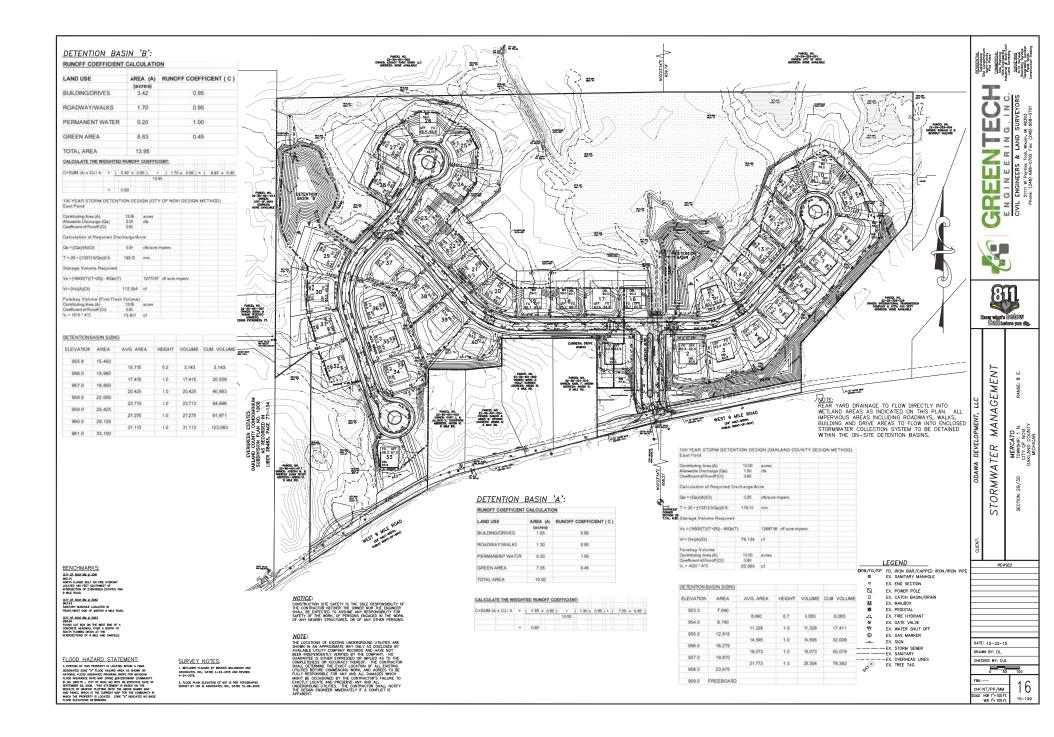


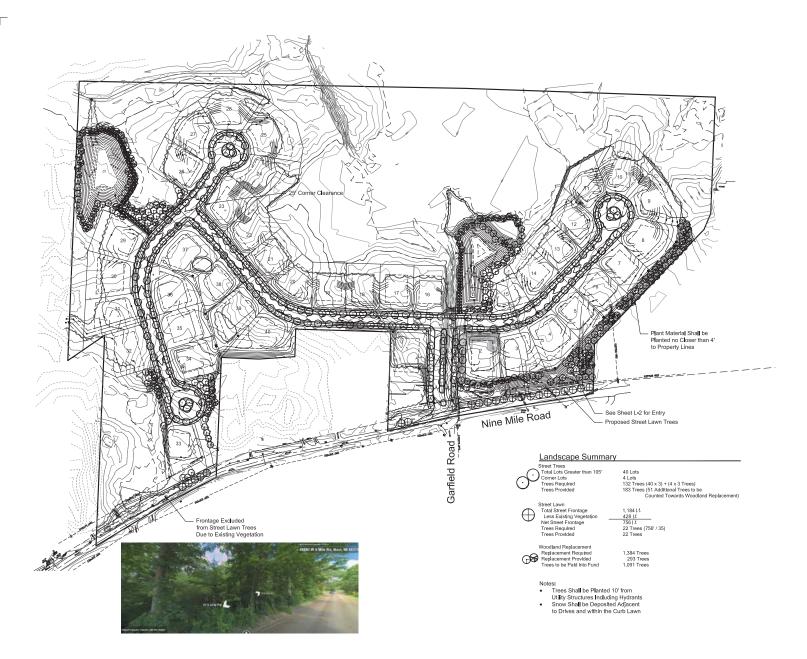














Seal:



## Landscape Plan

Project:

Mercato

Novi, MI

Prepared for:

Odawa Development LLC 51111 West Pontlac Trail Wixom, Michigan 48393

Bullder: Cambridge Homes 47765 Bellagio Northville, Michigan 48167

Revision: Issued: Sepember 8, 2015 December 17, 2015 January 4, 2016

Job Number:

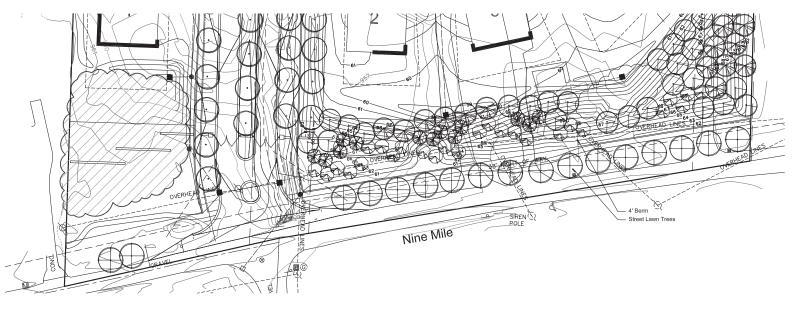
15-030

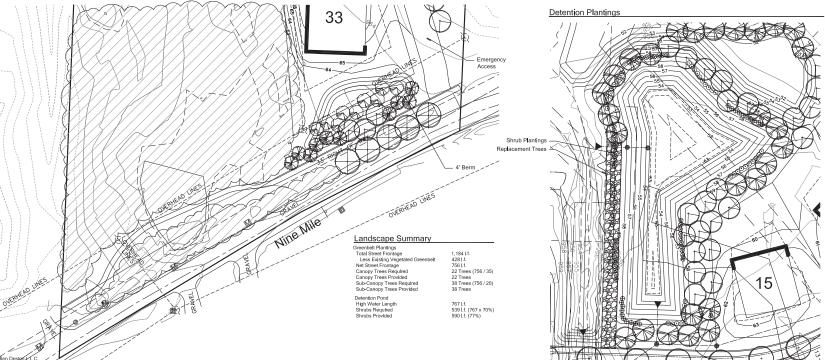
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Sheet No.







#### Seal:



Title:

## Greenbelt

Project:

Mercato

Novi, MI

#### Prepared for:

Odawa Development LLC 51111 West Pontjac Trail Wixom, Michigan 48393

Builder: Cambridge Homes 47765 Bellagio Northville, Michigan 48167

Revision:	Issued:	
Review	Sepember 8, 2015	
Revised	December 17, 201	
Revised	January 4, 2016	

Job Number:

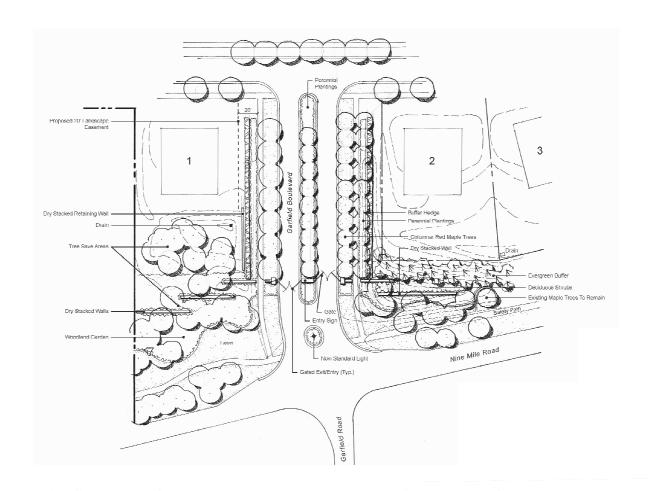
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Sheet No.





Seal:



Title: Entry Plan

Project: Mercato Novi, MI

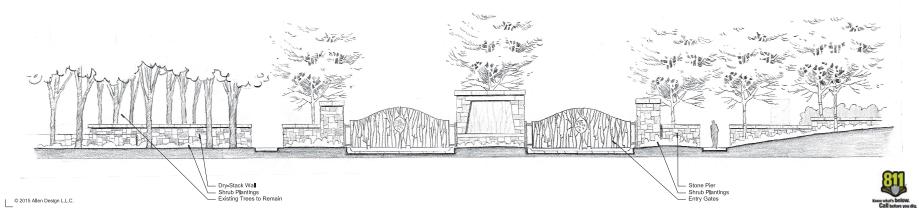
Prepared for:

Odawa Development LLC 51111 West Pontjac Trail Wixom, Michigan 48393

Builder: Cambridge Homes 47765 Bellagio Northville, Michigan 48167

Revision: Issued:

Sepember 8, 2015 December 17, 2015 January 4, 2016

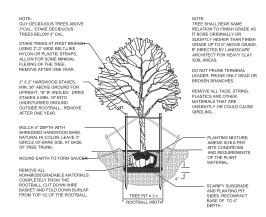


Job Number:

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NORTH 1"=30"

Sheet No.



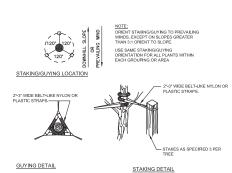
#### TREE SHALL BEAR SAME RELATION TO FINISH GRADE AS IT BORE ORIGINALLY OR GUY EVERGREEN TREES ABOVE 12' HEIGHT, STAKE EVERGREEN TREE BELOW 12' HEIGHT. II BUKE ORIGINALLY OR SLIGHTLY HIGHER THAN FINISH GRADE UP TO 6" ABOVE GRADE, IF DIRECTED BY LANDSCAPE ARCHITECT FOR HEAVY CLAY SOIL AREAS. STAKE TREES AT FIRST BRAI USING 2"-3" WIDE BELT-LIKE NYLON OR PLASTIC STRAPS. ALLOW FOR SOME MINIMAL FLEXING OF THE TREE. REMOVE AFTER ONE YEAR DO NOT PRUNE TERMINA LEADER. PRUNE ONLY DEAD OR BROKEN BRANCHES. 2" X 2" HARDWOOD STAKES, MIN. 36" ABOVE GROUND FOR UPRIGHT, 16" IF ANGLED. DRIVE STAKES A MIN. 18" INTO UNDISTURBED GROUND OUTSIDE ROOTBALL. REMOVE AFTER ONE YEAR. REMOVE ALL TAGS, STRING MATERIALS THAT ARE UNSIGHTLY OR COULD CAUSI MULCH 4" DEPTH WITH PLANTING MIXTURE SHREDDED HARDWOOD BARK AMEND SOILS PER SITE CONDITIONS NATURAL IN COLOR, LEAVE 3" -CIRCLE OF BARE SOIL AT BASE OF TREE TRUNK MOUND EARTH TO FORM SAUCER REMOVE ALL NON-BIODEGRADABLE MATERIALS COMPLETELY FROM THE ROOTBALL. CUT DOWN WIRE BASKET AND FOLD DOWN BURLAP FROM TOP 1/2 OF THE ROOTBALL. SCARIFY SUBGRADE AND PLANTING PIT SIDES, RECOMPACT BASE OF TO 4" DEPTH. REE PIT = 3

#### EVERGREEN TREE PLANTING DETAIL

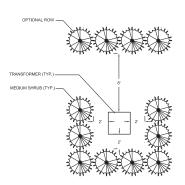
# 2" SHREDDED BARK -PLANTING MIXTURE, AS SPECIFIED

**DECIDUOUS TREE PLANTING DETAIL** 

## PERENNIAL PLANTING DETAIL



TREE STAKING DETAIL



TRANSFORMER SCREENING DETAIL

MULCH 3° DEPTH WITH HARDWOOD BARK NATURAL IN COLOR REMOVE ALL TAGS, STRING, PLASTICS AND OTHER
MATERIALS THAT ARE
UNSIGHTLY OR COULD CAUSE
GIRDLING. DI ANTING MIXTURE PLANTING MIXTURE: AMEND SOILS PER SITE CONDITIONS AND REQUIREMENTS OF THE PLANT MATERIAL MOUND EARTH TO FORM SAUCER REMOVE COLLAR OF ALL FIBER POTS POTS SHALL BE CUT TO PROVIDE FOR ROOT GROWTH. REMOVE ALL NONORGANIC CONTAINERS COMPLETELY.

SHRUB PLANTING DETAIL

#### LANDSCAPE NOTES

NON-BIODEGRADABLE MATERIALS
COMPLETELY FROM THE
ROOTBALL. FOLD DOWN BURLAP
FROM TOP § OF THE ROOTBALL.

- All plants shall be north Midwest American region grown, No. 1 grade plant materials, and shall be true to name, free from physical damage and wind burn.
   Plants shall be full, well-branched, and in healthy disporous growing.

- and shall be true to name, fee from physical diamage and whold burn.

  2. Places shall be watered before and after planning is complete.

  2. Places shall be watered before and after planning is complete.

  3. All ness much be staked, feefficials and mudded and shall be guaranteed.

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- areas ossurese ouang construction, throughout the contract limits.
   A pre-emergent weed control agent, "Pre-or or equal, shall be applied uniformly on top of all mulching in all planting beds.
   All landscape areas shall be provided with an underground automatic sprinkler system.
- Sod shall be two year old "Baron/Cherladelphl" Kentucky Blue Grass grown in a sod nursery on loam soil.

#### CITY OF NOVI NOTES

- All fundacepar jalands shall be backfilled with a sand misture to facilitate drainage.

  All sandscape areas shall be implaced incomment.

  All sandscape areas shall be implaced in the observation of the o and malntathed according to City of Novi standards. Replace Faling Material During the Next Appropriate Planting Period. The warranty period shall include a minimum of one cultivation in June - August. All proposed street trees shall be planted a minimum of 4" from both the back of curb and
- proposed vallet. And the proposed vallet is nutriened with shreeded hereleved task, spread to All the eard time, or all them is not livered which there is a flament offer offer which of which the here of the control of the order of the control of the control of the order of the order of the order of the disk copiend and which as incidented on the pleat list. Muthis is to be free from derived and offer copiend and which as incidented on the pleat list. Muthis is to be free from derived and All Substitutions or Deviations from the Landscape Flam Must be Approved in withing by the Gly of Note Fight of the Issualisation.

NOTES: THE APPROXIMATE DATE OF INSTALLATION FOR THE PROPOSED LANDSCAPE WILL BE SPRING OR FALL

THE SITE WILL BE MAINTAINED BY THE DEVELOPER IN ACCORDANCE WITH THE STANDARDS SET FORTH IN THE CITY OF NOVI ZONING DISTANCE. THIS INCLUDES WEEDING AND WATERING AS REQUIRED BY NORMAL MAINTENANCE PRACTICES.

PLANT MATERIALS SHALL BE GUARANTEED FOR 2 YEARS AND SHALL BE MAINTAINED IN ACCORDANCE WITH CITY ORDINANCES. WARRANTY PERIOD BEGINS AT THE TIME OF CITY APPROVAL. WATERING AS INCESSARY SHALL DOCUME DIRING THE WARRANTY PERIOD.

ALLEN DESIGN 557 CARPENTER + NORTHVILLE, MI 48167 248 467 4668 • Fax 248 349 0559

NOTE:
TREE SHALL BEAR SAME
RELATION TO FINISH GRADE AS
IT BORE ORIGINALLY OR
SLIGHTLY HIGHER THAN FINISH
GRADE UP TO 4" ABOVE GRADE,
IF DIRECTED BY LANDSCAPE
ARCHITECT FOR HEAVY CLAY
SOIL AREAS. PRUNE ONLY DEAD OR BROKEN

SCARIFY SUBGRADE AND PLANTING PIT SIDES. RECOMPACT BASE OF TO 4" DEPTH.

Title:

## Landscape Details

Seal:

Project: Mercato

Novi, MI

Prepared for: Odawa Development LLC.

Wixom, Michigan 48393

Bullder: Cambridge Homes 47765 Bellagio Northville, Michigan 48167

Revision:	Issued:
Review	Sepember 8, 2015
Revised	December 17, 2015

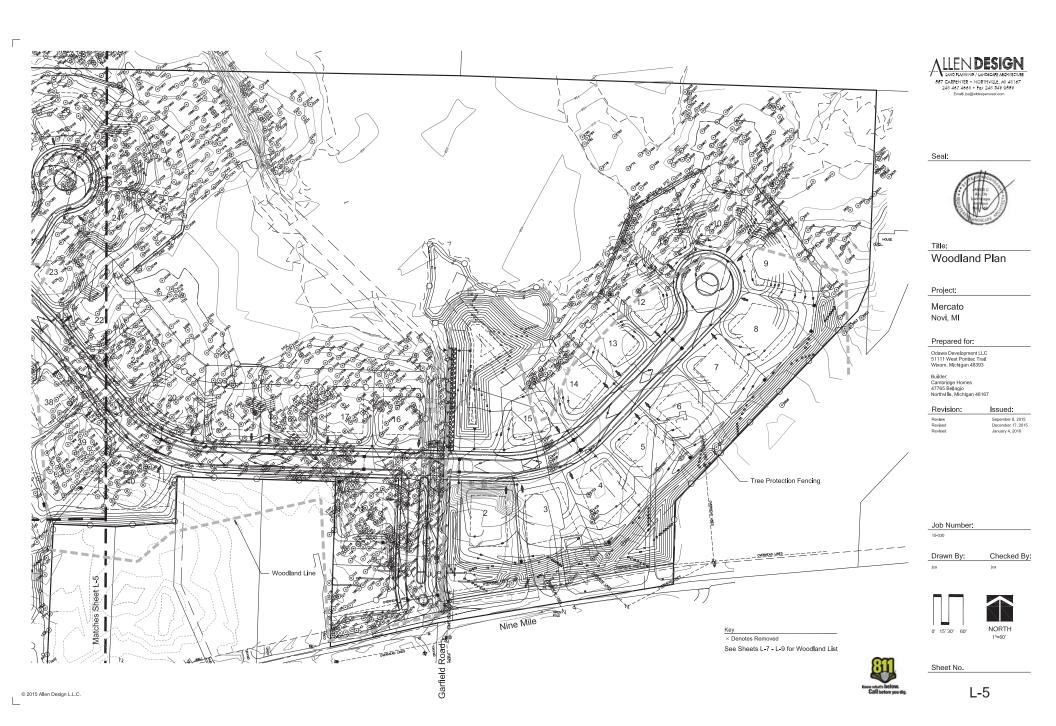
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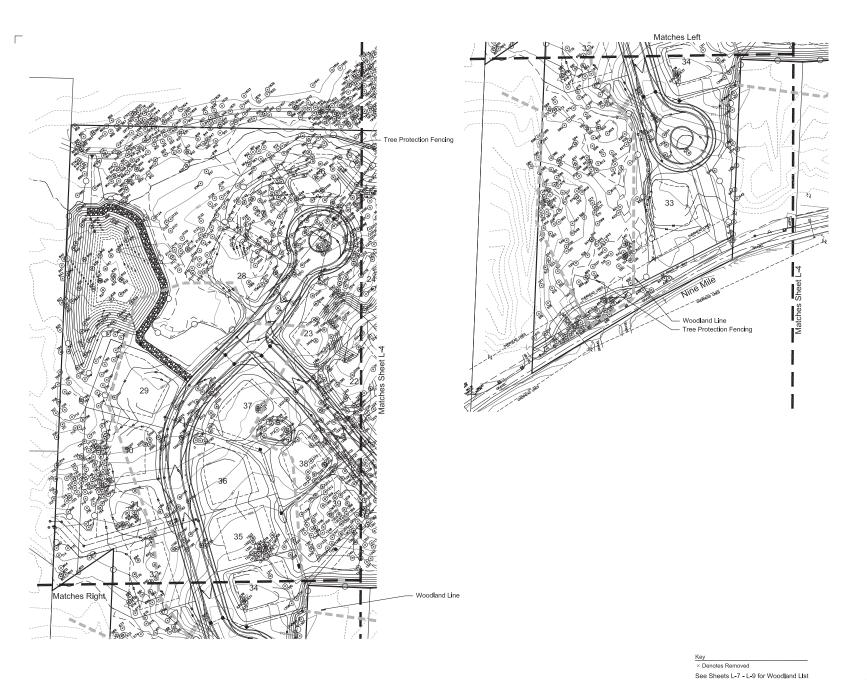
15-030

Drawn By: Checked By:



Sheet No.





ALLEN **DESIGN** LIND PLANNING / UNDSCAPE ARCHITECTURE

557 CARPENTER \* NORTHYILLE, MI 48167

248 447 4468 \* Fax 248 349 0559

Email: Jca@wideopenwest.com

Seal:



Title:

## Woodland Plan

Project:

Mercato Novi, MI

#### Prepared for:

Odawa Development LLC 51111 West Pontjac Trajl Wixom, Michigan 48393

Builder: Cambridge Homes 47765 Bellaglo Northville, Michigan 48167

Revision: Issued: Sepember 8, 2015 December 17, 2015 January 4, 2016

Job Number:

15-030

Drawn By: Checked By:



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Sheet No.

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Anni Cossa Dir.
Anni Cossa Dir.
Eastern Cotton
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Eastern Eas Review Revised January 4, 2016 Job Number: 15-030 Drawn By: Checked By: Sheet No.

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Regulated Trees Removed 71 Trees 2,004 Regulated Trees 837 Trees (42%) Greentech Engineering Title: Replacement Required Landscape Plan Trees 8" - 11" 391 trees x 1=
Trees 11" - 20" 319 trees x 2=
Trees 20" - 30" 52 trees x 3=
Trees 30"+ 12 trees x 4=
Multi-Stemmed Trees 638 Trees 156 Trees 48 Trees 299 Trees 1,532 Trees 148 Credits Sub-total Replacement Required
Less Credits
Total Replacement Required Project: 1.384 Trees Mercato Novi, MI Remarks Key: Save Tree will be saved Tree is located outside of a woodland area and will be saved. Credit Prepared for: Odawa Development LLC 51111 West Pontjac Trajl Wixom, Michigan 48393 Tree is located in a regulated woodland and will be removed Remove/Exempt Tree is located outside of a woodland area Builder: Cambridge Homes Northville, Michigan 48167 Gentle Agent State Country of the Co Revision: Revised Revised "POLES @ 5' O.C. PROTECTIVE FENCING PLACED 1' BEYOND DRIP LINE LIMITS ORGANIC LAYER FOP SOIL UNDERSTORY PLANTS - MINERAL LAYER Job Number: 15-030 1. Dies Flanke West Deutschaft an Ernstell auf der Beyord tie Oliffen. Under bei der Beyord tie Oliffen. Under bei der Beyord tie Oliffen. Under Bernation im Flanke West der Beschaft der Drawn By: TREE PROTECTION DETAIL NORTH

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Issued: Sepember 8, 2015 December 17, 2015 January 4, 2016

Checked By:

Sheet No.

# **PLANNING REVIEW**



## PLAN REVIEW CENTER REPORT

January 27, 2016

## <u>Planning Review</u>

Mercato
JSP15-63 with Rezoning 18.712

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## Petitioner

Odawa Development, LLC

## **Review Type**

Rezoning Request from RA (Residential Acreage) to R-1 (One-Family Residential) with Planned Rezoning Overlay (PRO)

## **Property Characteristics**

• Site Location: West side of Beck Road, east of Napier Road and north of Nine Mile

Road (Part Section 30)

Site Zoning: RA, Residential Acreage

Adjoining Zoning: North: R-1 One-Family Residential with a RUD agreement; All other

sides: RA, Residential Acreage

Current Site Use: Undeveloped

Adjoining Uses: North: Links of Novi/vacant; East: Single Family Residential; South: East:

Single Family Residential/Vacant; West: Single-family Residential

School District: Northville Community School District
 Site Size: 50.51 gross acres; 40.88 net acres

## **Project Summary**

The petitioner is requesting a Zoning Map amendment for a 50.51-acre property on the east side of Napier Road and north side of Nine Mile Road (Section 30) from RA (Residential Acreage) to R-1 (One-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 40-unit single-family site condominium.

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 RA to R-1, One-Family Residential) 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.

The applicant has proposed a 40-unit single-family development. The PRO Concept Plan shows two on-site detention ponds in the northeast corner of the site and on the eastern side. One boulevard access point is proposed off of Nine Mile Road. An emergency access road is proposed off of the proposed cul-de-sac to Nine Mile Road. The concept plan indicates that this will be a gated community.

The applicant has provided a Community Impact Statement addressing the items required in the Site development manual. Staff reviewed and agrees with the findings. However, staff is updating the statement with the following information.

- 1. The concept plan is proposing permanent impacts to the regulated woodlands on the site. The impact statement should reflect those changes.
- 2. Include a brief description of the proposed land use
- 3. Additional information is required with regards to sewer capacity as noted in Engineering review letter

#### Recommendation

The new rezoning category requested by the applicant is currently not supported by the Future Land Use Map. This matter shall be scheduled for consideration by Master Planning and Zoning Committee. The applicant is requesting an increase of 0.23 Dwelling Units per acre (about 28 percent more) than the maximum allowed density for RA (0.8 DUA). Even though it is less than the maximum allowed for R-1 (1.65 DUA), the proposed concept plan is considerably impacting the existing natural features (wetlands, woodlands and floodplain) to achieve the proposed density. Applicant should further articulate why the recommended Residential Unit Development (RUD) or other alternate options are not sought.

In addition, there are other opportunities as recommended by staff and consultants in their review letters to improve non-motorized connectivity and providing functional open spaces etc. to encourage healthy lifestyles. Staff also recommends that the applicant reevaluate and reconsider the public benefits being offered to meet the objective of the Community benefit.

Typically, any detrimental impact from an increase in total dwelling units in any development over that which would occur with conventional residential development is outweighed by benefits occurring from the preservation of open space, the anticipated high quality development and the creation and enhancement of park facilities that will be of substantial benefit to the residents of the subdivision and the City at large. The proposed concept plan does not meet the objective for additional density consideration.

#### Master Plan for Land Use

The Future Land Use Map of the 2010 City of Novi Master Plan for Land Use identifies this property and all adjacent land within the City as single family residential, with a density of 0.8 dwelling units per acre. This matches the existing zoning of the site.

The proposal would follow objectives listed in the Master Plan for Land Use including the following:

- 4. Objective: Attract new residents to the City by providing a full range of quality housing opportunities that meet the housing needs of all demographic groups including but not limited to singles, couples, first time home buyers, families and the elderly. The proposal would include smaller-lot single-family dwelling units, which is a product that has proven to be attractive to a wide demographic.
- 5. Objective: Protect and maintain open space throughout the community. Majority of the site is preserved as open space, for areas in and around the stormwater detention basin, and to preserve quality wetlands

If additional information is provided per staff's recommendations, the proposal would have the ability to follow objectives listed in the Master Plan for Land Use including the following:

PRO Concept Plan: Planning Review

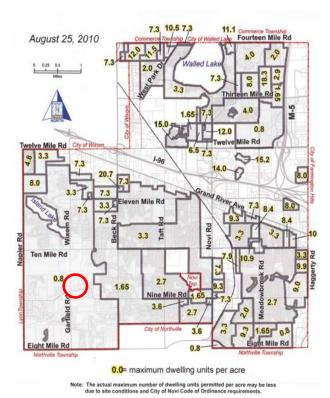
- 1. Objective: Continue to strive toward making the City of Novi a more bikeable and more walkable community. The development is in close proximity the City's proposed Trail system. on the northern side. The applicant is recommended to make pathway connections to the proposed trail system to promote walkability.
- 2. Objective: Encourage the use of functional open space in new residential developments. While the applicant is preserving considerable open space, no provisions or amenities are provided for functional open space for the benefit of the residents. The applicant is suggested to propose functional open space such as trails, benches, gazebos, play areas etc
- 3. Objective: Encourage residential developments that promote healthy lifestyles. The concept plan can propose pathways connection to the City's larger pathway system enables walking and bicycling.

#### **Development Potential**

Development under the current RA zoning could result in the construction of up to 33 single-family homes under the allowable density and net acreage of the site. It is not known whether the site could be developed with 33 lots that meet the dimensional requirements of the RA zoning district. Development under the master-planned density of 0.8 units to the acre (equivalent to existing RA zoning) would be up to 33 single family homes. Development under the proposed R-1 zoning without a PRO option could result in as many as 67 single family detached homes. As proposed, the development would be limited to 40 single-family detached homes.

### Density proposed

The applicant is proposing 40 units on the 40.88 net acres resulting in approximately 1.08 units/acre. As previously mentioned, the Master Plan for Land Use recommends 0.8 units per acre for the subject property and the properties surrounding it. The proposed density is 1.28 times the Master Plan recommendation for the site. Proposed density is most consistent with the R-1



One-Family Residential District (maximum density of 1.65 units per acre). This is the proposed new zoning classification for the site. The subject property is currently located in the southwest quadrant of the City which is predominantly low residential and is also master planned for low density residential.

## Existing Zoning and Land Use

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

> Land Use and Zoning: For Subject Property and Adjacent Properties Master Plan Land Use **Existing Zoning Existing Land Use** Designation

Subject Property	RA, Residential Acreage	Single-Family Residential	Single-Family Residential at a maximum of 0.8 units/acre
Northern Parcels	R-1, One-Family Residential	Links of Novi/Vacant Existing RUD agreement	Single-Family Residential at a maximum of 0.8 units/acre. Existing RUD agreement limits the number of units to 439 per 324 acres
Southern Parcels	RA, Residential Acreage	Vacant	Single-Family Residential at a maximum of 0.8 units/acre
Eastern Parcels	RA, Residential Acreage	Single-Family Residential	Single-Family Residential at a maximum of 0.8 units/acre
Western Parcels	RA, Residential Acreage	Single-Family Residential: Evergreen Estates	Single-Family Residential at a maximum of 0.8 units/acre

## Compatibility with Surrounding Land Use

The surrounding land uses are shown on the above chart. The compatibility of the proposed PRO concept plan 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 with the PRO option.



All properties immediately adjacent to the subject property are predominantly underdeveloped or vacant.

The property directly **north** of the subject property is currently functioning as a recreational use (Golf course). The current zoning map indicates R-1 for the property on the north, but it has recorded development agreement associated with it which limits the maximum number of units to 439 that can be developed under the conditions listed in Quail Hollow RUD agreement. The development

agreement also indicates that 42 percent of total site area (about 137 acres) will be preserved as permanent open space. About 73 acres will be contributed to the City. The development proposes trail system through the community.

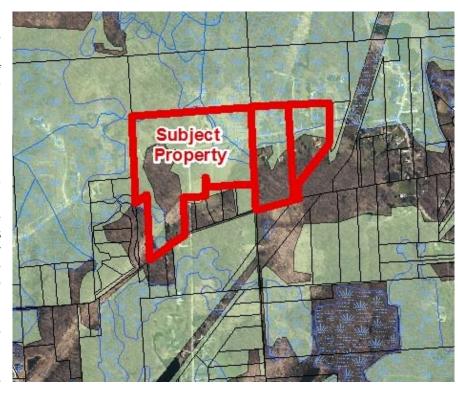
Directly to the **south** of the subject properties are a handful of single-family residential homes on residential lots along Nine Mile Road. All of these properties would experience traffic volumes along Nine Mile Road greater than existing (three single family houses exist on the subject property. However, the volumes are not considerably more than what would be expected with development under the current zoning.

The property to the **west** of the subject property along Nine Mile Road is the Evergreen Estates. It is developed according to RA requirements. The other property on the west is currently a single family residence.

To the **east** is one single family home and the ITC Corridor where the City is proposing a regional trail. (See attached proposed ITC regional trail layout)

The other developments which are in the vicinity are Bella Terra, Vasilios Estates and Park Place development. Bella Terra was developed using the Residential Unit Development option, thus permanently preserving 61 percent of the total site acreage. Park Place East was developed using the Open Space Conservation option, preserving about 45 percent Open space. All the developments in the surrounding area are either developed by RA requirements or used Open Space or RUD options and preserved open spaces. The applicant is recommended to use one of these options to maintain the natural quality of the area.

Impacts to the surrounding properties as a result of the proposal would be expected as part of the development of any residential 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. The vacant lots and the single family residences surrounding the subject property have minimum potential for possible future condominium development as they predominantly filled with regulated woodlands and wetlands (See Figure to the right).



### **Comparison of Zoning Districts**

The following table provides a comparison of the current (RA) and proposed (R-1) zoning classifications.

RA Zoning	R-1 Zoning
(Existing)	(Proposed)

	RA Zoning (Existing)	R-1 Zoning (Proposed)
Principal Permitted Uses	<ol> <li>One-family dwellings</li> <li>Farms and greenhouses</li> <li>Publicly owned and operated parks</li> <li>Cemeteries</li> <li>Schools</li> <li>Home occupations</li> <li>Accessory buildings and uses</li> <li>Family day care homes</li> </ol>	<ol> <li>One-family detached dwellings</li> <li>Farms and greenhouses</li> <li>Publicly owned and operated parks, parkways and</li> <li>outdoor recreational facilities</li> <li>Home occupations</li> <li>Keeping of horses and ponies</li> <li>Family day care homes</li> <li>Accessory buildings and uses</li> </ol>
Special Land Uses	<ol> <li>Raising of nursery plant materials</li> <li>Dairies</li> <li>Keeping and raising of livestock</li> <li>All special land uses in Section 402</li> <li>Nonresidential uses of historical buildings</li> <li>Bed and breakfasts</li> </ol>	<ol> <li>Places of worship</li> <li>Schools</li> <li>Utility and public service buildings (no storage</li> <li>yards)</li> <li>Group day care, day care centers, adult day care</li> <li>Private noncommercial recreation areas</li> <li>Golf courses</li> <li>Colleges and universities</li> <li>Private pools</li> <li>Cemeteries</li> <li>Mortuary establishments</li> <li>Bed and breakfasts</li> <li>Accessory buildings and uses</li> </ol>
Minimum Lot Size	43,560 square feet (1 acre)	21,780 sq ft (0.5 acres)
Minimum Lot Width	150 feet	120 ft
Building Height	2 1/2 stories -or- 35 feet	2 1/2 stories -or- 35 feet
Building Setbacks	Front: 45 feet Side: 20 feet (aggregate 50 feet) Rear: 50 feet	Front: 30 ft Side: 15 ft (aggregate 40 ft) Rear: 35 ft

#### Infrastructure Concerns

An initial engineering review was done as part of the rezoning with PRO application to analyze the information that has been provided thus far. Water main is currently available to connect along Nine Mile Road and the applicant is connecting it through Evergreen court. Sanitary sewer would be connecting to the existing pump evergreen pump station. Engineering is requesting the applicant to provide a study of the Evergreen Pump Station capacity to demonstrate that there is adequate capacity and also additional information regarding sizing of the proposed storm sewer that is enclosing the Garfield drain. 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 applicant has indicated that the proposed roads would be public on the concept plan, but the plan also proposes that it will be a gated community. Gates are not allowed on public roads. Gated Communities with Private roads will require City Council approval and has to be included in the PRO agreement.

The City's traffic consultant has reviewed the **Rezoning Traffic Impact Study** and notes that there is not a significant difference in trip generation estimates with the change in zoning. Refer to the traffic review letter for additional information.

#### Non-Motorized Improvements

City of Novi Non-motorized plan planned for two trails abutting the subject property: ITC Regional trail Phase 1A along the eastern boundary of the subject property and (2) proposed Singh trail in

the northern property. Staff believes that there is a good opportunity to connect to the proposed trails to continue to strive toward making the City of Novi a more bikeable and more walkable community. Staff recommends that the applicant work with Engineering to determine suitable locations for future connections. (See attached ITC Trail Map)

#### **Natural Features**

#### Woodlands

There is a significant area of regulated woodlands on the site including trees that are considered specimen trees. The applicant has proposed woodland impacts and will need to plant woodland replacement trees and contribute money to the tree fund to account for said impacts. The Woodland Review letter indicates that about 42 percent of the regulated woodland trees on the site are proposed to be removed, while 58 percent of the regulated woodland trees are proposed to be preserved. The applicant is proposing to provide 21 percent of the required woodland replacement tree credits on site and pay to the City of Novi Tree fund the remaining 79 percent. Staff suggests that the applicant consider modification of the Concept Plan to preserve additional quality woodlands on the site. The applicant should consider providing woodland conservation easements for any areas containing woodland replacement trees and for those woodland areas being preserved as open space. The applicant is encouraged to further modify lot boundaries to minimize impacts to quality/specimen trees. Please refer to the woodland review letter or additional information requested.

#### Wetlands

The Concept plan is proposing a total of 0.20-acre permanent wetland impacts a total permanent wetland buffer impact of 0.772-acre. The City's threshold for the requirement of wetland mitigation is 0.25-acre of proposed wetland impact. Wetland review could not complete a comprehensive review due to deficiencies in the plan. The applicant is suggested to consider alternate options to minimize impacts on natural features. For example, elimination of Lot 33 would further reduce the wetland impacts. Please refer to the wetland review letter or additional information requested.

#### Floodplain

The Plan appears to propose a total of 2,318 cubic yards of floodplain fill and a compensating floodplain cut of 3,288 cubic yards. Floodplain impacts will most likely need to be authorized by the Michigan Department of Environmental Quality (MDEQ). The applicant stated in the Community Impact Statement that the 100 year floodplain is being filled to create about 12 lots. The applicant should consider alternate layouts to minimize the impacts to the 100 year floodplain. The applicant needs to explain the need to enclose what appears to be over 350 lineal feet of existing drain/ditch and provide any alternative site layout analysis that has been completed.

#### Open Space

Planning staff previously suggested that the applicant to propose usable open space for the residents of the community. The current plan does not indicate the percentage of open space to be preserved. While the applicant is preserving open space on site, the concept plan does not provide any additional amenities. The amenities may include, but not limited to, parks, play areas, benches, pergolas, trails, etc. Staff suggests that the applicant consider commit to providing open space amenities on subsequent submittals.

#### 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 and community impact statement.

- 1. Maximum number of units shall be 40.
- 2. Minimum unit width shall be 100 feet and minimum square footage of 15,595 square feet
- 3. Improvement of existing Sanitary Sewer Lift Station
- 4. Improvement of the north end of Garfield Road

#### **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. <u>Lot Size and Width:</u> The minimum lot size in the R-1 District is 21,780 square feet and the minimum lot width is 120 feet. The applicant has proposed a minimum lot size of 15,595 square feet and a minimum width of 100 feet. The overall density at 1.03 units to the acre is most consistent with the R-1 Zoning District (maximum density is 1.65 units to the net site area).
- 2. <u>Design and Construction Standards (DCS) Waiver:</u> DCS waiver is required for exceeding the maximum allowed distance of 1,300 feet for intervals between streets to the property boundary. See Engineering Review letter for additional information.
- 3. Landscape Deviations:
  - a. Along frontage west of proposed Mercato Boulevard
    - i. Landscape deviation for not meeting the minimum required greenbelt canopy trees
    - ii. Landscape deviation for not meeting the minimum required greenbelt street sub canopy trees staff does not support this deviation
    - iii. Landscape deviation for not meeting the minimum required Street tree requirementstaff does not support this deviation
    - iv. Landscape deviation for proposing a decorative wall instead of required berm
  - b. Along frontage west of proposed Lot 33
    - i. Landscape deviation for not meeting the minimum required greenbelt canopy trees
    - ii. Landscape deviation for not meeting the minimum required greenbelt sub canopy trees

- iii. Landscape deviation for not meeting the minimum required street tree requirement
- iv. Landscape deviation for proposing a decorative wall instead of required berm

## 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:

- 1. Improvement of existing Sanitary Sewer Lift Station
- 2. Improvement of the north end of Garfield Road

Regarding the first benefit, lift station improvements, staff believes that the proposed improvements are necessary in order for this development to occur and provide no additional benefit to the public. Staff would be able to make a better determination after the review of the required sanitary sewer capacity study. Regarding the second proposed benefit, the applicant needs to be aware that the north end of Garfield Road is a gravel road with a chip seal surface and that there is no pavement to mill. A full reconstruct of this section as an asphalt pavement would be required if the applicant is still interested in offering the improvement as a public benefit. Since it benefits other motorists and reduces the amount of maintenance, staff would consider the reconstruction of that part of Garfield Road to be a public benefit.

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.

888

Sri Ravali Komaragiri - Planner

Attachments: Planning Review Chart

ITC Regional Corridor Trail Map Residential Entryway Lighting



## PLANNING REVIEW CHART

**Review Date:** January 23, 2016

**Review Type:** Planner Rezoning Overlay Concept Plan

Project Name:JSP15-63 MercatoPlan Date:December 22, 2015Prepared 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. <u>Underlined</u> items need to be addressed on the Preliminary Site Plan.

Item	Required Code	Proposed	Meets Code	Comments
Zoning and Use Re	quirements			
Master Plan (adopted August 25, 2010)	Single Family, with master planned 0.8 maximum dwelling units per acre.	40 Unit single family residential development with PRO overlay; 1.03 maximum dwelling units per acre	No	Planning Commission recommendation & City Council approval PRO Concept Plan - City Council approval PRO agreement - Site Plan or Plat normal approval process
Zoning (Effective December 25, 2013)	RA: Residential Acreage district	R-1 One-Family Residential District	No	
Uses Permitted (Sec.3.1.1)	Single Family Dwellings	Single Family Dwellings with PRO Overlay	No	Plans indicate that the proposed roads are public. Gates cannot be proposed for public roads. A private gated development would require City Council approval
The remainder of the	he review is against R-1 sta	ndards, which is the reque	sted rezo	oning district
Height, bulk, densi	ty and area limitations (Sec	c. 3.1.2)		
Maximum Dwelling Unit Density	For RA: 0.8 DUA( For 40.88 net acres, upto	1.03 DUA ( 40 Units)	Yes	The maximum density conform to R-1 requirements
	28 units)			The applicant was recommended to consider RUD option for additional density bonus as an alternate
Minimum Lot Area (Sec 3.1.2)	21,780 square feet  For RA: 1 Acre (43,560 square feet)	0.36 Acres (15,595 square feet)	No	The lot sizes conform to R-3 requirements of 12,000 square feet  This is considered a

Item	Required Code	Proposed	Meets Code	Comments
				deviation to be approved by the City Council as part of the PRO Concept Plan approval and should be included in the PRO agreement
Minimum Lot Width (Sec 3.1.2)	120 ft. For RA: 150 ft.	100 ft.	No	The lot widths conform to R-3 requirements of 90 ft.  This is considered a deviation to be approved by the City Council
<b>Building Setbacks</b>	(Sec 3.1.2)			
Front	30 ft. RA: 45ft.	30 ft.	Yes	The lot widths conform to R-1 requirements
Side	15 ft. one side and 40 ft. total two sides RA: 20 ft. one side, 50 ft. two sides	15 ft. minimum each side;40 ft. two sides	Yes	
Rear	35 ft. RA: 50 ft.	35 ft.	Yes	
Maximum % of Lot Area Covered (By All Buildings) (Sec 3.1.2)	25%	Information is not provided at this point		Details reviewed at plot plan phase
Minimum Floor Area (Sec 3.1.2)	1,000 Sq.ft.	Information is not provided at this point	No	Details reviewed at plot plan phase
Building Height (Sec 3.1.2)	35 ft. or 2.5 stories whichever is less	No elevations provided at this time. The applicant indicated in the response letter that the tentative height is 35 ft.	NA	Building height reviewed at plot plan phase. Please mention the tentative height.
Frontage on a Public Street. (Sec. 5.12)	No lot or parcel of land shall be used for any purpose permitted by this Ordinance unless said lot or parcel shall front directly upon a public street, unless otherwise provided for in this Ordinance.	All units front on a proposed public road within the proposed condominium, with access to Nine Mile Road	Yes	Frontage on Private road for individual lots is permitted for a Condominium development.  Plans indicate that the proposed roads are public. Gates cannot be proposed for public roads. A private gated development require City Council approval
Note to District Sta	indards (Sec 3.6)			
Area Requirements (Sec 3.6A & Sec. 2.2)	- Lot width shall be measured between two lines where a front setback line	Lot widths appear to be measured at the front lot line and not at the intersection as required	No	The deviation for the minimum lot width may be less when measured correctly. Please update

Item	Required Code	Proposed	Meets Code	Comments
	intersects with side setback lines.  - Distance between side lot lines cannot be less than 90% between the front setback line and the main building.	by the code.		the lot widths as suggested. Refer to the illustration in Section 3.1.2 for further assistance
Additional Setbacks (Sec 3.6B)	NA	Single family development and no off-street parking	NA	
Exterior Side yard abutting Streets(Sec 3.6C)	NA	Side yards abutting residential districts	NA	
Wetland/Water- course Setback (Sec 3.6M)	25ft. from boundary of a wetland and 25ft. from the ordinary highwater mark of a watercourse.	25ft. wetland buffer indicated. Rear yards for some lots are encroaching into the buffer, especially Lot 32	No	Wetlands are not recommending approval at this time. Refer to wetlands review for additional comments
Woodlands (City Code Chapter 37) Replacement of removed trees		Woodland impacts proposed	No	Woodlands are not recommending approval at this time. Refer to Wodlands review for additional comments
Subdivision Ordina	nce			
Blocks (Subdivision Ordinance: Sec. 4.01)	<ul> <li>Maximum length for all blocks shall not exceed 1,400 ft.</li> <li>Widths of blocks shall be determined by the conditions of the layout.</li> </ul>	Lots are laid out such that the internal streets avoid creating blocks longer than 1400 ft.	Yes	Distance between Lot 1 and Lot 37 seems too close to maximum allowed. Please label the distance on the plans
	pes (Subdivision Ordinance			
Lot Depth Abutting a Secondary Thoroughfare (Subdivision Ordinance: Sec. 4.02.A5)	Lots abutting a major or secondary thoroughfare must have a depth of at least 140'	All lots are at least 140'	Yes	
<b>Depth to Width Ratio</b> (Subdivision Ordinance: Sec. 4.02.A6)	Single Family lots shall not exceed a 3:1 depth to width ratio	All are under the maximum depth to width ratio	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Arrangement (Subdivision Ordinance: Sec. 4.02.B)	<ul> <li>Every lot shall front or abut on a street.</li> <li>Side lot lines shall be at right angles or radial to the street lines, or as nearly as possible thereto.</li> </ul>	<ul> <li>All lots front on proposed streets</li> <li>Al lots conform to shape requirement</li> </ul>	Yes	
Streets (Subdivision Ordinance: Sec. 4.04)	Extend streets to boundary to provide access intervals not to exceed 1,300 ft. unless one of the following exists: - practical difficulties because of topographic conditions or natural features - Would create undesirable traffic patterns	The proposed street between Lot 1 and 37 appears to be longer than the maximum 1,300 feet.	No	This is a Design and Construction Standards variance and would require City Council Variance
Topographic Cond	ditions (Subdivision Ordina)	nce Sec 4.03)		
A. Flood plain	Compliance with applicable state laws and City Code  Areas in a floodplain cannot be platted	There is an existing 100 year floodplain on the subject property. Some of the lots are encroaching into the floodplains	No	Applicant is responsible for contacting the necessary agencies and obtain the necessary permits for the modifying the floodplain limits  Clearly indicate the floodplain limits on the layout plan. Refer to Engineering letter for more details
B. Trees and Landscaping	Compliance with Chapter 37 and Article 5 of City Zoning Code	Landscape Plan is provided	Yes	Landscape plan is recommended for approval with some deviations identified
C. Natural Features	To be preserved Lots cannot extend into a wetland or watercourse	The site has considerable wetlands	Yes/ No	Refer to Wetland review letter for more comments
D. Man-made Features	To be built according to City standards	None Proposed	NA	
E. Open Space Areas	Any Open Space Area shall meet the following: Require performance guarantee Shall be brought to a	The open space that is provided will need to meet these standards.	No	The applicant is recommended to consider usable open spaces such as trails, parks within the proposed development.

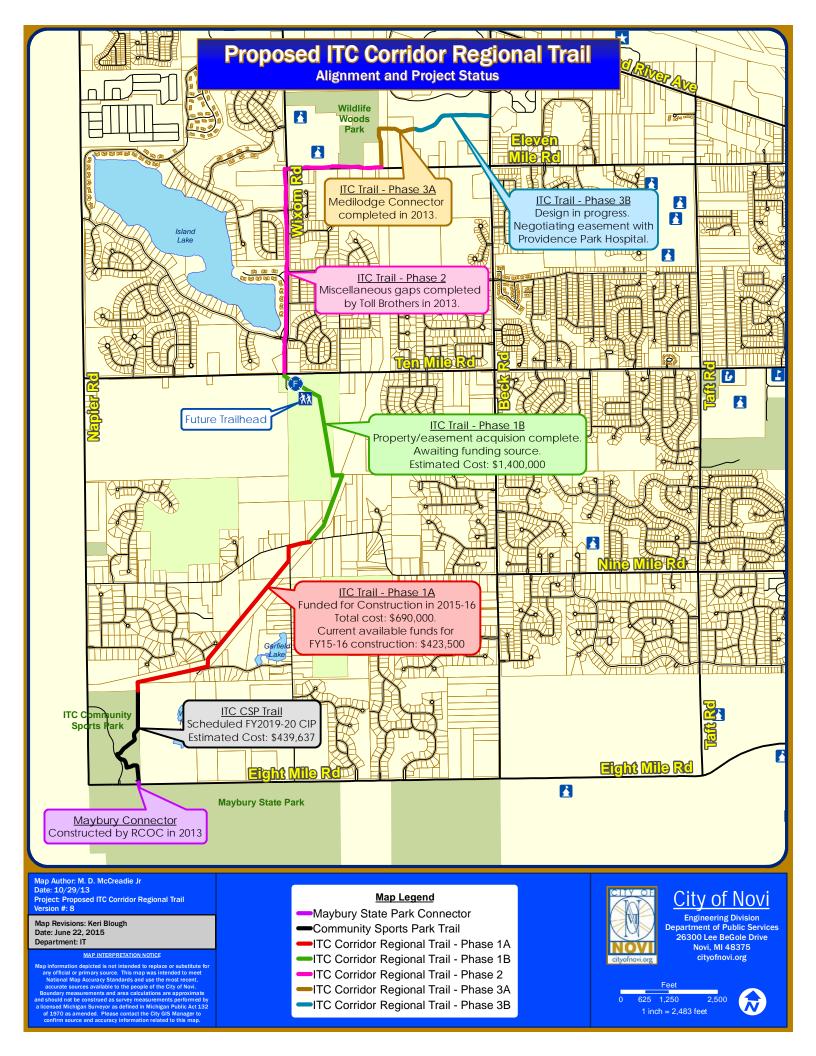
Item	Required Code	Proposed	Meets Code	Comments
	suitable grade - Compliance with zoning ordinance - Except for wooded areas, all ground area should be top dressed with a minimum of 25% of red fescue and a maximum of 20% perennial rye.			The response letter indicated access to natural open space, but the plan does not should any amenities for residents
F. Non-Access Greenbelt Easements	Along rear or side property lines for reverse frontage lots	Not applicable	NA	
G. Zoning Boundary Screening	A non-residential development abutting a residential development would need screening	Subject property is not abutting any non-residential development	NA	
Sidewalks and Oth	er Requirements			
Non-Motorized Plan	There are two trails that are proposed as part of the City's Non-Motorized along Eastern and Western boundaries	No Connections to the proposed trails are proposed	No	Applicant should consider future connections to proposed City of Novi ITC trail along east of the property
Sidewalks (Subdivision Ordinance: Sec. 4.05)	Sidewalks are required on both sides of proposed drives	Sidewalks are proposed on either side of the proposed Public drive	Yes	Revised the proposed sidewalk to be concrete as required. Refer to Engineering Review
Public Sidewalks (Chapter 11, Sec.11-276(b), Subdivision Ordinance: Sec. 4.05)	A 6 foot sidewalk is required along Nine Mile Road	A 6 foot asphalt pathway is proposed along Nine Mile Road	No	
Exterior Lighting (Section 5.7)	Photometric plan required at FSP  One light per entrance is required by the City.	One entry light is shown on the sheet L-3.		Please contact Jeremy Miller at <u>248.735.5694</u> for further details. <b>Provide</b> details of the proposed lighting
Phasing		Phasing is not proposed with the current proposed concept plan	NA	Please indicate if phasing is proposed or anticipated
Planned Rezoning	Overlay Document Require	ements		

Item	Required Code	Proposed	Meets Code	Comments
PRO Agreement (Sec. 7.13.2.D(3)	A PRO Agreement shall be prepared by the City Attorney and the applicant (or designee) and approved by the City Council, and which shall incorporate the PRO Plan and set forth the PRO Conditions and conditions imposed	Not applicable at this moment	NA	PRO Agreement shall be approved by the City Council after the Concept Plan is tentatively approved
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	Refer to Traffic Impact Study Review
Community Impact Statement (Sec. 2.2)	Assessment of the developmental, ecological, social, economic and physical impacts of the project on the natural environment and physical improvements on and surrounding the development site, including impact upon land within similar nearby districts. A projection of the cost of city services associated with the proposed development shall be provided compared with the real and personal property tax revenues to the City.	Applicant submitted a Community Impact Study.  Updated impacts to regulated trees in the statement		The concept plan is proposing permanent impacts to the regulated woodlands on the site. The impact statement should reflect those changes.  Include a brief description of the proposed land use  Additional information is required with regards to sewer capacity as noted in Engineering review letter
Other Legal Requi			1	
Development and Street Names	Development and street names must be approved by the Street Naming Committee before Preliminary Site Plan approval	Committee has approved development and street names	Yes	

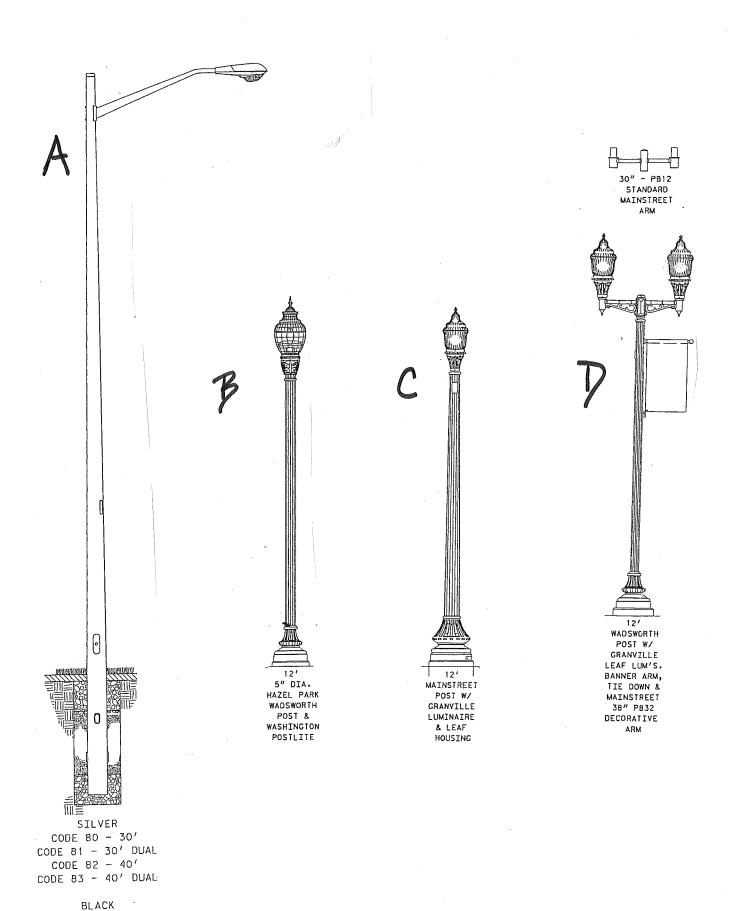
Item	Required Code	Proposed	Meets Code	Comments
Property Split or Combination	Property combination or split shall be reviewed and approved by the Community Development Department.	The subject property is proposing a combination of three lots.	Yes	The applicant must create this parcel prior to Stamping Set approval. Plans will not be stamped until the parcel is created.
Development/ Business Sign	Signage if proposed requires a permit.	An entry wall with a sign is proposed on the plans	Yes?	For sign permit information contact Jeannie Niland 248-347-0438.  Any sign deviations can be approved by City Council. Please contact Jeannie to identify any deviations
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	
Conservation easements	Conservation easements may be required for wetland and buffer impacts	Not applicable at this moment	NA	The following documents will be required during Site Plan review process after the Concept PRO approval

## 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.



# RESIDENTIAL DEVELOPMENT ENTRANCE LIGHTING OPTIONS



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

## **ENGINEERING REVIEW**



## PLAN REVIEW CENTER REPORT

01/29/2016

## **Engineering Review**

Mercato JSP15-0063

#### **Applicant**

Odawa Development, LLC

## Review Type

PRO Concept Plan

## **Property Characteristics**

Site Location:

N. Garfield and 9 Mile Intersection

Site Size:

31.7 acres

Plan Date:

12/22/15

## **Project Summary**

- Construction of an approximately 40 lot subdivision. Site access would be provided a boulevard entrance from 9 Mile Rd. Public roadways with be constructed to provide access throughout the site.
- Water service would be provided by an 8-inch extension from the existing 12-inch water main along the north side of 9 Mile Rd. and looping to the existing 8-inch stub from Evergreen Estates. Along with 8 additional hydrants to be installed.
- Sanitary sewer service would be provided an 8-inch extension from the existing 8inch sanitary sewer stub from Evergreen Estates.
- Storm water would be collected by a single storm sewer collection system and detained in 2 on-site detention ponds.

## Comments:

The Concept Plan and the Preliminary Storm Water Management Plan does not meet the general requirements of Chapter 11 of the Code of Ordinances, the Storm Water Management Ordinance and/or the Engineering Design Manual. The following items must be addressed prior to resubmittal:

- 1. Provide a study of the Evergreen Pump Station capacity to demonstrate that there is adequate capacity. Propose any improvements that will be necessary to serve the expanded service area.
- There is work involving the enclosure of the Garfield Drain. While this is no longer a county maintained drain, it does still function as a city drain. The revised plan should review the flow in the drain and provide calculations to demonstrate that the storm sewer proposed for the enclosure is sized properly. Additionally, the applicant will need approval from Oakland County to vacate the existing easement. As part of the project, the applicant will be required to provide a new easement to the City of Novi for the relocated drain.
- 3. Provide a pathway connection to the north for eventual connection to the planned Singh Trail.
- 4. The liber and page for the offsite water and sewer easements shall be shown on the plan.
- 5. Provide details for any changes to the existing floodplain. No lots are allowed in the existing floodplain. A FEMA LOMA will be required for any changes to the floodplain.
- 6. Public roads are not permitted in gated communities. Roads must be private if proposed gate remains.

## Additional Comments (to be addressed prior to the Preliminary Site Plan submittal):

## General

- 1. A right-of-way permit will be required from the City of Novi. The notes referring to the Road Commission for Oakland County should be removed.
- 2. The master planned right-of-way for Nine Mile Road is 43' half right-of-way. The pathway proposed along the frontage of Nine Mile Road should be located 1' off the master planned right-of-way, but can be located elsewhere to avoid wetlands and natural features. Additionally, there should be realigned adjacent to existing parcels based on existing features to facilitate future extension of the pathway.
- 3. Show all drives and roadways with 200 feet of the site, including clearly showing Garfield Rd. alignment with the proposed entrance.
- 4. Provide a minimum of two ties to established section or quarter section corners.
- 5. Provide a utility crossing table indicating that at least 18-inch vertical clearance will be provided, or that additional bedding measures will be utilized at points of conflict where adequate clearance cannot be maintained.
- 6. Provide a traffic control plan for the proposed road work activity (City roads).
- 7. 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.
- 8. A letter from either the applicant or the applicant's engineer must be submitted with the Preliminary Site Plan submittal highlighting the changes made to the plans addressing each of the comments in this review.
- 9. The City standard detail sheets are not required for the Final Site Plan submittal. They will be required with the Stamping Set submittal. They can be found on the City website (<a href="www.cityofnovi.org/DesignManual">www.cityofnovi.org/DesignManual</a>).

## Water Main

- 10. The water main stubs shall terminate with a hydrant followed by a valve in well. If the hydrant is not a requirement of the development for another reason the hydrant can be labeled as temporary allowing it to be relocated in the future.
- 11. Note that a tapping sleeve, valve and well will be provided at the connection to the existing water main.
- 12. Three (3) sealed sets of revised utility plans along with the MDEQ permit application (1/07 rev.) for water main construction and the Streamlined Water Main Permit Checklist should be submitted to the Engineering Department for review, assuming no further design changes are anticipated. Utility plan sets shall include only the cover sheet, any applicable utility sheets and the standard detail sheets.

## Sanitary Sewer

- 13. Provide a sanitary sewer basis of design.
- 14. Note on the construction materials table that 6-inch sanitary leads shall be a minimum SDR 23.5, and mains shall be SDR 26.
- 15. Provide a note on the Utility Plan and sanitary profile stating the sanitary lead will be buried at least 5 feet deep where under the influence of pavement.
- 16. Provide a testing bulkhead immediately upstream of the sanitary connection point. Additionally, provide a temporary 1-foot deep sump in the first sanitary structure proposed upstream of the connection point, and provide a secondary watertight bulkhead in the downstream side of this structure.
- 17. Seven (7) sealed sets of revised utility plans along with the MDEQ permit application (04/14 rev.) for sanitary sewer construction and the Streamlined Sanitary Sewer Permit Certification Checklist should be submitted to the Engineering Department for review, assuming no further design changes are anticipated. Utility plan sets shall include only the cover sheet, any applicable utility sheets and the standard detail sheets. Also, the MDEQ can be contacted for an expedited review by their office.

## Storm Sewer

18. A minimum cover depth of 3 feet shall be maintained over all storm sewers. Currently, a few pipe sections do not meet this standard. Grades shall be elevated and minimum pipe slopes shall be used to maximize the cover

- depth. In situations where the minimum cover <u>cannot</u> be achieved, Class V pipe must be used with an absolute minimum cover depth of 2 feet. An explanation shall be provided where the cover depth cannot be provided.
- 19. Provide a 0.1-foot drop in the downstream invert of all storm structures where a change in direction of 30 degrees or greater occurs.
- 20. Match the 0.80 diameter depth above invert for pipe size increases.
- 21. Storm manholes with differences in invert elevations exceeding two feet shall contain a 2-foot deep plunge pool.
- 22. Provide a four-foot deep sump and an oil/gas separator in the last storm structure prior to discharge to the storm water basin.
- 23. Label all inlet storm structures on the profiles. Inlets are only permitted in paved areas and when followed by a catch basin within 50 feet.
- 24. Label the 10-year HGL on the storm sewer profiles, and ensure the HGL remains at least 1-foot below the rim of each structure.
- 25. Provide a schedule listing the casting type and other relevant information for each proposed storm structure on the utility plan. Round castings shall be provided on all catch basins except curb inlet structures.

## Storm Water Management Plan

- 26. The Storm Water Management Plan for this development shall be designed in accordance with the Storm Water Ordinance and Chapter 5 of the new Engineering Design Manual.
  - a. Provide detention volume calculations using the formulas in the City of Novi Engineering Design Manual, not the Oakland County Method. The calculations for Basin A refer to the Oakland County Method.
- 27. An adequate maintenance access route to the Basin B outlet structure and any other pretreatment structures shall be provided (15 feet wide, maximum slope of 1V:5H, and able to withstand the passage of heavy equipment). Verify the access route does not conflict with proposed landscaping. Access routes should be located in common areas and not on individual parcels.
- 28. A 25-foot vegetated buffer shall be provided around the perimeter of each storm water basin. This buffer cannot encroach onto adjacent lots. Clearly show and callout the buffer.
- 29. A 4-foot wide safety shelf is required one-foot below the permanent water surface elevation within the basin.
- 30. Provide release rate calculations for the three design storm events (first flush, bank full, 100-year).

## Paving & Grading

- 31. The proposed emergency access drive must be hard surface or grass pavers.
- 32. The proposed emergency access drive must be a minimum of 18-feet wide in a 25-foot wide easement.
- 33. Add a note to the plan stating that the emergency access gate is to be installed and closed prior to the issuance of the first TCO in the subdivision.

- 34. Crosswalks shall be provided at all intersections.
- 35. Provide top of curb/walk and pavement/gutter grades to indicate height of curb.
- 36. The pathway along 9 Mile Rd. must be concrete, not asphalt as shown.
- 37. Provide a cross-section for the R.O.W. sidewalk.
- 38. Provide a stub street to the property boundary at intervals not to exceed 1,300 feet along the perimeter or provide a variance application from Appendix C Section 4.04(A)(1) of the Novi City Code. City staff would support this request.
- 39. Add the required 2-percent maximum cross-slope to the sidewalk detail.
- 40. Soil borings along the proposed road will be required at 500 foot intervals per Section 11-195(d) of the Design and Construction Standards. A minimum of 5 borings meeting ordinance requirements will be acceptable.

#### Flood Plain

41. A City of Novi floodplain use permit will be required for the proposed floodplain impact. This should be submitted as soon as possible. Contact the Building Department for submittal information. An MDEQ floodplain use permit may also be required prior to site plan approval.

## Off-Site Easements

42. Any off-site utility easements anticipated must be executed by both parties **prior to final approval of the plans**. Drafts of the easement shall be submitted at the time of the Preliminary Site Plan submittal for review, and shall be approved by the City prior to final signatures.

## The following must be provided at the time of Concept Plan resubmittal:

43. A letter from either the applicant or the applicant's engineer <u>must</u> be submitted with the revised concept plan highlighting the changes made to the plans addressing each of the comments listed above <u>and indicating the revised sheets involved</u>.

Please contact Jeremy Miller at (248) 735-5694 with any questions.

cc:

Adam Wayne, Engineering Brian Coburn, Engineering

Jecoms & Millere

Sri Komaragiri, Community Development

Becky Arold, Water & Sewer

## LANDSCAPE REVIEW



## PLAN REVIEW CENTER REPORT

January 25, 2016

## **PRO Concept Site Plan**

Mercato

Review TypeJob #PRO Concept Landscape ReviewJSP15-0063

## **Property Characteristics:**

Site Location:9 Mile Road and Garfield Road

• Site Zoning: RA – Residential Acreage – seeking PRO

Site Size: 50.51 ac.

Adjacent Zoning:
 RA – Residential Acreage N, W, S & E, R1 at northwest corner.

• Plan Date: 12/22/2015

#### **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. Please follow guidelines of the Zoning Ordinance and Landscape Design Guidelines. This review is a summary and not intended to substitute for any Ordinance.

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

Provided.

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

- 1. All utilities provided.
- 2. Please show proposed hydrants clearly on Sheets L-5 and L-6

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

1. Trees shown on Sheets 3, 4, L-5, L-6, L-7.

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

- 1. 1184 If frontage less 428 areas to be left natural. Calculations based on 756 If frontage. Large evergreens or canopy trees: 1 tree per 35 If = 22 trees required, 22 provided.
- 2. Subcanopy trees required: 1 tree per 20 lf = 38 trees required, 38 provided.
- 3. Berms minimum 4' tall with 4' crest required, and provided except in areas to be left natural.
- 4. Waivers required for these shortfalls in screening. Based on the plan and a site visit, it seems that a total of 410 lf of frontage will be left natural. While the condition of the eastern woodland is not at all pristine, being composed of mainly black locust, an invasive species, with an understory that also seems to be composed of honeysuckle and other undesirable species, it does still have a natural appearance from 9 Mile road

and will provide screening for the developed area behind it. The western woodland area seems to be mostly composed of naturally occurring woodland species. A waiver for the 410 If of frontage will be supported by staff. Additional plantings for the 18 If not accounted for in the calculations should be added.

- 5. Decorative walls are proposed at entrance. Please show walls on Sheet L-5.
- A waiver will be required if walls are to take place of any berms or other screening.

## Street Tree Requirements (Zoning Sec. 5.5.3.E.i.c and LDM 1.d.)

#### 9 Mile Road

- 1. 1184 If frontage less 428 areas to be left natural. Calculations based on 756 If frontage.
- 2. Large evergreens or canopy trees: 1 tree per 35 lf = 22 trees required, 22 provided.
- 3. A waiver is required for the shortfalls in street trees along 9 Mile Road. During a site visit, the western 270 If frontage is composed of maples, hickories and other high-quality trees and a waiver for this portion is supported by staff. The trees proposed to be left as street trees in the eastern 140 If of frontage were black locust and American elm, in varying levels of condition. Based on this, a waiver for this section of frontage would not be supported by staff. The trees along this frontage should be replaced with 4 street trees (140 If/35) with a better chance of long-term survival, and more in keeping with the character of the natural woodlands surrounding the site.

## **Internal streets**

- 1. Based on lot widths, 132 deciduous canopy trees are required.
- 2. 132 deciduous canopy trees are required, with 51 additional trees being woodland replacement trees.
- 3. Cul-de-sac islands can't count toward required street trees.
- 4. If trees can't be planted due to utility or other conflicts, reduction must come from replacement trees along internal streets.

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

When utility box locations are provided, required screening should be added to plan and plant list.

#### Plant List (LDM 2.h. and t.)

- 1. Please provide on Preliminary Site Plans.
- 2. Please include the proposed seed mix to be used in the detention basin.

#### Planting Notations and Details (LDM)

- 1. Provided details all conform with city standards.
- 2. Please revise notes per comments on Landscape Chart.

#### Storm Basin Landscape (Zoning Sec 5.5.3.E.iv and LDM 1.d.(3)

Requirement for 70% of pond rim to be landscaped with large native shrubs appears to be satisfied.

## <u>Irrigation (LDM 1.a.(1)(e) and 2.s)</u>

<u>Irrigation plan for landscaped areas is required for Final Site Plan.</u>

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

Proposed grading is provided for entire site as requested.

#### Snow Deposit (LDM.2.g.)

A note on the plan states that snow will be deposited along curbs.

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

Proposed trees to be saved are shown on Sheets L-5 and L-6.

## Corner Clearance (Zoning Sec 5.9)

- 1. Corner clearance zones are shown at all internal intersections and at the main 9 Mile Road entrance.
- 2. Please remove the tree in the western 9 Mile Road entrance corner clearance zone.
- 3. Corner clearance zone should be provided for emergency access lane at 9 Mile Road.

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 <a href="mailto:rmeader@cityofnovi.org">rmeader@cityofnovi.org</a>.

Rick Meader - Landscape Architect

The Meader

## LANDSCAPE REVIEW SUMMARY CHART

Review Date:January 25, 2016Project Name:JSP15 - 0063: MercatoPlan Date:December 22, 2015

**Prepared by:** Rick Meader, Landscape Architect E-mail: <a href="mailto:rmeader@cityofnovi.org">rmeader@cityofnovi.org</a>;

Phone: (248) 735-5621

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

Item	Required	Proposed	Meets Code	Comments
Landscape Plan Requir	ements (LDM (2)			
Landscape Plan (Zoning Sec 5.5.2, LDM 2.e.)	<ul> <li>New commercial or residential developments</li> <li>Addition to existing building greater than 25% increase in overall footage or 400 SF whichever is less.</li> <li>1"=20' minimum with proper North. Variations from this scale can be approved by LA</li> <li>Consistent with plans throughout set</li> </ul>	Yes	Yes	Overall plan: 1"=100' Details: 1"=30' Both are acceptable.
Project Information (LDM 2.d.)	Name and Address	Yes	Yes	
Owner/Developer Contact Information (LDM 2.a.)	Name, address and telephone number of the owner and developer or association	Yes	Yes	
Landscape Architect contact information (LDM 2.b.)	Name, Address and telephone number of RLA/LLA	Yes	Yes	
Sealed by LA. (LDM 2.g.)	Requires original signature	Yes	Yes	
Miss Dig Note (800) 482-7171 (LDM.3.a.(8))	Show on all plan sheets	Yes	Yes	
Zoning (LDM 2.f.)	Include all adjacent zoning	Yes	Yes	On cover sheet
Survey information (LDM 2.c.)	<ul><li>Legal description or boundary line survey</li><li>Existing topography</li></ul>	Yes	Yes	Description on cover sheet.

Item	Required	Proposed	Meets Code	Comments	
Existing plant material Existing woodlands or wetlands (LDM 2.e.(2))	<ul> <li>Show location type and size. Label to be saved or removed.</li> <li>Plan shall state if none exists.</li> </ul>	Yes	Yes	All comments from Preapplication have been addressed.	
Soil types (LDM.2.r.)	<ul> <li>As determined by Soils survey of Oakland county</li> <li>Show types, boundaries</li> </ul>	Yes	Yes	Sheet 2	
Existing and proposed improvements (LDM 2.e.(4))	Existing and proposed buildings, easements, parking spaces, vehicular use areas, and R.O.W	Yes	Yes		
Existing and proposed utilities (LDM 2.e.(4))	Overhead and underground utilities, including hydrants	Yes/No	Yes/No	<ol> <li>Existing utility lines, including overhead lines, are shown.</li> <li>All utility lines have been added.</li> <li>Please show hydrants clearly on sheets L-5 and L-6.</li> </ol>	
Proposed grading. 2' contour minimum (LDM 2.e.(1))	Provide proposed contours at 2' interval	Yes	Yes	<ol> <li>Proposed berm contours shown.</li> <li>Proposed contours for entire site have been added.</li> </ol>	
Snow deposit (LDM.2.q.)	Show snow deposit areas on plan	Yes	Yes	A note has been added indicating that snow will be along streets.	
LANDSCAPING REQUIRE	MENTS				
Parking Area Landscap	e Requirements LDM 1.c. &	Calculations (LDM 2.0	o.)		
General requirements (LDM 1.C)	<ul><li>Clear sight distance within parking islands</li><li>No evergreen trees</li></ul>	NA			
Name, type and number of ground cover (LDM 1.c.(5))	As proposed on planting islands	NA			
General (Zoning Sec 5.5.3.C.ii)					
Parking lot Islands (a, b. i)	<ul> <li>A minimum of 300 SF to qualify</li> <li>6" curbs</li> <li>Islands minimum width</li> <li>10' BOC to BOC</li> </ul>	NA			
Curbs and Parking stall reduction (C)	Parking stall can be reduced to 17' and the curb to 4" adjacent to a sidewalk of minimum 7	NA			

Item	Required	Proposed	Meets Code	Comments	
	ft.				
Contiguous space limit (i)	Maximum of 15 contiguous spaces	NA			
Plantings around Fire Hydrant (d)	No plantings with matured height greater than 12' within 10 ft. of fire hydrants	Some trees may be close to hydrants, manholes – can't tell at present.	No	<ol> <li>A note stating that all trees are to be kept 10' away from hydrants and manholes has been provided.</li> <li>Please show all proposed hydrants.</li> <li>Trees should also be kept at least 5' away from underground utility lines.</li> </ol>	
Landscaped area (g)	Areas not dedicated to parking use or driveways exceeding 100 sq. ft. shall be landscaped	NA			
Clear Zones (LDM 2.3.(5))	25 ft corner clearance required. Refer to Zoning Section 5.5.9			<ol> <li>Clear zones are provided for interior intersections and the main entrance at 9 Mile Road.</li> <li>Please also provide a clear vision zone for the fire emergency lane at 9 Mile Road.</li> <li>Please remove all trees from clear vision zones.</li> </ol>	
Berms, Walls and ROW	Planting Requirements				
Berms					
Gradual slopes are el contours  Berm should be locat conflict with utilities.  Berms should be cons	a maximum slope of 33%. ncouraged. Show 1ft. ed on lot line except in structed with 6" of top soil.				
Residential Adjacent to	Non-residential (Zoning Se	c 5.5.3.A and LDM 1.a)			
Berm requirements (Zoning Sec 5.5.A)	Adjacent Zoning is RA and R1	NA			
Planting requirements (LDM 1.a.)	LDM Novi Street Tree List	NA			
Adjacent to Public Rights-of-Way (Zoning Sec 5.5.3.A and LDM 1.b)					
Cross-Section of Berms	(Zoning Sec 5.5.3.B and LI	OM 2.j)			
Slope, height and width (Zoning Sec	<ul><li>Label contour lines</li><li>Maximum 33% slope</li></ul>	Yes/No	Yes/No	Berms are provided and appear to meet	

Item	Required	Proposed	Meets Code	Comments
5.5.3.A.v)	■ Min. 4 feet crest			the height, crest and slope requirements.  2. Please provide a cross section detail of the berm that includes notation that the berms are to be constructed of loam, and have a 6" layer of topsoil on top.
Type of Ground Cover		Yes	Yes	Lawn
Setbacks from Utilities	Overhead utility lines and 15 ft. setback from edge of utility or 20 ft. setback from closest pole	No	No	All overhead utility lines are noted and trees are properly spaced.
Walls (LDM 2.k & Zoning	y Sec 5.5.3.vi)			
Material, height and type of construction footing	Freestanding walls should have brick or stone exterior with masonry or concrete interior	Decorative entrance walls		Please provide dimensioned construction details for walls.
Walls greater than 3 ½ ft. should be designed and sealed by an Engineer		NA		If proposed walls are greater than 3.5' tall, they need to be designed and sealed by a design engineer
ROW Landscape Scree	ning Requirements (Sec 5.5)	.3.B. ii)		
Greenbelt width (2)(3) (5)	34 ft.	45-55′	Yes	
Min. berm crest width	4 ft.	4'	Yes	
Minimum berm height (9)	4 ft.	4′	Yes	
3' wall (4) (7)	NA	No		
Canopy deciduous or large evergreen trees Notes (1) (10) LDM1.d.(1)(b)	<ul> <li>1 tree per 35 l.f.;</li> <li>9 Mile Road (1184-428)/35 = 22 trees</li> </ul>	426 If of frontage subtracted from calculation due to existence of existence of natural area to remain.  9 Mile Road: 22 trees		1. Waiver can be sought for natural areas along right-of-way where area would be negatively impacted by grading/planting and where existing screening is sufficient. While the woodland is mostly composed of nonnative black locust, it

Item	Required	Proposed	Meets Code	Comments
				does provide screening for the development so the waiver would be supported by staff.  2. If proposed walls are providing required screening, a landscape waiver will also be required for that.  3. Tree ID numbers for trees to remain are shown on detail.  4. If screening is not deemed to be sufficient, some additional plantings in that area may be required.
Sub-canopy deciduous trees Notes (2)(10)	■ 1 tree per 20 l.f.; ■ 9 Mile Road (1184-428)/20 = 38 trees	9 Mile Road: 38 subcanopy trees	Yes	<ol> <li>Calculations provided</li> <li>Be sure to use subcanopy trees whose height does not exceed utility line height requirements.</li> <li>Please be sure to identify with unique labeling which trees are greenbelt trees, which are replacement trees, etc.</li> <li>Waiver can be sought for natural areas along right-ofway where area would be negatively impacted by grading/planting and where existing screening is sufficient. Staff would support this waiver for the western 270 If of frontage.</li> <li>For the eastern 140 If of frontage, there doesn't seem to be much in the way of</li> </ol>

Item	Required	Proposed	Meets Code	Comments
				existing understory vegetation, and there is room along the path for either large shrubs or subcanopy trees to be planted beneath the wires and soften the view to the woods. Please plant 7 subcanopy trees or large shrubs (min. 6- 10' tall) along the path in this area.
Street Trees (LDM 1.d.(1) and Novi Street Tree List))	<ul> <li>9 Mile Road: 1 tree per 35 lf (1184-428)/35=22 trees</li> <li>Internal lots - trees set by frontage - see table in LDM</li> </ul>	9 Mile Road: 22 trees (Should have 4 additional street trees along eastern frontage.)  Lots: 183 trees (132 calculated as required, 46 extra counted toward replacement trees)	Yes	1. Waiver can be sought for natural areas along right-of-way where area would be negatively impacted by grading/planting of street trees. Based on a site visit, a waiver for only the western 270lf of frontage would be supported by staff. The eastern frontage should have the existing black locusts and elms replaced with 4 street trees of species in keeping with the natural woodland near it.  2. For internal street trees, please be sure to label woodland replacement trees uniquely to assist with counts, monitoring.
Island & Boulevard Planting (Zoning Sec & LDM 1.d.(1)(e))	<ul> <li>Must be landscaped &amp; irrigated</li> <li>Mix of canopy/subcanopy trees, shrubs, groundcovers, etc.</li> <li>No plant materials between heights of 3-6 feet as measured from street grade</li> </ul>	Trees shown in all islands, additional plantings in entry island.	Yes/No	1. A mix of canopy and subcanopy trees, shrubs, groundcovers etc. is required for 75% of the island area for all islands.  2. Cul-de-sac island trees do not count as street trees.
Transformers/Utility	A minimum of 2ft.	No		When location of

Item	Required	Proposed	Meets Code	Comments
boxes (LDM 1.e from 1 through 5)	separation between box and the plants  Ground cover below  'i is allowed up to pad.  No plant materials within 8 ft. from the doors			transformer/utility boxes is determined, add landscaping per city requirements.
Detention/Retention Ba	sin Requirements (Sec. 5.5.3	3.E.iv)		
Planting requirements (Sec. 5.5.3.E.iv)	<ul> <li>Clusters shall cover 70-75% of the basin rim area</li> <li>10" to 14" tall grass along sides of basin</li> <li>Refer to wetland for basin mix</li> </ul>	Shrubs around 77% of high water line		Shrubs exceeding the 70% requirements are proposed.
Woodland Replaceme	nts (Chapter 37 Woodlands	Protection)		
Woodland Replacement Calculations – Required/Provided	<ul> <li>Show calculations based on existing tree chart.</li> <li>Indicate boundary of regulated woodland on plan</li> <li>127 replacement trees shown as required.</li> </ul>	<ul> <li>Extent of regulated woodland boundaries is not clearly indicated in plans.</li> <li>Tree chart showing trees to be removed has been provided.</li> </ul>	Yes	<ol> <li>Calculations are provided.</li> <li>Tree chart has been revised to show scientific names</li> </ol>
Woodland Replacement Trees Proposed	<ul> <li>Show clearly on plan and plant list which trees are proposed as woodland replacement trees</li> <li>Reforestation credit table breakdown, if applicable</li> </ul>	<ul> <li>246 trees + 46         additional street         trees proposed,         per calculation.</li> <li>1640 tree credits         to be         contributed to         tree fund.</li> </ul>	No	Please uniquely label woodland replacement trees for verification.
	DETAILS AND GENERAL REQU			
Landscape Notes - Utili Installation date	ze City of Novi Standard No	otes		
(LDM 2.1. & Zoning Sec 5.5.5.B)	Provide intended date	Between Mar 15 – Nov 15	Yes	
Maintenance & Statement of intent (LDM 2.m & Zoning Sec 5.5.6)	<ul> <li>Include statement of intent to install and guarantee all materials for 2 years.</li> <li>Include a minimum</li> </ul>		Yes	Please add note regarding cultivations in June-Aug

Item	Required	Proposed	Meets Code	Comments
	for the 2-year warranty period.			
Plant source (LDM 2.n & LDM 3.a.(2))	Shall be northern nursery grown, No.1 grade	Yes	Yes	
Irrigation plan (LDM 2.s.)	A fully automatic irrigation system and a method of draining is required with Final Site Plan	No	No	Need for final site plan
Other information (LDM 2.u)	Required by Planning Commission	NA		
Establishment period (Zoning Sec 5.5.6.B)	2 yr. Guarantee			
Approval of substitutions. (Zoning Sec 5.5.5.E)	City must approve any substitutions in writing prior to installation.	Yes	Yes	Please add "in writing" to City of Novi note #9.
Plant List (LDM 2.h.) - In	clude all cost estimates			
Quantities and sizes		No plant list	No	Plant list is required for Preliminary Site Plans.
Root type				
Botanical and common names				
Breakdown of genus/species diversity (LDM 1.d.(1).d.	Refer to LDM suggested plant list			Please be sure that diversity of plantings conforms with standard listed in Landscape Design Manual Section 1.d.1.(d).
Type and amount of lawn		No		Need for Final Site Plan
Cost estimate (LDM 2.t)	I mulch and sod as listed			Need for Final Site Plan
Planting Details/Info (LE	OM 2.i) - Utilize City of Novi	Standard Details		
Canopy Deciduous Tree		Yes	Yes	
Evergreen Tree		Yes	Yes	
Shrub	Refer to LDM for detail	Yes	Yes	
Perennial/ Ground Cover	drawings	Yes	Yes	
Tree stakes and guys. (Wood stakes, fabric guys)		Yes	Yes	
Tree protection fencing	Located at Critical Root Zone (1' outside of dripline)	Yes	Yes	
Other Plant Material Re	quirements (LDM 3)			

Item	Required	Proposed	Meets Code	Comments	
General Conditions (LDM 3.a)	Plant materials shall not be planted within 4 ft. of property line	Yes	Yes	Note has been added near property line as requested.	
Plant Materials & Existing Plant Material (LDM 3.b)	Plant Materials & Clearly show trees to be removed and trees to		Yes	Trees to be removed are clearly shown on plan and tree chart.	
Landscape tree credit (LDM3.b.(d))	Substitutions to landscape standards for preserved canopy trees outside woodlands/wetlands should be approved by LA. Refer to Landscape tree Credit Chart in LDM	Yes		Credits are included in woodland tree replacement calculations on Sheet	
Plant Sizes for ROW, Woodland replacement and others (LDM 3.c)	Refer to Chapter 37, LDM for more details	No No		Include sizes on plant list.	
Plant size credit (LDM3.c.(2))	NA				
Prohibited plants (LDM 3.d)	No plants on City Invasive Species List	No plant list included			
Recommended trees for planting under overhead utilities (LDM 3.e)	Label the distance from the overhead utilities			Please dimension distance from proposed trees close to overhead lines	
Collected or Transplanted trees (LDM 3.f)		NA			
Nonliving Durable Material: Mulch (LDM 4)	<ul> <li>Trees shall be mulched to 4" depth and shrubs, groundcovers to 3" depth</li> <li>Specify natural color, finely shredded hardwood bark mulch. Include in cost estimate.</li> <li>Refer to section for additional information</li> </ul>	Yes	Yes		

## NOTES:

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

## WETLANDS REVIEW



January 27, 2016

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

Re: Mercato (Red Maple Sub) JSP15-0063

Wetland Review of the Planned Rezoning Overlay (PRO)/Concept Plan (PSP15-0180)

Dear Ms. McBeth:

Environmental Consulting & Technology, Inc. (ECT) has reviewed the Planned Rezoning Overlay (PRO)/Concept Plan (Plan) for the proposed Mercato project prepared by Greentech Engineering, Inc. dated December 22, 2015. 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. ECT has also reviewed the Wetland Delineation and Determination of Jurisdiction Report prepared by Brooks Williamson and Associates, Inc. dated August 2015. ECT most recently visited the site on Tuesday, January 19, 2016 for the purpose of a wetland boundary verification.

The proposed development is located north of the intersection of Nine Mile Road and Garfield Road (i.e., north of Nine Mile Road between Napier Road and North Beck Road, Section 29 & 30. The Plan appears to propose the construction of 40 single-family residential homes, associated roads and utilities, and two (2) stormwater detention basins. The proposed project site contains a significant amount of City-Regulated Wetland, a tributary to the Novi-Lyon Drain, and areas of City-regulated Woodlands (see Figure 1).

A Natural Features Plan (Sheets 14 & 15) has been provided with the Plan. The existing site wetland/watercourse areas and the proposed wetland/watercourse impact information has been provided by the Applicant.

## Onsite Wetland Evaluation

ECT has reviewed the City of Novi Official Wetlands Map and completed an onsite wetland evaluation on Tuesday, January 19, 2016. The focus of the site inspection was to review site conditions in order to determine whether City-regulated wetlands are found on the subject property and whether these wetlands meet the City of Novi's Wetland Essentiality Criteria.

As noted above, the proposed project site contains a significant amount of regulated wetland as well as woodland (see Figure 1). It appears as if the proposed development site contains all or a portion of eleven (11) wetland areas, as well as a section of a tributary to the Novi/Lyon Drain. With the exception of Wetland 9, the wetland areas found on-site are forested wetlands containing common plant species including cottonwood (Populus deltoides) and silver maple (Acer saccharinum). Wetland 9 is a small isolated pocket of emergent and scrub shrub wetland located in an open field area in the western portion of the site. Many of the wetland areas also contained at least some amount of standing, frozen water. The site is essentially surrounded by areas designated as either City of Novi Regulated Wetland or Woodland. A portion of the southeastern section of the proposed development site

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FAX (734) 769-3164 Mercato (Red Maple Sub) JSP15-0063 Wetland Review of the Planned Rezoning Overlay (PRO)/Concept Plan (PSP15-0180) January 27, 2016 Page 2 of 13

includes existing residential lots. A portion of the western side of the site includes an area that appears to be somewhat disturbed and contains existing overhead utility lines.

The Natural Features Plan (Sheets 14 & 15) indicates the locations of the existing site wetland/watercourse areas as well as the proposed wetland/watercourse impact information. The Plan notes that the on-site wetland areas were flagged by Brooks Williamson and Associates, Inc. on April 22 and April 24, 2015. Existing wetland boundary flagging consisted of blue and pink survey flagging. All of these wetlands are of moderate to high quality and the Plan appears to propose direct impacts to four (4) of the proposed twelve (12) wetland areas. The Plan appears to identify the wetlands with letters (i.e., Wetland A, Wetland B, etc.). The applicant's Wetland Delineation Report identifies the on-site wetlands by number (i.e., Wetland 1 through Wetland 11, see Figure 2. Wetlands F and G are actually hydraulically connected by a culvert and are referred to as Wetland 8 in the Wetland Determination Report.

ECT has verified that the wetland boundaries appear to be accurately flagged in the field and depicted on the Plan. However, given the winter, snow-covered conditions during the time of our inspection, the results should be considered preliminary in nature. This preliminary wetland boundary verification/approval should be adequate for preliminary site planning purposes. We suggest that a final wetland boundary verification be completed during the growing season, and minor adjustments to the wetland boundary be made at that time if necessary.

What follows is a summary of the wetland impacts associated with the proposed site design.

## Wetland Impact Review

Currently, the Plan indicates impacts to four (4) of the twelve (12) on-site wetlands (i.e., Wetlands F, G, J, and K). The Plan proposes to fill Wetlands J and K for the purpose of constructing proposed Lots 27 and 28, and Lots 31 and 32, respectively. The impact to Wetland F is indicated as a temporary impact for the purpose of constructing a stormwater detention basin outlet pipe in the northwest section of the site. Finally, a section of Wetland G/Tributary to the Novi/Lyon Drain will be filled for the purpose of constructing the entry drive/boulevard for the site. This impact appears to include an enclosure of the existing drain of at least 360 lineal feet.

In addition to the proposed wetland impacts and proposed impact to the regulated drain, the Plan appears to propose impacts to regulated floodplain. The Plan appears to propose a total of 2,318 cubic yards of floodplain fill and a compensating floodplain cut of 3,288 cubic yards. Floodplain impacts will most likely need to be authorized by the Michigan Department of Environmental Quality (MDEQ).

The following table summarizes the existing wetlands and the proposed wetland impacts as listed on the Natural Features Plan (Sheets 14 and 15):

*Table 1.* Proposed Wetland Impacts

Wetland	Wetland Area (square feet)	Wetland Area (acres)	City Regulated?	MDEQ Regulated?	Impact Area (square feet)	Impact Area (acres)	Estimated Impact Volume (cubic yards)
A (1)	12,831	0.295	Yes City Regulated /Essential	Yes	None Indicated	None Indicated	None Indicated



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Wetland	Wetland Area (square feet)	Wetland Area (acres)	City Regulated?	MDEQ Regulated?	Impact Area (square feet)	Impact Area (acres)	Estimated Impact Volume (cubic yards)
B (3)	842	0.019	Yes City Regulated /Essential	Yes	None Indicated	None Indicated	None Indicated
C (4)	617	0.014	Yes City Regulated /Essential	Yes	None Indicated	None Indicated	None Indicated
D (5)	Not Provided	Not Provided	Yes City Regulated /Essential	Yes	None Indicated	None Indicated	None Indicated
E (7)	Not Provided	Not Provided	Yes City Regulated /Essential	Yes	None Indicated	None Indicated	None Indicated
F (8)	Not Provided	Not Provided	Yes City Regulated /Essential	Yes	2,269 (Temporary)	0.052 (Temporary)	None Indicated
G (8)	Not Provided	Not Provided	Yes City Regulated /Essential	Yes	4,497 (Permanent)	0.103 (Permanent)	Not Provided
J (9)	1,804	0.041	Yes City Regulated /Essential	Yes	1,804 (Permanent)	0.041 (Permanent)	Not Provided
K (6)	2,405	0.055	Yes City Regulated /Essential	Yes	2,405 (Permanent)	0.055 (Permanent)	Not Provided
L (2)	Not Provided	Not Provided	Yes City Regulated /Essential	Yes	None Indicated	None Indicated	None Indicated
AA (11)	Not Provided	Not Provided	Yes City Regulated /Essential	Yes	None Indicated	None Indicated	None Indicated
ZZ (10)	Not Provided	Not Provided	Yes City Regulated /Essential	Yes	None Indicated	None Indicated	None Indicated
TOTAL	Not Provided	Not Provided			8,706 (Permanent) 2,269 (Temporary)	0.200 (Permanent) 0.052 (Temporary)	Not Provided

In addition to the proposed wetland impacts, the Plan indicates a total permanent wetland buffer impact of 33,610 square feet (0.772-acre) and a total temporary wetland buffer impact of 33,815 square feet (0.776-acre). In total,



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the Plan proposes to encroach over 1.5 acres of 25-foot wetland/watercourse setback for the purpose of both permanent and temporary construction activities.

The Plan currently includes existing 25-foot wetland buffer on 10 of the 40 proposed Lots. These lots include: 11, 12, 16, 26, 27, 28, 29, 30, 32 and 33. Temporary impacts to the 25-wetland buffer are proposed on Lots 11, 12, 16, 26, 28, and 33. Permanent wetland buffer impacts appear to be proposed on proposed Lots 28 and 33. The current site design includes a total temporary wetland buffer impact of 33,815 square feet (0.776-acre) and a total permanent wetland buffer impact of 33,610 square feet (0.772-acre). In total, the Plan proposes to encroach over 1.5 acres of 25-foot wetland/watercourse setback for the purpose of both permanent and temporary construction activities. With regard to the preservation of 25-foot wetland buffers, the applicant should work in order to preserve the existing wetland buffers to the greatest extent practicable. The preservation of the 25-foot buffer areas is important to the overall health of the existing wetlands as the existing buffers serve to filter pollutants and nutrients from storm water before entering the wetlands, as well as provide additional wildlife habitat.

The following table summarizes the existing wetland setbacks and the proposed wetland setback impacts as listed on the Plan:

Table 2. Proposed 25-Foot Wetland/Watercourse Buffer Impacts

Wetland Buffer	Wetland Buffer Area (square feet)	Wetland Buffer Area (acres)	Impact Area (square feet)	Impact Area (acres)
A (1)	Not Provided	Not Provided	None Indicated	None Indicated
B (3)	Not Provided	Not Provided	44 (Permanent) 1,341 (Temporary)	0.001 (Permanent) 0.031 (Temporary)
C (4)	Not Provided	Not Provided	None Indicated	None Indicated
D (5)	Not Provided	Not Provided	1,570 (Temporary)	0.036 (Temporary)
E (7)	Not Provided	Not Provided	None Indicated	None Indicated
F (8)	Not Provided	Not Provided	14,180 (Temporary) 761 (Permanent) 94 (Permanent) 1,745 (Temporary)	0.326 (Temporary) 0.017 (Permanent) 0.002 (Permanent) 0.040 (Temporary)
G (8)	Not Provided	Not Provided	19,016 (Permanent) 340 (Temporary) 11,757 (Temporary)	0.437 (Permanent) 0.008 (Temporary) 0.270 (Temporary)



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Wetland Buffer	Wetland Buffer Area (square feet)	Wetland Buffer Area (acres)	Impact Area (square feet)	Impact Area (acres)
			2,882	0.066
			(Temporary)	(Temporary)
1 (0)	6,573	0.151	6,573	0.151
J (9)			(Permanent)	(Permanent)
V (6)	K (6) 7,122 0.163	7,122	0.163	
K (0)		(Permanent)	(Permanent)	
L (2)	Not Provided	Not Provided	None Indicated	None Indicated
AA (11)	Not Provided	Not Provided	None Indicated	None Indicated
ZZ (10)	Not Provided	Not Provided	None Indicated	None Indicated
			33,610	0.772
TOTAL	Not Provided	Not Provided	(Permanent)	(Permanent)
			33,815	0.776
			(Temporary)	(Temporary)

## Permits & Regulatory Status

All of the wetland on the project site appears to be considered essential and regulated by the City of Novi and any impacts to wetlands or wetland buffers would require approval and authorization from the City of Novi. All of the wetland areas 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., storm water storage/flood control, wildlife habitat, etc.). This information has been noted in the Proposed Wetland Impacts table, above.

Wetland areas 5, 7, 8, 9, 10, and 11 appear to be regulated by the MDEQ as they appear to be within 500 feet of a watercourse/regulated drain (Novi/Lyon Drain) or part of larger wetland systems that are greater than 5 acres in size. Wetlands 1, 2, 3, 4, and 6 do not appear to be regulated by the MDEQ because they are less than 5 acres in size and are not located within 500 feet of a stream. It should however, be noted that final determination of regulatory status should be made by the MDEQ. It is the Applicant's responsibility to contact MDEQ in order to determine the regulatory status of the on-site wetlands. ECT Staff (Matt Carmer and Pete Hill) met with MDEQ's Southeast Michigan District Office Water Resources Division (WRD) Staff (Andy Hartz and Sue Tepatti) on January 27, 2016. MDEQ Staff have confirmed that the proposed impacts to Wetland #8/Novi Lyon Drain appear to require an MDEQ Permit. MDEQ re-iterated that the Department's approach to proposed site development is: avoid, minimize, mitigate. The applicant will be required to submit an application for permit to MDEQ that explains the need to enclose what appears to be over 350 lineal feet of existing drain/ditch and provide any alternative site layout analysis that has been completed. Finally, MDEQ Staff recommended that the applicant request an on-site pre-application meeting with MDEQ Staff in order to obtain information about the proposed project in order to minimize planning costs and delays.

WRD staff will ask the applicant to explain what they want to do and where. They will provide any information that they have about the site based on existing maps and information stored in DEQ databases. If the meeting is held on site, they will walk the site in order to evaluate current conditions.

MDEQ Staff will discuss what aquatic resources, including wetlands or inland lakes and streams, appear to be present on the site. If enough information is available for them to do so, they will provide a written statement regarding the need for a permit for the project. The applicant will have an opportunity to ask questions regarding



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the regulatory process. If the applicant has a draft permit application, MDEQ Staff will answer any questions and point out deficiencies that could delay processing. Staff may also point out issues relating to the aquatic resources that could be impacted as a result of the proposed project.

MDEQ Staff may ask the applicant about options considered to avoid impacts to aquatic resources, and may be able to suggest other ways of avoiding impacts. They may also point out sensitive resource issues associated with the site, if any exist, and may be able to discuss what mitigation would be required if the project were permitted. MDEQ Staff will not indicate during a pre-application meeting whether or not a permit will be issued. The DEQ cannot make a decision regarding a permit until it has considered all of the information provided in the final permit application and, in some instances, has also considered comments received in response to a public notice of the project. Therefore, staff cannot legally tell that applicant in advance whether the project will be authorized. They can, however, give the applicant information that will improve the likelihood that it will meet regulatory standards, and thus be authorized, or they may also be able to identify issues which will be of significant concern.

The project as proposed will require a City of Novi Wetland Non-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 currently proposed permanent wetland impacts total 0.20-acre. The City's threshold for the requirement of wetland mitigation is 0.25-acre of proposed wetland impact. As such, wetland mitigation will not be a requirement for this project as currently proposed. This should be taken into account on subsequent site Plan submittals, if necessary.

## Wetland Comments

Please consider the following comments during preparation of any subsequent site plan submittals:

- 1. ECT encourages the applicant to minimize impacts to on-site wetlands, watercourses and associated setbacks to the greatest extent practicable. It should be noted that although the impacts to regulated wetlands appears to be relatively small, the applicant could minimize, or avoid, impacts to regulated wetland/watercourse (i.e., tributary to Novi/Lyon Drain/Wetland G). ECT recommends that the applicant consider alternate site layouts that minimize or avoid the need for the apparent enclosure of the on-site drain at Nine Mile Road. It appears as if the current location of proposed access boulevard could be altered in order to minimize or avoid impacts to the wetland/drain.
- 2. Subsequent site plan submittals shall identify, label and quantify all areas of existing on-site wetland and 25-foot wetland setback as well as the area and proposed cut/fill within all areas of proposed permanent wetland impact. In addition, the Plan should use one consistent labelling system for all on-site wetland areas (i.e., number all wetlands numerically; Wetland 1 through Wetland 11, for example).
- 3. The Plan currently includes existing 25-foot wetland buffer on 10 of the 40 proposed Lots. These lots include: 11, 12, 16, 26, 27, 28, 29, 30, 32 and 33. Temporary impacts to the 25-wetland buffer are proposed on Lots 11, 12, 16, 26, 28, and 33. Permanent wetland buffer impacts appear to be proposed on proposed Lots 28 and 33.

The current site design includes a total permanent wetland buffer impact of 33,610 square feet (0.772-acre) and a total temporary wetland buffer impact of 33,815 square feet (0.776-acre). In total, the Plan proposes to encroach over 1.5 acres of 25-foot wetland/watercourse setback for the purpose of both permanent and



Mercato (Red Maple Sub) JSP15-0063 Wetland Review of the Planned Rezoning Overlay (PRO)/Concept Plan (PSP15-0180) January 27, 2016 Page 7 of 13

temporary construction activities. With regard to the preservation of 25-foot wetland buffers, the applicant should work in order to preserve the existing wetland buffers to the greatest extent practicable. The preservation of the 25-foot buffer areas is important to the overall health of the existing wetlands as the existing buffers serve to filter pollutants and nutrients from storm water before entering the wetlands, as well as provide additional wildlife habitat.

- 4. The applicant shall provide information for any proposed seed mixes that will be used to restore the floodplain areas and/or any areas of temporary wetland and wetland buffer impacts. ECT would like to ensure that the proposed plant/seed material contains native plants as opposed to invasive or threatened plant types.
- 5. The Applicant is encouraged to provide wetland conservation easements for any areas of remaining wetland or 25-foot wetland buffer.
- 6. It should be noted that it is the Applicant's responsibility to confirm the need for a Permit from the MDEQ for any proposed wetland, watercourse, or floodplain impact. Final determination as to the regulatory status of each of the on-site wetlands shall be made by MDEQ. The Applicant should provide a copy of the MDEQ Wetland Use Permit application or letter of no jurisdiction to the City (and our office) for review and a copy of the approved permit upon issuance.

MDEQ Staff have confirmed that the proposed impacts to Wetland #8/Novi Lyon Drain appear to require an MDEQ Permit. MDEQ re-iterated that the Department's approach to proposed site development is: avoid, minimize, mitigate. The applicant will be required to submit an application for permit to MDEQ that explains the need to enclose what appears to be over 350 lineal feet of existing drain/ditch and provide any alternative site layout analysis that has been completed. Finally, MDEQ Staff recommended that the applicant request an on-site pre-application meeting with MDEQ Staff in order to obtain information about the proposed project in order to minimize planning costs and delays.

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

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

Peter Hill, P.E.

Senior Associate Engineer

Matthew Carmer Senior Scientist

Professional Wetland Scientist #1746

Matthew (armer



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

Attachments: Figure 1, Figure 2 and Site Photos



Figure 1. City of Novi Regulated Wetland & Woodland Map (approximate property boundary shown in red). Regulated Woodland areas are shown in green and regulated Wetland areas are shown in blue).





Figure 2. Wetland Sketch map provided by Brooks Williamson & Associates, Inc. Wetland 1 through Wetland 11 are indicated on the map.



# Site Photos



Photo 1. Looking north at existing drain/wetland (Wetland 8) near Nine Mile Road. Designated as impacted/filled on current Plan. ECT, January 19, 2016.



Photo 2. Looking south at existing forested Wetland D (i.e., Wetland 5), located in the southwest section of the site. ECT, January 19, 2016.





Photo 3. Looking south at existing forested Wetland E (i.e., Wetland 7), located in the west section of the site. ECT, January 19, 2016.



Photo 4. Looking east at existing forested Wetland F (i.e., Wetland 8), located in the north section of the site. ECT, January 19, 2016.





Photo 5. Looking southeast at existing forested Wetland AA (i.e, Wetland 11), located in the northeast section of the site. ECT, January 19, 2016.



Photo 6. Looking west at existing forested Wetland ZZ (i.e., Wetland 10), located in the northeast section of the site. ECT, January 19, 2016.





Photo 7. Looking southeast at existing forested Wetlands F and G (i.e., Wetland 8; Tributary to the Novi/Lyon Drain) located in the north/central section of the site. ECT, January 19, 2016.



Photo 8. Looking south at existing forested Wetland A (i.e., Wetland 1) located in the southwest section of the site. ECT, January 19, 2016.



# **WOODLANDS REVIEW**



January 21, 2016

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

Re: Mercato (Red Maple Sub) JSP15-0063

Woodland Review of the Planned Rezoning Overlay (PRO)/Concept Plan

(PSP15-0180)

Dear Ms. McBeth:

Environmental Consulting & Technology, Inc. (ECT) has reviewed the Planned Rezoning Overlay (PRO)/Concept Plan (Plan) for the proposed Mercato project prepared by Greentech Engineering, Inc. dated December 22, 2015. The Plan was reviewed for conformance with the City of Novi Woodland Protection Ordinance Chapter 37. The purpose of the Woodlands Protection Ordinance 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.

The proposed development is located north of the intersection of Nine Mile Road and Garfield Road (i.e., north of Nine Mile Road between Napier Road and North Beck Road, Section 29 & 30. The Plan appears to propose the construction of 40 single-family residential homes, associated roads and utilities, and two (2) stormwater detention basins. The proposed project site contains a significant

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amount of City-Regulated Woodland area as well as a significant amount of on-site wetlands and a tributary to the Novi-Lyon Drain (see Figure 1).

A Woodland Plan (Sheets L-5 & L-6) and Landscape Plan (Sheet L-7, L-8, and L-9) have been provided with the Plan. The existing site woodland information (tree sizes, species and conditions) have been provided by the Applicant. In addition, proposed impacts to on-site regulated woodlands have been described/quantified.

### **Onsite Woodland Evaluation**

ECT has reviewed the City of Novi Official Woodlands Map and completed an onsite woodland evaluation on Tuesday, January 19, 2016.

As noted above, the proposed project site contains a significant area of regulated woodland (see Figure 1). High quality woodlands are found throughout the property; many of the woodlands also contain forested wetland. The highest quality woodlands (and the largest diameter trees) are located in the northeast, central and western portions of the site. The site is essentially surrounded by areas designated as either City of Novi Regulated Wetland or Woodland. A portion of the southeastern section of the proposed development site includes existing residential lots. A portion of the western side of the site includes an area that appears to be somewhat disturbed and contains some existing overhead utility lines.

The proposed site development will involve significant impacts to regulated woodlands and will include a significant number of tree removals. The on-site trees have been identified in the field with metal tags on aluminum nails (and some metal tags on fishing line) allowing ECT to compare the tree diameters reported on the *Landscape Plan* to the existing tree diameters in the field. ECT found that the *Woodland Plan* and the *Woodland Tree List* appear to accurately depict the location, species composition and the size of the existing trees. ECT took a sample of diameter-at-breast-height (d.b.h.) measurements and found that the data provided on the Plan was consistent with the field measurements. It should be noted that in some wetland areas of the site (i.e., Wetlands G, F, AA, ZZ, and parts of Wetland F) the existing regulated trees have not been surveyed. This is acceptable, as there are no impacts proposed in these particular areas.

On-site woodland within the project area consists of American elm (*Ulmus americana*), basswood (*Tilia americana*), bitternut hickory (*Carya cordiformis*), black cherry (*Prunus serotina*), black locust (*Robinia pseudoacacia*), black walnut (*Juglans nigra*), common apple (*Malus spp.*), eastern cottonwood (Populus deltoides), eastern white cedar (*Thuja occidentalis*), Norway maple (*Acer platanoides*), Norway spruce (*Picea abies*), red oak (*Quercus rubra*), silver maple (*acer saccharinum*), sugar maple (*Acer saccharum*), white oak (*Quercus alba*) and several other species.

Based on the Landscape Plan information as well as our site assessment, the maximum size tree diameters on the site are a 60-inch d.b.h. red oak (Tree #1254) and a 60-inch d.b.h. silver maple (Tree #2938). The 60-inch red oak will be removed (for the development of Lot 20) and the 60-inch silver maple will be saved based on the current Plan. In terms of habitat quality and diversity of tree species, the overall project site is of good to very good quality. The majority of the woodland areas consist of



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mature growth trees of good health. These wooded areas provide a relatively high level environmental benefit and function in terms of a scenic asset, windblock, noise buffer and habitat for local wildlife.

After our woodland evaluation and review of the *Landscape Plan*, there are a total of 144 trees on-site that meet the minimum caliper size for designation as a specimen tree. Of these potential specimen trees, a total of thirty-eight (38) are proposed for removal (26% of all potential specimen trees). The proposed removal of these potential specimen trees requires 136 Woodland Replacement credits. The potential specimen trees proposed for removal include:

- Tree # 632, 24" Norway spruce (exempt as it is not within regulated woodland area);
- Tree # 634, 30" black cherry (exempt as it is not within regulated woodland area);
- Tree # 639, 26" black cherry (exempt as it is not within regulated woodland area);
- Tree # 792, 26" red oak (24" is minimum caliper size for specimen trees);
- Tree # 800, 24" red oak (24" is minimum caliper size for specimen trees);
- Tree # 809, 24" silver maple (24" is minimum caliper size for specimen trees);
- Tree # 824, 26" red oak (24" is minimum caliper size for specimen trees);
- Tree # 840, 30" red oak (24" is minimum caliper size for specimen trees);
- Tree # 842, 14"/24" red oak (24" is minimum caliper size for specimen trees);
- Tree # 852, 24" black walnut (24" is minimum caliper size for specimen trees);
- Tree # 976, 28" red oak (24" is minimum caliper size for specimen trees);
- Tree # 977, 24" red oak (24" is minimum caliper size for specimen trees);
- Tree # 981, 24" silver maple (24" is minimum caliper size for specimen trees);
- Tree # 995, 36" white oak (24" is minimum caliper size for specimen trees);
- Tree # 1024, 24" black walnut (24" is minimum caliper size for specimen trees);
- Tree # 1042, 24" basswood (24" is minimum caliper size for specimen trees);
- Tree # 1050, 26" white oak (24" is minimum caliper size for specimen trees);
- Tree # 1122, 16"/26"/36" red oak (24" is minimum caliper size for specimen trees);
- Tree # 1143, 8"/10"/24"/26" basswood (24" is minimum caliper size for specimen trees);
- Tree # 1150, 26" white oak (24" is minimum caliper size for specimen trees);
- Tree # 1161, 24" white oak (24" is minimum caliper size for specimen trees);
- Tree # 1253, 40" black cherry (24" is minimum caliper size for specimen trees);
- Tree # 1254, 60" red oak (24" is minimum caliper size for specimen trees);
- Tree # 1260, 32" silver maple (24" is minimum caliper size for specimen trees);
- Tree # 1384, 32" black cherry (24" is minimum caliper size for specimen trees);
- Tree # 1392, 26" white oak (24" is minimum caliper size for specimen trees);
- Tree # 2081, 26" red oak (24" is minimum caliper size for specimen trees);
- Tree # 2202, 28" red oak (24" is minimum caliper size for specimen trees);
- Tree # 2434, 26" black cherry (24" is minimum caliper size for specimen trees);
- Tree # 2475, 36" silver maple (24" is minimum caliper size for specimen trees);
- Tree # 2716, 24" sugar maple (24" is minimum caliper size for specimen trees);
- Tree # 2725, 24" sugar maple (24" is minimum caliper size for specimen trees);



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- Tree # 2763, 10"/12"/16"/20"/24"/28" sugar maple (24" is minimum caliper size for specimen trees);
- Tree # 2767, 24" silver maple (24" is minimum caliper size for specimen trees);
- Tree # 2776, 24" sugar maple (24" is minimum caliper size for specimen trees);
- Tree # 2788, 24" black cherry (24" is minimum caliper size for specimen trees);
- Tree # 2801, 24" sugar maple (24" is minimum caliper size for specimen trees);
- Tree # 2998, 26" sugar maple (24" is minimum caliper size for specimen trees).

The Applicant should be aware of the City's Specimen Tree Designation as outlined in Section 37-6.5 of the Woodland Ordinance. This section states that:

"A person may nominate a tree within the city for designation as a historic or specimen tree based upon documented historical or cultural associations. Such a nomination shall be made upon that form provided by the community development department. A person may nominate a tree within the city as a specimen tree based upon its size and good health. Any species may be nominated as a specimen tree for consideration by the planning commission. Typical tree species by caliper size that are eligible for nomination as specimen trees must meet the minimum size qualifications as shown below:

#### Specimen Trees Minimum Caliper Size

Common Name	Species	DBH
Arborvitae	Thuja occidentalis	16"
Ash	Fraxinus spp.	24"
American basswood	Tilia Americana	24"
American beech	Fagus grandifolia	24"
American elm	Ulmus americana	24"
Birch	Betula spp.	18"
Black alder	Alnus glutinosa	12"
Black tupelo	Nyssa sylvatica	12"
Black walnut	Juglans nigra	24"
White walnut	Juglans cinerea	20"
Buckeye	Aesculus spp.	18"
Cedar, red	Juniperus spp.	14"
Crabapple	Malus spp.	12"
Douglas fir	Pseudotsuga menziesii	18"
Eastern hemlock	Tsuga Canadensis	14"
Flowering dogwood	Cornus florida	10"
Ginkgo	Ginkgo biloba	24"
Hickory	Carya spp.	24"
Kentucky coffee tree	Gymnocladus dioicus	24"
Larch/tamarack	Larix laricina (eastern)	14"



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Locust	Gleditsia triacanthos/Robinia	24"
	pseudoacacia	
Sycamore	Platanus spp.	24"
Maple	Acer spp. (except negundo)	24"
Oak	Quercus spp.	24"
Pine	Pinus spp.	24"
Sassafras	Sassafras albidum	16"
Spruce	Picea spp.	24"
Tulip tree	Liriodendron tulipifera	24"
Wild cherry	Prunus spp.	24"

A nomination for designation of a historic or specimen tree shall be brought on for consideration by the planning commission. Where the nomination is not made by the owner of the property on which the tree is located, the owner shall be notified in writing at least fifteen (15) days in advance of the time, date and place that the planning commission will consider the designation. The notice shall advise the owner that the designation of the tree as a historic or specimen tree will make it unlawful to remove, damage or destroy the tree absent the granting of a woodland use permit by the city. The notice shall further advise the owner that if he objects to the tree designation the planning commission shall refuse to so designate the tree.

Absent objection by the owner, the planning commission may designate a tree as an historic tree upon a finding that because of one (1) or more of the following unique characteristics the tree should be preserved as a historic tree: The tree is associated with a notable person or historic figure;

- The tree is associated with the history or development of the nation, the state or the City;
- The tree is associated with an eminent educator or education institution;
- The tree is associated with art, literature, law, music, science or cultural life;
- The tree is associated with early forestry or conservation;
- The tree is associated with American Indian history, legend or lore.

Absent objection by the owner, the planning commission may designate a tree as a specimen tree upon a finding that because of one (1) or more of the following unique characteristics the tree should be preserved as a specimen tree:

- The tree is the predominant tree within a distinct scenic or aesthetically-valued setting;
- The tree is of unusual age or size. Examples include those trees listed on the American Association Social Register of Big Trees, or by the Michigan Botanical Club as a Michigan Big Tree, or by nature of meeting the minimum size standards for the species as shown in the "Specimen Trees Minimum Caliper Size" chart, above;
- The tree has gained prominence due to unusual form or botanical characteristics.



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Any tree designated by the planning commission as an historical or specimen tree shall be so depicted on an historic and specimen tree map to be maintained by the community development department. The removal of any designated specimen or historic tree will require prior approval by the planning commission. Replacement of the removed tree on an inch for inch basis may be required as part of the approval".

### **Proposed Woodland Impacts and Replacements**

As shown on the site plans, there appear to be substantial impacts proposed to regulated woodlands associated with the site construction. It appears as if the proposed work (proposed buildings and roads) will cover a significant portion of the buildable areas of the site (i.e., upland areas not containing wetlands or 100-year floodplain) and will involve a considerable number of tree removals. It should be noted that the City of Novi replacement requirements pertain to regulated trees with d.b.h. greater than or equal to 8 inches that are located within areas designated as regulated on the City of Novi Regulated Woodland Map or any tree 36 inches diameter-at-breast height (d.b.h.) or greater.

A Woodland Summary Table has been included on the Landscape Plan (Sheet L-9). The Applicant has noted the following:

Total Trees: 2,075
Exempt Trees: 71
Total Regulated Trees: 2,004

Regulated Trees Removed: 837 (42% of Total Regulated Trees)
 Regulated Trees Preserved: 1,167 (58% of Total Regulated Trees)

- Stems to be Removed 8" to 11": 391 x 1 replacement (Requiring 391 Replacements)
- Stems to be Removed 11" to 20": 319 x 2 replacements (Requiring 638 Replacements)
- Stems to be Removed 20" to 30": 52 x 3 replacements (Requiring 156 Replacements)
- Stems to be Removed 30"+: 12 x 4 replacements (Requiring 48 Replacements)
- Multi-Stemmed Trees: (Requires 299 Replacements)

Sub-Total Replacement Trees Required: 1,532
 Less Credits: 148
 (for preservation of non-regulated trees)

Total Replacement Trees Required: 1,384

The Landscape Plan (*Sheet L-1*) notes that a total of 293 Woodland Replacement Trees will be provided on-site (21% of the required Woodland Replacement Tree Credits) and 1,091 credits (79% of the required Woodland Replacement Tree Credits) will be paid to the City of Novi Tree Fund. This Sheet specifically notes that a total of 242 Woodland Replacement Trees will be provided on site around each of the stormwater detention basins and several other areas. In addition to the 242 Woodland Replacement Trees to be planted, the Plan proposes to meet 51 Woodland Replacement Credits by providing 51 extra street trees. The Plan does not currently appear to indicate the proposed sizes and



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species of the proposed Woodland Replacement or Street Trees. Subsequent site Plans should include this information. The Plan should clearly indicate the locations, sizes, species and quantities of all woodland replacement trees to be planted. The applicant should review and revise the Plan in order to better indicate how the on-site Woodland Replacement requirements will be met. It is recommended that the applicant provide a table that specifically describes the species and quantities of proposed Woodland Replacement trees. It should also be noted that 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. All coniferous replacement trees shall be 6-feet in height (minimum) and provide 1.5 trees-to-1 replacement credit replacement ratio (i.e., each coniferous tree planted provides for 0.67 credits). The "upsizing" of Woodland Replacement trees for additional Woodland Replacement credit is not supported by the City of Novi. Finally, all proposed Woodland Replacement tree material shall meet the species requirements in the *Woodland Tree Replacement Chart* (attached).

With regard to the location of woodland replacement trees, the Woodland Ordinance states:

- The location of replacement trees shall be subject to the approval of the planning commission
  and shall be such as to provide the optimum enhancement, preservation and protection of
  woodland areas. Where woodland densities permit, tree relocation or replacement shall be
  within the same woodland areas as the removed trees. Such woodland replanting shall not be
  used for the landscaping requirements of the subdivision ordinance or the zoning landscaping;
- Where the tree relocation or replacement is not feasible within the woodland area, the relocation or replacement plantings may be placed elsewhere on the project property;
- Where tree relocation or replacement is not feasible within the woodland area, or on the project property, the permit grantee shall pay into the city tree fund monies for tree replacement in a per tree amount representing the market value for the tree replacement as approved by the planning commission. The city tree fund shall be utilized for the purpose of woodland creation and enhancement, installation of aesthetic landscape vegetation, provision of care and maintenance for public trees and provision and maintenance of specialized tree care equipment. Tree fund plantings shall take place on public property or within right-of-ways with approval of the agency of jurisdiction. Relocation or replacement plantings may be considered on private property provided that the owner grants a permanent conservation easement and the location is approved by the planning commission;
- Where replacements are installed in a currently non-regulated woodland area on the project property, appropriate provision shall be made to guarantee that the replacement trees shall be preserved as planted, such as through a conservation or landscape easement to be granted to the city. Such easement or other provision shall be in a form acceptable to the city attorney and provide for the perpetual preservation of the replacement trees and related vegetation.

The applicant shall demonstrate that all proposed Woodland Replacement Trees will be guaranteed to be preserved as planted within a conservation easement or landscape easement to be granted to the



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City. It should be noted that the current Plan proposes to preserve Regulated Woodland trees on a significant number of the proposed lots. These lots include 1, 10, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 35, 36, 37, 38, 39, and 40 (i.e., 27 of the 40 proposed lots, or approximately 68% of the proposed lots).

## 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. The Mercato development consists of 40 single-family residential homes, associated roads and utilities, and two (2) stormwater detention basins. As noted, the Plan currently proposes to remove 42% of the existing regulated on-site trees. In general the proposed project site is bordered by either regulated wetlands or woodlands. Impacts to a portion of the site woodlands are deemed unavoidable if this property is to be developed for residential use. While the overall ecological values of the existing woodlands cannot be immediately replaced through the planting of woodland replacement trees, the applicant will need to show that they are prepared to meet the requirements of the Woodland Ordinance through on-site Woodland Replacement Credits and/or a payment to the City of Novi Tree Fund.

Proposed woodland impacts will require a Woodland Permit from the City of Novi that allows for the removal of trees eight (8)-inch diameter-at-breast-height (d.b.h.) or greater. 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 6-feet in height (minimum).

## **Woodland Comments**

ECT recommends that the Applicant address the items noted below in subsequent site plan submittals:

1. ECT encourages the Applicant to minimize impacts to on-site Woodlands to the greatest extent practicable; especially those trees that may meet the minimum size qualifications to be



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considered a Specimen Tree (as described above). Approximately 42% of regulated on-site trees are proposed to be removed. Currently, approximately 26% of the potential Specimen Trees are proposed for removal. The applicant should demonstrate why additional trees cannot be preserved through the implementation of alternative site layouts or modified site/lot grading that could reduce the overall impacts to woodlands. The applicant is also encouraged to minimize impacts to on-site trees that may meet the minimum size qualifications to be considered a Specimen Tree (as described above).

- 2. The Landscape Plan (*Sheet L-1*) notes that a total of 293 Woodland Replacement Trees will be provided on-site (21% of the required Woodland Replacement Tree Credits) and 1,091 credits (79% of the required Woodland Replacement Tree Credits) will be paid to the City of Novi Tree Fund. ECT recommends that the applicant make additional efforts to provide more of the required Woodland Replacement Trees on the development site. The applicant shall meet all tree spacing requirements as outlined in the City of Novi Zoning Article 5.5 Landscape Standards as well as the Landscape Design Manual.
- 3. The applicant appears to be requesting 148 credits towards the necessary Woodland Replacement trees. The Plan defines a credit as a tree located outside of a woodland area that will be saved. The quantity of credits shown on the tree list included on the Landscape Plan does not appear to equal 148. Please clarify how this credit value was calculated and/or review and revise the Plan as necessary.
- 4. A total of 242 Woodland Replacement Trees will be provided on site around each of the proposed stormwater detention basins and several other areas. In addition to the 242 Woodland Replacement Trees to be planted, the Plan proposes to meet 51 Woodland Replacement Credits be providing 51 extra street trees. Subsequent site plans shall provide information indicating which of the street trees are intended to meet the Woodland Replacement Tree requirements. The City or its Woodland Consultant will need to confirm the planting of this Woodland Replacement material and monitor them for a period of 2 years following the initial planting.
- 5. The Plan does not currently appear to indicate the proposed sizes and species of the proposed Woodland Replacement or Street Trees. The Plan should clearly indicate the locations, sizes, species and quantities of all woodland replacement trees to be planted. It is recommended that the applicant provide a table that specifically describes the species and quantities of proposed Woodland Replacement trees. It should also be noted that 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. All coniferous replacement trees shall be 6-feet in height (minimum) and provide 1.5 trees-to-1 replacement credit replacement ratio (i.e., each coniferous tree planted provides for 0.67 credits). The "upsizing" of Woodland Replacement trees for additional Woodland Replacement credit is not supported by the City of Novi. Finally, all proposed Woodland Replacement tree material shall meet the species requirements in the Woodland Tree Replacement Chart (attached).



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- 6. The Applicant is encouraged to provide preservation/conservation easements for any areas of remaining woodland. These areas should be indicated on the Plan.
- 7. The Applicant is encouraged to provide woodland conservation easements for any areas containing woodland replacement trees. These areas should be indicated on the Plan.
- 8. A Woodland Replacement 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. Currently, the required Woodland Replacement Financial Guarantee would be \$175,800 (293 trees x \$400/tree x 1.5).
  - Based on a successful inspection of the installed on-site Woodland Replacement trees, seventy-five percent (75%) of the original Woodland Financial Guarantee shall be returned to the Applicant. Twenty-five percent (25%) of the original Woodland Replacement financial guarantee will be kept for a period of 2-years after the successful inspection of the tree replacement installation as a Woodland Maintenance and Guarantee Bond.
- 9. 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. Currently, the applicant intends to pay 1,091 credits to the Tree Fund. The required payment will be \$436,400 (1,091 credits x \$400/tree).
- 10. 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*.



Mercato (Red Maple Sub) JSP15-0063 Woodland Review of the Planned Rezoning Overlay (PRO)/Concept Plan (PSP15-0180) January 21, 2016 Page 11 of 16

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

Respectfully submitted,

**ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.** 

Peter Hill, P.E. Senior Associate Engineer Matthew Carmer Senior Scientist Professional Wetland Scientist #1746

Matthew (armer

cc: Chris Gruba, City of Novi Planner Sri Komaragiri, City of Novi Planner

> Richelle Leskun, City of Novi Planning Assistant Rick Meader, City of Novi Landscape Architect

Attachments: Figure 1, Site Photos, and Woodland Replacement Tree Chart





**Figure 1**. City of Novi Regulated Wetland & Woodland Map (approximate property boundary shown in red). Regulated Woodland areas are shown in green and regulated Wetland areas are shown in blue).



# Site Photos



**Photo 1.** Tree #601, 28" silver maple located in southeast corner of site. Designated as preserved on current Plan. ECT, January 19, 2016.



**Photo 2.** Tree #601, 28" silver maple located in southeast corner of site. Designated as preserved on current Plan. ECT, January 19, 2016.



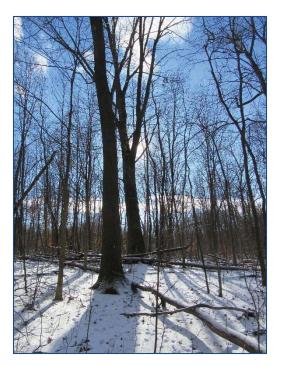


**Photo 3.** Looking southeast at section of Novi/Lyon Drain (Wetland G) proposed for enclosure just north of Nine Mile Road. Multiple regulated trees to be removed. ECT, January 19, 2016.



**Photo 4.** Looking east at area of forested Wetland AA in northwest section of site. Wetland and trees designated for preservation on current Plan. ECT, January 19, 2016.





**Photo 5.** Tree #976 & #977 (28" and 26" red oaks) designated for removal on current Plan; located on proposed Lots 26 and 27. ECT, January 19, 2016.



**Photo 6.** Looking southeast at area of forested Wetland F/Wetland G/Tribuary to Novi Lyon Drain in the northern section of site. Wetland and trees to be preserved on current Plan. ECT, January 19, 2016.



Mercato (Red Maple Sub) JSP15-0063 Woodland Review of the Planned Rezoning Overlay (PRO)/Concept Plan (PSP15-0180) January 21, 2016 Page 16 of 16

# **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	



# TRAFFIC REVIEW



AECOM 27777 Franklin Road Suite 2000 Southfield, MI 48034 www.aecom.com 248.204.5900 tel 248.204.5901 fax

January 28, 2016

Barbara McBeth, AICP Deputy Director of Community Development City of Novi 45175 W. 10 Mile Road Novi, MI 48375

SUBJECT: Mercato (Red Maple Montpelier) Traffic Review for PRO Concept Plan JSP15-0063

Dear Ms. McBeth.

#### 1. General Comments

- a. The applicant, Red Maple Montpelier, LLC, is proposing to construct a single-family residential community north of 9 Mile Road at Garfield Road, which are both under the City of Novi's jurisdiction.
- b. The property consists of 50.51 acres with a net parcel area of 40.88 acres. There are 40 proposed units giving a proposed density of 1.03 acres per unit. Of the 50.51 acres, 1.17 acres belong to the 9 Mile R.O.W. and 8.46 acres are existing wetlands.
- c. The site is currently zoned as RA, Residential Acreage. The developer is proposing a PRO-planned rezoning overlay to R-3.

# 2. Potential Traffic Impacts

- a. The applicant submitted a rezoning traffic impact study (RTIS). Comments on the traffic impact study will be provided in a separate letter.
- 3. External Site Access and Operations Review of the plan generally shows compliance with City standards; however, the following items at minimum may require further detail in the Preliminary Plan submittal.
  - a. Provide information on how the intersection of 9 Mile Road and Mercato Boulevard is aligned with the intersection of 9 Mile Road and Garfield Road.
  - b. Provide detailed (dimensioned) plans for the proposed site, including but not limited to:
    - i. The design of the Mercato Boulevard divided driveway island (nearest 9 Mile) should be designed according to standards provided in the City's Code of Ordinances (Chapter 11, Article IX, Figure IX.3). Please provide additional dimensions for the island.
    - ii. Typical cross-section(s) of roadway, including the emergency access driveway
    - iii. Design details of the emergency access driveway, including the following:
      - 1. Confirmation that the driveway can support a 35-ton vehicle
      - 2. The location of a permanent "break-away" gate
    - iv. Acceleration and deceleration lanes for the Garfield Rd driveway
    - v. Details for any revisions on 9 Mile Road (such as passing lanes)
    - vi. Other details as necessary to convey design intent and the meeting of applicable City standards.



- **4. Internal Site Access and Operations -** Review of the plan generally shows compliance with City standards; however, the following items at minimum may require further detail in the Preliminary Plan submittal.
  - a. Provide detailed (dimensioned) plans for the proposed site, including but not limited to:
    - i. Provide the available length of R.O.W. for the cul-de-sacs as depicted in the City's Code of Ordinances Chapter 11, Article VIII, Figure VIII-F
    - ii. Provide the total length of the three cul-de-sacs within the development
    - iii. Other details as necessary to convey design intent and the meeting of applicable City standards.
- **5. Signing and Pavement Marking** Proposed signing and pavement markings were not included in this submittal and will be reviewed in detail in the next submittal, as provided.
- **6. Bicycle and Pedestrian** Review of the plan generally shows compliance with City standards.

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 Suite 2000 Southfield, MI 48034 www.aecom.com 248.204.5900 tel 248.204.5901 fax

January 28, 2016

Barbara McBeth, AICP Deputy Director of Community Development City of Novi 45175 W. 10 Mile Road Novi, MI 48375

SUBJECT: Mercato (Red Maple Montpelier) Traffic Review for PRO Concept Plan JSP15-0063

Dear Ms. McBeth,

- 1. The trip generation estimates for RA to R-1 residential zoning do not indicate a significant enough difference to warrant further traffic impact studies.
- It should be noted that the traffic volumes provided from SEMCOG for 9 Mile Road are from the year 2007. The traffic volumes for Garfield Road, although assumed to be low volume, were not provided. If further traffic analysis is requested by the City, the following should be considered:
  - a. Due to development of the surrounding areas in the last ten years, more recent traffic volumes should be considered for 9 Mile Road and for Garfield Road.
  - b. Because the proposed entrance (Mercato Boulevard), forms a four-leg intersection with 9 Mile Road and Garfield Road, current traffic volumes should be collected and analyzed to determine the potential requirement of traffic control at this location.
- 3. The annual crash average was given for the years of 2009-2013 for 9 Mile Road; however, it should be noted that there were two crashes that occurred on the same 9 Mile Road segment in 2014 and one crash on Garfield Road in 2014.

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** 

# **FIRE REVIEW**



January 11, 2016

TO: Barbara McBeth- Deputy Director of Community Development Sri Komaragiri- Plan Review Center Christopher Gruba- Plan Review Center

**CITY COUNCIL** 

Mayor **Bob Gatt** 

Mayor Pro Tem Dave Staudt

Gwen Markham

Andrew Mutch

Wayne Wrobel

Laura Marie Casey

Brian Burke

**City Manager** Pete Auger

**Director of Public Safety** 

**Chief of Police** 

David E. Molloy

**Director of EMS/Fire Operations** Jeffery R. Johnson

**Assistant Chief of Police** 

Erick W. Zinser

**Assistant Chief of Police** 

Jerrod S. Hart

RF: Mercato

PSP# 15-180

**<u>Project Description:</u>** A 40 unit single family home development located on the North side of Nine Mile at Garfield.

# Comments:

- 1. Provide gate details for the emergency access roadway and fire lane signage at both ends, not on all future plans.
- 2. Emergency access roadway must be capable of supporting 35 tons.
- 3. Main entrance gates must meet Fire Department approval. Gates must comply with IFC (International Fire Code) 2012 section 503.5.

Electric gate operators, where provided, shall be listed in accordance with UL 325. Gates intended for automatic operation shall be designed, constructed, and installed to comply with the requirements of ASTM F 2200

4. Hydrant spacing does not meet city standard. Relocate hydrant at lot#20 a minimum of 20' to the West. In single family residential areas, hydrants shall be spaced a maximum of 500 feet apart. It is recommended that a hydrant be located at every intersection on the same corner with the street sign. This will help with locating the fire hydrants in winter when they are covered with snow. (D.C.S. Sec. 11-68 (f)(1)b)

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

# Recommendation: Approval with the above conditions

Sincerely,

Joseph Shelton- Fire Marshal City of Novi – Fire Dept.

cc: file

# STATEMENT OF COMMUNITY BENEFIT

#### MERCATO DEVELOPMENT

#### STATEMENT OF COMMUNITY BENEFIT

The Red Maple development, which is a proposed PRO, is proposing two major community benefits that will Novi citizens and save the City of Novi costs.

Improvement of existing Sanitary Sewer Lift Station
 There is an existing sanitary sewer lift station located on the property adjacent east of Red Maple. Current City plans call for an upgrade to the capacity and pressure of the 9 Mile force main sanitary sewer pump station pumps. Said upgrade will increase pressure in the 9 Mile force main sanitary sewer and this pressure increase will require the City to replace existing pumps at this existing adjacent sanitary sewer lift station.

Red Maple will drain its sanitary sewers to the adjacent sanitary sewer lift station. As part of our project, we will install a new wet well and replace the existing pumps with larger and stronger pumps. This will eliminate the need for the City bear the cost of increasing the capacity of the pumps in said lift station.

2. Improvement of the north end of Garfield Road
The northern end of Garfield Road is in poor condition. See attached pictures and location map.

The Red Maple project will improve the condition of the north end of Garfield as follows:

- a. Mill down the existing wearing course on the north 1,300 linear feet of Garfield Road.
- b. Remove and replace the roadway base and base course with six inches of road gravel in a total of 200 linear feet of roadway in locations as depicted on the location map.
- c. Place a new wearing course over the northern 1,300 feet of Garfield.

### **COMMUNITY IMPACT STATEMENT**

### COMMUNITY IMPACT STATEMENT Mercato (The Project) CITY OF NOVI

### 1. POLICE RESPONSES

a. The Project will contain 40 lots. Police response calls are estimated to be similar to the fire response calls (2.5 per year) per the information in no.2 below.

### 2. FIRE RESPONSES

a. Per the fiscal impact study contained in the report, The Fiscal Impact of Residential Development in Unincorporated Wabash Township, <a href="http://www.agecon.purdue.edu/crd/localgov/Essays/wabashFIA.htm">http://www.agecon.purdue.edu/crd/localgov/Essays/wabashFIA.htm</a>, the number of fire department responses per year for the studied developments was 0.063 runs per single family home. For Red Maple Montpelier, with 40 lots, applying this ratio would result in an average of two and one half (2.52) fire response per year.

### 3. ANTICIPATED EMPLOYEES

- a. Per the National Association of Home Builders study, <a href="http://www.nahb.org/fileUpload\_details.aspx?contentTypeID=3&contentID=3560">http://www.nahb.org/fileUpload\_details.aspx?contentTypeID=3&contentID=3560</a> <a href="188">1&subContentID=219188</a>, an average of 0.53 local permanent jobs are supported for each new home built. So, for Red Maple Montpelier, approximately 21 new permanent jobs are supported.
- b. This study also estimates that 2.13 direct local jobs and 1.11 indirect and induced local jobs are created in the construction of each new single family home. So, for Red Maple Montpelier, approximately 85 direct construction jobs and 44 indirect construction jobs would be created.

### 4. CITY PERFORMANCE STANDARDS

- a. Smoke. No smoke to a density greater than the density described as No. 1 on the Ringelmann Chart will be generated from either construction or permanent sources.
- b. Dust, Dirt, Fly Ash. The only furnaces that will operate within the Project will be conventional natural gas fired forced air furnaces that meet all applicable air quality standards. Said furnaces will not exceed 0.20 grains of gas-borne or airborne solids per cubic foot of the carrying medium at a temperature of 500 degrees Fahrenheit.
- c. Odor. No offensive, noxious, or foul odors will be generated.
- d. Gases. No injurious or destructive gases will be generated.
- e. Airborne Matter, General. No quantities of air contaminants or other material will be discharged which cause injury, detriment or nuisance to the public or which endanger the comfort, repose, health or safety of persons or which cause injury or damage to business or property.
- f. Glare and Radioactive Materials. No glare or radioactive materials will be generated in the Project.
- g. Fire and Explosive Hazards. No activities which create fire or explosive hazards will be conducted.
- h. Vibration. No machines or operations which cause vibration will be operated.
- Sewage Wastes. No sanitary sewage wastes will be generated which are dangerous to the public health.

j. Noise. No activities will be conducted that generate noise in excess of the standards stated in Section 2519 of the Novi Zoning Ordinance.

### 5. WATER AND SEWER TAPS

a. The Project will require 40 water and 40 sewer taps.

b. The estimated design maximum (peak) daily flow is 0.056 mgd based on 140 Residential Equivalent Units (40 units x 3.5 person per unit) and maximum (peak) flow of 400 gallons per person per day.

### 6. RELATION TO SURROUNDING USES

- a. To the north are the Legacy Parc golf course (the western half), zoned R-1, City owned park land (the eastern half), zoned RA.
- b. To the west is a single family home development and an independent single family home, both with RA zoning.
- c. To the south are vacant lands with RA zoning.
- To the east is ITC high tension electric line with RA zoning.

### 7. ENVIRONMENTAL FACTORS & IMPACTS

- a. Existing Natural Features:
  - i. Topography. The site has gently rolling topography to the west and flat topography to the north and east.
  - ii. Wetlands. There are eleven (11) wetlands on the site, all regulated by the City of Novi and six (6) of which are regulated by the MDEQ:
    - There a series of small separated wooded wetland pockets located in the southwest corner of the site – Wetlands 1,2,3,4, and 6 not regulated by the MDEQ. Wetlands 5 and 9 are regulated by the MDEQ.
    - Wetland 8, in the northwest corner of the site is wooded and connected to a large regulated wetland system offsite to the north of the property.
    - 3. Wetland 9, wooded and the largest wetland on the site, is also connected to the large offsite wetland system to the north and contains the ditch drain coming north off the 9 Mile/Garfield intersection.
    - Wetland 10 is part of the large wetland system to the north of the property, is wooded and located in the north central portion of the site.
    - 5. Wetland 11 is part of the large wetland system to the north of the property, is wooded and located in the northeast corner of the site.

### iii. Trees.

- Number and location. The majority of the site is wooded with regulated trees. Open areas exist in the southwest and southeast areas of the site. Overall there are 3,000 regulated trees on the property.
- Species. There a fairly wide variety of species, including a lot of upland deciduous: locust, walnut, maple, elm, oak, walnut, basswood, hickory, poplar.
- b. Temporary Impacts on Natural Features.

- i. Portions of the property will be cleared and graded for the development. Only very small portions of wetlands will be filled, primarily the small isolated ones in the southwest area of the site. Small portions of wetlands 1, 2 and 4 would be filled. All of the smaller small wetlands 3 and 9 would be filled. A small portion of the 9 Mile/Garfield (wetland 8) ditch would be filled to create the east entry road to the site.
- The disturbed areas will be covered in paving, new house construction and landscaping so that no unvegetated disturbed soil will remain at the end of construction.
- iii. Some grading will occur in Natural Features setback areas located on the home sites being created. These areas will be restored with appropriate native ground cover and shrubs. This activity will occur on Lots 33, 32 and 28.
- c. Permanent Impacts on Natural Features
  - Wetlands 3, 4, 6 and 9 would be filled. A small portion of the 9
     Mile/Garfield (wetland 8) ditch would be filled to create the east entry
     road to the site.
  - ii. The Project stormwater, after treated, will outlet to Wetland Area 8 in two locations.
  - iii. 100 year floodplain would be filled on lots 8,9,10,11,12,18,19,22,23,24,25 and 26. Compensating cut would be provided for the volume of floodplain filled on these lots.
- d. Hazardous or toxic substances. None will be generated, used or stored.
- e. Underground Storage Tanks. None are known to exist. None are planned.
- f. Environmental Use History. Some construction debris and woodchips have been disposed of on the 10 acre Lamp Trust property. These areas have been investigated and determined to have no hazardous waste.
- g. Wildlife Impacts. Most of the upland area is being disturbed. Rodents and birds that nest in open field areas will lose habitat. Some bird nesting areas in existing trees being removed will be lost.

### 8. SOCIAL IMPACTS

- a. Relocation of Occupants. The one homeowner in the home on the site will be relocated to another home. The second house is unoccupied.
- b. Traffic Impacts. Trip generation is estimated as follows:
  - i. AM Peak Hour: 30 trips.
  - ii. PM Peak Hour: 115 trips.
  - iii. 24 Hour Average: 383 trips (weekday)
- c. Site Amenities:
  - i. Sidewalks in front of each lot.
  - ii. Sidewalk/bikepath along 9 Mile Road.
  - iii. Significant natural feature open space.
- d. Population increases. Population is estimated to increase by 94 people.

### TRAFFIC IMPACT STUDY





To:

Re:

**DRAFT VIA EMAIL** Mr. Bruce Michael **Red Maple Montpelier, LLC** Michael J. Labadie, PE From: Steven J. Russo, E.I.T. Fleis & VandenBrink Date: October 14, 2015 **Proposed Red Maples Residential Development** City of Novi. Michigan **Rezoning Traffic Study** 

### Introduction

This memorandum presents the results of the Rezoning Traffic Impact Study (RTIS) for the proposed rezoning of the vacant parcel located on the north side of 9 Mile Road near Garfield Road in the City of Novi, Michigan. This RTIS is required pursuant to the requests of the City's traffic consultant AECOM and as indicated in the City Site Plan and Development Manual. Included in this RTIS are a description of existing conditions, current traffic data, land use planning and zoning information, and a vehicle trip generation comparison between the existing and proposed zoning classifications. All traffic volume data are attached and were obtained from the Southeast Michigan Council of Governments (SEMCOG).

### **Existing Conditions**

The subject property consists of 50.51 acres, of which 1.17 acres belong to the 9 Mile Right of Way and 8.46 acres is existing wetland area, resulting in a net buildable area of 40.88 acres. The subject parcel is proposed for rezoning from the existing RA Residential Acreage district to a PRO, with R-1 overlay zoning. The parcel is bound by RA zoning to the east, west, and south of 9 Mile Road and R-1 zoning to the north.

9 Mile Road runs generally east and west adjacent to the south side of the parcel, with a posted speed limit of 30 miles per hour (mph). The study section of 9 Mile Road is under City jurisdiction and carries an Average Annual Daily Traffic (AADT) volume of approximately 600 vehicles per day. The study section of 9 Mile Road is an unpaved roadway and has a narrow two lane cross section with one lane in each direction.

Garfield Road runs in the north and south directions between 9 Mile Road and 8 Mile Road with a posted speed limit of 25 mph. The study section of Garfield Road is under City jurisdiction and has a narrow two lane cross section with one lane in each direction. No existing traffic volume data for Garfield Road is available.

### **Future Conditions**

According to the City Future Land Use Map, the subject parcel is planned for single family residential land use. The City Zoning Ordinance indicates that the RA and R-1 zoning districts have a maximum density of 0.8 and 1.65 dwellings per acre, respectively. The proposed rezoning is being sought for the development of a 40-unit single family residential subdivision.

### **Site Trip Generation Comparison**

The trip generation potential of the subject parcel was forecast for the existing RA zoning and the proposed PRO with R-1 zoning overlay. The number of weekday, AM peak hour, and PM peak hour vehicle trips was calculated based on the rates and equations published by the Institute of Transportation Engineers (ITE) in *Trip Generation*,  $g^{th}$  *Edition* and the *Trip Generation Handbook*,  $g^{rd}$  *Edition*. The trip generation forecasts are shown in Table 1 and indicate that the proposed rezoning would result in a net increase in daily and peak hour vehicle trips as compared to current zoning.

Table 1
Site Trip Generation Comparison <sup>1</sup>

Land Use	ITE Code	Amount	Units	Weekday	<u>AM</u> In	l Peak Out	Hour Total	<u>PM</u> In	1 Peak Out	Hour Total
RA Residential	210	32	Dwellings	368	8	24	32	24	14	38
R-1 Residential	210	67	Dwellings	727	14	43	57	46	27	73
DIFFERENCE				359	6	19	25	22	13	35
Proposed Development	210	40	Dwellings	452	10	28	38	29	17	46

<sup>1.</sup> Trip generation based on the Institute of Transportation Engineers' <u>Trip Generation</u>, 9th Edition and <u>Trip Generation Handbook</u>, 3rd Edition

Any questions related to the study methodologies, calculations, and results should be addressed to Fleis & VandenBrink.

Attachments: SEMCOG Data

Zoning Ordinance Data

SJR:mjl



SEMCOG | Southeast Michigan Council of Governments

## **Crash and Road Data**

# **Road Segment Report**

### 9 Mile Rd, (PR Number 633603)

Beck Rd7.218 BMP
Napier Rd9.440 EMP
912
City of Novi
Oakland
17 - Urban Collector
-
2
0 (source: )
Not a route
<u>3</u>
600 (Observed AADT)
Asphalt
Poor
No TIP projects for this segment.
(20112) Reconstruct Roadway

<sup>\*</sup> AADT values are derived from Traffic Counts

# SEMCOG 125661\_WB Weekly Volume Report - Mon 10/01/2007 - Sun 10/07/2007

Location ID: 125661\_WB
Located On: 9 Mile Rd
From Road: Beck Rd
Direction WB
Community: Novi
AADT: 310

Type: LINK

To Road: Napier Rd

Period: Mon 10/01/2007 - Sun 10/07/2007

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg
12:00 AM				1	2			2
1:00 AM				1	1			1
2:00 AM				0	0			0
3:00 AM				0	0			0
4:00 AM				0	0			0
5:00 AM				4	7			6
6:00 AM				6	6			6
7:00 AM				16	15			16
8:00 AM				16	18			17
9:00 AM				16	13			15
10:00 AM				9	8			9
11:00 AM			20	19				20
12:00 PM			13	19				16
1:00 PM			12	10				11
2:00 PM			18	25				22
3:00 PM			23	36				30
4:00 PM			32	32				32
5:00 PM			53	52				53
6:00 PM			39	40				40
7:00 PM			15	20				18
8:00 PM			18	8				13
9:00 PM			16	14				15
10:00 PM			10	5				8
11:00 PM			1	4				3
Total	0	0	270	353	70	0	0	
24HrTotal		<u> </u>	3:	· · · · · · · · · · · · · · · · · · ·	54	<u> </u>		347
AM Pk Hr				11:00				
AM Peak				19				19
PM Pk Hr				5:00				
PM Peak				52				52
% Peak Hr	Г		<u> </u>	14.73%	<u> </u>		<u> </u>	15.00%
% Peak Hr			15.	63% 14.	69%			15.16%

## SEMCOG 125661\_EB Weekly Volume Report - Mon 10/01/2007 - Sun 10/07/2007

Location ID: 125661\_EB
Located On: 9 Mile Rd
From Road: Beck Rd
Direction EB
Community: Novi
AADT: 260

Type: LINK

To Road: Napier Rd

Period: Mon 10/01/2007 - Sun 10/07/2007

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg
12:00 AM				0	0			0
1:00 AM				0	0			0
2:00 AM				0	1			1
3:00 AM				1	0			1
4:00 AM				0	1			1
5:00 AM				2	3			3
6:00 AM				26	24			25
7:00 AM				32	31			32
8:00 AM				38	36			37
9:00 AM				13	12			13
10:00 AM				8	15			12
11:00 AM			18	22				20
12:00 PM			10	11				11
1:00 PM			12	9				11
2:00 PM			15	11				13
3:00 PM			14	22				18
4:00 PM			17	19				18
5:00 PM			21	24				23
6:00 PM			21	23				22
7:00 PM			16	28				22
8:00 PM			7	7				7
9:00 PM			4	3				4
10:00 PM			2	4				3
11:00 PM			4	0				2
Total	0	0	161	303	123	0	0	
24HrTotal			28	81 3	06			294
AM Pk Hr				8:00				
AM Peak				38				38
PM Pk Hr				7:00				
PM Peak				28				28
% Peak Hr				12.54%				13.00%
% Peak Hr			7.4	17% 12.	42%			9.95%

# RA Residential Acreage

### **DEVELOPMENT STANDARDS**

### Lot Size

Minimum lot area<sup>□</sup>: 1 acre Minimum lot width :: 150 ft

### **Lot Coverage**<sup>□</sup>

Maximum lot coverage

(by all buildings): 25%

### Setbacks<sup>□</sup>

Minimum front yard setback: 45 ft Minimum rear yard setback: 50 ft

Minimum side yard setback: 20 ft one side

50 ft total two sides

### Building Height<sup>(1)</sup>

Maximum building height: 35 ft or 2.5 stories.

whichever is less

### Floor Area

Minimum floor area per unit<sup>(1)</sup>: 1,000 sq ft

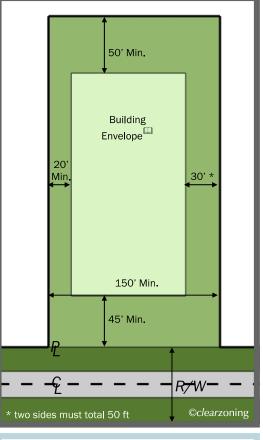
### **Dwelling Unit Density**

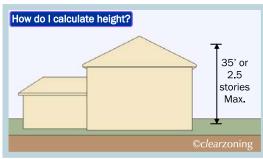
Maximum density

8.0 DU's/Net Site Area:

### **NOTES**

- For additions to the above requirements, refer to Section 3.6.2 Notes to District Standards: A, B, C,
- See Selected References below for applicability





The above drawings are not to scale.

### SELECTED REFERENCES

- 3. Zoning Districts

  RA, R-1, R-2, R-3, and R-4 Required Conditions §3.7
- **RUD Residential Unit Development**
- **Open Space Preservation Option**

### 4. Use Standards

- Keeping of Cats and Dogs § 4.83
- Uses Not Otherwise Included § 4.86
- Unlisted Use Determination § 4.87

### 5. Site Standards

- Commercial and Recreational
- Vehicle Parking § 5.1
  Off-street Parking Requirements
- Off-street Parking Layout, Standards... § 5.3
- Off-street Loading and Unloading § 5.4
- Landscape Standards § 5.5
- **Signs** § 5.6
- Exterior Lighting § 5.7
- Residential Entryways § 5.8
- Corner Clearance § 5.9
- Additional Road Design § 5.10

- **Fences** § 5.11
- Frontage on a Public Street § 5.12
- Performance Standards § 5.14
- **Exterior Building Wall Facade** Materials § 5.15
- **Bike Parking Facility Requirements**

### 6. Development Procedures

- Site Plan Review § 6.1
- Public Hearing § 6.2

### 7. Admin. and Enforcement

- Nonconformities § 7.1Planned Rezoning Overlay § 7.13.2







# R-1 One-Family Residential

### **DEVELOPMENT STANDARDS**

Lot Size

Minimum lot area  $\Box$ : 21,780 sq ft Minimum lot width<sup>□</sup>: 120 ft

Lot Coverage

Maximum lot coverage: 25%

Setbacks<sup>□</sup>

Minimum front yard setback: 30 ft Minimum rear yard setback: 35 ft

Minimum side yard setback: 15 ft one side

40 ft total two sides

Building Height<sup>(1)</sup>

Maximum building height: 35 ft or 2.5 stories.

whichever is less

Floor Area<sup>111</sup>

Minimum floor area per unit<sup>(1)</sup>: 1,000 sq ft

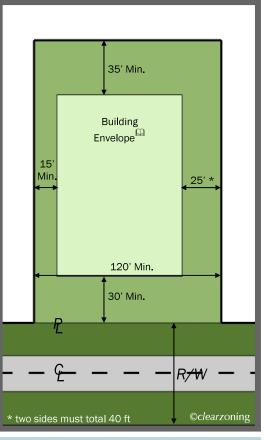
**Dwelling Unit Density** 

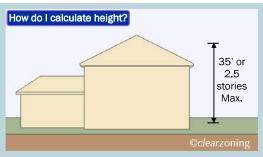
Maximum density

1.65 DU's/Net Site Area:

### **NOTES**

- For additions to the above requirements, refer to Section 3.6.2 Notes to District Standards: A, B, C,
- See Selected References below for applicability





The above drawings are not to scale.

### SELECTED REFERENCES

### 3. Zoning Districts

- RA, R-1, R-2, R-3, and R-4 Required Conditions § 3.7
- One-Family Clustering Option §3.28 **RUD Residential Unit Development**
- **Open Space Preservation Option**

### 4. Use Standards

- Keeping of Cats and Dogs § 4.83
- Uses Not Otherwise Included § 4.86
- Unlisted Use Determination § 4.87

### 5. Site Standards

- Commercial and Recreational
- Vehicle Parking § 5.1
  Off-street Parking Requirements
- Off-street Parking Layout, Standards... § 5.3
- Off-street Loading and Unloading § 5.4
- Landscape Standards § 5.5
- **Signs** § 5.6
- Exterior Lighting § 5.7
- Residential Entryways § 5.8
- Corner Clearance § 5.9
- Additional Road Design § 5.10

- **Fences** § 5.11
- Frontage on a Public Street § 5.12
- Performance Standards § 5.14
- **Exterior Building Wall Facade** Materials § 5.15
- **Bike Parking Facility Requirements**

### 6. Development Procedures

- Site Plan Review § 6.1
- Public Hearing § 6.2

### 7. Admin. and Enforcement

- Nonconformities § 7.1Planned Rezoning Overlay § 7.13.2







### WETLAND DELINEATION

# **Red Maple Montpelier**

# Wetland Delineation and Determination of Jurisdiction

Part of Section 15, T.3N., R.10E. City of Novi Oakland County, Michigan

August 2015

# Red Maple Montpelier

# Wetland Delineation and Determination of Jurisdiction

Part of Section 15, T.3N., R.10E.
City of Novi
Oakland County, Michigan

### August 2015

**Prepared For:** 

Mr. Bruce Michael Odawa Development, LLC 51111 West Pontiac Trail Wixom, MI 48393

Prepared By:

Brooks Williamson and Associates, Inc.

30366 Beck Road Wixom, Michigan 48393

BWA 15-016

### EXECUTIVE SUMMARY

This document with associated field mapping is a determination of the existence and extent of any wetlands, ponds, lakes, or streams on four (4) parcels of property (Parcel ID 22-30-401-016, 22-29-362-002, 22-29-326-022, 22-30-401-011) located on the north side of 9 Mile Road at Garfield Road in part of Section 29 and 30, T.1N., R.8E., City of Novi, Oakland County, Michigan and is a determination of their regulatory status under the following:

- a) Natural Resources and Environmental Protection Act (1994 P.A. 451),
  - Part 301, Inland Lakes and Streams Protection;
  - Part 303, Wetland Protection;
- b) Regulation of any wetland and water features by City of Novi.

The wetland and water features on the parcels were delineated at the request of Mr. Bruce Michael of Odawa Development, LLC. This work revealed that eleven (11) wetlands are present on the parcels. One (1) stream/drain located within a wetland area is also present. It is our opinion that six (6) of these wetlands and the associated stream/drain are subject to regulation by the Michigan Department of Environmental Quality (MDEQ). Permits will be required for construction activities involving regulated areas. Additionally, all eleven (11) wetlands are regulated by the City of Novi (City).

These findings represent the opinion of Brooks Williamson and Associates, Inc. Wetland delineation in the field conforms to currently accepted State wetland definitions and procedures. A detailed description of methods and site conditions follows.

### SITE LOCATION

The site is located at 49800 West 9 Mile Road, 49300 West 9 Mile Road, and 49280 West 9 Mile Road along with a vacant parcel directly west of 49300 West 9 Mile Road in part of Sections 29 and 30, T.1N., R.8E., City of Novi, Oakland County, Michigan (Figure 1). The site consists of four parcels, parcel IDs 22-30-401-016, 22-29-362-002, 22-29-326-022, and 22-30-401-011. The majority of the site is undeveloped woodland and wetland areas with two single family homes present in the southeast corner.

### AVAILABLE MAPPING

### County Soil Survey

The Oakland County Soil Survey was reviewed prior to the site visit. Four different soil mapping units are shown on the parcels (Figures 2a, 2b, c). These are Sebewa loam (19), Houghton and Adrian mucks (27), Gilford sandy loam (48), and Matherton sandy loam (54A).

Out of these four different series of soils, three are hydric. Sebewa loam, Houghton and Adrian Mucks, and Gilford sandy loam are listed by the U.S. Department of Agriculture as hydric soils. A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic (wetland) vegetation.

According to the technical definition used by the Natural Resources Conservation Service (NRCS) the following soils are hydric:

- 1. All Histosols except Folists; or
- 2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Pachic subgroups, or Cumulic subgroups that are:
  - a. Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or
  - b. poorly drained or very poorly drained and have either:
    - (1) water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches (in), or for other soils
    - (2) water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour (h) in all layers within 20 in, or
    - (3) water table at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/h in any layer within 20 in, or
- 3. Soils that are frequently ponded for long duration or very long duration during the growing season, or
- 4. Soils that are frequently flooded for long duration or very long duration during the growing season.

The Sebewa series is considered to be a hydric soil because it is poorly to very poorly drained and has a water table less than or equal to one foot from the surface during the growing season. It has a permeability less than six inches per hour in any layer located within twenty inches of the surface. In addition, it is frequently ponded for long or very long duration during the growing season.

The Houghton and Adrian series are listed as hydric because they are Histosols other than Folists and they are frequently ponded for long to very long duration during the growing season.

The Gilford series is considered to be a hydric soil because it is poorly to very poorly drained and has a water table less than or equal to one foot from the surface during the growing season. It has a permeability less than six inches per hour in any layer located within twenty inches of the surface. In addition, it is frequently ponded for long or very long duration during the growing season.

In a natural or unaltered condition, the hydric soils shown on a parcel typically support wetland vegetation. Therefore, the soil survey information provides an idea of what may be expected on the property in question.

### U.S. Geological Survey Map (USGS)

The USGS Quadrangle map for this area (Figure 3) shows one wetland located within the delineated area. The wetland occurs across the northern area of the site, with portions located off-site. These maps typically show only the more distinct wetland and water features, and should be utilized for preliminary analysis only. Actual field mapping is necessary to determine the actual existence, type, and boundaries of wetland on a given site.

### National Wetland Inventory (NWI)

The NWI map for this area (Figure 4) shows Palustrine Forested Saturated (PFOB) wetlands across the northern portion of the site with portions continuing off-site. Please note that NWI maps are compiled from aerial photography and may not show all wetlands in a given area, nor accurately characterize all wetlands shown. These maps should be used only for preliminary analysis.

### **METHODOLOGY**

Wetland areas are defined by P.A. 451 of 1994, Part 303, Wetland Protection, as:

"... land characterized by the presence of water at a frequency and duration sufficient to support and that under normal circumstances does support wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh ..."

The methodology used in defining the location of wetland areas within the parcel was that established by Rule 4 of the rules promulgated pursuant to the Act and by the <u>Michigan Department of Environmental Quality: A Technical Manual for Identifying Wetlands in Michigan</u> (March, 2001). When questions arose regarding the proper location of the line, the <u>Corps of Engineers Wetlands Delineation Manual</u>, 1987, and supporting documents were used.

Determination of the possible existence, extent, or distance of any off-site wetlands, ponds, lakes, streams, or other features is based on publicly available information including aerial photographs, U.S. Geological Survey maps, National Wetland Inventory maps, and County Soil Surveys.

At the time the site was delineated, the wetland definition utilized by the City of Novi was similar to the State definition. There is currently no delineation manual produced by the City of Novi. Therefore, the State methodology was used. Our experience has shown that this methodology has been accepted in the past.

# DESCRIPTIONS OF WETLAND AND WATER FEATURES

The site was inspected and delineated during a number of site inspections and finalized on July 22<sup>nd</sup>, 2015. Eleven (11) wetland areas (1 through 11) and a stream/drain were identified within the delineated area. The wetland/upland boundaries were flagged with fluorescent pink and blue survey ribbon. A preliminary map of the general location and size of the wetland areas is included as a sketch with flag numbering (Figure 5). Please note that this map shows only an approximate location of wetland/upland boundaries, and any ponds, lakes, or streams. We recommend that the delineated wetland boundaries be surveyed and incorporated into the site plan.

The wetland areas and the stream/drain are briefly described below:

### Wetland #5, 7, 8, 10, 11

These wetlands are all part of a larger wetland complex that continues off site to the north, west, and northeast. This area is an extensive forested and scrub shrub wetland with emergent inclusions. A stream/drain runs east/west within this wetland along the northern half of the property then turns southeast and finally due south entering a culvert at the intersection of 9 Mile and Garfield Roads.

Overstory wetland vegetation includes silver maple (*Acer saccharinum*), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), and black willow (*Salix nigra*). Understory wetland vegetation includes jewelweed (*Impatiens capensis*), buttonbush (*Cephalanthus occidentalis*), silky dogwood (*Cornus amomum*), glossy buckthorn (*Rhamnus frangula*), elderberry (*Sambucus canadensis*) and cattail (*Typha latifolia*). Exposed roots, water-stained leaf litter, bare soil and standing water to depths of approximately 2' indicate wetland hydrology. Hydric soils including muck soils were identified within the wetland limits. The soils were generally saturated along the edge of the wetland grading into inundated conditions toward the central areas.

Upland vegetation in areas adjacent to the wetland includes honeysuckle (*Lonicera tatarica*), gray dogwood (*Cornus racemosa*), prickly ash (*Zanthoxylum americanum*), Florida dogwood (*Cornus florida*), spicebush (*Lindera benzoin*), beech (*Fagus grandifolia*), basswood (*Tilia americana*), spring beauty (*Claytonia virginica*), wild geranium (*Geranium maculatum*), black cherry (*Prunus serotina*), blue cohosh

(Caulophyllum thalictroides), may apple (Podophyllum peltatum), trout lily (Erythronium americanum), cut-leaved toothwort (Cardamine concatenata), witch hazel (Hamamelis virginiana), shagbark hickory (Carya ovata), raspberry (Rubus allegheniensis), bloodroot (Sanguinaria canadensis), musclewood (Carpinus caroliniana), and trillium (Trillium sp.).

### Wetland #9

This is a small isolated pocket of emergent and scrub shrub wetland within equipment ruts located in an open field area. Wetland vegetation includes sandbar willow (*Salix exigua*), beaked willow (*Salix bebbiana*), Dudley's rush (*Juncus dudleyi*) and silky dogwood. Saturated soils were present within this wetland area. Hydric soils were identified within the wetland limits. Upland vegetation includes common buckthorn (*Rhamnus cathartica*), queen Anne's lace (*Daucus carota*), and autumn olive (*Elaeagnus umbellata*).

### Wetlands #1, 2, 3, 4, and 6

These five (5) wetlands are small isolated forested depressional areas. The vegetation is similar to that found in the other forested wetlands on site. Overstory wetland vegetation includes silver maple, red maple, and green ash. Understory wetland vegetation includes silky dogwood, glossy buckthorn, elderberry, and beggar-tick (*Bidens frondosus*). Exposed roots, water-stained leaf litter, bare soil and saturated soils indicate wetland hydrology. Hydric soils including muck soils were identified within the wetland limits.

Upland vegetation in areas adjacent to the wetland includes gray dogwood, prickly ash, spring beauty, wild geranium, black cherry, trout lily, and cut-leaved toothwort.

### REGULATION OF WETLAND AND WATER FEATURES

### Regulation of Inland Lakes and Streams by the State of Michigan

Inland lakes and streams are protected under Part 301 of 1994 P.A. 451, Inland Lakes and Streams Protection. The Michigan Department of Environmental Quality (MDEQ) assumes authority over natural or artificial inland streams that have definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water; and natural or artificial lakes or ponds with a surface area of five acres or greater. The Great Lakes and Lake St. Clair are not considered to be inland lakes under this act.

One (1) stream/drain was identified during the site inspection. Observations of bed, bank, and flow within sections of this feature suggest that the definition of a stream is met under Part 301. Therefore, it is our opinion that this feature is regulated.

Please note that the following activities are prohibited within regulated inland lakes and streams without a MDEQ permit:

- 1. Dredging or filling bottomland;
- 2. Constructing, enlarging, extending, removing or placing a structure on bottomland;
- 3. Erecting, maintaining or operating a marina;
- 4. Creating, enlarging or diminishing an inland lake or stream;
- 5. Structurally interfering with the natural flow of an inland lake or stream;
- 6. Constructing, dredging, commencing, extending or enlarging an artificial canal, channel, ditch, lagoon, pond, lake, or similar waterway where the purpose is ultimate connection with an existing inland lake or stream, or where any part of the artificial waterway is located within 500 feet of the ordinary high water mark of an existing inland lake or stream;
- 7. Connecting any natural or artificially constructed waterway, canal, channel, ditch, lagoon, pond, lake or similar water with an existing inland lake or stream for navigation or any other purpose.

### Wetland Regulation by the State of Michigan

Wetlands are protected under Part 303 of 1994 P.A. 451, Wetland Protection. The Michigan Department of Environmental Quality (MDEQ) assumes authority over wetlands that are contiguous to an inland lake, pond, or stream, within 500 feet of an inland lake, pond, or stream, or within 1,000 feet of a Great Lake, Lake St. Clair, the St. Clair River, or the Detroit River. Isolated wetlands five acres in size or greater are also regulated in counties with a population of greater than 100,000 per the most recent Federal census. The population of Oakland County was in excess of 100,000 at the time of the most recent Federal census (2010).

The MDEQ may also exert regulatory control over isolated wetlands less than five acres in size "...if the department determines that protection of the area is essential to the preservation of the natural resources of the state from pollution, impairment, or destruction and the department has so notified the owner".

The Wetland Protection Rules state that upon the request of a property owner or his or her agent, the department shall determine if there is no surface or groundwater connection that meets the definition of contiguous under R.281.921(1)(b)(iii). Thus the MDEQ may decline regulatory jurisdiction over a wetland less than 5 acres in size which is initially considered to be regulated because it is located within 500 feet of an inland lake, pond, or stream. A wetland area may not be subject to regulation if it is isolated, less than 5 acres, and has no surface water or groundwater connection to a lake, pond, or stream. The Department may decline jurisdiction of such a wetland if field inspection suggests that no surface connection is present and additional hydrogeologic investigation, including survey and soil studies, indicate that no sub-surface connection exists due to lack of groundwater movement. Although the Department has accepted this type of information in the past, current unwritten policy is to consider <u>all</u> wetlands within 500 feet to have a groundwater connection.

### Wetland #5, 7, 8, 9, 10, 11

These wetlands are subject to regulation by the MDEQ because they are larger than five acres in size including off-site portions and are contiguous and/or within 500' of an inland stream.

### Wetlands #1, 2, 3, 4, and 6

These wetlands are not subject to regulation by the MDEQ because they are less than 5 acres in size and are not located within 500' of a stream.

Please note that the following activities are prohibited within regulated wetlands without a MDEQ permit:

- 1. The placement of fill material;
- Dredging;
- 3. Construction within; and/or
- 4. The draining of surface water from a wetland.

### Regulation by the City of Novi

The City of Novi regulates all wetlands and watercourses regardless of size and proximity to inland lakes and streams. The City must grant a use permit for non-contiguous wetlands less than two acres in size unless it finds that such a wetland is essential to the preservation of the natural resources of the City. However, recent discussions with the City reveal that they deem all wetlands essential so therefore, all wetlands regardless of size are regulated. In making this determination, at least one of the following must exist at the particular site:

- 1. The site supports State or Federal endangered or threatened plants, fish, or wildlife appearing on a list specified in Section 6 of the Endangered Species Act of 1974, Act No. 203 of the Public Acts of 1974, being Section 299.226 of the Michigan Compiled Laws.
- 2. The Site represents what is identified as a locally rare or unique ecosystem.
- 3. The site supports plants or animals of an identified local importance.
- 4. The site provides groundwater recharge documented by a public agency.
- 5. The site provides flood and storm control by the hydrologic absorption and storage capacity of the wetland.
- 6. The site provides wildlife habitat by providing breeding, nesting, or feeding grounds or cover for forms of wildlife, waterfowl, including migratory water fowl and rare, threatened, or endangered wildlife species.

- 7. The site provides protection of subsurface water resources and provision of valuable watersheds and recharging groundwater supplies.
- 8. The site provides pollution treatment by serving as a biological and chemical oxidation basin.
- 9. The site provides erosion control by serving as a sedimentation area and filtering basin, absorbing silt and organic matter.
- 10. The site provides sources of nutrients in water cycles and nursery grounds and sanctuaries for fish.

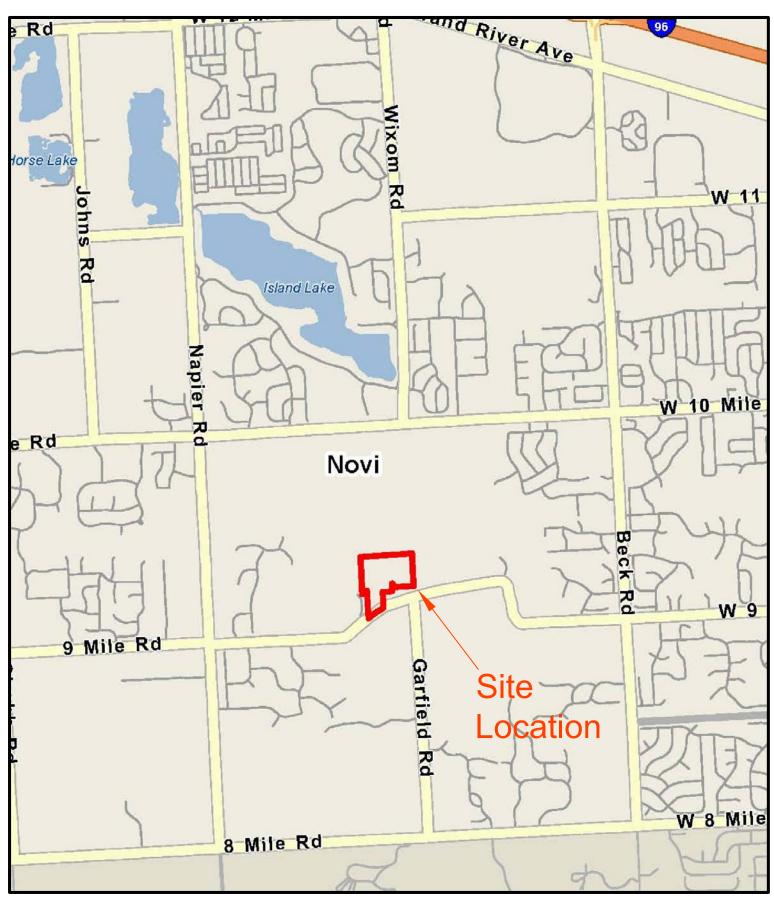
In addition, the City of Novi requires a 25 foot setback from the boundary of a wetland, and a 25 foot setback from the ordinary high water mark of a watercourse.

All of the wetlands on site are regulated by the City of Novi regardless of size and proximity to watercourses. Additionally, the City of Novi requires a 25 foot setback from the boundary of all wetlands and from the ordinary high water mark of a watercourse.

### CONFIRMATION BY REGULATORY AGENCIES

Numerous natural environmental factors and human induced changes may cause changes in the extent of wetland on a parcel over a period of time. Identification of wetland or water features on the property represents what this firm believes the MDEQ and the City would consider to be a wetland, pond, lake, or stream based on the condition of the site at the time of inspection and on recent regulatory policies and attitudes. Please note that the MDEQ and the City have the final decision in matters of jurisdiction and delineation.

We recommend that this delineation report be forwarded to the MDEQ and the City for confirmation, should any questions arise. Purchase or detailed planning should generally be considered only after receiving written confirmation.



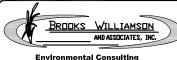


## **Red Maple Montpelier**

City of Novi

Oakland County





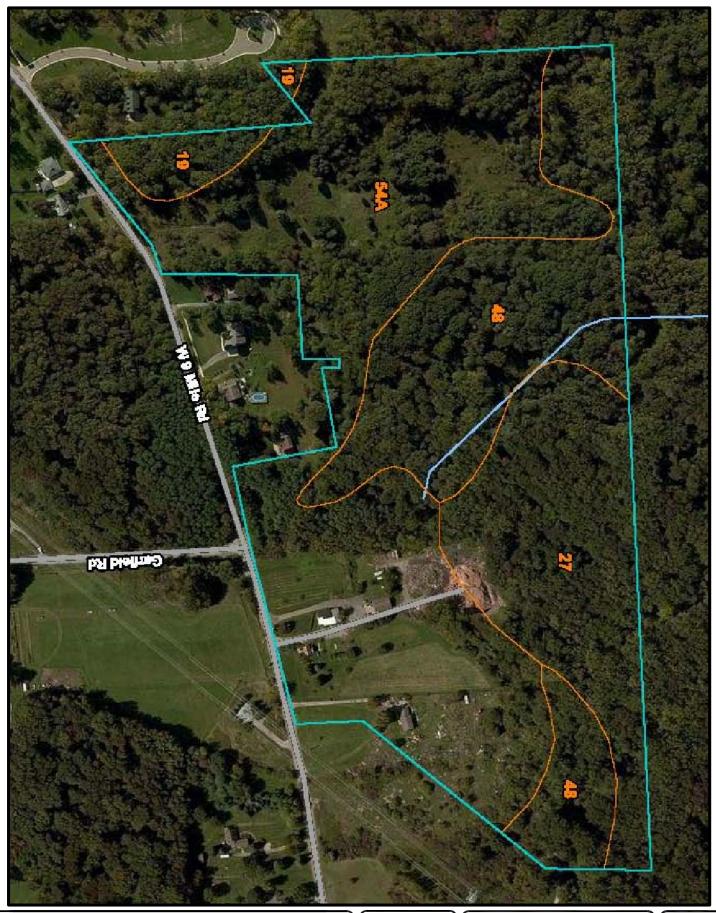
**Environmental Consulting** 

30366 Beck Road Wixom, MI 48393 Phone: (248) 624–9100 Fax: (248) 624–3963

August 2015 PROJECT NUMBER

15-016

FIGURE 1



Soil Map

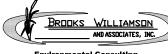
# Red Maple Montpelier

City of Novi

Oakland County



Not to Scale



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August 2015

PROJECT NUMBER 15-016

> FIGURE 2a

# MAP LEGEND

Soils

Soil Map Unit Polygons

8 O

Very Stony Spot

Special Point Features

Water Features

Streams and Canals

Transportation ŧ

Rails

Soil Map Unit Points

Other

Wet Spot

Special Line Features

Soil Map Unit Lines

Clay Spot Borrow Pit Blowout

Closed Depression

Area of Interest (AOI)

Area of Interest (AOI)

# Stony Spot Spoil Area

# MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800

Warning: Soil Map may not be valid at this scale

misunderstanding of the detail of mapping and accuracy of soil line Enlargement of maps beyond the scale of mapping can cause soils that could have been shown at a more detailed scale. placement. The maps do not show the small areas of contrasting

Please rely on the bar scale on each map sheet for map

Coordinate System: Web Soil Survey URL: Source of Map: Natural Resources Conservation Service Web Mercator (EPSG:3857) http://websoilsurvey.nrcs.usda.gov

calculations of distance or area are required. Albers equal-area conic projection, should be used if more accurate distance and area. A projection that preserves area, such as the projection, which preserves direction and shape but distorts Maps from the Web Soil Survey are based on the Web Mercator

Gravelly Spot Gravel Pit

Major Roads

Local Roads

US Routes

Interstate Highways

the version date(s) listed below. This product is generated from the USDA-NRCS certified data as of

Survey Area Data: Soil Survey Area: Oakland County, Michigan Version 12, Sep 30, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000

Date(s) aerial images were photographed: 27, 2014 Sep 17, 2014—Sep

of map unit boundaries may be evident imagery displayed on these maps. As a result, some minor shifting compiled and digitized probably differs from the background The orthophoto or other base map on which the soil lines were

Soil Map Legend

Sodic Spot

Slide or Slip

Severely Eroded Spot

Sandy Spot

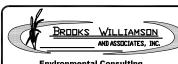
Saline Spot Rock Outcrop Perennial Water Miscellaneous Water Mine or Quarry Marsh or swamp Lava Flow Landfill

Aerial Photography

# **Red Maple Monpelier**

City of Novi

Oakland County



30366 Beck Road Wixom, MI 48393 Phone: (248) 624-911 Fax: (248) 624-3963

DATE August 2015

PROJECT NUMBER 15-016

> FIGURE 2b

# **Map Unit Legend**

	Oakland County, Mi	chigan (MI125)	
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Sebewa Ioam	1.5	3.0%
27	Houghton and Adrian mucks	9.5	19.3%
48	Gilford sandy loam	12.5	25.3%
54A	Matherton sandy loam, 0 to 3 percent slopes	25.9	52.5%
Totals for Area of Interest		49.4	100.0%

Soil Unit Legend

# **Red Maple Montpelier**

City of Novi Oakland County

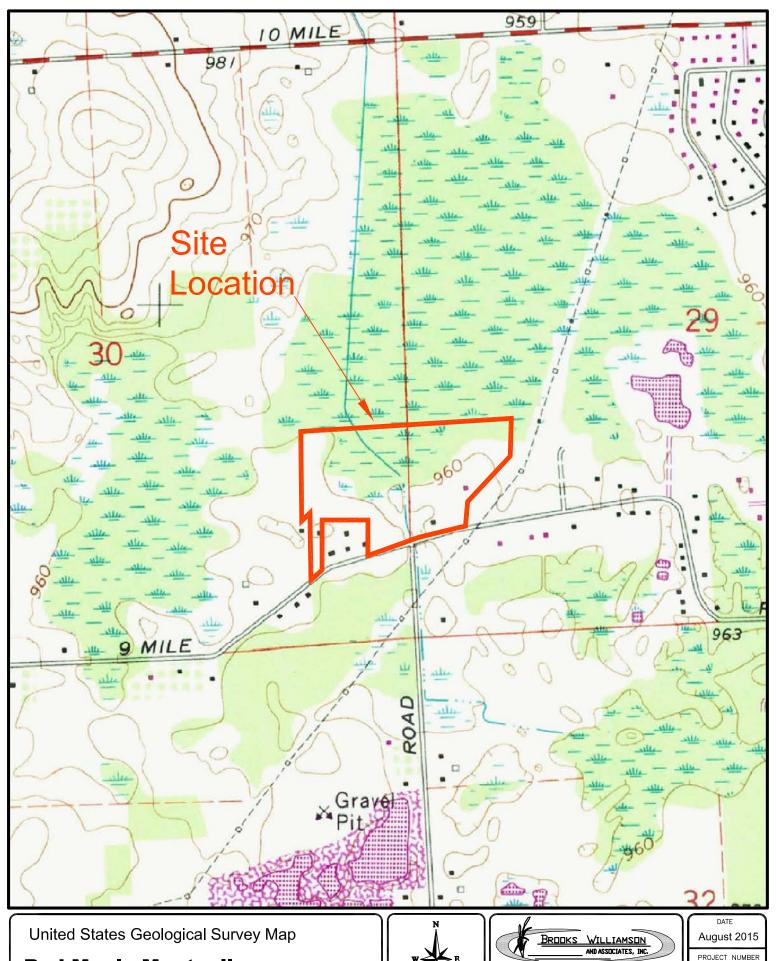


**Environmental Consulting** 

30366 Beck Road Wixom, MI 48393 Phone: (248) 624–9100 Fax: (248) 624–3963 August 2015

PROJECT NUMBER 15-016

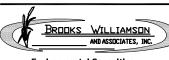
FIGURE 2c



# Red Maple Montpelier

City of Novi Oakland County





30366 Beck Road Wixom, MI 48393 Phone: (248) 624–9100 Fax: (248) 624–3963

PROJECT NUMBER 15-016

> FIGURE 3

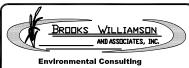


National Wetlands Inventory Map

### **Red Maple Montpelier**

City of Novi Oakland County





30366 Beck Road Wixom, MI 48393 Phone: (248) 624–9100 Fax: (248) 624–3963

DATE August 2015 PROJECT NUMBER

15-016 FIGURE 4



Wetland Sketch Map

# Red Maple Montpelier

City of Novi

Oakland County





### Environmental Consulting

30366 Beck Road Wixom, MI 48393 Phone: (248) 624–9100 Fax: (248) 624–3963 DATE
August 2015

PROJECT NUMBER

FIGURE

### WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Red Maple Montpelier					Sampling Date: Jul 22, 2	
Applicant/Owner: Odawa Devp.				State: Michigan	Sampling Point: 1W	!
Investigator(s): CK		Secti	on, Townsh	ip, Range: <u>Sec. 30, T1</u>	N, R8E	
Landform (hillslope, terrace, etc.)		_ Local reli	ef (concave	, convex, none): none		
Slope (%): 0 Lat:		Long	j:	Datu	m:	
Soil Map Unit Name: Sebawa Loam						
Are climatic / hydrologic conditions on the site typical for t	this time of ye	ear? Y	es X N	o (If no, explain in F	Remarks.)	
Are Vegetation , Soil , or Hydrology sig						No
Are Vegetation, Soil, or Hydrology X_ nat	turally proble	matic?	(If ne	eeded, explain any answ	/ers in Remarks.)	
SUMMARY OF FINDINGS – Attach site ma				ocations, transect	ts, important featu	res, etc.
Hydrophytic Vegetation Present? Yes	X No _					
	X No	IS	the Sample thin a Wetl		No	
	X No		umi a weu	and: 165 _	No	
Remarks:	<u> </u>	<del></del> ]			_	
Wetland 1 - data point						
Trouble Transfer of the Control of t						
VEGETATION - Use scientific names of plants.						
Coo continue names of plante.	A h = = 1, ,4 =	Daminant	lu di a atau	Dominance Test wor	ksheet	
Tree Stratum (Plot size: )	Absolute % Cover	Dominant Species?				
Acer saccharinum (Maple,silver)	50	Υ		Number of Dominant		(4)
2. Acer rubrum (Maple,red)	30	<u>Y</u>	FAC	That Are OBL, FACV	V, or FAC: <u>6</u>	_ (A)
3. Fraxinus pennsylvanica (Ash,green)	20	<u> </u>	FACW	Total Number of Don	ninant	
4				Species Across All S	Strata: 6	_ (B)
	100	= Total Co	ver	Percent of Dominant	. Snecies	
					V, or FAC: 100	(A/B)
Sapling/Shrub Stratum (Plot size:)	20	V	EAC	Prevalence Index wo		
Rhamnus frangula (Buckthorn,glossy)     Cornus amomum (Dogwood,silky)	30 20	<u>Y</u> Y	FACW	Total % Cover of		
Sambucus canadensis (Elder,american)	5	<u> </u>	FACW	OBL species	x 1 =	
4.				FACW species	X 2 =	
5				FAC species	X 3 =	
	55	= Total Co	ver	FACU species	X 4 =	
Herb Stratum (Plot size: )				UPL species	X 5 =	
Bidens frondosa (Beggar-ticks,devil's)	10	Y	FACW	Column Totals:	(A)	(B)
2.						
3. 4.				Prevalence Hydrophytic Vegetation	ce Index = B/A =	
5.					· Hydrophytic Vegetation	1
6.	<del></del>			X 2 - Dominance Te		
7.				3 - Prevalence Te	est is ≤ 3.0¹	
8					Adaptations <sup>1</sup> (Provide s	
9. 10.					ks or on a separate shee ophytic Vegetation¹ (Exp	•
10	10	= Total Co	ver	1 Toblematic Hydro	ophytic vegetation (Exp	Jani)
Woody Vine Stratum (Plot size: )				be present, unless dis	oil and wetland hydrolog sturbed or problematic.	y must
1.				Hydrophytic Vegetation		
2				Present?	Yes X No	
	0	= Total Co	ver		_	
Remarks: (Include photo numbers here or on a separate	e sheet.)					

	cription: (Describe	to the de	oth needed to docu	ment the ir	ndicator o	r confirm	n the absend		ng Point: _ s.)	
Depth	Matrix Color (moist)	%	Color (moist)	edox Featu %		Loc <sup>2</sup>	Texture		Remar	·ke
(inches) 0-11	10YR3/3		10YR5/1	5 5	Type <sup>1</sup> C	M	-		Remai	KS
11-18	101R3/3 10YR4/2		101R3/1 10YR4/2	20		M	Loam Loam	_		
11-10	1011(4)2		1011(4/2			101	Loan			
/pe: C=C	oncentration, D=De	pletion, RN	/I=Reduced Matrix, C	S=Covered	d or Coate	d Sand G	Grains.	<sup>2</sup> Location: PL:	=Pore Linir	ng, M=Matrix
dric Soil	Indicators:						Indica	ators for Probl	ematic Hy	ydric Soils³:
Histo	sol (A1)		Sandy Gle	eyed Matrix	(S4)			Coast Prairie	Redox (A1	6)
Histic	Epipedon (A2)		Sandy Red	dox (S5)				Dark Surface	(S7)	
Black	(Histic (A3)		Stripped M	/latrix (S6)				Iron-Mangene	se Masses	s (F12)
Hydro	ogen Sulfide (A4)			icky Minera				Very Shallow	Dark Surfa	aces (TF12)
Strati	fied Layers (A5)		Loamy Gle	eyed Matrix	(F2)			Other (Explain	ı in Remar	ks)
	Muck (A10)		Depleted I	, ,						
Deple	eted Below Dark Sur	face (A11)	X Redox Da	rk Surface	(F6)					
Thick	Dark Surface (A12)	)		Dark Surfac	. ,		3Indic	ators of Hydrop	hytic yeae	tation and
Sand	y Mucky Mineral (S	1)	Redox De	pressions (	F8)			land hydrology		
5 cm	Mucky Peat or Peat	(S3)					dist	urbed or proble	matic.	
Type:	Layer (if observed)	):			Hyd	ric Soil F	Present?	Yes	x	No
Type:		):	<u></u>		Hyd	ric Soil F	Present?	Yes	X	_ No
Type:	OGY vdrology Indicators	:	uired: check all that a	apply)	Hyd	ric Soil F		ondary Indicato	ors (minimu	um of two rec
DROLO etland Hy mary Indi Surface High W Saturat Water I Sedime	oches):  oches):  oches):  oches  och	:	True Aqu Hydroge X Oxidized	tained Leav Fauna (B13 uatic Plants n Sulfide O l Rhizosphe	ves (B9) 3) (B14) dor (C1) eres on Liv	ring Roots	Sec   X   X   X   S (C3)	ondary Indicato Surface Soil C Drainage Patt Dry-Season W Crayfish Burro Saturation Vis Stunted or Str	ors (minimu Cracks (B6) erns (B10) /ater Table ows (C8) ible on Aei essed Plar	um of two red ) e (C2) rial Imagery (
DROLO etland Hy mary Indi Surface High W Saturat Water I Sedime Drift De Algal M Iron De	oGY vdrology Indicators icators (minimum of e Water (A1) vdter Table (A2) tion (A3) Marks (B1)	: one is requ	X Water-St Aquatic f True Aqu Hydroget X Oxidized X Presencet Recent li Thin Muc (B7) Gauge o	tained Leav Fauna (B13 uatic Plants n Sulfide O	ves (B9) 3) 4 (B14) 4 (C1) 4 (C1) 5 (C2) 6 (C7) 6 (C7) 6 (C9)	ring Roots	Sec   X   X   X   S (C3)   X	ondary Indicato Surface Soil O Drainage Patt Dry-Season W Crayfish Burro Saturation Vis	ors (minimu Cracks (B6) erns (B10) /ater Table ows (C8) ible on Aer essed Plar Position (D2	um of two red ) e (C2) rial Imagery (
Type:	proches):  proches):  proches):  proches:  pro	: one is requ	X Water-St Aquatic f True Aqu Hydroget X Oxidized X Presencet Recent li Thin Muc (B7) Gauge o	tained Leav Fauna (B13 uatic Plants n Sulfide O I Rhizosphe e of Reduct ron Reduct ck Surface r Well Data	ves (B9) 3) 4 (B14) 4 (C1) 4 (C1) 5 eres on Live 6 Iron (C4) 6 ion in Tille 7 (C7) 8 (D9)	ring Roots	Sec   X   X   X   S (C3)   X	ondary Indicato Surface Soil C Drainage Patt Dry-Season W Crayfish Burro Saturation Vis Stunted or Str Geomorphic P	ors (minimu Cracks (B6) erns (B10) /ater Table ows (C8) ible on Aer essed Plar Position (D2	um of two red ) e (C2) rial Imagery (
DROLO etland Hy mary Indi Surface High W Saturat Water I Sedime Drift De Algal M Iron De Inundat Sparse	orches):  OGY  Idrology Indicators  Idrology Indica	: one is required in the second of the secon	X Water-St Aquatic f True Aqu Hydroget X Oxidized X Presencet Recent li Thin Muc (B7) Gauge o	tained Leav Fauna (B13 uatic Plants n Sulfide O I Rhizosphe e of Reduct ron Reduct ck Surface or Well Data xplain in Re	ves (B9) 3) 4 (B14) 4 (C1) 4 (C1) 5 eres on Live 6 Iron (C4) 6 ion in Tille 7 (C7) 8 (D9)	ring Roots	Sec   X   X   X   S (C3)   X	ondary Indicato Surface Soil C Drainage Patt Dry-Season W Crayfish Burro Saturation Vis Stunted or Str Geomorphic P	ors (minimu Cracks (B6) erns (B10) /ater Table ows (C8) ible on Aer essed Plar Position (D2	um of two red ) e (C2) rial Imagery (
Type:	procession of the process of the pro	: one is required I Imagery ( ve Surface	X Water-St Aquatic F True Aqu Hydroget X Oxidized X Presence Recent It Thin Muc (B7) Gauge o (t) (B8) Other (E.	tained Leav Fauna (B13 Latic Plants In Sulfide O I Rhizosphe I Reduct I Red	ves (B9) 3) 4 (B14) 4 (C1) 4 (C1) 5 eres on Live 6 Iron (C4) 6 ion in Tille 7 (C7) 8 (D9)	ring Roots 4) d Soils (C	Sec   X   X   X   S (C3)   X	ondary Indicate Surface Soil C Drainage Patte Dry-Season W Crayfish Burre Saturation Vis Stunted or Str Geomorphic P FAC-Neutral T	ors (minimu Cracks (B6) erns (B10) /ater Table ows (C8) ible on Aer essed Plar Position (D2	um of two red ) e (C2) rial Imagery ( nts (D1) 2)

### WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Red Maple Montpelier		City/C	ounty: Oak	dand S	Sampling Da	ate: <u>Jul 22, 2</u>	2015
Applicant/Owner: Odawa Devp.				State: Michigan	Samplir	ng Point: 1U	
Investigator(s): CK		Sectio	n, Townshi	p, Range: <u>Sec. 30, T1</u>	N, R8E		
Landform (hillslope, terrace, etc.)							
Slope (%): Lat:		<del>_</del>		· · · · · · · · · · · · · · · · · · ·	m:		
Soil Map Unit Name:							
Are climatic / hydrologic conditions on the site typical for the							
Are Vegetation, Soil, or Hydrologysign				· <del></del>		Yes X	No
Are Vegetation, Soil, or Hydrologynatu				eded, explain any answ			
SUMMARY OF FINDINGS – Attach site map	showing	sampling	point lo	cations, transect	s, import	ant featu	res, etc.
Hydrophytic Vegetation Present? Yes	No	х					
	No	ls t	he Sample			No X	
	No		iiii a wea				
Remarks:							
Upland 1 test plot							
Cp.a.ia i tost pot							
VEGETATION - Use scientific names of plants.							
Ose solerano names of plants.	Λ h a alta	Daminant	la dia atau	Dominance Test wo	rksheet		
Tree Stratum (Plot size: )	Absolute % Cover	Dominant Species?	Status				
Carya ovata (Hickory,shag-bark)	40	Y		Number of Dominar		0	(4)
2. Fagus grandifolia (Beech)	40	Y	FACU	That Are OBL, FAC	W, or FAC:	9	_ (A)
3. Tilia americana (Basswood,american)	20	Y	FACU	Total Number of Do	minant		
4 5.				Species Across All	Strata:	2	_ (B)
0.	100	= Total Co	ver	Percent of Dominar	nt Species		
				That Are OBL, FAC		22.2	(A/B)
Sapling/Shrub Stratum (Plot size:)		.,	= 4 0 1 4	Prevalence Index w	orkshoot:		
Cornus foemina (Dogwood,stiff)     Rhamnus cathartica (Buckthorn,common)	25 25	<u>Y</u> Y	FACU	Total % Cover of		Multiply by	<u>:                                    </u>
Zanthoxylum clava-herculis (Hercules-club)			FAC	OBL species 0	)	x 1 = 0	
4.				FACW species 2	25	X 2 = <u>50</u>	
5.				FAC species 2	20	X 3 = <u>60</u>	
	70	= Total Co	ver	FACU species1	160	X 4 = 640	
Herb Stratum (Plot size: )				UPL species 0	)	X 5 = 0	
Geranium maculatum (Crane's-bill,purple)	15	Υ	FACU	Column Totals: 2	205	(A) <u>750</u>	(B)
2. Claytonia virginica (Springbeauty,narrow-leaf)	10	Υ	FACU				
3. Podophyllum peltatum (May-apple)	10	Y	FACU			B/A = 3.66	3
4.   5.				Hydrophytic Vegetat 1 - Rapid Test fo			n
				2 - Dominance T	, ,	ū	11
7.				3 - Prevalence T			
8.				4 - Morphologica	al Adaptatio	ns <sup>1</sup> (Provide	supporting
9.				data in Rema			
10		- Total Co		Problematic Hyd	Irophytic Ve	getation' (Ex	(plain)
	35	= Total Co	vei	<sup>1</sup> Indicators of hydric			gy must
Woody Vine Stratum (Plot size:)				be present, unless d	isturbed or p	problematic.	
1				Hydrophytic Vegetation			
2				Present?	Yes	No	<u> </u>
	0	= Total Co	ver				
Remarks: (Include photo numbers here or on a separate	e sheet.)						

	cription: (Describe	to the denth	needed to docu	ment the ir	ndicator o	r confirm	the absence	of indicators \	
Depth	Matrix			edox Featu		ı commi	i tile absence	or malcators.	
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Re	marks
0-10"	10YR5/3				N/A	N/A	Loam		
11-18"	10YR5/4				N/A	N/A	N/A		
Гуре: С=С	oncentration, D=De	epletion, RM=	Reduced Matrix, C	S=Covered	d or Coate	d Sand G	rains. <sup>2</sup>	Location: PL=Pore	Lining, M=Matrix.
lydric Soil	Indicators:						Indicat	ors for Problemation	c Hydric Soils³:
Histo	sol (A1)			yed Matrix	(S4)			Coast Prairie Redox	(A16)
	Epipedon (A2)		Sandy Red					Dark Surface (S7)	
	Histic (A3)		Stripped N					ron-Mangenese Ma	` '
	ogen Sulfide (A4)			icky Minera				Very Shallow Dark S	
_	fied Layers (A5)		Loamy Gie	eyed Matrix	(F2)			Other (Explain in Re	marks)
	Muck (A10) eted Below Dark Su	urface (A11)		rk Surface (	(E6)				
	Dark Surface (A12	,		Dark Surface	` '				
	y Mucky Mineral (S	•		pressions (				tors of Hydrophytic v	
	Mucky Peat or Pea			p. 000.01.0 (	. 0)			nd hydrology must brbed or problematic.	e present, uniess
-	Layer (if observed								
Type:	Layer (II observed	·)·			Hyd	ric Soil F	Procent?	Yes	No X
Depth (ir	nches):		<u></u>		'''y		resent:	103	110X
YDROLO		ve:					Soci	ondani Indicatore (n	ainimum of two roccu
YDROLO Wetland F	lydrology Indicato						Sec	condary Indicators (n	
YDROLO Wetland F	lydrology Indicato				aves (B9)		<u>Sec</u>	Surface Soil Crack	s (B6)
YDROLO Wetland F Primary In Surfa High	dicators (minimum of ce Water (A1) Water Table (A2)		Water-	apply) Stained Lea Fauna (B1			<u>Sec</u>	Surface Soil Cracks Drainage Patterns Dry-Season Water	s (B6) (B10) Table (C2)
YDROLO Wetland F Primary In Surfa High Satur	dicators (minimum of the Water (A1) Water Table (A2) ation (A3)		Water-9 Aquation True Ad	Stained Lea Fauna (B1 quatic Plan	l3) ts (B14)		<u>Sec</u>	Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows (	s (B6) (B10) Table (C2) C8)
YDROLO Wetland F Primary In Surfa High Satur Wate	dicators (minimum of the Water (A1) Water Table (A2) ation (A3) r Marks (B1)		Water-S Aquatio True Ao Hydrog	Stained Lea Fauna (B1 quatic Plan en Sulfide	13) ts (B14) Odor (C1)		_ _ _	Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible of	s (B6) (B10) Table (C2) C8) on Aerial Imagery (C
YDROLO Wetland F Primary In Surfa High Satur Wate Sedin Drift I	dicators (minimum of the Water (A1) Water Table (A2) ation (A3) r Marks (B1) nent Deposits (B2) Deposits (B3)		Water-t Aquatic True Ac Hydrog Oxidize Presen	Stained Lea Fauna (B1 quatic Plant en Sulfide ed Rhizosph ce of Redu	l3) ts (B14) Odor (C1) neres on L ced Iron (	iving Roc C4)	ots (C3)	Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible of Stunted or Stresse Geomorphic Position	s (B6) (B10) Table (C2) C8) on Aerial Imagery (C d Plants (D1) on (D2)
YDROLO Wetland F Primary In Surfa High Satur Wate Sedin Drift I	dicators (minimum of the Water (A1) Water Table (A2) ation (A3) r Marks (B1) nent Deposits (B2) Deposits (B3) Mat or Crust (B4)		Water-s Aquatic True Ac Hydrog Oxidize Presen Recent	Stained Lea Fauna (B1 quatic Planten Sulfide ed Rhizosph ce of Redu Iron Reduc	l3) ts (B14) Odor (C1) neres on L ced Iron ( ction in Til	iving Roc C4)	ots (C3)	Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible of Stunted or Stresse	s (B6) (B10) Table (C2) C8) on Aerial Imagery (C d Plants (D1) on (D2)
YDROLO Wetland F Primary In Surfa High Satur Wate Sedin Drift [ Algal Iron [	dicators (minimum of the Water (A1) Water Table (A2) ation (A3) r Marks (B1) nent Deposits (B2) Deposits (B3)	of one is requ	Water-t Aquatic True Ac Hydrog Oxidize Presen Recent Thin Me	Stained Lead Fauna (B1 quatic Plant en Sulfide ed Rhizosph ce of Redu Iron Reducuck Surface	ts (B14) Odor (C1) heres on L ced Iron (ction in Til e (C7)	iving Roc C4)	ots (C3)	Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible of Stunted or Stresse Geomorphic Position	s (B6) (B10) Table (C2) C8) on Aerial Imagery (C d Plants (D1) on (D2)
YDROLO Wetland F Primary In Surfa High V Satur Wate Sedin Drift I Algal Iron I	dicators (minimum of the Water (A1) Water Table (A2) ation (A3) r Marks (B1) nent Deposits (B2) Deposits (B3) Mat or Crust (B4) Deposits (B5)	of one is requ	Water-s Aquatic True Ac Hydrog Oxidize Presen Recent Thin Mi Gauge	Stained Lea Fauna (B1 quatic Plan en Sulfide ed Rhizosph ce of Redu Iron Reducuck Surface or Well Da	ts (B14) Odor (C1) neres on L ced Iron (ction in Til e (C7) ta (D9)	iving Roc C4)	ots (C3)	Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible of Stunted or Stresse Geomorphic Position	s (B6) (B10) Table (C2) C8) on Aerial Imagery (C d Plants (D1) on (D2)
YDROLO Wetland F Primary In Surfa High V Satur Sedin Drift I Algal Iron I Inund Spars	dicators (minimum of the Water (A1) Water Table (A2) ation (A3) r Marks (B1) nent Deposits (B2) Deposits (B3) Mat or Crust (B4) Deposits (B5) lation Visible on Aeres	of one is requ	Water-s Aquatic True Ac Hydrog Oxidize Presen Recent Thin Mi Gauge	Stained Lea Fauna (B1 quatic Plan en Sulfide ed Rhizosph ce of Redu Iron Reducuck Surface or Well Da	ts (B14) Odor (C1) neres on L ced Iron (ction in Til e (C7) ta (D9)	iving Roc C4)	ots (C3)	Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible of Stunted or Stresse Geomorphic Position	s (B6) (B10) Table (C2) C8) on Aerial Imagery (C d Plants (D1) on (D2)
YDROLO Wetland F Primary In Surfa High ' Satura Wate Sedin Drift I Algal Iron I Inund Spars	dicators (minimum of the Water (A1) Water Table (A2) ation (A3) or Marks (B1) ment Deposits (B2) Deposits (B3) Mat or Crust (B4) Deposits (B5) lation Visible on Aerole Vegetated Concervations:	of one is requ rial Imagery (I cave Surface	Water-s Aquatic True Ac Hydrog Oxidize Presen Recent Thin Mi Gauge	Stained Lea: Fauna (B1 quatic Planten Sulfide d Rhizosph ce of Redu Iron Reduct uck Surface or Well Dat Explain in F	ts (B14) Odor (C1) neres on L ced Iron (ction in Til e (C7) ta (D9) Remarks)	iving Roc C4)	ots (C3)	Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible of Stunted or Stresse Geomorphic Position	s (B6) (B10) Table (C2) C8) on Aerial Imagery (C d Plants (D1) on (D2)
Primary In Surfa High V Satur Watee Sedin Drift I Algal Iron I Inund Spars  Field Obse	dicators (minimum of the Water (A1) Water Table (A2) ation (A3) The Marks (B1) The Marks (B1) The Marks (B3) Mat or Crust (B4) Deposits (B5) Ation Visible on Aerical Sely Vegetated Conservations: Water Present?	of one is requ rial Imagery (I cave Surface	Water-s Aquatic True Ac Hydrog Oxidize Presen Recent Thin Mi Gauge (B8) Other (	Stained Lea: Fauna (B1 quatic Plani en Sulfide ed Rhizosph ce of Redu Iron Redu uck Surface or Well Dai Explain in F	ts (B14) Odor (C1) neres on L ced Iron (i ction in Til e (C7) ta (D9) Remarks)	iving Roo C4) led Soils	ots (C3)	Surface Soil Crack: Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible of Stunted or Stresse Geomorphic Position FAC-Neutral Test (	s (B6) (B10) Table (C2) C8) on Aerial Imagery (C d Plants (D1) on (D2)

Remarks:

### WETLAND DETERMINATION DATA FORM - Midwest Region

	Project/Site: Red Maple Montpelier		City/	County: Oa	kland	Sampling Date: May 15	5, 2015
Landform (hillslope, terrace, etc.)  Lat: Long: Datum: Soli Map Unit Name: Houghton & Adrian Mukes Soli Map Unit Name: Houghton & Adrian Mukes Are climate? In yordrologic conditions on the site typical for this time of year? Yes_X_No_(If no, explain in Remarks.) Are Vegetation, Soil, or Hydrologysignificantly disturbanc? (If needed, explain any answers in Remarks.) Are Vegetation, Soil, or Hydrologynaturally problemate? (If needed, explain any answers in Remarks.)  SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.  Hydrophytic Vegetation Present?	Applicant/Owner: Odawa Devp.				State: Michigan	Sampling Point: 2V	V
Slope (%):	Investigator(s): CK		Secti	on, Townsh	nip, Range: Sec. 30, T1	N, R8E	
Slope (%):	Landform (hillslope, terrace, etc.)		Local reli	ef (concave	e, convex, none): none		
Note							
Ace claimatic / hydrologic conditions on the site typical for this time of year?   Yes_X_ No (If no, explain in Remarks.)							
Are Vegetation, Soil, or Hydrology significantly disturbed?							
Summary   Summ							Nο
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.  Hydrophytic Vegetation Present? Yes X No							
Hydrophylic Vegetation Present?	Are vegetation, 30ii, or rivulologyna	turally proble	matic:	(11 116	seded, explain any answ	ers in Remarks.)	
Hydric Soil Present?	SUMMARY OF FINDINGS – Attach site ma	p showing	g samplin	ıg point l	ocations, transect	ts, important featu	ures, etc.
Hydric Soil Present?	Lludranhutia Vagatatian Pracent?	V No					
Welland Hydrology Present?   Yes   X   No			IS	the Sample	ed Area		
Number of Dominant Species   Number of Domi				thin a Wetl	and? Yes _	No	_
VEGETATION - Use scientific names of plants.           Tree Stratum (Plot size:		<u>X</u> No _					
Absolute	Remarks:						
Absolute							
Absolute							
Absolute							
Tree Stratum (Plot size:	<b>VEGETATION -</b> Use scientific names of plants.						
1. Acer saccharinum (Maple,silver) 2. Acer nubrum (Maple,red) 3. Fraxinus pennsylvanica (Ash,green) 3. Lindera benzoin (Spicebush,northem) 3. Lindera benzoin (Spicebush,northem) 4. Salix nigra (Willow,black) 3. Lindera benzoin (Spicebush,northem) 4. Salix nigra (Buckthorn,glossy) 3. Lindera benzoin (Spicebush,northem) 4. Salix nigra (Buckthorn,glossy) 3. Lindera benzoin (Spicebush,northem) 4. Salix nigra (Buckthorn,glossy) 3. Lindera benzoin (Spicebush,northem) 4. Salix nigra (Willow,black) 5. Sapling/Shrub Stratum (Plot size: 2. Cornus amomum (Dogwood,silky) 3. Lindera benzoin (Spicebush,northem) 4. Salix nigra (Willow,black) 5. Sapling/Shrub Stratum (Plot size: 5. Sapling/Shrub Stratum (Plot size: 6. Sapling/Shrub Stratum (Plot size: 7. (B)  7. FACW 7. FACW 7. FACW 8. Salix nigra (Willow,black) 7. FACW 8. Salix nigra (Willow,black) 8. Salix nigra (Willow,black) 9. FACW 10. (A/B)  10. (B)  10. (A/B)  10. (B)  10. (A/B)  10. (B)  10. (A/B)  10. (B)  10. (A/B)  10. (B)  10. (A/B)  10. (B)  10. (A/B)				Indicator	Dominance Test wor	ksheet:	
2. Acer rubrum (Maple,red)       25       Y       FAC         3. Fraxinus pennsylvanica (Ash,green)       10       FACW         4. Salix nigra (Willow,black)       10       OBL         5. Sapling/Shrub Stratum       (Plot size:	I——— `     ——				Number of Deminary	t Chaoina	
Total Number of Dominant Species Across All Strata:							(A)
Salik nigra (Willow,black)	<u>'</u>						
Sapling/Shrub Stratum   (Plot size:							(D)
Sapling/Shrub Stratum (Plot size:					Species Across Air S	ilala. <u>1</u>	_ (D)
Sapling/Shrub Stratum   (Plot size:)		100	= Total Co	ver	Percent of Dominant	Species	
Rhamnus frangula (Buckthorn,glossy)   30	Capting/Chapte Chapters (District				That Are OBL, FACV	V, or FAC: 100	_ (A/B)
2.   Cornus amomum (Dogwood,silky)   15		30	V	FΔC	Prevalence Index wo	orksheet:	
3. Lindera benzoin (Spicebush,northern)         15         Y         FACW         OBL species         X 1 =           4         5         60         = Total Cover         FACW species         X 3 =         FACU species         X 4 =         UPL species         X 5 =         Column Totals:         (A)         (B)           1. Impatiens capensis (Touch-me-not,spotted)         20         Y         FACW         Column Totals:         (A)         (B)           2. Bidens frondosa (Beggar-ticks,devil's)         10         Y         FACW         Prevalence Index = B/A =         Hydrophytic Vegetation Indicators:         1 - Rapid Test for Hydrophytic Vegetation         Hydrophytic Vegetation Indicators:         1 - Rapid Test for Hydrophytic Vegetation         X 2 - Dominance Test is ≤ 3.0¹         X 2 - Dominance Test is ≤ 3.0¹         X 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)         Y 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)         Problematic Hydrophytic Vegetation¹ (Explain)           Woody Vine Stratum         (Plot size: )         1 - Total Cover         ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.         Hydrophytic Vegetation           Vegetation         Present?         Yes X No	<u>'</u>				Total % Cover of	Multiply by	<u>:                                    </u>
FAC species	3. Lindera benzoin (Spicebush,northern)	15	Υ		OBL species	x 1 =	
Herb Stratum   (Plot size:	4						
Herb Stratum (Plot size:)   1. Impatiens capensis (Touch-me-not,spotted)   20	5						
Herb Stratum (Plot size:		60	= Total Co	ver	FACU species	X 4 =	
1. Impatiens capensis (Touch-me-not,spotted)         20         Y         FACW         Column Totals:         (A)         (B)           2. Bidens frondosa (Beggar-ticks,devil's)         10         Y         FACW         Prevalence Index = B/A =         Hydrophytic Vegetation Indicators:         1 - Rapid Test for Hydrophytic Vegetation           5.         1 - Rapid Test for Hydrophytic Vegetation         X 2 - Dominance Test is > 50%         3 - Prevalence Test is ≤ 3.0¹         X 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)         Problematic Hydrophytic Vegetation¹ (Explain)           10.         30         = Total Cover         ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.         Hydrophytic Vegetation Present?         Yes X No	Herb Stratum (Plot size:				UPL species	<del></del>	
Prevalence Index = B/A =   Hydrophytic Vegetation Indicators:   1 - Rapid Test for Hydrophytic Vegetation		20	Υ	FACW	Column Totals:	(A)	(B)
4.       Hydrophytic Vegetation Indicators:	2. Bidens frondosa (Beggar-ticks,devil's)	10	Υ	FACW			
5.       1 - Rapid Test for Hydrophytic Vegetation         6.       X 2 - Dominance Test is > 50%         7.       3 - Prevalence Test is ≤ 3.0¹         8.       X 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)         9.       Problematic Hydrophytic Vegetation¹ (Explain)         10.       Problematic Hydrophytic Vegetation¹ (Explain)         1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.       Hydrophytic Vegetation         1 Present?       Yes X No							
6.							<b>.</b>
7	6						[]
8	7						
9 data in Remarks or on a separate sheet) 10 Problematic Hydrophytic Vegetation¹ (Explain)  Woody Vine Stratum (Plot size: ) 1 1	l o						supporting
Woody Vine Stratum (Plot size: )  1.	9				data in Remar	ks or on a separate she	eet)
Woody Vine Stratum (Plot size: )  1.	10				Problematic Hydr	ophytic Vegetation <sup>1</sup> (Ex	(plain)
Woody Vine Stratum (Plot size:) 1		30	= Total Co	ver	<sup>1</sup> Indicators of hydric s	oil and wetland hydrolo	av must
1 Hydrophytic Vegetation 2 0 = Total Cover	Woody Vine Stratum (Plot size: )				be present, unless dis	sturbed or problematic.	gy muot
2							
	1 -					Yes X No	
Remarks: (Include photo numbers here or on a separate sheet.)		0	= Total Co	ver		<del></del>	
	Remarks: (Include photo numbers here or on a separate	e sheet.)			•		

Depth		to the dept	h needed to docu			r confir	n the absen	ice of indicators.)
(inches)	Matrix Color (moist)	%	Color (moist)	edox Featur %	es Type <sup>1</sup>	Loc <sup>2</sup>	_ Texture	Remarks
0-18	10YR2/1	100	Color (molot)		N/A	N/A	N/A	Tromano
								<u> </u>
				-		-	<u> </u>	
ype: C=C	oncentration, D=Dep	oletion, RM=	Reduced Matrix, C	S=Covered	or Coate	d Sand G	Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
-	Indicators:						Indic	cators for Problematic Hydric Soils <sup>3</sup> :
	sol (A1)			yed Matrix	(S4)			Coast Prairie Redox (A16)
	Epipedon (A2)		Sandy Red				_X	Dark Surface (S7)
	Histic (A3)		Stripped M		. (=4)			Iron-Mangenese Masses (F12)
	ogen Sulfide (A4)			icky Minera				Very Shallow Dark Surfaces (TF12)
	fied Layers (A5)			eyed Matrix	(F2)		X	Other (Explain in Remarks)
	Muck (A10)	food (A11)	Depleted N	viatrix (F3) rk Surface (	E6)			
	eted Below Dark Sur Dark Surface (A12)	. ,		Dark Surface (	,			
	y Mucky Mineral (S1			pressions (F				cators of Hydrophytic vegetation and
	Mucky Peat or Peat		Redox Del	pressions (i	0)			etland hydrology must be present, unless sturbed or problematic.
	macky . cat c cat	(00)					uis	nuibed of problematic.
estrictive	Layer (if observed)						uis	natibed of problematic.
estrictive Type: Depth (ir	Layer (if observed)				Hyd	ric Soil I	Present?	Yes X No
estrictive Type: Depth (ir	Layer (if observed)				Hyd	ric Soil F		·
estrictive Type: Depth (ir emarks: apric	Layer (if observed) inches):	:			Hyd	ric Soil F		·
estrictive Type: Depth (ir emarks: apric	Layer (if observed)	:			Hyd	ric Soil F	Present?	·
Type:	Layer (if observed) nches):  OGY drology Indicators: cators (minimum of o	:				ric Soil F	Present?	Yes X No  condary Indicators (minimum of two requestions Surface Soil Cracks (B6)
estrictive Type: Depth (ir emarks: apric  /DROLO /etland Hy rimary Indi X Surface	DGY rdrology Indicators: cators (minimum of ce Water (A1)	:	X Water-St	ained Leav	es (B9)	ric Soil F	Present?	Yes X No  condary Indicators (minimum of two requestrates Soil Cracks (B6) Drainage Patterns (B10)
estrictive Type: Depth (ir emarks: apric  /DROLO /etland Hy /rimary Indi X Surface X High W	DGY Idrology Indicators: Cators (minimum of ce Water (A1) Vater Table (A2)	:	X Water-St X Aquatic F	ained Leav auna (B13	es (B9)	ric Soil F	Present?	Yes X No  condary Indicators (minimum of two requestrates Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2)
rimary Indi X Surface X High W X Saturat X Water I	DGY Idrology Indicators: Cators (minimum of of the Water (A1) Vater Table (A2) Cion (A3) Marks (B1)	:	X Water-St X Aquatic F True Aqu Hydrogei	rained Leav Fauna (B13 uatic Plants n Sulfide Oo	es (B9) ) (B14) dor (C1)		Se   X   X   X	condary Indicators (minimum of two requestions Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C
rimary Indi X Surface X Saturat X Sedime	Aches):  OGY  Ordrology Indicators: Cators (minimum of of ewater (A1) Vater Table (A2) Cion (A3) Marks (B1) Ent Deposits (B2)	:	X Water-St X Aquatic F True Aqu Hydroger X Oxidized	ained Leav Fauna (B13 Jatic Plants In Sulfide Oo Rhizosphe	es (B9) ) (B14) dor (C1) res on Liv	ing Roots	Se   X   X   S (C3)   S (C3)	Condary Indicators (minimum of two requestions Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C Stunted or Stressed Plants (D1)
rimary Indi X Surface X Saturat X Sedime X Drift De X Sedime X Drift De	Action (A3) Marks (B1) ent Deposits (B2) eposits (B3)	:	X Water-St X Aquatic F True Aqu Hydroger X Oxidized Presence	ained Leav Fauna (B13 uatic Plants n Sulfide Oo Rhizosphe e of Reduce	es (B9) ) (B14) dor (C1) res on Liv	ing Roots	Se   X   X   X   S (C3)   X   X   X   X   X   X   X   X   X	Condary Indicators (minimum of two requestions of two requestions)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C8)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
rimary Indi  Surface  Williams  Will	Aches):  OGY  Ordrology Indicators: Cators (minimum of ote Water (A1) Valer Table (A2) Valer (B1) Pent Deposits (B2) Peposits (B3) Ilat or Crust (B4)	:	X Water-St X Aquatic F True Aqu Hydroger X Oxidized Presence	ained Leav Fauna (B13 Jatic Plants In Sulfide Oo Rhizosphe In Geduce In Reduce	es (B9) ) (B14) dor (C1) res on Liv ed Iron (C4)	ing Roots	Se   X   X   X   S (C3)   X   X   X   X   X   X   X   X   X	Condary Indicators (minimum of two requestions Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C Stunted or Stressed Plants (D1)
Estrictive Type: Depth (ir Emarks: Apric  DROLO  Tetland Hy Firmary Indi Surface High W Surface Water I Water I Sedime Unified Drift De Algal M Iron De Inundati	Aches):  OGY  Ordrology Indicators: Cators (minimum of ore Water (A1) Vater Table (A2) Vater Table (A2) Vater Deposits (B3) Vater Deposits (B3) Vater Crust (B4) Vater (B5) Vate	: one is requir	X Water-St X Aquatic F True Aqu Hydrogei X Oxidized Presence Recent In X Thin Muc 7) Gauge o	ained Leav Fauna (B13 Jatic Plants In Sulfide Oo Rhizosphe In Geduce In Reducting In Well Data	es (B9) ) (B14) dor (C1) res on Liv dd Iron (C4) on in Tille (C7) (D9)	ing Roots	Se   X   X   X   S (C3)   X   X   X   X   X   X   X   X   X	Condary Indicators (minimum of two requestions of two requestions)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C8)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Estrictive Type: Depth (ir Emarks: Apric  Dretland Hy Fimary Indi Surface High W Surface User I Sedime User I Sedi	DGY  Inches):  I	: one is requir	X Water-St X Aquatic F True Aqu Hydrogei X Oxidized Presence Recent In X Thin Muc 7) Gauge o	ained Leav Fauna (B13 Jatic Plants In Sulfide Oo Rhizosphe In Geduce In Reducting In Well Data	es (B9) ) (B14) dor (C1) res on Liv dd Iron (C4) on in Tille (C7) (D9)	ing Roots	Se   X   X   X   S (C3)   X   X   X   X   X   X   X   X   X	Condary Indicators (minimum of two requestions of two requestions)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C8)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
rype:	DGY Inches):  In	: one is requir I Imagery (B	X Water-St X Aquatic F True Aqu Hydroger X Oxidized Presence Recent Ir X Thin Muc 7) Gauge o Other (E:	ained Leav Fauna (B13 uatic Plants n Sulfide Oo Rhizosphe e of Reduce ron Reducti ck Surface ( r Well Data xplain in Re	es (B9) ) (B14) dor (C1) res on Lived Iron (C4) on in Tille C7) (D9) emarks)	ing Roots	Se   X   X   X   S (C3)   X   X   X   X   X   X   X   X   X	Condary Indicators (minimum of two requestions of two requestions)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C8)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
/DROLO //DROLO	Aches):  OGY  Ordrology Indicators: Cators (minimum of of the Water (A1) Idea Table (A2) Cition (A3) Marks (B1) Ent Deposits (B2) Exposits (B3) Illat or Crust (B4) Exposits (B5) Ition Visible on Aerial Illy Vegetated Concavivations: Cater Present?	: one is require I Imagery (B ve Surface (	X Water-St X Aquatic F True Aqu Hydroger X Oxidized Presence Recent In X Thin Muc 7) Gauge o B8) Other (Ex	ained Leav Fauna (B13 uatic Plants n Sulfide Oo Rhizosphe e of Reduce ron Reducti ck Surface ( r Well Data xplain in Re	es (B9) ) (B14) dor (C1) res on Lived Iron (C4) on in Tille C7) (D9) emarks)	ing Roots	Se   X   X   X   S (C3)   X   X   X   X   X   X   X   X   X	Condary Indicators (minimum of two requestions of two requestions)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery (C8)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
rype:	Aches):  OGY  Ordrology Indicators: Cators (minimum of order (A1) Vater Table (A2) Vater Table (A2) Vater Deposits (B1) Vater Deposits (B3) Vater Crust (B4) Veposits (B5)	: one is requir one Surface ( es X No	X Water-St X Aquatic F True Aqu Hydroger X Oxidized Presence Recent Ir X Thin Muc 7) Gauge o Other (E:	ained Leav Fauna (B13 uatic Plants in Sulfide Or Rhizosphe e of Reduce ron Reducti ck Surface ( ir Well Data explain in Re  es): 12-30 es): 2"	es (B9) ) (B14) dor (C1) res on Lived Iron (C4) on in Tille C7) (D9) emarks)	ing Roots 4) d Soils (0	Se   X   X   X   S (C3)   X   X   X   X   X   X   X   X   X	Condary Indicators (minimum of two requestions)  Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C3) Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)
rimary Indi C Sedime C Sedime C Sedime C Sedime C Signal Water I C Sparse C Surface C Sedime	Aches):  OGY  Ordrology Indicators: Cators (minimum of order (A1) Vater Table (A2) Vater Table (A2) Vater Deposits (B1) Vater Deposits (B3) Vater Crust (B4) Veposits (B5)	: one is requir one Surface ( es X No	X Water-St X Aquatic F True Aqu Hydroger X Oxidized Presence Recent In X Thin Muc 7) Gauge o B8) Other (Ex	ained Leav Fauna (B13 uatic Plants in Sulfide Or Rhizosphe e of Reduce ron Reducti ck Surface ( ir Well Data explain in Re  es): 12-30 es): 2"	es (B9) ) (B14) dor (C1) res on Lived Iron (C4) on in Tille C7) (D9) emarks)	ing Roots 4) d Soils (0	Se   X   X   X   S (C3)   X   X   X   X   X   X   X   X   X	Condary Indicators (minimum of two requestions)  Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C) Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)

### WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Red Maple Montpelier		Cit	y/County: Oa	kland	Sampling Da	te: <u>May 15,</u>	2015
Applicant/Owner: Odawa Devp.				State: Michigan	Sampling	g Point: 2U	
Investigator(s): CK		Sec	ction, Townsh	ip, Range: Sec. 30, T	1N, R8E		
Landform (hillslope, terrace, etc.)		_ Local re	elief (concave	, convex, none): none			
Slope (%): Lat:		Loi	ng:	Dat	um:		
Soil Map Unit Name: Matherton sandy loam				NWI Classification:			
Are climatic / hydrologic conditions on the site typical for t	his time of ye	ear?	Yes X No	o(If no, explain in	Remarks.)		
Are Vegetation, Soil, or Hydrologysig	nificantly dis	turbed?	Are "	Normal Circumstances	s" present? `	Yes X	No
Are Vegetation, Soil, or Hydrologynat	urally proble	matic?	(If ne	eded, explain any ans	wers in Rema	rks.)	
SUMMARY OF FINDINGS – Attach site map	p showing	g sampl	ing point l	ocations, transed	cts, import	ant featu	res, etc.
Hydrophytic Vegetation Present? Yes	No	х					
	No No		s the Sample within a Wetl		N	n x	
_	No _			<u> </u>	''	<u> </u>	
Remarks:							
VEGETATION - Use scientific names of plants.							
	Absolute	Dominar	nt Indicator	Dominance Test wo	orksheet:		
Tree Stratum (Plot size:)	% Cover	Species'	? Status				
1. Prunus serotina (Cherry,black)	30	Y		Number of Domina That Are OBL, FAC		5	(A)
Tilia americana (Basswood,american)     Carya ovata (Hickory,shag-bark)	20 10	Y	FACU_ FACU				. (- ')
4.			1700	Total Number of Do		1	(D)
5.				Species Across All	Strata.	1	(B)
	60	= Total C	Cover	Percent of Dominar That Are OBL, FAC		20	(A/B)
Sapling/Shrub Stratum (Plot size:)  1. Rhamnus cathartica (Buckthorn,common)	20	Υ	FACU	Prevalence Index w	orksheet:		
Carpinus caroliniana (Hornbeam,american)	15	<u>'</u> Y	FAC	Total % Cover of	of:	Multiply by:	
Hamamelis virginiana (Witch-hazel,american)	15	Υ	FACU			1 = 0	
4.	·			FACW species(		2 = 0	
5	50	= Total C	`ovor	FAC species		3 = 45	_
		- Total C	ovei	FACU species 9		4 = 380	_
Herb Stratum (Plot size:)						5 = 0	(B)
1	<del></del>			Column Totals.	110 (	(A) <u>425</u>	(B)
2. 3.				Dravala	naa Inday - D	// - 2.06	
4.				Hydrophytic Vegetat	nce Index = B/ tion Indicator		
5.				1 - Rapid Test fo	or Hydrophytic	: Vegetation	
6				2 - Dominance 1	Γest is > 50%		
7. 8.	<del></del>			3 - Prevalence T		1 (Day data a	
9.		-		4 - Morphologica	ai Adaptations arks or on a se		
10.				Problematic Hyd		•	,
	0	= Total C	Cover	1			
Woody Vine Stratum (Plot size:)				<sup>1</sup> Indicators of hydric be present, unless d <b>Hydrophytic</b>	isturbed or pro	oblematic.	y must
1.	·			Vegetation			v
2		= Total C	:over	Present?	Yes	No _	<u>X</u>
Remarks: (Include photo numbers here or on a separate		- Total C	OVEI				
remarks. (molude proto numbers here of on a separate	e sneet.)						

SOIL Sampling Point: 2U Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Redox Features Depth Matrix Loc<sup>2</sup> Color (moist) Texture \_\_\_\_ (inches) Color (moist) % Type<sup>1</sup> 10YR5/4 N/A N/A 8-0 N/A 10YR4/4 N/A N/A N/A 9-18 <sup>2</sup>Location: PL=Pore Lining, M=Matrix. <sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Hvdric Soil Indicators:** Indicators for Problematic Hydric Soils<sup>3</sup>: Histosol (A1) Sandy Gleyed Matrix (S4) Coast Prairie Redox (A16) Histic Epipedon (A2) Sandy Redox (S5) Dark Surface (S7) Stripped Matrix (S6) Iron-Mangenese Masses (F12) Black Histic (A3) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Surfaces (TF12) Other (Explain in Remarks) Stratified Layers (A5) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) 2 cm Muck (A10) Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) <sup>3</sup>Indicators of Hydrophytic vegetation and Sandy Mucky Mineral (S1) Redox Depressions (F8) wetland hydrology must be present, unless 5 cm Mucky Peat or Peat (S3) disturbed or problematic. Restrictive Layer (if observed): Type: **Hydric Soil Present?** Yes \_\_\_\_\_ No \_\_X Depth (inches): Remarks: **HYDROLOGY** Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6) Surface Water (A1) Water-Stained Leaves (B9) Drainage Patterns (B10) High Water Table (A2) Aquatic Fauna (B13) Dry-Season Water Table (C2) Saturation (A3) True Aquatic Plants (B14) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Stunted or Stressed Plants (D1) Drift Deposits (B3) Presence of Reduced Iron (C4) Geomorphic Position (D2) Algal Mat or Crust (B4) FAC-Neutral Test (D5) Recent Iron Reduction in Tilled Soils (C6) Iron Deposits (B5) Thin Muck Surface (C7) Inundation Visible on Aerial Imagery (B7) Gauge or Well Data (D9) Sparsely Vegetated Concave Surface (B8) Other (Explain in Remarks) Field Observations: Surface Water Present? Yes \_\_\_ No X Depth (inches): Yes \_\_\_ No X Depth (inches): Water Table Present? Wetland Hydrology Present? Yes No X Yes \_\_\_ No X Depth (inches): Saturation Present? (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

2 Upland - test plot

### WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Red Maple Montpelier			Ci	ty/County: Oa	kland	Sampling Date:	Jul 22, 2015		
Applicant/Owner: Odawa Devp.			State: Michigan Sampling Point: 3W						
Investigator(s): CK									
Landform (hillslope, terrace, etc.)									
Slope (%): Lat:	Datum:								
Soil Map Unit Name: Gf - Gilford sandy loam									
Are climatic / hydrologic conditions on the site typic	<del>-</del>								
Are Vegetation, Soil, or Hydrology	<del></del>	<del></del>							
Are Vegetation, Soil _X_, or Hydrology		eeded, explain any ansv							
SUMMARY OF FINDINGS – Attach site									
	.,	V N							
		X No _		Is the Sample					
		X No _		within a Wetl					
	Yes _	<u>X</u> No _							
Remarks:									
<b>VEGETATION</b> - Use scientific names of plants	:								
Control of the contro		Λ h = = l · · 4 =	Damina	mt loodinatas	Dominance Test wo	rksheet			
Tree Stratum (Plot size: )		Absolute % Cover		nt Indicator ? Status	Dominarios rest wo	Ronou.			
Acer saccharinum (Maple,silver)		30		FACW	Number of Dominan		(4)		
2. Acer rubrum (Maple,red)		20	Y	FAC	That Are OBL, FAC	W, or FAC: 8	(A)		
Ulmus americana (Elm,american)		10		FACW	Total Number of Do	minant			
4					Species Across All S		(B)		
5		60	= Total (	Cover					
		00	= Total C	Jover	Percent of Dominan That Are OBL, FAC		)O (A/P)		
Sapling/Shrub Stratum (Plot size:	)				That Are Obl., I Act	77, 01 1 AC. 10	<u>10 (A/B)</u>		
Rhamnus frangula (Buckthorn,glossy)		30	Y	FAC	Prevalence Index wo Total % Cover o		Itinhy by:		
Lindera benzoin (Spicebush,northern)		20	Y	FACW			ltiply by:		
3. Salix bebbiana (Willow,bebb)		15	Y	FACW	OBL species FACW species		=		
4 5.					FACW species				
5		65	= Total (	Cover	FAC species  FACU species	X3 - X4 =	=		
					UPL species				
Herb Stratum (Plot size:)					Column Totals:	(A)			
Impatiens capensis (Touch-me-not,spotted)		20	<u>Y</u>		Column Totals.	(^)	(B)		
Glyceria striata (Grass,fowl manna)     Lycopus americanus (Bugleweed,american)		10 10	Y	OBL OBL	Decorates	and Indian D/A			
1				UBL	Hydrophytic Vegetati	ce Index = B/A =	<u> </u>		
5.					1 - Rapid Test for		egetation		
6.					X 2 - Dominance To		9-1-1-1		
7.					3 - Prevalence To				
8					X 4 - Morphologica				
9						rks or on a sepa	,		
10					Problematic Hydi	rophytic Vegetat	ion¹ (Explain)		
		40	= Total (	Cover	<sup>1</sup> Indicators of hydric s	soil and wetland	hydrology must		
Woody Vine Stratum (Plot size: )			be present, unless di						
1					Hydrophytic Vegetation				
2.					Present?	Yes X	No		
		0	= Total 0	Cover					
Remarks: (Include photo numbers here or on a separate sheet.)									

	ription: (Describe t	o the dent	h needed to	docum	ent the in	dicator o	r confirm	n the absen	Sampling Point: 3W			
Depth	Matrix				lox Feature			_	·			
(inches)	Color (moist)	%	Color (mo	oist)	<u>%</u>	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks			
0-11	10YR2/1					N/A	N/A	N/A				
11-18	10YR3/1					N/A	N/A	N/A				
								-	<del>-</del>			
									_			
/pe: C=Co	oncentration, D=Dep	letion, RM=	Reduced Ma	atrix, CS	=Covered	or Coate	d Sand G	Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matr			
dric Soil I	ndicators:							Indic	ators for Problematic Hydric Soils			
Histos	ol (A1)		Sar	dy Gley	ed Matrix (	S4)			Coast Prairie Redox (A16)			
Histic Epipedon (A2) Sandy Redox (S5)						X	Dark Surface (S7)					
Black Histic (A3) Stripped Matrix (S6)					atrix (S6)		Iron-Mangenese Masses					
Hydrogen Sulfide (A4) X Loamy Mucky Mineral												
Stratifi	ied Layers (A5)		Loa	my Gley	ed Matrix (	(F2)	Other (Explain in Remarks)					
	Muck (A10)				atrix (F3)							
	ted Below Dark Surf	ace (A11)			Surface (F	,						
	Dark Surface (A12)		Dep	leted Da	ark Surface	e (F7)		<sup>3</sup> Indic	cators of Hydrophytic vegetation and			
Sandy	Mucky Mineral (S1	)	Rec	lox Depr	ressions (F	8)	wetland hydrology must be present, ur					
5 cm N	Mucky Peat or Peat	(S3)						dist	turbed or problematic.			
	ayer (if observed):											
Type:	ches):					Hyd	ric Soil F	Present?	Yes X No			
Type: Depth (independent) emarks:	ches):		_			Hyd	ric Soil F	Present?	Yes X No			
DROLOG etland Hyd Surface High Water M Sedimer Drift Dep Algal Ma	GY drology Indicators: eators (minimum of c Water (A1) ater Table (A2)		X W Ac Tr Hy X O:	ater-Stai quatic Fa ue Aqua /drogen kidized F esence ecent Iro	ined Leave auna (B13) atic Plants ( Sulfide Od Rhizospher of Reduce on Reductio	es (B9) (B14) lor (C1) res on Liv d Iron (C4) on in Tille	ring Roots	Sec   X	Condary Indicators (minimum of two results)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  FAC-Neutral Test (D5)			
DROLOGETIAND WATER TO THE PROPERTY OF THE PROP	GY  drology Indicators: cators (minimum of compared to the com	ne is requir	X   W   Ad   Ad   Tr   Hy   X   Oo   Oo   Oo   Tr   Fr   Fr   Fr   Tr   Tr   Tr   Fr   Tr   Fr   Tr   T	ater-Stai quatic Fa ue Aqua /drogen kidized F esence ecent Iro nin Muck auge or N	ined Leave auna (B13) atic Plants ( Sulfide Od Rhizospher of Reduced	es (B9) (B14) (lor (C1) res on Liv d Iron (C4 on in Tille C7) (D9)	ring Roots	Sec   X	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2)			
DROLOG etland Hyc Surface High Wa Saturatic Water M Sedimer Drift Dep Algal Ma Iron Dep Inundati	GY  drology Indicators: cators (minimum of compared to the com	ne is requir	X   W   Ad   Ad   Tr   Hy   X   Oo   Oo   Oo   Tr   Fr   Fr   Fr   Tr   Tr   Tr   Fr   Tr   Fr   Tr   T	ater-Stai quatic Fa ue Aqua /drogen kidized F esence ecent Iro nin Muck auge or N	ined Leave auna (B13) httic Plants ( Sulfide Od Rhizospher of Reduce on Reduction Surface (Well Data (	es (B9) (B14) (lor (C1) res on Liv d Iron (C4 on in Tille C7) (D9)	ring Roots	Sec   X	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2)			
DROLOGETANDERS  DROLOGETANDERS  DROLOGETANDERS  DROLOGETANDERS  Surface  High Wa  Saturation  Water M  Sedimer  Drift Dep  Algal Ma  Iron Dep  Inundation  Sparsely	GY drology Indicators: eators (minimum of of water (A1) eater Table (A2) on (A3) darks (B1) ent Deposits (B2) posits (B3) eat or Crust (B4) eators (B5) en Visible on Aerial by Vegetated Concaverations:	lmagery (B e Surface (	X   W   Ad   Ad   Tr   Hy   X   Oo   Oo   Oo   Tr   Fr   Fr   Fr   Tr   Tr   Tr   Fr   Tr   Fr   Tr   T	ater-Stai quatic Fa ue Aqua drogen kidized F esence ecent Iro in Muck auge or \ her (Exp	ined Leave auna (B13) stic Plants ( Sulfide Od Rhizospher of Reduce in Reductic s Surface ( Well Data ( blain in Rer	es (B9) (B14) (lor (C1) res on Liv d Iron (C4 on in Tille C7) (D9)	ring Roots	Sec   X	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2)			
DROLOGETANDERS  DROLOGETANDERS  DROLOGETANDERS  DROLOGETANDERS  Surface  High Wa  Saturation  Water M  Sedimer  Drift Dep  Algal Ma  Iron Dep  Inundation  Sparsely	GY  drology Indicators: cators (minimum of content of c	Imagery (B e Surface (	X   W   Ad   Ad   Tr   Hy   X   Oi   Pr   Re   X   Tr   Tr   Ga   B8)   Oi	ater-Stai quatic Fa ue Aqua /drogen kidized F esence ecent Iro hin Muck auge or V ther (Exp	ined Leave auna (B13) atic Plants ( Sulfide Od Rhizospher of Reduced on Reductic Surface (G Well Data ( Dain in Rer	es (B9) (B14) (lor (C1) res on Liv d Iron (C4 on in Tille C7) (D9)	ring Roots 4) d Soils (C	Sec   X	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)			
DROLOG etland Hyc Surface High Wa Saturatic Water M Sedimer Drift Dep Algal Ma Iron Dep Inundatic Sparsely Surface Water Table Saturation F	GY  drology Indicators: cators (minimum of content of c	Imagery (B e Surface ( s <u>X</u> No s <u>X</u> No	X   W   Ad   Ad   Tr   Hy   X   Oo   Oo   Tr   Fr   Fr   Fr   Fr   Fr   Fr   Fr	ater-Stai quatic Fa ue Aqua /drogen kidized F esence ( ecent Iro hin Muck auge or V ther (Exp	ined Leave auna (B13) atic Plants ( Sulfide Od Rhizospher of Reduce on Reductic Surface (( Well Data ( Dain in Rer  S): 12"	es (B9) (B14) (lor (C1) res on Liv d Iron (C4 on in Tille C7) (D9)	ring Roots 4) d Soils (C	Sec   X	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2)			

### WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Red Maple Montpelier	City	City/County: Oakland Sampling Date: Jul 22, 2015							
Applicant/Owner: Odawa Devp.			State: Michigan	Sampling Point: 3U					
Investigator(s): CK		Sec	ction, Townsh	ip, Range: Sec. 30, T	1N, R8E				
Landform (hillslope, terrace, etc.)									
		Long: Datum:							
Soil Map Unit Name: Matherton sandy loam									
Are climatic / hydrologic conditions on the site typical for									
Are Vegetation, Soil, or Hydrologysig	turbed?	ed? Are "Normal Circumstances" present? Yes X							
Are Vegetation, Soil, or Hydrologyna	turally proble	matic?	(If ne	eded, explain any ans	wers in Remark	ks.)			
SUMMARY OF FINDINGS – Attach site ma	p showin	g sampli	ing point l	ocations, transec	ts, importa	nt featur	res, etc.		
Hydrophytic Vegetation Present? Yes _	X								
	No	Is the Sampled Area							
<u> </u>									
Remarks:	Vetland Hydrology Present? Yes No								
VEGETATION - Use scientific names of plants.									
	Absolute	Dominan	t Indicator	Dominance Test wo	orksheet:				
Tree Stratum (Plot size: )	% Cover								
1. Tilia americana (Basswood,american)	20	Y		Number of Dominar					
2. Acer negundo (Box-elder)	15	Υ		That Are OBL, FAC	W, or FAC: _	8	(A)		
Prunus serotina (Cherry,black)	15	Y	FACU	Total Number of Do	ominant				
4				Species Across All		3	(B)		
5	50				_				
	= Total C	over	Percent of Dominant Species That Are OBL, FACW, or FAC:37.5 (A/B)						
Sapling/Shrub Stratum (Plot size:)							. ` '		
Rhamnus cathartica (Buckthorn,common)	40	Y	FACU	Prevalence Index w Total % Cover of		fultiply by:			
2. Carpinus caroliniana (Hornbeam,american)		Y	FAC	-		I = 0			
3. Elaeagnus angustifolia (Olive,russian)	20	<u>Y</u>	<u>FACU</u>	FACW species 1		2 = 30			
4 5.		-					_		
J	80 = Total Cover			FAC species 30 X 3 = 90 FACU species 110 X 4 = 440					
Herb Stratum (Plot size:)				· —	5 X 5				
Geranium maculatum (Crane's-bill,purple)	15	Y	<u>FACU</u>	Column Totals: 1	160 (A	A) <u>585</u>	(B)		
2. Rumex crispus (Dock,curly)	10	Y	FAC						
3. Trillium erectum (Trillium,purple)	5		UPL		nce Index = B/A				
4 5.		-		Hydrophytic Vegetat					
6	<del>-</del>		<del></del>	1 - Rapid Test fo		vegetation			
7.	<del></del>	-	2 - Dominance Test is > 50%  3 - Prevalence Test is ≤ 3.0¹						
8.		-		4 - Morphologica		(Provide s	upportina		
9.					arks or on a sep				
10			Problematic Hydrophytic Vegetation <sup>1</sup> (Exp			lain)			
	30	= Total C	over	1, ,, , , , , , , , , , , , , , , , , ,					
Manda Vina Charles (Diet sine)			<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.						
Woody Vine Stratum (Plot size:) 1.				Hydrophytic					
	<del>-</del>		<del></del>	Vegetation	Vos	No	<b>v</b>		
2			Present? Yes   otal Cover			No _	<u>X</u>		
Remarks: (Include photo numbers here or on a separate	- VOI								
Tremains. (morage prote numbers here of on a separate	o sneet.)								

SOIL Sampling Point: 3U Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Redox Features Depth Matrix Loc<sup>2</sup> Color (moist) Texture \_\_\_\_ (inches) Color (moist) % Type<sup>1</sup> 10YR3/2 N/A N/A 8-0 N/A N/A N/A N/A 8-18 10YR5/2 <sup>2</sup>Location: PL=Pore Lining, M=Matrix. <sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Hvdric Soil Indicators:** Indicators for Problematic Hydric Soils<sup>3</sup>: Histosol (A1) Sandy Gleyed Matrix (S4) Coast Prairie Redox (A16) Histic Epipedon (A2) Sandy Redox (S5) Dark Surface (S7) Stripped Matrix (S6) Iron-Mangenese Masses (F12) Black Histic (A3) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Surfaces (TF12) Other (Explain in Remarks) Stratified Layers (A5) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) 2 cm Muck (A10) Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) <sup>3</sup>Indicators of Hydrophytic vegetation and Sandy Mucky Mineral (S1) Redox Depressions (F8) wetland hydrology must be present, unless 5 cm Mucky Peat or Peat (S3) disturbed or problematic. Restrictive Layer (if observed): Type: **Hydric Soil Present?** Yes \_\_\_\_\_ No \_\_X Depth (inches): Remarks: **HYDROLOGY** Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6) Surface Water (A1) Water-Stained Leaves (B9) Drainage Patterns (B10) High Water Table (A2) Aquatic Fauna (B13) Dry-Season Water Table (C2) Saturation (A3) True Aquatic Plants (B14) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Stunted or Stressed Plants (D1) Drift Deposits (B3) Presence of Reduced Iron (C4) Geomorphic Position (D2) Algal Mat or Crust (B4) FAC-Neutral Test (D5) Recent Iron Reduction in Tilled Soils (C6) Iron Deposits (B5) Thin Muck Surface (C7) Inundation Visible on Aerial Imagery (B7) Gauge or Well Data (D9) Sparsely Vegetated Concave Surface (B8) Other (Explain in Remarks) Field Observations: Surface Water Present? Yes \_\_\_ No X Depth (inches): Yes \_\_\_ No X Depth (inches): Water Table Present? Wetland Hydrology Present? Yes \_\_\_\_ No X Yes \_\_\_ No X Depth (inches): Saturation Present? (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Upland 3 - sample plot