

*Our Mission is to Provide Quality Public Services in a Fiscally Responsible
Manner While Preserving the City's Open Space Character*

NOTICE OF MEETING
City Council Meeting
Tuesday, August 19, 2014 7:00 P.M.
City of Lake Elmo | 3800 Laverne Avenue North
AGENDA

- A. Call to Order**
- B. Pledge of Allegiance**
- C. Roll Call**
- D. Order of Business**
- E. Approval of Agenda**
- F. Accept Minutes**
 - 1. Accept July 15, 2014 City Council Meeting Minutes
- G. Council Reports**
 - Mayor
 - Council
- H. Presentations/Public Comments/Inquiries**
- I. Finance Consent Agenda**
 - 2. Approve Payment of Disbursements and Payroll
 - 3. Accept Financial Report dated July 31, 2014
 - 4. Accept Building Report dated July 31, 2014
 - 5. Accept City Assessor Report dated July 31, 2014
 - 6. Pumphouse No. 4 Improvements – Pay Requests No. 3
 - 7. 2014 Street Improvements – Pay Request No. 1
 - 8. Lake Elmo Watermain Improvements – Pay Request No. 1
 - 9. Purchasing Policy
- J. Regular Agenda**
 - 10. Village East Trunk Sanitary Sewer: UP Rail to TH 5 – Improvements Hearing and Order Improvement; ***Resolution No. 2014-62***
 - 11. 39th Street N: Street & Sanitary Sewer Improvements (Village East) – Accept Bids and Award Contract; ***Resolution No. 2014-63***
 - 12. Inwood Creek EAW – Authorize for Distribution
 - 13. 3880 Laverne Ave. Lease for Additional Municipal Space
- K. Staff Reports and Announcements**
 - City Administrator
 - City Attorney
 - Planning Director
 - City Engineer
 - Finance Director
 - City Clerk
- L. Adjourn**

LAKE ELMO CITY COUNCIL MINUTES

JULY 15, 2014

CITY OF LAKE ELMO CITY COUNCIL MINUTES JULY 15, 2014

Mayor Pearson called the meeting to order at 7:01 pm.

PRESENT: Mayor Mike Pearson and Council Members Wally Nelson, Anne Smith, Justin Bloyer, and Mike Reeves

Staff present: City Administrator Zuleger, City Attorney Snyder, Community Development Director Klatt, City Engineer Griffin, Finance Director Bendel, and City Clerk Bell.

PLEDGE OF ALLIGENCE

APPROVAL OF AGENDA

Council Member Nelson requested that Items 6 and 13 be pulled from Consent for discussion. Council Member Reeves requested Item 3 be pulled. Council Member Smith requested Item 5 be pulled.

MOTION: Council Member Nelson moved **TO APPROVE THE JULY 15, 2014 CITY COUNCIL AGENDA AS AMENDED.** Council Member Reeves seconded the motion. **MOTION PASSED 5-0.**

ITEM 1: ACCEPT MINUTES

THE JULY 1, 2014 CITY COUNCIL MINUTES WERE APPROVED AS AMENDED BY CONSENSUS OF THE CITY COUNCIL.

COUNCIL REPORTS:

Mayor Pearson: Appoint Anne Cohen to EDA. Mayor Pearson noted that the Finance Committee is looking for one more candidate, HR committee is looking for one more candidate, Planning Commission is looking for one more candidate; Library Board is looking for two more members; attended third neighborhood meeting at Pebble Park ; attended library meetings; attended Gateway Corridor meetings. There will be a future council discussion on the matter.

Council Member Smith: no report.

Council Member Nelson: attended Finance Committee meeting and addressed the 2015 budget; rode with a resident who has a background in street construction to view the streets that are planned for the 2015 Street Improvement project.

Council Member Bloyer: Provided input on some previously discussed items: has some concerns regarding the consensus plan adopted by village workgroup; he has evolved in his opinion on the need of concrete curb and gutter in rural areas; agrees that the water levels of Lake Elmo lakes looked at to see if there is any way to lower them; however, the lake level policy should not be changed midseason; the DNR sent a letter stating that the damage done to manmade items along the shore, such as sod, retaining walls, fire pits, etc., is not considered erosion damage to natural shoreline.

Council Member Reeves: attended Gateway Corridor meeting; acknowledged the Rotary Club, staff and everyone to helped in the successful street dance.

PUBLIC COMMENTS/INQUIRIES

FINANCE CONSENT AGENDA

2. Approve Payment of Disbursements and Payroll in the amount of \$690,040.67
3. ~~Accept Financial Report dated June 30, 2014~~
4. Accept Building Report dated June 30, 2014
5. ~~Accept City Assessor Report dated June 30, 2014~~
6. ~~Lake Elmo Ave Sewer Infrastructure Improvements: I-94 to 30th Street — Compensating C.O. No. 6~~
7. Lake Elmo Ave Sewer Infrastructure Improvements: I-94 to 30th Street — Pay Estimate No. 8 (Final)
8. Section 34 Water & Sewer Utility Extension Improvements — Compensating C.O. No. 3
9. Section 34 Water & Sewer Utility Extension Improvements — Pay Estimate No. 6 (Final)

JULY 15, 2014

10. Well No. 4 Connecting Watermain Improvements – Pay Request No. 3
11. Production Well No. 4 – Pay Request No. 7
12. Pumphouse No. 4 Improvements – Pay Request No. 2
13. ~~Investment Policy~~

MOTION: Council Member Reeves moved **TO APPROVE THE FINANCE CONSENT AGENDA AS AMENDED**. Council Member Bloyer seconded the motion. **MOTION PASSED 5-0.**

ITEM 3: ACCEPT FINANCIAL REPORT DATED JUNE 30, 2014

Council Member Reeves asked for a quarterly report on financial trends to increase transparency.

MOTION: Mayor Pearson moved **TO ACCEPT THE FINANCIAL REPORT DATED JUNE 30, 2014**. Council Member Reeves seconded the motion. **MOTION PASSED 5-0.**

ITEM 5: ACCEPT CITY ASSESSOR REPORT DATED JUNE 30, 2014

Council Member Smith explained that she intended to pull Item 4 for discussion and not Item 5. She questioned the need to increase building department staff when the number of new homes being built has actually less than previous years. Because this item had already been passed as part of Consent Agenda, there was no debate.

MOTION: Council Member Smith moved **TO ACCEPT THE ASSESSOR'S REPORT DATED JUNE 30, 2014**. Council Member Reeves seconded the motion. **MOTION PASSED 5-0.**

ITEM 6: LAKE ELMO AVE SEWER INFRASTRUCTURE IMPROVEMENTS: I-94 TO 30TH STREET – COMPENSATING C.O. NO. 6

It was explained that the lift station access driveway was not being built at this time due to the current topography. The resulting surplus funds should be held in the enterprise fund and earmarked for future construction of the access driveway.

MOTION: Council Member Nelson moved **TO APPROVE COMPENSATING CHANGE ORDER NO. 6 FOR THE LAKE ELMO AVENUE INFRASTRUCTURE IMPROVEMENTS: I-94 TO 30TH STREET, THEREBY DECREASING THE FINAL CONTRACT AMOUNT BY \$59,982.54, SETTING THAT ASIDE IN AN EARMARKED FUND FOR A DRIVEWAY PROJECT ASSOCIATED WITH THIS PROJECT FOR UP TO TWO YEARS. AFTER TWO YEARS, IF THE DRIVEWAY PROJECT IS NOT COMPLETED, THE MONEY WOULD BE USED FOR DEBT SERVICE**. Council Member Smith seconded the motion. **MOTION PASSED 5-0.**

ITEM 13: INVESTMENT POLICY

MOTION: Council Member Nelson moved **TO ACCEPT THE LAKE ELMO INVESTMENT POLICY AS AMENDED BY REMOVING SECTION NINE OF THE POLICY**. Council Member Bloyer seconded the motion. **MOTION PASSED 5-0.**

REGULAR AGENDA

ITEM 14: EASTON VILLAGE PRELIMINARY PLAT; RES. NO. 2014-58

Community Development Klatt provided summary of proposal. Proposal by Easton Village LLC includes 98.47 acres consisting of 217 single family units with 2.5 units per acre net density. Mr. Klatt summarized major issues including storm water management, Village Parkway, Lake Elmo Airport, Village sewer line and Manning Ave. access. Staff recommends the access to the development from Manning Ave until the Village Parkway is completed be only temporary.

He also summarized the recommended 21 conditions of approval and 4 draft findings.

The Planning Commission unanimously recommended approval. Who comprised the unanimous vote was discussed. Mr. Klatt will obtain the specific headcount and provide it.

The drainage and stormwater management conditions were discussed. The proposal meets the City's standards. City Engineer Griffin further explained the requirements for council.

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Tom Wolter, developer for the project, asked for 5 year duration after final plat for Manning Ave. access. Council inquired how they can address the temporary access issue.

Todd Erickson addressed the drainage and grading conditions as well as the temporary access. The costs associated with street/signal lights and the railroad crossing were discussed with the applicant. City Attorney Snyder advised that adding additional clarifying language does enhance the City's position. Mr. Wolter was reluctant to include language regarding the crossing as the current plat does not include it. Mr. Snyder noted that the crossing is inevitable, so it is appropriate to address.

MOTION: Council Member Nelson moved TO ADOPT RESOLUTION NO. 2014-58, APPROVING THE EASTON VILLAGE PRELIMINARY PLAT WITH 15 CONDITIONS OF APPROVAL. Council Member Reeves seconded the motion.

The council discussed adding language regarding the timeframe for the temporary access. Mr. Snyder recommended using the most restrictive language as it is easier to open it up later. The converse is not true.

Mr. Nelson offered a friendly amendment that the “**TEMPORARY ACCESS IS GRANTED FOR FIVE YEARS FROM FINAL PLAT APPROVAL.**” This language was changed upon advice of counsel that “**THE COUNCIL WILL ESTABLISH THE TIME FRAME AT FINAL PLAT APPROVAL.**”

For condition #14, **THE COSTS ASSOCIATED WITH THE RAILROAD CROSSING SHALL BE BORNE BY THE APPLICANT UNLESS OTHERWISE PERMITTED IN A SUBSEQUENT COUNCIL RESOLUTION**” was added.

Condition #22 was added regarding the 30th Street and Manning Ave. intersection that included the language similar to #14 and added: **THE COSTS ASSOCIATED WITH SIGNALIZATION AT INTERSECTIONS SHALL BE BORNE BY THE APPLICANT UNLESS OTHERWISE CHANGED BY A SUBSEQUENT COUNCIL RESOLUTION.** Council discussed how much of the costs this applicant should bear. It was noted that other parties will likely have to pay a share of these costs as they also will be causing the impact.

Council consensus was adamant that the drainage issues be addressed before final approval.

Council Member Smith explained her concerns about the proposal not matching the 2007 Old Village Master Plan design, the area drainage, the uncertainty of who the builder will be. She wants the entire Village area to seem more fluid. Council Member Bloyer voiced his approval of what is being proposed in the Village area. He said the opportunity to further control what was being proposed, in regards to larger lots, has passed. Now they must move forward.

Council Member Reeves took issue with any accusations that the current council doesn't want development to be special or unique. Council Member Nelson noted that the decision should be about land use. If the proposals meet the land use standards, the proposal should be approved. He also voiced his frustration with past planning expenses that are still being paid off. Ms. Smith explained that she wants potential developers to consider the work that has been done in devising what the City designed for the Old Village area.

Mayor Pearson noted that the proposal meets the land use plan. The current proposals appear to be quality developments, and there is infrastructure that needs to be paid for, which these developments achieve. Not responding to these plans places the City at greater risk.

MOTION PASSED 4-1 (SMITH – NAY).

Council Member Smith left the room at 8:40pm.

ITEM 15. VILLAGE PRESERVE PRELIMINARY PLAT; RES. NO. 2014-59

Community Development Klatt provided summary of proposal. Proposal by GWSA Land Development, LLC (Gonyea) includes 39.8 acres consisting of 97 units with 2.64 units per acre net density. Stormwater management is a critical issue. There are ongoing collaborative efforts between the applicants, Robert

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Engstrom Companies and Valley Branch Watershed District regarding this issue. Parkland dedication and sanitary sewer are other critical issues that are being addressed. Mr. Klatt summarized the recommended 13 conditions of approval and draft findings. The proposal meets all land use plans. The Planning Commission recommended approval.

It was confirmed that the stormwater management issues are being worked out with the property to the north. Dave Gonyea addressed the stormwater management.

MOTION: *Council Member Reeves moved TO ADOPT RESOLUTION NO. 2014-59, APPROVING THE VILLAGE PRESERVE PRELIMINARY PLAT SUBJECT TO 13 CONDITIONS OF APPROVAL. Council Member Bloyer seconded the motion. MOTION PASSED 4-0.*

Council Member Smith returned at 8:59pm.

ITEM 16: HOLLIDAY PROPERTY COMPREHENSIVE PLAN AMENDMENT; RES. NO. 2014-60

Community Development Klatt provided summary of proposal. Proposal by GWSA Land Development, LLC (Gonyea) includes changing 14.85 acres of RAD – Rural Area Development to V-LDR (1.5-2.49 units per acre) for area where 26 single family homes will be placed as part of the Village Preserve. Staff finds the completion of the collector road is the most important consideration of the Comp Plan Amendment.

The overall village density was confirmed to be between 900-1100 units and the current expectation is that it will be lower than that. The McCleod property will be screened or buffered.

Dave Gonyea noted that without the amendment, the property is undevelopable. He also addressed the stormwater management and parkway/sewer line. The expected build out is 2-4 years.

Steve DeLapp 8468 Lake Jane Trail, spoke about Village density. His concern is that the already approved developments are already near the total target density.

Anne Bucheck 2301 Legion Ave. N. spoke about the Village water problems. She suggested going back to previous rate and volume rules the City recently amended.

Mayor Pearson asked about the issues with the Greenbelt. Mr. Klatt explained that the Planning Commission recommended that the Greenbelt issues be addressed on individual basis.

Mr. Gonyea confirmed that he believes his current proposals will alleviate Village drainage and not make it worse. It was noted that the Village was originally developed before there were drainage rules.

Ms. Smith asked about how the peripheral developments would affect the center density of the Village. Mr. Klatt stated that the current proposals do fit within the land use plans. He went on to clarify that is unlikely that the current VMX planned areas will build out as guided.

MOTION: *Mayor Pearson moved TO ADOPT RESOLUTION NO. 2014-60, APPROVING THE HOLLIDAY PROPERTY COMPREHENSIVE PLAN AMENDMENT SUBJECT TO 2 CONDITIONS OF APPROVAL. Council Member Reeves seconded the motion.*

Council Members Bloyer, Reeves, and Nelson all acknowledged that they were impressed with the coordination and cooperation in making the developments work within the Village.

MOTION PASSED 5-0.

Mayor Pearson asked for point of privilege. Meeting recessed at 9:38pm. Meeting reconvened at 9:43pm.

ITEM 17: VILLAGE PRESERVE SOUTH SKETCH PLAN

Community Development Klatt provided a summary of sketch plan proposal. Proposal by GWSA Land Development, LLC (Gonyea) includes 64 acres consisting of 104 single family units. The 15.77 acres east of Reid Park will be dedicated to the City. Mr. Klatt explained the next steps in the process. No formal action requested. The width of the proposed trail was clarified. The standard is 8 feet wide. The development trails do have potential to tie into the regional trail plan.

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Dave Gonyea stated that he would like larger lots if there was different zoning, but can accommodate the mixed sizes.

NEW BUSINESS

ITEM 18: FUTURE OF LAKE ELMO LIBRARY

Mayor Pearson explained his reason for bringing this to council. He would like the Council's input on what situation would take place where they council see the City rejoining the County system. The legal Maintenance of Effort was asked for. Staff will obtain and provide details of the MOE for Council.

Steve Linder described the importance of the library use by the Boy Scouts for meetings. He is concerned about the ability the use the facility if the County takes it over.

Karen Johnston spoke about the various programs the library offers. She is concerned that the programs and services would be discontinued if the County takes it over.

Paul Ryberg spoke about the how the library can be beneficial to the business community as a business resource.

Anne Bucheck wants the library to be the same as the Stillwater and Bayport libraries as an Associate Library.

Judy Gibson concerned about losing control of the library if the County takes over. Increased collaboration would be good but not at the expense of losing control.

Sarah Linder stated that the Board has no desire to "go back" to the County system; however, the Board does desire to become an Associate Library. Ms. Linder explained all her concerns with County control. She also noted how the Lake Elmo library has met all the criteria that were set out by the County to re-affiliate with the system as an independent library.

The issue of residents being able to access County resources was discussed. The related recent JPA proposal that the Mayor had brought to the Board was discussed. The Board has several concerns with the proposal.

Marjorie Williams spoke about the federated system in the Arrowhead region.

Council Member Smith noted that she had initially voted against leaving Washington County but due to the success, she has had a change of heart. She really likes the library now and thinks it is an important part of downtown. She does not see the issue of rejoining the County as simple. She wants to make sure that any re-affiliation maintains local control.

Mr. Reeves noted that the biggest issue he has received is convenient access to County resources. Other issues that were brought up were hours, volunteers, and cost. The proposed JPA was further discussed. It would not allow the residents to access other counties' resources. The biggest concern with the JPA was the expense of an open number of cards to residents. There has not been a formal response from the Board in regards to the JPA.

Ms. Smith wants the Board to negotiate with the County, not the Mayor. Council Member Nelson is in favor of having the Council involved in finding a win-win scenario. Council Members Reeves, Bloyer and Nelson are in favor of the Mayor and Mr. Reeves work with the County. Mr. Reeves implored the Board to work with the Council to coordinate any discussions so there is a unified voice. Ms. Smith also wants to be included in the discussions. City Attorney Snyder stated that anyone can speak to the County. He also

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declared that any meeting that included three council members would have to be an open meeting and publicly noticed.

Rosemary Meier noted that the public who come to the library love it.

Assistant Administrator Bell noted that almost every person who requests reimbursement asks when the City will be rejoining the County.

Mayor Pearson adjourned meeting at 11:10 pm.

LAKE ELMO CITY COUNCIL

ATTEST:

Mike Pearson, Mayor

Adam R. Bell, City Clerk



MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014
CONSENT
ITEM #2
MOTION

AGENDA ITEM: Approve Disbursements in the amount of \$1,963,142.28

SUBMITTED BY: Cathy Bendel, Finance Director

THROUGH: Cathy Bendel, Finance Director

REVIEWED BY: Dean Zuleger, City Administrator

SUGGESTED ORDER OF BUSINESS:

- Introduction of Item City Administrator
- Report/Presentation.....City Administrator
- Questions from Council to Staff..... Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion..... Mayor & City Council
- Action on Motion..... Mayor Facilitates

POLICY RECOMMENDER: Finance

FISCAL IMPACT: \$1,963,142.28

SUMMARY AND ACTION REQUESTED: As part of its Consent Agenda, the City Council is asked to approve disbursements in the amount of \$1,963,142.28. No specific motion is needed as this is recommended to be part of the *Consent Agenda*.

LEGISLATIVE HISTORY: NA

BACKGROUND INFORMATION/STAFF REPORT: The City of Lake Elmo has the fiduciary responsibility to conduct normal business operations. Below is a summary of current claims to be disbursed and paid in accordance with State law and City policies and procedures.

Claim #	Amount	Description
ACH	\$ 12,545.27	Payroll Taxes to IRS & MN Dept of Revenue 8/05/14
ACH	\$ 5,690.07	Payroll Retirement to PERA 8/05/14
DD5710-DD5757	\$ 35,546.65	Payroll Dated (Direct Deposits) 8/05/14
41637	\$ 631.37	Payroll (Check) 8/05/14
41639-41716	\$ 1,907,768.92	Accounts Payable 8/19/14
2454-2453	\$ 960.00	Library Card Reimbursement 8/19/14
TOTAL	\$ 1,963,142.28	

RECOMMENDATION: Based on the aforementioned, the staff recommends the City Council approve as part of the Consent Agenda the aforementioned disbursements in the amount of \$1,963,142.28.

ATTACHMENTS:

1. Accounts Payable – check registers

Accounts Payable To Be Paid Proof List

User: pattyb

Printed: 08/14/2014 - 12:38 PM

Batch: 012-08-2014

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
ACEHARD Ace Hardware, Inc										
151987	07/07/2014	20.96	0.00	08/19/2014	Padlocks		-	No		0000
602-495-9450-44030	Repairs\Maint Imp Not Bldgs									
	151987 Total:	20.96								
152078	07/09/2014	60.91	0.00	08/19/2014	Padlocks, lamp, keys		-	No		0000
602-495-9450-44030	Repairs\Maint Imp Not Bldgs									
	152078 Total:	60.91								
	ACEHARD Total:	81.87								
AMERICAN American Eng and Testing, Inc.										
63105	07/30/2014	112.00	0.00	08/19/2014	LE Ave Sewer #6		-	No		0000
602-495-9450-43030	Engineering Services									
	63105 Total:	112.00								
	AMERICAN Total:	112.00								
AMERWATE Works Association American Water										
7000852966	07/31/2014	76.00	0.00	08/19/2014	AWWA Membership		-	No		0000
601-494-9400-44370	Conferences & Training									
	7000852966 Total:	76.00								
	AMERWATE Total:	76.00								
AMFLAG American Flagpole & Flag Corp										
114878	08/07/2014	69.95	0.00	08/19/2014	Flag for City Hall		-	No		0000
101-410-1940-44300	Miscellaneous									
	114878 Total:	69.95								
	AMFLAG Total:	69.95								
AMLEGAL American Legal Publishing Corp										
0100177-178	07/30/0214	299.25	0.00	08/19/2014	July 2014 S-9 folio editing		-	No		0000
101-410-1320-43510	Legal Publishing									
	0100177-178 Total:	299.25								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close PO Line #
AMLEGAL Total:		299.25								
ASPENMI Aspen Mills, Inc.										
152547	07/25/2014	119.20	0.00	08/19/2014	Uniforms - L. Cornell		-	No		0000
101-420-2220-44170 Uniforms										
152547 Total:		119.20								
ASPENMI Total:		119.20								
BAKERPAT Baker Patricia										
2014-07	08/04/2014	1,056.56	0.00	08/19/2014	Contract hours - July		-	No		0000
101-410-1520-43150 Contract Services										
2014-07	08/04/2014	905.63	0.00	08/19/2014	Contract hours - July		-	No		0000
601-494-9400-43150 Contract Services										
2014-07	08/04/2014	150.94	0.00	08/19/2014	Contract hours - July		-	No		0000
602-495-9450-43150 Contract Services										
2014-07	08/04/2014	905.62	0.00	08/19/2014	Contract hours - July		-	No		0000
603-495-9500-43150 Contract Services										
2014-07 Total:		3,018.75								
BAKERPAT Total:		3,018.75								
BECKER Becker Fire and Safety, LLC										
1493	07/30/2014	62.50	0.00	08/19/2014	Refill extinguisher, provide bracket		-	No		0000
101-420-2220-44040 Repairs/Maint Eqpt										
1493 Total:		62.50								
BECKER Total:		62.50								
BERTELSON Bertelson's										
WO-936857-1	08/05/2014	64.99	0.00	08/19/2014	Kleenex bath tissue		-	No		0000
101-410-1320-42000 Office Supplies										
WO-936857-1 Total:		64.99								
BERTELSON Total:		64.99								
BOLTONME Bolton & Menk, Inc										
0165074	03/31/2014	945.00	0.00	08/19/2014	2013.126 Section 34 water/sewer		-	No		0000
601-494-9400-43030 Engineering Services										
0165074	03/31/2014	630.00	0.00	08/19/2014	2013.126 Section 34 water/sewer		-	No		0000
602-495-9450-43030 Engineering Services										
0165074 Total:		1,575.00								
BOLTONME Total:		1,575.00								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
C A C Companion Animal Control, LLC										
6	07/01/2014	500.00	0.00	08/19/2014	Animal Control - July		-	No		0000
101-420-2700-43150	Contract Services									
6	07/01/2014	30.00	0.00	08/19/2014	Dog/Cat 7am-7pm		-	No		0000
101-420-2700-43160	Impounding									
6	07/01/2014	45.00	0.00	08/19/2014	Dog/Cat 7pm - 7am		-	No		0000
101-420-2700-43160	Impounding									
6	07/01/2014	60.00	0.00	08/19/2014	Pick up Holiday		-	No		0000
101-420-2700-43160	Impounding									
6	Total:	635.00								
	C A C Total:	635.00								
CARDBLDR Cardinal Home Builders, Inc.										
	07/25/2014	5,000.00	0.00	08/19/2014	Escrow Release #8655 9949 Tapestry Grove		-	No		0000
803-000-0000-22900	Deposits Payable									
	Total:	5,000.00								
	CARDBLDR Total:	5,000.00								
CARQUEST Car Quest Auto Parts										
2055-324323	07/24/2014	56.06	0.00	08/19/2014	Truck parts		-	No		0000
101-450-5200-42210	Equipment Parts									
	2055-324323 Total:	56.06								
2055-324668	07/28/2014	45.34	0.00	08/19/2014	Mower parts		-	No		0000
101-450-5200-42210	Equipment Parts									
	2055-324668 Total:	45.34								
2055-325922	08/11/2014	112.69	0.00	08/19/2014	Parts - battery		-	No		0000
101-450-5200-42210	Equipment Parts									
2055-325922	08/11/2014	69.89	0.00	08/19/2014	Oil		-	No		0000
101-450-5200-42120	Fuel, Oil and Fluids									
2055-325922	08/11/2014	20.78	0.00	08/19/2014	Belt - cushion		-	No		0000
101-450-5200-42210	Equipment Parts									
2055-325922	08/11/2014	29.62	0.00	08/19/2014	Blades Adapter		-	No		0000
101-450-5200-42210	Equipment Parts									
	2055-325922 Total:	232.98								
	CARQUEST Total:	334.38								
CENCOLLE Century College										
548809	07/30/0214	825.00	0.00	08/19/2014	1/4 yearly CEU Training		-	No		0000
101-420-2220-44370	Conferences & Training									
	548809 Total:	825.00								
	CENCOLLE Total:	825.00								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
COMCAST Comcast										
	07/27/2014	7.90	0.00	08/19/2014	Monthly Service		-		No	0000
101-420-2220-44300	Miscellaneous									
	Total:	7.90								
877210535	07/24/2014	4.19	0.00	08/19/2014	Monthly Service		-		No	0000
101-410-1940-43210	Telephone									
	877210535 Total:	4.19								
	COMCAST Total:	12.09								
CTYBLOOM City of Bloomington										
July 2014	07/31/2014	31.50	0.00	08/19/2014	Lab bacteria tests		-		No	0000
601-494-9400-42270	Utility System Maintenance									
	July 2014 Total:	31.50								
	CTYBLOOM Total:	31.50								
CTYOAKDA City of Oakdale										
1000460-01	07/31/2014	16,586.68	0.00	08/19/2014	Water Service 7/01-8/01/14 South Pit		-		No	0000
601-494-9400-43820	Water Utility									
	1000460-01 Total:	16,586.68								
	CTYOAKDA Total:	16,586.68								
CTYROSEV City of Roseville										
219053,219080	08/04/2014	2,635.58	0.00	08/19/2014	Monthly IT Services		-		No	0000
101-410-1450-43180	Information Technology/Web									
219053,219080	08/04/2014	87.10	0.00	08/19/2014	Monthly IT Services		-		No	0000
101-410-1320-43210	Telephone									
219053,219080	08/04/2014	13.75	0.00	08/19/2014	Monthly IT Services		-		No	0000
101-420-2400-43210	Telephone									
219053,219080	08/04/2014	13.75	0.00	08/19/2014	Monthly IT Services		-		No	0000
101-410-1450-43210	Telephone									
219053,219080	08/04/2014	13.75	0.00	08/19/2014	Monthly IT Services		-		No	0000
101-410-1910-43210	Telephone									
219053,219080	08/04/2014	27.50	0.00	08/19/2014	Monthly IT Services		-		No	0000
101-410-1520-43210	Telephone									
219053,219080	08/04/2014	38.15	0.00	08/19/2014	Monthly IT Services		-		No	0000
101-410-1910-43210	Telephone									
219053,219080	08/04/2014	181.75	0.00	08/19/2014	Monthly IT Services		-		No	0000
101-430-3100-43210	Telephone									
	219053,219080 Total:	3,011.33								
	CTYROSEV Total:	3,011.33								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
CUSH Cushman Motor Co., Inc.										
163758	08/06/2014	100.15	0.00	08/19/2014	Parts - Cushman		-		No	0000
101-450-5200-42210	Equipment Parts									
	163758 Total:	100.15								
	CUSH Total:	100.15								
CUSTOMON Custom One Homes										
	08/04/2014	4,950.00	0.00	08/19/2014	Escrow Release #2013-157 10353		-		No	0000
803-000-0000-22900	Deposits Payable				Tapestry					
	Total:	4,950.00								
	CUSTOMON Total:	4,950.00								
DAMON Damon Farbar Associates										
24499	08/06/2014	4,493.90	0.00	08/19/2014	LE Avenue CSAH 17		-		No	0000
409-480-8000-43150	Contract Services									
	24499 Total:	4,493.90								
	DAMON Total:	4,493.90								
DECATUR Decatur Electronics										
10195	07/18/2014	615.00	0.00	08/19/2014	Radar Antenna Speed Trailer		-		No	0000
101-430-3120-42210	Equipment Parts									
	10195 Total:	615.00								
	DECATUR Total:	615.00								
EARLANDE Earl F. Andersen, Inc.										
0105675IN	08/07/2014	1,141.40	0.00	08/19/2014	Street signs, posts		-		No	0000
101-430-3120-42260	Sign Repair Materials									
	0105675IN Total:	1,141.40								
	EARLANDE Total:	1,141.40								
EMERGAPP Emergency Apparatus Maint. Inc										
74984	07/30/2014	325.00	0.00	08/19/2014	Service Ranger		-		No	0000
101-420-2220-44040	Repairs/Maint Eqpt									
	74984 Total:	325.00								
74985	07/30/2014	1,040.00	0.00	08/19/2014	T2 Pump Test		-		No	0000
101-420-2220-44040	Repairs/Maint Eqpt									
	74985 Total:	1,040.00								
74986	07/30/2014	962.67	0.00	08/19/2014	T1 Pump Test		-		No	0000
101-420-2220-44040	Repairs/Maint Eqpt									
	74986 Total:	962.67								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
74987	07/30/2014	245.00	0.00	08/19/2014	U2 Safety Inspection		-		No	0000
101-420-2220-44040	Repairs/Maint Eqpt									
	74987 Total:	245.00								
74988	07/30/2014	237.00	0.00	08/19/2014	B1 Safety Inspection		-		No	0000
101-420-2220-44040	Repairs/Maint Eqpt									
	74988 Total:	237.00								
74989	07/30/2014	893.00	0.00	08/19/2014	E1 Pump Test		-		No	0000
101-420-2220-44040	Repairs/Maint Eqpt									
	74989 Total:	893.00								
74990	07/30/2014	237.00	0.00	08/19/2014	B2 Safety Inspection		-		No	0000
101-420-2220-44040	Repairs/Maint Eqpt									
	74990 Total:	237.00								
74991	07/30/2014	965.00	0.00	08/19/2014	E2 Pump Test		-		No	0000
101-420-2220-44040	Repairs/Maint Eqpt									
	74991 Total:	965.00								
	EMERGAPP Total:	4,904.67								
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EXPRESS Express Services, Inc										
14410078-1	07/23/2014	663.60	0.00	08/19/2014	Temp Services		-		No	0000
101-410-1320-43150	Contract Services									
	14410078-1 Total:	663.60								
14437281-0	07/30/0214	948.00	0.00	08/19/2014	Temp Services		-		No	0000
101-410-1320-43150	Contract Services									
	14437281-0 Total:	948.00								
14480188-3	08/06/2014	948.00	0.00	08/19/2014	Temp Service		-		No	0000
101-410-1320-43150	Contract Services									
	14480188-3 Total:	948.00								
	EXPRESS Total:	2,559.60								
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FERGUSON Ferguson Waterworks, Inc #2516										
99160	08/05/2014	3,296.52	0.00	08/19/2014	Water meters		-		No	0000
601-494-9400-42300	Water Meters & Supplies									
	99160 Total:	3,296.52								
	FERGUSON Total:	3,296.52								
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FOCUS Focus Engineering, Inc.										
July	07/26/2014	3,990.47	0.00	08/19/2014	General		-		No	0000
101-410-1930-43030	Engineering Services									
July	07/26/2014	180.00	0.00	08/19/2014	Planning		-		No	0000
101-410-1910-43030	Engineering Services									
July	07/26/2014	804.36	0.00	08/19/2014	Sewer		-		No	0000
101-430-3100-43030	Engineering Services									

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close PO Line #
July 101-420-2400-43030	07/26/2014 Engineering	978.75	0.00	08/19/2014	Building		-		No	0000
July 101-410-1910-43030	07/26/2014 Engineering Services	1,011.38	0.00	08/19/2014	Planning		-		No	0000
July 703-430-3120-43030	07/26/2014 Engineering Services	998.50	0.00	08/19/2014	Cap Proj PW		-		No	0000
July 601-494-9400-43030	07/26/2014 Engineering Services	804.33	0.00	08/19/2014	Water		-		No	0000
July 602-495-9450-43030	07/26/2014 Engineering Services	1,155.00	0.00	08/19/2014	Sewer		-		No	0000
July 603-496-9500-43030	07/26/2014 Engineering Services	989.80	0.00	08/19/2014	Surface Water		-		No	0000
July 601-494-9400-43030	07/26/2014 Engineering Services	208.00	0.00	08/19/2014	2012.128 Water System		-		No	0000
July 601-494-9400-43030	07/26/2014 Engineering Services	276.79	0.00	08/19/2014	2012.129 Keats Ave Watermain		-		No	0000
July 409-480-8000-43030	07/26/2014 Engineering Services	366.91	0.00	08/19/2014	2012.129 Keats Ave Street		-		No	0000
July 803-000-0000-22910	07/26/2014 Developer Payments	5,378.67	0.00	08/19/2014	2012.130A Lennar		-		No	0000
July 409-480-8000-43030	07/26/2014 Engineering Services	1,414.32	0.00	08/19/2014	2013.125 LE Ave I94-30th Str		-		No	0000
July 601-494-9400-43030	07/26/2014 Engineering Services	486.25	0.00	08/19/2014	2013.125 Production Well 4		-		No	0000
July 601-494-9400-43030	07/26/2014 Engineering Services	685.89	0.00	08/19/2014	2013.126 Section 34 water		-		No	0000
July 602-495-9450-43030	07/26/2014 Engineering Services	1,028.83	0.00	08/19/2014	2013.126 Section 34 Sewer		-		No	0000
July 803-000-0000-22910	07/26/2014 Developer Payments	206.50	0.00	08/19/2014	2013.127 CSAH 15		-		No	0000
July 803-000-0000-22910	07/26/2014 Developer Payments	2,137.44	0.00	08/19/2014	2013.128 Amaris		-		No	0000
July 803-000-0000-22910	07/26/2014 Developer Payments	1,011.88	0.00	08/19/2014	2013.129 Hammes		-		No	0000
July 803-000-0000-22910	07/26/2014 Developer Payments	677.94	0.00	08/19/2014	2013.130 Landucci		-		No	0000
July 601-494-9400-43030	07/26/2014 Engineering Services	1,543.38	0.00	08/19/2014	2013.131 Well No 4		-		No	0000
July 601-494-9400-43030	07/26/2014 Engineering Services	928.50	0.00	08/19/2014	2013.132 Pumpphouse 4		-		No	0000
July 601-494-9400-43030	07/26/2014 Engineering Services	10,927.42	0.00	08/19/2014	2013.133 LE Trunk Watermain		-		No	0000
July 409-480-8000-43030	07/26/2014 Engineering Services	610.90	0.00	08/19/2014	2013.134 LE Ave Corridor		-		No	0000

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
July 409-480-8000-43030	07/26/2014 Engineering Services	11,254.89	0.00	08/19/2014	2013.135 2014 Street		-	No		0000
July 409-480-8000-43030	07/26/2014 Engineering Services	456.88	0.00	08/19/2014	2014.114 Transportation & Traffic		-	No		0000
July 409-480-8000-43030	07/26/2014 Engineering Services	1,007.00	0.00	08/19/2014	2014.115 Street System & Mainten		-	No		0000
July 409-480-8000-43030	07/26/2014 Engineering Services	241.60	0.00	08/19/2014	2014.117 Capital Improvement		-	No		0000
July 409-480-8000-43030	07/26/2014 Engineering Services	205.29	0.00	08/19/2014	2014.118 2014 Seal Coat		-	No		0000
July 409-480-8000-43030	07/26/2014 Engineering Services	312.25	0.00	08/19/2014	2014.119 2014 Crack Seal		-	No		0000
July 803-000-0000-22910	07/26/2014 Developer Payments	29.50	0.00	08/19/2014	2014.124 Engstrom Village		-	No		0000
July 803-000-0000-22910	07/26/2014 Developer Payments	190.44	0.00	08/19/2014	2014.126 Easton Village		-	No		0000
July 602-495-9450-43030	07/26/2014 Engineering Services	3,323.50	0.00	08/19/2014	2014.127 Village East Trunk Sewer		-	No		0000
July 601-494-9400-43030	07/26/2014 Engineering Services	718.50	0.00	08/19/2014	2014.129 Inwood Booster Station		-	No		0000
July 601-494-9400-43030	07/26/2014 Engineering Services	1,060.00	0.00	08/19/2014	2014.130 Inwood Trunk Watermain		-	No		0000
July 409-480-8000-43030	07/26/2014 Engineering Services	3,958.25	0.00	08/19/2014	2014.131 39th Street - Street		-	No		0000
July 803-000-0000-22910	07/26/2014 Developer Payments	1,032.50	0.00	08/19/2014	2014.127B Kwik Trip		-	No		0000
July 803-000-0000-22900	07/26/2014 Deposits Payable	177.00	0.00	08/19/2014	2014.132 Sprint 2.5 Equipment		-	No		0000
July 803-000-0000-22910	07/26/2014 Developer Payments	74.50	0.00	08/19/2014	2014.133 Gonyea Parcel E		-	No		0000
July 803-000-0000-22910	07/26/2014 Developer Payments	59.00	0.00	08/19/2014	2014.134 Eagle Point Medical		-	No		0000
July 409-480-8000-43030	07/26/2014 Engineering Services	441.50	0.00	08/19/2014	2014.135 Beehive Asset Management		-	No		0000
July 409-480-8000-43030	07/26/2014 Engineering Services	1,760.00	0.00	08/19/2014	2014.136 2015 Street/Utility		-	No		0000
July 409-480-8000-43030	07/26/2014 Engineering Services	67.50	0.00	08/19/2014	2014.137 OV Phase 1 Street/Utility		-	No		0000
July 803-000-0000-22910	07/26/2014 Developer Payments	1,260.50	0.00	08/19/2014	2014.138 Savonna 2nd addition		-	No		0000
July Total:		66,432.81								
FOCUS Total:		66,432.81								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
GKSERVIC G&K Services										
1182427274	07/28/2014	50.57	0.00	08/19/2014	Uniforms		-	No		0000
101-430-3100-44170	Uniforms									
1182427274 Total:										
1182438508	08/04/2014	50.57	0.00	08/19/2014	Uniforms		-	No		0000
101-430-3100-44170	Uniforms	34.75								
1182438508 Total:										
1182449877	08/11/2014	34.75	0.00	08/19/2014	Uniforms		-	No		0000
101-430-3100-44170	Uniforms	34.30								
1182449877 Total:										
GKSERVIC Total:										
		34.30								
		119.62								
GMCONTR G.M. Contracting, Inc.										
Pay No 1	08/01/2014	772,877.65	0.00	08/19/2014	2013.133 LE Ave Trunk Watermain		-	No		0000
601-494-9400-43030	Engineering Services									
Pay No 1 Total:										
GMCONTR Total:										
		772,877.65								
		772,877.65								
GREATAME Great American Marine Inc										
11397	07/31/2014	350.99	0.00	08/19/2014	Boat repairs		-	No		0000
101-420-2220-44040	Repairs/Maint Eqpt									
11397 Total:										
GREATAME Total:										
		350.99								
		350.99								
HARDDRIV Harddrives, Inc.										
Pay No 1	07/31/2014	116,998.97	0.00	08/19/2014	2013.135 2014 Street Improvement		-	No		0000
409-480-8000-43030	Engineering Services									
Pay No 1 Total:										
HARDDRIV Total:										
		116,998.97								
		116,998.97								
HARTMAN Hartman Homes										
803-000-0000-22900	08/04/2014	5,000.00	0.00	08/19/2014	Escrow #8728 10149 Tapestry Hill		-	No		0000
Deposits Payable										
Total:										
HARTMAN Total:										
		5,000.00								
		5,000.00								
		5,000.00								
HELKESTR Helke's Tree Service										
468528	08/05/2014	3,600.00	0.00	08/19/2014	Trimmed ROW		-	No		0000
101-430-3250-43150	Contract Services									
468528	08/05/2014	800.00	0.00	08/19/2014	Hauled 2 loads		-	No		0000
101-430-3250-43150	Contract Services									

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
468528 Total:		4,400.00								
HELKESTR Total:		4,400.00								
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HYDRO Hydromethods										
201408503	08/01/2014	588.00	0.00	08/19/2014	Storm Sewer 2015 Street/Utility		-	No		0000
602-495-9450-43030 Engineering Services		588.00								
201408503 Total:		588.00								
HYDRO Total:		588.00								
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JOHNSON& Johnson & Turner Attorneys										
37301	08/12/2014	4,512.50	0.00	08/19/2014	Prosecution		-	No		0000
101-420-2150-43045 Attorney Criminal		4,512.50								
37301 Total:		630.00								
37425	08/12/2014	630.00	0.00	08/19/2014	Lennar		-	No		0000
803-000-0000-22910 Developer Payments		630.00								
37425 Total:		1,150.00								
37613	08/12/2014	1,150.00	0.00	08/19/2014	39th Street		-	No		0000
409-480-8000-43030 Engineering Services		1,150.00								
37613 Total:		1,693.75								
37614	08/12/2014	1,693.75	0.00	08/19/2014	Easton Village		-	No		0000
803-000-0000-22910 Developer Payments		1,693.75								
37614 Total:		3,214.50								
37615	08/12/2014	3,214.50	0.00	08/19/2014	Civil		-	No		0000
101-410-1320-43040 Legal Services		3,214.50								
37615 Total:		11,200.75								
JOHNSON& Total:										
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kathifuel Kath Fuel Oil Service Co										
472536	07/30/2014	1,638.20	0.00	08/19/2014	Fuel		-	No		0000
101-430-3120-42120 Fuel, Oil and Fluids		1,638.20								
472536 Total:		1,638.20								
kathfuel Total:										
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LANDMARK Landmark, Inc.										
803-000-0000-22900	08/05/2014	5,000.00	0.00	08/19/2014	Escrow Release 2013-626 11815 56th St		-	No		0000
Deposits Payable		5,000.00								
Total:		5,000.00								
LANDMARK Total:		5,000.00								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
LANDUCCI Landucci Nathan										
	08/07/2014	40.00	0.00	08/19/2014	Refund Burn Permit		-		No	0000
101-000-0000-32260	Burning Permit									
Total:		40.00								
LANDUCCI Total:		40.00								
LANG RON Ron's Inspection Services, LLC										
2	08/04/2014	841.00	0.00	08/19/2014	Inspector Services		-		No	0000
101-420-2400-43150	Inspector Contract Services									
2	08/04/2014	84.00	0.00	08/19/2014	Mileage		-		No	0000
101-420-2400-43310	Mileage									
2 Total:		925.00								
3	08/04/2014	391.50	0.00	08/19/2014	Inspector Services		-		No	0000
101-420-2400-43150	Inspector Contract Services									
3	08/04/2014	37.52	0.00	08/19/2014	Mileage		-		No	0000
101-420-2400-43310	Mileage									
3 Total:		429.02								
LANG RON Total:		1,354.02								
LCSLAWN L.C.S. Lawn Service, Inc										
1341262907-09	07/30/0214	58.50	0.00	08/19/2014	Station 1 lawn		-		No	0000
101-420-2220-44010	Repairs/Maint Bldg									
1341262907-09	07/30/0214	212.00	0.00	08/19/2014	Station 2 lawn		-		No	0000
101-420-2220-44010	Repairs/Maint Bldg									
1341262907-09	Total:	270.50								
LCSLAWN Total:		270.50								
LEOIL Lake Elmo Oil, Inc.										
	07/31/2014	525.35	0.00	08/19/2014	Fuel		-		No	0000
101-420-2220-42120	Fuel, Oil and Fluids									
Total:		525.35								
LEOIL Total:		525.35								
Lillie Newspapers Inc, Lillie Suburban										
	07/31/2014	64.50	0.00	08/19/2014	7/9 Notice - village east		-		No	0000
101-410-1450-43510	Public Notices									
	07/31/2014	22.00	0.00	08/19/2014	7/16 Planning Comm		-		No	0000
101-410-1450-43510	Public Notices									
	07/31/2014	21.50	0.00	08/19/2014	7/23 Notice of Filing		-		No	0000
101-410-1450-43510	Public Notices									
	07/31/2014	19.80	0.00	08/19/2014	7/30 Notice of Accuracy		-		No	0000
101-410-1450-43510	Public Notices									

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
101-410-1450-43510	07/31/2014	22.00	0.00	08/19/2014	7/30 Village East		-		No	0000
	Public Notices									
	Total:	149.80								
	Lillie Total:	149.80								
MARONEYS Maroney's Sanitation, Inc										
538023	08/07/2014	109.78	0.00	08/19/2014	City Hall		-		No	0000
101-410-1940-43840	Refuse									
538023	08/07/2014	48.30	0.00	08/19/2014	Fire		-		No	0000
101-420-2220-43840	Refuse									
538023	08/07/2014	210.63	0.00	08/19/2014	PW		-		No	0000
101-430-3100-43840	Refuse									
538023	08/07/2014	256.23	0.00	08/19/2014	Fire		-		No	0000
101-420-2220-43840	Refuse									
538023	08/07/2014	49.61	0.00	08/19/2014	Library		-		No	0000
206-450-5300-43840	Refuse									
	538023 Total:	674.55								
	MARONEYS Total:	674.55								
MCKINZIE McKinzie Metro Appraisal										
14-0602LRWO	06/10/2014	2,000.00	0.00	08/19/2014	Appraisal Report - Lennar		-		No	0000
803-000-0000-22910	Developer Payments									
	14-0602LRWO Total:	2,000.00								
	MCKINZIE Total:	2,000.00								
MENARDMA Menards - Maplewood										
46739	07/28/2014	5.98	0.00	08/19/2014	Wasp killer		-		No	0000
101-420-2220-44370	Conferences & Training									
	46739 Total:	5.98								
	MENARDMA Total:	5.98								
MENARDSO Menards - Oakdale										
52004	07/30/0214	157.84	0.00	08/19/2014	Catch Basin Repair		-		No	0000
603-496-9500-44030	Repairs/Maint Not Bldg									
	52004 Total:	157.84								
52812	08/11/2014	39.96	0.00	08/19/2014	Field Paint - Parks		-		No	0000
101-450-5200-42250	Landscaping Materials									
	52812 Total:	39.96								
53154	08/11/2014	42.13	0.00	08/19/2014	Shop Supplies		-		No	0000
101-430-3100-42150	Shop Materials									
	53154 Total:	42.13								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close PO Line #
MENARDSO Total:		239.93								
MENARDST Menards - Stillwater										
47340	08/06/2014	139.60	0.00	08/19/2014	Fence Posts		-		No	0000
101-450-5200-44030	Repairs/Maint Imp Not Bldgs									
47340 Total:		139.60								
MENARDST Total:		139.60								
METCOU Metropolitan Council										
1036738	08/05/2014	1,550.84	0.00	08/19/2014	Monthly Wastewater		-		No	0000
602-495-9450-43820	Sewer Utility - Met Council									
1036738 Total:		1,550.84								
METCOU Total:		1,550.84								
MEYERER Meyer Erik										
803-000-0000-22900	08/13/2014	5,000.00	0.00	08/19/2014	Escrow Release 2013-169 10100 Tapestry		-		No	0000
Total:		5,000.00								
MEYERER Total:		5,000.00								
MINGERCO Minger Construction Inc										
Pay No 8	08/05/2014	179,094.45	0.00	08/19/2014	2013.123 LE Ave Sewer - Final		-		No	0000
602-495-9450-43030	Engineering Services									
Pay No 8 Total:		179,094.45								
MINGERCO Total:		179,094.45								
MN NATIV Minnesota Native Land, Inc.										
10807	08/01/2014	1,000.00	0.00	08/19/2014	Herbicide - Sunfish Lake		-		No	0000
101-450-5200-42250	Landscaping Materials									
10807 Total:		1,000.00								
MN NATIV Total:		1,000.00								
MNLABOR MN Dept of Labor & Industry										
101-430-3100-44010	08/02/2014	10.00	0.00	08/19/2014	Air pressure vessel inspections		-		No	0000
Repairs/Maint Bldg										
101-450-5200-44010	08/02/2014	10.00	0.00	08/19/2014	Air pressure vessel inspections		-		No	0000
Repairs/Maint Bldg										
601-494-9400-42270	08/02/2014	10.00	0.00	08/19/2014	Air pressure vessel inspections		-		No	0000
Utility System Maintenance										

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
101-420-2220-44010	08/02/2014	10.00	0.00	08/19/2014	Air pressure vessel inspections		-			No 0000
	Repairs/Maint Bldg									
	Total:	40.00								
	MNLABOR Total:	40.00								
NIEBUR Niebur Tractor & Equipment										
01-33790	07/31/2014	17,726.57	0.00	08/19/2014	2014 Kabota Utility Vehicle		-			No 0000
404-480-8000-45800	Other Equipment									
01-33790	07/31/2014	10,635.94	0.00	08/19/2014	2014 Kabota Utility Vehicle		-			No 0000
410-480-8000-45800	Other Equipment									
01-33790	07/31/2014	7,090.63	0.00	08/19/2014	2014 Kabota Utility Vehicle		-			No 0000
603-480-8000-45800	Other Equipment									
	01-33790 Total:	35,453.14								
	NIEBUR Total:	35,453.14								
NORIRRIG Northland Irrigation, Inc										
08/12/2014		1,000.00	0.00	08/19/2014	Escrow Release 10689 60th Street		-			No 0000
803-000-0000-22900	Deposits Payable									
	Total:	1,000.00								
	NORIRRIG Total:	1,000.00								
ONECALL Gopher State One Call										
118066	07/31/2014	287.30	0.00	08/19/2014	FTP tickets - July 2014		-			No 0000
101-430-3100-43150	Contract Services									
	118066 Total:	287.30								
	ONECALL Total:	287.30								
OVERDRIV OverDrive, Inc										
CD0729142	07/29/2014	5,000.00	0.00	08/19/2014	OverDrive Content Purchases		-			No 0000
206-450-5300-42500	Library Collection Maintenance									
	CD0729142 Total:	5,000.00								
	OVERDRIV Total:	5,000.00								
PEARSON Pearson Bros, Inc.										
Pay No1 Final	08/05/2014	193,101.48	0.00	08/19/2014	2014.118 2014 Seal Coat Project		-			No 0000
409-480-8000-43030	Engineering Services									
Pay No1 Final	08/05/2014	32,545.00	0.00	08/19/2014	2014.118 2014 Seal Coat - Baytown		-			No 0000
101-000-0000-11500	Accounts Receivable									
Pay No1 Final	08/05/2014	44,148.78	0.00	08/19/2014	2014.118 2014 Seal Coat - W. Lakeland		-			No 0000
101-000-0000-11500	Accounts Receivable									
	Pay No1 Final Total:	269,795.26								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
PEARSON Total:		269,795.26								
PERFORPO Performance Pools & Spa, Inc										
	08/08/2014	500.00	0.00	08/19/2014	Escrow Release 2013-495 1643 Ivy Ave		-		No	0000
803-000-0000-22900 Deposits Payable		500.00								
Total:		500.00								
PERFORPO Total:		500.00								
PINKY Pinky's Sewer Service, Inc.										
	08/04/2014	100.00	0.00	08/19/2014	Pumped two tanks		-		No	0000
206-450-5300-44010 Repairs/Maint Bldg		100.00								
70665 Total:		100.00								
PINKY Total:		100.00								
PIONEER Pioneer Press										
	07/31/2014	139.00	0.00	08/19/2014	City Notice/Public Hearing 7/17 & 7/09		-		No	0000
101-410-1450-43510 Public Notices		258.60								
	07/31/2014		0.00	08/19/2014	City Notice/Public Hearing 7/23/14		-		No	0000
101-410-1450-43510 Public Notices		397.60								
614520397 Total:		397.60								
PIONEER Total:		397.60								
PRESSPUB Press Publications										
	07/31/2014	50.00	0.00	08/19/2014	Battle of the Bands		-		No	0000
439308 Contract Services		50.00								
Total:		50.00								
PRESSPUB Total:		50.00								
S&T S&T Office Products, Inc.										
	08/12/2014	8.75	0.00	08/19/2014	Office Supplies - Admin		-		No	0000
01QL6720,7546 Office Supplies		6.27								
	08/12/2014		0.00	08/19/2014	Office Supplies - Planning		-		No	0000
01QL6720,7546 Office Supplies		9.55								
	08/12/2014		0.00	08/19/2014	Office Supplies - Building		-		No	0000
01QL6720,7546 Office Supplies		-49.29								
	08/12/2014		0.00	08/19/2014	Office Supplies - Credit memo		-		No	0000
01QL6720,7546 Office Supplies		16.92								
	08/12/2014		0.00	08/19/2014	Office Supplies - Building		-		No	0000
01QL6720,7546 Office Supplies		34.88								
	08/12/2014		0.00	08/19/2014	Office Supplies - Planning		-		No	0000
01QL6720,7546 Office Supplies										

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
01QL6720,7546 Total:										
01QM6533	08/01/2014	27.08								
206-450-5300-42000	Office Supplies	53.63	0.00	08/19/2014	Office supplies - Library		-		No	0000
01QM6533 Total:										
S&T Total:		53.63								
		80.71								
SAMSCLUB Sam's Club										
08/06/2014										
101-420-2220-44300	Miscellaneous	15.92	0.00	08/19/2014	Restock station/rehab supplies		-		No	0000
08/06/2014										
101-410-1940-44300	Miscellaneous	40.72	0.00	08/19/2014	City Hall Supplies		-		No	0000
Total:		56.64								
SAMSCLUB Total:		56.64								
SW/WC SW/WC Service Cooperatives										
C1210-20 7	07/29/2014	21,222.00	0.00	08/19/2014	September Premium		-		No	0000
101-000-0000-21706 Medical Insurance										
C1210-20 7 Total:		21,222.00								
SW/WC Total:		21,222.00								
TASCH T.A. Schifsky & Sons Inc										
56602	07/26/2014	862.50	0.00	08/19/2014	Asphalt		-		No	0000
101-430-3120-42240 Street Maintenance Materials										
56602 Total:		862.50								
TASCH Total:		862.50								
TDS TDS Metrocom - LLC										
6517798882	08/13/2014	89.35	0.00	08/19/2014	Analog Lines - Fire		-		No	0000
101-420-2220-43210	Telephone	219.22	0.00	08/19/2014	Analog Lines - PW		-		No	0000
6517798882	08/13/2014	82.40	0.00	08/19/2014	Analog Lines - Lift Station Alarms		-		No	0000
101-430-3100-43210	Telephone	43.20	0.00	08/19/2014	Alarm Well House #2		-		No	0000
6517798882	08/13/2014	434.17								
602-495-9450-43210	Telephone	434.17								
6517798882	08/13/2014	434.17								
601-494-9400-43210	Telephone	434.17								
6517798882 Total:		434.17								
TDS Total:		434.17								
TESSMAN Tessman Company Corp										
S200573-IN	08/05/2014	398.87	0.00	08/19/2014	Seed herbicide, field chalk		-		No	0000
101-450-5200-42250 Landscaping Materials										

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
S200573-IN Total:		398.87								
TESSMAN Total:		398.87								
TKDA TKDA, Inc.										
002014002528	08/08/2014	3,282.53	0.00	08/19/2014	2013.133 LE Ave Trunk Watermain		-	No		0000
Engineering Services										
601-494-9400-43030	002014002528 Total:	3,282.53								
TKDA Total:		3,282.53								
TOTALMEC Total Mechanical Services, Inc										
Pay No 3	08/01/2014	72,798.50	0.00	08/19/2014	2013.132 Pumphouse No 4		-	No		0000
Engineering Services										
601-494-9400-43030	Pay No 3 Total:	72,798.50								
TOTALMEC Total:		72,798.50								
TRKUTI Truck Utilities Inc.										
271994	07/25/2014	104.60	0.00	08/19/2014	Ladder repairs for certification		-	No		0000
Repairs/Maint Eqpt										
101-420-2220-44040	271994 Total:	104.60								
TRKUTI Total:		104.60								
UNITEDPR NorthMarq										
7242014	07/24/2014	110.00	0.00	08/19/2014	Semi Annual Easement OEA Cost 1/1-		-	No		0000
Miscellaneous					6/30					
101-410-1320-44300	7242014 Total:	110.00								
UNITEDPR Total:		110.00								
WARDIES Ward Diesel Filter Systems										
823	07/25/2014	176.20	0.00	08/19/2014	Replacement parts for exhaust on T1		-	No		0000
Repairs/Maint Eqpt										
101-420-2220-44040	823 Total:	176.20								
WARDIES Total:		176.20								
WAS-SHER Washington County										
79267	08/01/2014	254,161.06	0.00	08/19/2014	Jan - June 2014 Police Services		-	No		0000
Law Enforcement Contract										
101-420-2100-43150	79267 Total:	254,161.06								
WAS-SHER Total:		254,161.06								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
WASH-REC Washington County 78782 101-410-1320-42030 Printed Forms	08/01/2014	138.00	0.00	08/19/2014	Encroachment Agreements		-		No	0000
78782 Total:		138.00								
WASH-REC Total:		138.00								
WHEATON Wheaton Joseph 20140629 101-000-0000-20802 Building Permit Surcharge	08/04/2014	404.25	0.00	08/19/2014	Electrical Inspection Services		-		No	0000
20140629 Total:		404.25								
20140731 101-000-0000-20802 Building Permit Surcharge	08/05/2014	1,010.70	0.00	08/19/2014	Electrical Inspection Services		-		No	0000
20140731 Total:		1,010.70								
WHEATON Total:		1,414.95								
Whiteani White Anita 08/05/2014 101-410-1450-43620 Cable Operations	08/05/2014	55.00	0.00	08/19/2014	Cable Operations 8/05/14 CC		-		No	0000
Total:		55.00								
Whiteani Total:		55.00								
XCEL Xcel Energy 07/22/2014 101-450-5200-43810 Electric Utility	07/22/2014	108.34	0.00	08/19/2014	Electrical Services		-		No	0000
07/22/2014 602-495-9450-43810 Electric Utility	07/22/2014	38.15	0.00	08/19/2014	Electrical Services		-		No	0000
07/22/2014 101-430-3160-43810 Street Lighting	07/22/2014	84.38	0.00	08/19/2014	Electrical Services		-		No	0000
07/22/2014 101-430-3160-43810 Street Lighting	07/22/2014	27.25	0.00	08/19/2014	Electrical Services		-		No	0000
07/22/2014 101-420-2220-43810 Electric Utility	07/22/2014	333.29	0.00	08/19/2014	Electrical Services		-		No	0000
07/22/2014 101-410-1940-43810 Electric Utility	07/22/2014	383.26	0.00	08/19/2014	Electrical Services		-		No	0000
07/22/2014 101-430-3160-43810 Street Lighting	07/22/2014	35.86	0.00	08/19/2014	Electrical Services		-		No	0000
07/22/2014 101-410-1940-43810 Electric Utility	07/22/2014	397.27	0.00	08/19/2014	Electrical Services		-		No	0000
07/22/2014 101-450-5200-43810 Electric Utility	07/22/2014	11.84	0.00	08/19/2014	Electrical Services		-		No	0000
07/22/2014 101-450-5200-43810 Electric Utility	07/22/2014	45.45	0.00	08/19/2014	Electrical Services		-		No	0000

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close PO Line #
601-494-9400-43810	07/22/2014	1,708.95	0.00	08/19/2014	Electrical Services		-	No		0000
	07/22/2014	316.54	0.00	08/19/2014	Electrical Services		-	No		0000
101-420-2220-43810	07/22/2014	47.13	0.00	08/19/2014	Electrical Services		-	No		0000
101-430-3160-43810	07/22/2014	119.38	0.00	08/19/2014	Electrical Services		-	No		0000
101-450-5200-43810	07/22/2014	20.70	0.00	08/19/2014	Electrical Services		-	No		0000
602-495-9450-43810	07/22/2014	17.04	0.00	08/19/2014	Electrical Services		-	No		0000
602-495-9450-43810	07/22/2014	58.79	0.00	08/19/2014	Electrical Services		-	No		0000
101-450-5200-43810	07/22/2014	1,820.48	0.00	08/19/2014	Electrical Services		-	No		0000
101-430-3160-43810	07/22/2014	33.11	0.00	08/19/2014	Electrical Services		-	No		0000
101-430-3160-43810	07/22/2014	14.51	0.00	08/19/2014	Electrical Services		-	No		0000
101-450-5200-43810	07/22/2014	338.52	0.00	08/19/2014	Electrical Services		-	No		0000
101-450-5200-43810	07/22/2014	651.36	0.00	08/19/2014	Electrical Services		-	No		0000
101-430-3100-43810	07/22/2014	27.48	0.00	08/19/2014	Electrical Services		-	No		0000
601-494-9400-43810	07/22/2014	13.07	0.00	08/19/2014	Electrical Services		-	No		0000
101-430-3160-43810	07/22/2014	623.08	0.00	08/19/2014	Electrical Services		-	No		0000
206-450-5300-43810	07/22/2014	169.29	0.00	08/19/2014	Electrical Services		-	No		0000
602-495-9450-43810	07/22/2014	113.45	0.00	08/19/2014	Electrical Services		-	No		0000
601-494-9400-43810	07/22/2014	37.54	0.00	08/19/2014	Electrical Services		-	No		0000
101-450-5200-43810	07/22/2014	7,595.51	0.00	08/19/2014	Electrical Services		-	No		0000
	Total:	7,595.51								
	XCEL Total:									
XCELENG XCEL ENERGY										
Work Order	07/23/2014	1,625.64	0.00	08/19/2014	Pre pay to expediate install		-	No		0000
404-480-8000-45300	Improvements Other Than Bldgs									
	Work Order Total:	1,625.64								

Invoice #	Inv Date	Amount	Quantity	Pmt Date	Description	Reference	Task	Type	PO #	Close POLine #
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XCELENG Total:		1,625.64								
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Report Total:		1,907,768.92								
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MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014
CONSENT
ITEM #3
MOTION

AGENDA ITEM: July 2014 Financial Reporting

SUBMITTED BY: Cathy Bendel, Finance Director

THROUGH: Cathy Bendel, Finance Director

REVIEWED BY: Finance Committee

SUGGESTED ORDER OF BUSINESS:

- Introduction of Item City Administrator
- Report/Presentation City Administrator
- Questions from Council to Staff Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion Mayor & City Council
- Action on Motion Mayor Facilitates

POLICY RECOMMENDER: Finance

FISCAL IMPACT: NA

SUMMARY AND ACTION REQUESTED: As part of its Consent Agenda, the City Council is asked to accept the July 2014 Financial Reporting Packet. No specific motion is needed as this is recommended to be part of the overall approval of the *Consent Agenda*.

BACKGROUND INFORMATION: The City of Lake Elmo has fiduciary authority and responsibility to conduct normal business operations and report the financial (unaudited) statement to the City Council. City guidelines suggest the Council be updated on a regular basis.

STAFF REPORT: Attached please find the comparative financial statements for the month of July 2014 reflecting the monthly and year to date detail, comparing the actual results to the 2014 Budget.

The most significant budget to actual variances are highlighted below:

Revenues:

- The Ad Valorem Tax revenue for the month/year to date (first of two installments) was 9% lower than budget. This is primarily due to property tax payments/collections being lower than projected. It is anticipated that the majority of those payments/collections will be received by Washington County by the end of the year.
- The Fiscal Disparity revenue for the month/year to date (also first of two installments) was 51% higher than budgeted. This is primarily due to the budget being a conservative estimate due to the nature of the program.
- Building Permit revenue for the month was 4% below budget and the year to date results are at 12% better than budget. There were four new homes started in July bringing the year to date new home starts to 16 compared to 21 in 2013. Although fewer homes, the actual valuations are above the estimates used in the budget resulting in the actual permit fee revenue being better than budgeted.
- The year to date recycling grant revenue was budgeted to be received in June and was actually received 8/15/14. This year to date variance is just a timing issue.
- Plan check fees are 83% better than budget for the month and the year to date results are 31% better than budget. As mentioned previously, the valuations are higher than projected resulting in the revenue also being higher than budgeted.

Expenses:

Most departments were at or below budget for the month due to diligently managing expenditures to the bottom line. A few items to note:

- Communications – In July there were \$1.2k in newsletter expenses not budgeted for July. This is a timing issue.
- Finance – Audit services expense is higher than budget by \$4.9k for the month and this is also a timing issue. The total expense for the year represents all costs for the audit and is right at the budgeted amount.
- Planning – Salaries are less than budgeted due to the recovery of personnel time spent on developer work. This expense recovery was not included in the 2014 budget. Planning related engineering support costs for July are \$1.5k below budget and on a year to date basis by \$7.4k due to the majority of the workload being new development related and as such is recoverable through the developer escrow funds.
- Engineering – Similarly, the general engineering support is also at 30% below budget for the month and 18% year to date due to the majority of the current work being performed is developer related and recoverable through escrow funds.
- Police – The cost for policing services is billed each year in two installments. The amounts were budgeted in June and December. The bill for the first half of the year will be paid 8/19/14 so this variance is a timing issue.
- Fire – Repairs and Maintenance for the month were \$12.8k above budget for the month which brings the year to date expense to \$18.4k above budget for the year. As

mentioned last month, the majority of the expenses relate to unforeseen repairs which were needed to the fire equipment fleet and not budgeted for.

- Public Works – The part time salaries are \$2.8k higher than budget for the month due to all salaries being budgeted in the full time salary line item. On a year to date basis, the some of the two salary expense lines are above budget due to the extra costs for snow removal as well as the summer focus on street repairs.
- Streets – Due to the summer focus on street repairs, the street maintenance expenses are higher than budgeted for the month but within the full year budgeted amount. Contract services included cost of \$4.5k to rent the spray-patcher for street repairs.
- Parks & Recreation – As mentioned with Public Works, all salary costs were budgeted under full-time salaries. In total, the salaries are \$5.8k below budget on a year to date basis. Landscaping materials for the month were \$2.2k higher than budget due to having the resources available to focus on the parks initiative.

RECOMMENDATION: Based on the aforementioned, the staff recommends the City Council accept the attached July Financial Report.

ATTACHMENT:

1. July Financial Reports

City of Lake Elmo
2014 By Month
Budget to Actual Comparative
For the month ending July 31, 2014
101-General Fund Summary
By Department

8/19/2014

	MONTH				YTD			
	BUDGET Month	ACTUAL Month	Variance (\$) Month	Variance (%) Month	BUDGET YTD	ACTUAL YTD	Variance (\$) YTD	Variance (%) YTD
DEPT 410 - GEN'L GOV'T								
REVENUE								
Total Revenue	1,444,025.50	1,367,693.77	(76,331.73)	-5.29%	1,730,970.58	1,676,463.20	(54,507.38)	-3.15%
EXPENSE								
Total Mayor & Council	100.00	0.00	100.00	100.00%	30,491.66	17,952.56	12,539.10	41.12%
Total Administration	27,942.70	25,917.90	2,024.80	7.25%	243,162.51	258,661.18	(15,498.67)	-6.37%
Total Elections	3,025.00	32.03	2,992.97	98.94%	4,700.00	972.03	3,727.97	79.32%
Total Communications	5,903.48	7,268.79	(1,365.31)	-23.13%	45,600.43	56,509.48	(10,909.05)	-23.92%
Total Finance	18,460.24	23,488.64	(5,028.40)	-27.24%	103,012.30	101,986.11	1,026.19	1.00%
Total Planning & Zoning	20,208.41	19,092.83	1,115.58	5.52%	155,413.02	140,363.47	15,049.55	9.68%
Total Engineering Services	4,000.00	2,789.28	1,210.72	30.27%	28,000.00	22,965.71	5,034.29	17.98%
Total City Hall	2,233.32	2,004.05	229.27	10.27%	15,816.56	14,264.64	1,551.92	9.81%
Total General Government	81,873.15	80,593.52	1,279.63	1.56%	626,196.48	613,675.18	12,521.30	2.00%
DEPT 420 - PUBLIC SAFETY								
Total Police	0.00	677.55	(677.55)	-100.00%	250,000.00	1,311.72	248,688.28	99.48%
Total Prosecution	4,250.00	4,587.50	(337.50)	-7.94%	29,750.00	27,261.25	2,488.75	8.37%
Total Fire	31,791.73	39,672.34	(7,880.61)	-24.79%	242,015.00	224,691.96	17,323.04	7.16%
Total Fire Relief	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%
Total Building Inspections	12,122.24	12,174.45	(52.21)	-0.43%	92,934.05	93,289.97	(355.92)	-0.38%
Total Emergency Communications	0.00	0.00	0.00	0.00%	5,800.00	3,373.08	2,426.92	41.84%
Total Animal Control	500.00	935.00	(435.00)	-87.00%	3,632.08	3,759.00	(126.92)	-3.49%
Total Public Safety	48,663.97	58,046.84	(9,382.87)	-19.28%	624,131.13	353,686.98	270,444.15	43.33%

DEPT 430 - PUBLIC WORKS	MONTH			
	BUDGET Month	ACTUAL Month	Variance (\$) Month	Variance (%) Month
Total Public Works	27,658.91	29,542.76	(1,883.85)	-6.81%
Total Streets	1,300.00	5,027.93	(3,727.93)	-286.76%
Total Ice & Snow Removal	500.00	1,011.76	(511.76)	-102.35%
Total Street Lighting	2,400.00	1,892.79	507.21	21.13%
Total Recycling	0.00	251.23	(251.23)	-100.00%
Total Tree Program	0.00	0.00	0.00	0.00%
Total Public Works	31,858.91	37,726.47	(5,867.56)	-18.42%

DEPT 450 - CULTURE, RECREATION

Total Parks & Recreation	21,637.23	19,990.99	1,646.24	7.61%
DEPT 460 - COMP ADJ	0.00	0.00	0.00	0.00%
DEPT 490 - CONTINGENCY FUND	0.00	0.00	0.00	0.00%
DEPT 493 - OTH FINANCING	0.00	0.00	0.00	0.00%
GRAND TOTAL ALL DEPTS	184,033.26	196,357.82	(12,324.56)	-6.70%
Net Income over Expenses	1,259,992.24	1,171,335.95	(88,656.29)	-7.04%

	YTD			
	BUDGET YTD	ACTUAL YTD	Variance (\$) YTD	Variance (%) YTD
	238,293.73	239,687.23	(1,393.50)	-0.58%
	9,700.00	19,944.94	(10,244.94)	-105.62%
	63,000.00	58,353.25	4,646.75	7.38%
	16,800.00	12,400.72	4,399.28	26.19%
	7,400.00	5,083.09	2,316.91	31.31%
	5,000.00	950.00	4,050.00	81.00%
	340,193.73	336,419.23	3,774.50	1.11%
	128,828.27	120,161.43	8,666.84	6.73%
	0.00	0.00	0.00	0.00%
	0.00	0.00	0.00	0.00%
	0.00	0.00	0.00	0.00%
	1,719,349.61	1,423,942.82	295,406.79	17.18%
	11,620.97	252,520.38	240,899.41	-2072.97%

City of Lake Elmo

2014 By Month

Budget to Actual Comparative

For the month ending July 31, 2014

101-General Fund Detail

By Department

8/19/2014

DEPT 410 - GEN'L GOV'T	Full Year BUDGET 2014	% to date	MONTH			YTD			YTD variance notes		
			BUDGET	ACTUAL	Variance (\$)	Variance (%)	BUDGET	ACTUAL		Variance (\$)	Variance (%)
			Month	Month	Month	Month	YTD	YTD		YTD	YTD
REVENUE											
Current Ad Valorem Taxes	2,565,000.00	45.46%	1,282,500.00	1,165,956.51	(116,543.49)	-9.09%	1,282,500.00	1,165,956.51	Based on amounts collected		
Delinquent Ad Valorem Taxes	20,000.00	37.76%	10,000.00	7,551.53	(2,448.47)	-24.48%	10,000.00	7,551.53			
Mobile Home Tax	8,000.00	71.92%	4,000.00	5,753.84	1,753.84	43.85%	4,000.00	5,753.84			
Fiscal Disparities	120,000.00	75.37%	60,000.00	90,444.17	30,444.17	50.74%	60,000.00	90,444.17			
Penalty & Interest on Taxes	5,180.00	7.23%	2,590.00	374.52	(2,215.48)	-85.54%	2,590.00	374.52			
Liquor License	3,000.00	0.00%	0.00	0.00	0.00	0.00%	3,000.00	0.00	Prepaid in 2013 rather than early 2014		
Wastewater License	0.00	100.00%	0.00	0.00	0.00	0.00%	0.00	0.00			
General Contractor License	165.00	30.30%	0.00	0.00	0.00	0.00%	165.00	0.00			
Heating Contractor License	6,650.00	51.28%	500.00	650.00	150.00	30.00%	4,150.00	3,410.00			
Blacktopping Contractor License	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00			
Building Permits	170,500.00	59.23%	17,500.00	16,698.85	(801.15)	-4.58%	90,500.00	100,988.25	3 new home starts in June; YTD of 11 compared to 17 in 2013		
Building Re-inspect Fees	0.00	100.00%	0.00	0.00	0.00	100.00%	0.00	0.00			
Heating Permits	15,600.00	61.25%	1,300.00	250.00	(1,050.00)	-80.77%	9,100.00	9,555.00			
Plumbing Permits	9,000.00	94.72%	500.00	1,980.00	680.00	52.31%	6,500.00	8,525.00			
Sewer Permits	485.00	0.00%	0.00	0.00	0.00	0.00%	485.00	0.00			
Animal License	1,991.00	116.70%	150.00	185.00	35.00	23.33%	1,641.00	2,323.50			
Utility Permits (ROW)	11,000.00	155.69%	1,000.00	4,624.80	3,624.80	362.48%	5,000.00	17,125.80	Due to I-94 expansion		
Burning Permit	3,350.00	32.84%	500.00	240.00	(260.00)	-52.00%	2,600.00	1,100.00			
Massage Therapy Licenses	150.00	0.00%	0.00	0.00	0.00	0.00%	150.00	0.00			
Electrical Permit	0.00	100.00%	0.00	418.93	418.93	100.00%	0.00	2,019.04	Permit refund		
Homestead Credit Aid	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	City share only (25%)		
MSA-Maintenance	98,022.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00			
State Fire Aid	41,500.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00			
PERA Aid	2,749.00	50.00%	1,374.50	1,374.50	0.00	0.00%	4,374.50	1,374.50			
Gravel Tax	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00			
Recycling Grant	15,500.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	Budgeted based on funds rec'd in 2013 for the fire relief assn		
Misc State Grant/Surcharge Rev	1,150.00	8871.43%	49,011.00	51,066.79	2,055.79	4.19%	15,500.00	0.00	Grant funds received 8/15/14		
Cable Franchise Revenue	42,852.00	91.77%	0.00	0.00	0.00	0.00%	99,172.00	102,021.47	DNR trail grooming funds of \$4k		
Zoning & Subdivision Fees	1,250.00	614.00%	0.00	0.00	0.00	0.00%	42,851.98	39,323.71	Cable franchise revenue received May 1st		
Plan Check Fees	82,000.00	78.38%	7,000.00	12,832.67	5,832.67	83.32%	500.00	7,675.00			
Sale of Copies, Books, Maps	206.00	111.17%	0.00	61.25	61.25	100.00%	49,000.00	64,275.69			
Assessment Searches	1,285.00	44.36%	100.00	165.00	65.00	65.00%	206.10	229.00			
Clean Up Days	3,000.00	75.93%	0.00	0.00	0.00	0.00%	785.00	570.00			
Cable Operation Reimbursement	1,950.00	39.68%	1,200.00	0.00	(1,200.00)	-100.00%	3,000.00	2,278.00			
Fines	48,000.00	53.64%	4,500.00	4,314.91	(185.09)	-4.11%	1,200.00	773.75			
Miscellaneous Revenue	2,400.00	153.86%	200.00	646.50	446.50	223.25%	29,500.00	25,748.29			
Internal Charges	1,600.00	34.00%	100.00	64.00	(36.00)	-36.00%	1,400.00	3,692.63	CUP permits		
Interest Earnings	20,000.00	0.00%	0.00	0.00	0.00	0.00%	1,100.00	544.00	Fewer library card reimb than budgeted		
Donations	0.00	100.00%	0.00	0.00	0.00	0.00%	0.00	0.00			
Total Revenue	3,303,535.00	50.75%	1,444,025.50	1,367,693.77	(76,331.73)	-5.29%	1,730,970.58	1,676,463.20	Donation from LE Jaycees		
							</				

EXPENSE	Full Year BUDGET 2014	% to date	MONTH				YTD				
			BUDGET		ACTUAL		BUDGET		ACTUAL		
			Month	Variance (\$)	Month	Variance (%)	YTD	Variance (\$)	YTD	Variance (%)	
1110 - Mayor & Council											
PT Salaries	25,690.00	50.00%	0.00	0.00	0.00	0.00%	12,845.00	0.00	0.00%		
FICA Contributions	1,592.78	50.00%	0.00	0.00	0.00	0.00%	796.39	0.00	0.00%		
Medicare Contributions	372.54	50.00%	0.00	0.00	0.00	0.00%	186.27	0.00	0.00%		
Workers Compensation	300.00	0.00%	0.00	0.00	0.00	0.00%	300.00	0.00	100.00%		
Miscellaneous	800.00	0.00%	100.00	0.00	100.00	100.00%	350.00	0.00	100.00%		
Dues & Subscriptions	5,000.00	14.56%	0.00	0.00	0.00	0.00%	5,000.00	0.00	100.00%		
Dues & Subscriptions	10,514.00	32.31%	0.00	0.00	0.00	0.00%	10,514.00	0.00	85.44%		
Conferences & Training	1,000.00	0.00%	0.00	0.00	0.00	0.00%	3,397.00	7,117.00	67.69%		
Total Mayor & Council	45,269.32	39.66%	100.00	0.00	100.00	100.00%	30,491.66	17,952.56	41.12%		
Includes Memberships											
1320 - Administration											
PT Salaries	176,384.00	56.19%	13,271.46	0.00	296.54	2.19%	101,760.00	99,117.12	2,642.88	2.60%	
PERA Contributions	12,505.02	57.45%	962.16	0.00	21.52	2.19%	7,236.19	7,184.27	51.92	0.72%	
ICMA Contributions	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
FICA Contributions	10,603.92	54.88%	779.61	0.00	61.61	7.32%	6,143.18	5,819.54	323.64	5.27%	
Medicare Contributions	2,479.96	54.88%	196.74	0.00	14.42	7.33%	1,436.72	1,360.98	75.74	5.27%	
Health/Dental Insurance	47,636.00	53.20%	3,716.00	0.00	96.00	2.58%	27,342.00	25,340.00	2,002.00	7.32%	
Unemployment Benefits	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
Workers Compensation	1,000.00	13.94%	0.00	0.00	0.00	0.00%	1,000.00	139.37	860.63	86.06%	
Office Supplies	6,000.00	66.18%	918.05	0.00	(418.05)	-83.61%	3,500.00	3,970.92	(470.92)	-13.45%	
Printed Forms	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
Legal Services	60,000.00	39.18%	2,766.00	0.00	2,234.00	44.68%	35,000.00	23,507.75	11,492.25	32.84%	
Newsletter/Website	0.00	100.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
Assessing Services	30,500.00	73.56%	2,000.00	0.00	(500.00)	-25.00%	15,500.00	22,435.39	(6,935.39)	-44.74%	
Information Technology	0.00	100.00%	0.00	0.00	0.00	0.00%	0.00	3,380.02	(3,380.02)	-100.00%	
Contract Services	0.00	100.00%	0.00	0.00	0.00	0.00%	0.00	25,000.00	(25,000.00)	-100.00%	
Software Programs	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
Telephone	4,044.72	16.92%	337.06	117.00	(179.00)	65.29%	2,359.42	684.45	1,674.97	70.99%	
Postage	4,000.00	34.65%	500.00	0.00	500.00	-100.00%	2,500.00	1,386.17	1,113.83	44.55%	
Mileage	600.00	16.75%	0.00	0.00	0.00	0.00%	600.00	100.51	499.49	83.25%	
Legal Publishing	2,400.00	150.99%	200.00	290.40	(90.40)	-45.20%	1,400.00	3,623.67	(2,223.67)	-158.83%	
Insurance	35,000.00	70.88%	0.00	0.00	0.00	0.00%	35,000.00	24,808.00	10,192.00	29.12%	
Cable Operation Expense	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
Miscellaneous	600.00	177.08%	50.00	179.91	(129.91)	-259.82%	350.00	1,062.47	(712.47)	-203.56%	
Dues & Subscriptions	600.00	88.86%	50.00	151.99	(101.99)	-203.98%	350.00	533.18	(183.18)	-52.34%	
Books	0.00	100.00%	0.00	0.00	0.00	0.00%	0.00	42.28	(42.28)	-100.00%	
Conferences & Training	2,185.00	393.83%	0.00	0.00	0.00	0.00%	1,685.00	8,605.22	(6,920.22)	-410.70%	
Staff Development	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
Total Administration	396,538.62	65.23%	27,942.70	25,917.90	2,024.80	7.25%	243,162.51	258,661.18	(15,498.67)	-6.37%	
1410 - Elections											
PT Salaries	10,000.00	0.00%	2,500.00	0.00	0.00	100.00%	2,500.00	0.00	2,500.00	100.00%	
Office Supplies	500.00	0.00%	125.00	0.00	0.00	100.00%	125.00	0.00	125.00	100.00%	
Legal Publications/Notification	500.00	0.00%	125.00	0.00	0.00	100.00%	250.00	0.00	250.00	100.00%	
Election Equipment	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
Equipment Repair	450.00	0.00%	125.00	0.00	0.00	100.00%	225.00	0.00	225.00	100.00%	
County Election Fees	950.00	0.00%	0.00	0.00	0.00	0.00%	950.00	0.00	950.00	100.00%	
Printed Forms	350.00	0.00%	0.00	0.00	0.00	0.00%	350.00	0.00	350.00	100.00%	
Miscellaneous	600.00	162.01%	150.00	32.03	117.97	78.65%	300.00	972.03	(672.03)	-224.01%	
Total Elections	13,350.00	7.28%	3,025.00	32.03	2,992.97	98.94%	4,700.00	972.03	3,727.97	79.32%	
WA Cty Ann Elect Much Califor											
Not budgeted since no election scheduled; had to reallocate machines for special school election.											

Full Year BUDGET 2014	% to date	MONTH				YTD			
		BUDGET Month	ACTUAL Month	Variance (\$)	Variance (%) Month	BUDGET YTD	ACTUAL YTD	Variance (\$)	Variance (%) YTD
1450 - Communications									
FT Salaries	85.17%	13,390.00	1,030.00	1,345.21	(515.21)	7,725.00	11,404.60	(3,679.60)	-47.63%
PERA Contributions	85.17%	970.78	74.68	112.05	(37.37)	560.06	826.84	(266.78)	-47.63%
FICA Contributions	82.60%	830.18	63.86	92.97	(29.11)	478.95	685.76	(206.81)	-43.18%
Medicare Contributions	82.60%	194.16	14.94	21.73	(6.79)	112.01	160.37	(48.36)	-43.17%
Health/Dental Insurance	61.03%	3,120.00	240.00	272.00	(32.00)	1,800.00	1,904.00	(104.00)	-5.78%
Workers Compensation	14.90%	110.00	0.00	0.00	0.00	110.00	16.39	93.61	85.10%
Newsletter	63.60%	8,000.00	0.00	1,258.00	(1,258.00)	4,000.00	5,088.06	(1,088.06)	-27.20%
Office Supplies	201.63%	304.41	0.00	0.00	0.00	154.41	613.77	(459.36)	-297.49%
Info Technology/Web	69.36%	42,000.00	3,500.00	2,635.58	864.42	24,500.00	29,129.13	(4,629.13)	-18.89%
Telephone	31.40%	1,560.00	130.00	75.79	54.21	910.00	489.78	420.22	46.18%
Mileage	100.00%	0.00	0.00	0.00	0.00	50.00	36.96	13.04	26.08%
Public Notices	63.41%	4,200.00	300.00	181.40	118.60	2,700.00	2,663.20	36.80	1.36%
Cable Operations	74.74%	3,600.00	300.00	374.06	(74.06)	2,100.00	2,690.62	(590.62)	-28.12%
Conferences	87.50%	800.00	250.00	700.00	(450.00)	250.00	700.00	(450.00)	-180.00%
Repair/Maint Equipment	200.00%	50.00	0.00	0.00	0.00	150.00	100.00	50.00	33.33%
Total Communications	71.41%	79,129.53	5,903.48	7,268.79	(1,365.31)	45,600.43	56,509.48	(10,909.05)	-23.92%
1520 - Finance									
FT Salaries	56.77%	87,880.00	6,760.00	6,258.13	501.87	50,700.00	49,889.35	810.65	1.60%
PERA Contributions	54.88%	6,371.30	490.10	453.72	36.38	3,675.75	3,496.78	178.97	4.87%
FICA Contributions	52.25%	5,448.56	419.12	366.34	52.78	3,143.40	2,847.09	296.31	9.43%
Medicare Contributions	52.25%	1,274.26	98.02	85.67	12.35	735.15	665.80	69.35	9.43%
Health/Dental Insurance	35.47%	19,936.00	1,568.00	870.40	697.60	11,408.00	7,072.00	4,336.00	38.01%
Unemployment Benefits	100.00%	0.00	0.00	0.00	0.00	0.00	456.86	(456.86)	-100.00%
Workers Compensation	12.93%	600.00	0.00	0.00	0.00	600.00	77.56	522.44	87.07%
Office Supplies	51.86%	300.00	25.00	0.00	25.00	175.00	155.57	19.43	11.10%
Printed Forms	100.00%	0.00	0.00	0.00	0.00	0.00	433.47	(433.47)	-100.00%
Audit Services	100.00%	27,000.00	13,940.00	0.00	0.00	27,000.00	27,000.00	0.00	0.00%
Contract Services	151.08%	4,500.00	0.00	946.88	(946.88)	3,500.00	6,798.46	(3,298.46)	-94.24%
Software Programs	1249.69%	150.00	0.00	0.00	0.00	150.00	1,874.54	(1,724.54)	-1149.69%
Telephone	16.04%	1,200.00	100.00	27.50	72.50	700.00	192.50	507.50	72.50%
Mileage	0.00%	50.00	0.00	0.00	0.00	50.00	0.00	50.00	100.00%
Miscellaneous	2.53%	1,000.00	0.00	0.00	0.00	850.00	25.28	824.72	97.03%
Dues & Subscriptions	0.00%	0.00	0.00	540.00	(540.00)	0.00	540.00	(540.00)	-100.00%
Conferences & Training	80.15%	575.00	0.00	0.00	0.00	325.00	460.85	(135.85)	-41.80%
Total Finance	65.26%	156,285.12	18,466.24	23,488.64	(5,028.40)	103,012.30	101,986.11	1,026.19	1.00%
		Ehlers conf recommended by City Admin Zuleger							

	Full Year BUDGET 2014	% to date	MONTH				YTD				YTD variance notes
			BUDGET Month	ACTUAL Month	Variance (\$) Month	Variance (%) Month	BUDGET YTD	ACTUAL YTD	Variance (\$) YTD	Variance (%) YTD	
1910 - Planning & Zoning											
FT Salaries	159,874.00	57.15%	12,298.00	12,962.69	(664.69)	-5.40%	92,235.00	91,363.08	871.92	0.95%	
PERA Contributions	11,590.87	60.52%	891.61	848.08	43.53	4.88%	6,687.04	7,014.82	(327.78)	-4.90%	
FICA Contributions	9,912.19	58.81%	762.48	757.95	4.53	0.59%	5,718.57	5,829.76	(111.19)	-1.94%	
Medicare Contributions	2,318.17	58.82%	178.32	177.27	1.05	0.59%	1,337.41	1,363.44	(26.03)	-1.95%	
Health/Dental Insurance	34,814.00	53.85%	2,678.00	2,678.00	0.00	0.00%	20,085.00	18,746.00	1,339.00	6.67%	
Workers Compensation	800.00	17.97%	0.00	0.00	0.00	0.00%	800.00	143.78	656.22	82.03%	
Office Supplies	2,000.00	53.84%	150.00	122.41	27.59	18.39%	1,050.00	1,076.73	(26.73)	-2.55%	
Printed Forms	750.00	60.80%	0.00	0.00	0.00	0.00%	250.00	456.00	(206.00)	-82.40%	
Engineering Services	36,000.00	37.83%	3,000.00	1,444.63	1,555.37	51.85%	21,000.00	13,619.34	7,380.66	35.15%	
Contract Services	10,000.00	0.00%	0.00	0.00	0.00	0.00%	5,000.00	0.00	5,000.00	100.00%	
Information Technology	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
Telephone	1,200.00	26.49%	100.00	54.63	45.37	45.37%	700.00	317.90	382.10	54.59%	
Postage	200.00	61.34%	0.00	17.40	(17.40)	-100.00%	100.00	122.68	(22.68)	-22.68%	
Mileage	200.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
Miscellaneous	500.00	14.19%	50.00	29.77	20.23	40.46%	250.00	70.94	179.06	71.62%	
Dues & Subscriptions	600.00	39.83%	0.00	0.00	0.00	0.00%	0.00	239.00	(239.00)	-100.00%	
Books	300.00	0.00%	100.00	0.00	100.00	100.00%	200.00	0.00	200.00	100.00%	
Conferences & Training	2,000.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%	
Total Planning & Zoning	273,059.23	51.40%	20,208.41	19,092.83	1,115.58	5.52%	155,413.02	140,363.47	15,049.55	9.68%	
1930 - Engineering Services											
Engineering Services	48,000.00	47.85%	4,000.00	2,789.28	1,210.72	30.27%	28,000.00	22,965.71	5,034.29	17.98%	
Total Engineering Services	48,000.00	47.85%	4,000.00	2,789.28	1,210.72	30.27%	28,000.00	22,965.71	5,034.29	17.98%	
1940 - City Hall											
Cleaning Supplies	25.00	0.00%	0.00	0.00	0.00	0.00%	25.00	0.00	25.00	100.00%	
Building Repair Supplies	200.00	81.99%	25.00	0.00	25.00	100.00%	75.00	163.97	(88.97)	-118.63%	
Telephone	2,400.00	28.98%	200.00	89.01	110.99	55.50%	1,400.00	695.51	704.49	50.32%	
Utilities	13,200.00	49.90%	1,100.00	702.80	397.20	36.11%	7,700.00	6,586.73	1,113.27	14.46%	
Refuse	1,408.16	46.84%	108.32	109.93	(1.61)	-1.49%	866.56	659.58	206.98	23.89%	
Repairs/Maint Contractual Bldg	7,200.00	37.96%	600.00	230.00	370.00	61.67%	4,200.00	2,733.29	1,466.71	34.92%	
Repairs/Maint Contractual Equip	2,400.00	132.90%	200.00	837.85	(637.85)	-318.93%	1,400.00	3,189.62	(1,789.62)	-127.83%	Annex repairs - Yale Mech
Miscellaneous	300.00	78.65%	0.00	34.46	(34.46)	-100.00%	150.00	235.94	(85.94)	-57.29%	
Total City Hall	27,133.16	52.57%	2,233.32	2,004.05	229.27	10.27%	15,816.56	14,264.64	1,551.92	9.81%	
Total General Government	1,038,764.98	59.08%	81,873.15	80,593.52	1,279.63	1.56%	626,196.48	613,675.18	12,521.30	2.00%	

DEPT 420 - PUBLIC SAFETY

DEPT 420 - PUBLIC SAFETY	Full Year BUDGET 2014	% to date	MONTH			YTD			Variance (%)
			BUDGET Month	ACTUAL Month	Variance (\$) Month	BUDGET YTD	ACTUAL YTD	Variance (\$) YTD	
2100 - Police	500,000.00	0.26%	0.00	677.55	(677.55)	250,000.00	1,311.72	248,688.28	99.48%
Law Enforcement Contract	500,000.00	0.26%	0.00	677.55	(677.55)	250,000.00	1,311.72	248,688.28	99.48%
Total Police									
2150 - Prosecution	51,000.00	53.45%	4,250.00	4,587.50	(337.50)	29,750.00	27,261.25	2,488.75	8.37%
Attorney Criminal	51,000.00	53.45%	4,250.00	4,587.50	(337.50)	29,750.00	27,261.25	2,488.75	8.37%
Total Prosecution									
2220 - Fire	74,119.04	57.78%	5,701.46	5,712.98	(11.52)	42,760.98	42,824.30	(63.32)	-0.15%
PT Salaries	109,455.98	56.77%	7,618.46	8,225.88	(607.42)	67,554.45	62,142.12	5,412.33	8.01%
PERA Contributions	11,785.11	65.63%	949.39	1,033.72	(84.33)	7,038.16	7,734.14	(695.98)	-9.89%
FICA Contributions	11,381.65	30.46%	825.84	449.19	376.65	6,839.56	3,466.29	3,373.27	49.32%
Medicare Contributions	2,661.84	55.13%	193.14	194.58	(1.44)	1,599.57	1,467.46	132.11	8.26%
Health/Dental Insurance	15,990.00	49.99%	1,230.00	1,142.00	88.00	9,225.00	7,994.00	1,231.00	13.34%
Unemployment Benefits	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Workers Compensation	9,000.00	17.11%	0.00	0.00	0.00	9,000.00	1,539.45	7,460.55	82.90%
Office Supplies	500.00	142.80%	50.00	0.00	50.00	250.00	714.02	(464.02)	-185.61%
EMS Supplies	4,900.00	4.66%	0.00	0.00	0.00	1,900.00	228.37	1,671.63	87.98%
Fire Prevention	3,000.00	0.00%	0.00	0.00	0.00	1,750.00	0.00	1,750.00	100.00%
Fuel, Oil & Fluids	14,000.00	58.83%	1,200.00	2,674.07	(1,474.07)	8,400.00	8,236.73	163.27	1.94%
Small Tools & Equip	22,500.00	35.49%	1,900.00	104.90	1,795.10	13,300.00	7,984.58	5,315.42	39.97%
Physicals	6,900.00	15.57%	575.00	0.00	575.00	4,025.00	1,074.00	2,951.00	73.32%
Information Technology	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Telephone	4,200.00	66.30%	350.00	344.64	5.36	2,450.00	2,784.40	(334.40)	-13.65%
Radio	16,203.04	53.75%	3,800.76	547.00	3,253.76	8,601.52	8,708.87	(107.35)	-1.25%
Mileage	350.00	0.00%	50.00	0.00	50.00	100.00	0.00	100.00	100.00%
Insurance	5,237.80	97.69%	0.00	0.00	0.00	5,237.00	5,116.00	121.00	2.31%
Electric Utility	21,600.00	39.28%	1,800.00	567.04	1,232.96	12,600.00	8,484.08	4,115.92	32.67%
Refuse	572.16	124.47%	47.68	259.32	(211.64)	333.76	712.16	(378.40)	-113.37%
Repair/Maint Bldg	12,000.00	32.67%	1,000.00	318.37	681.63	7,000.00	3,920.21	3,079.79	44.00%
Repair/Maint Equip	41,000.00	102.83%	3,400.00	16,165.90	(12,765.90)	23,800.00	42,158.83	(18,358.83)	-77.14%
Uniforms	3,000.00	56.34%	250.00	1,270.85	(1,020.85)	1,750.00	1,690.20	59.80	3.42%
Miscellaneous	900.00	153.28%	100.00	218.90	(118.90)	700.00	1,379.53	(679.53)	-97.08%
Dues & Subscriptions	2,200.00	114.91%	0.00	293.00	(293.00)	2,200.00	2,528.00	(328.00)	-14.91%
Books	200.00	51.00%	0.00	0.00	0.00	100.00	102.00	(2.00)	-2.00%
Conferences & Training	6,000.00	62.14%	500.00	150.00	350.00	3,500.00	3,728.60	(228.60)	-6.53%
Conferences & Training (Reimb)	0.00	-100.00%	0.00	0.00	0.00	0.00	(2,026.38)	2,026.38	100.00%
Total Fire	399,655.82	56.22%	31,791.73	39,672.34	(7,880.61)	242,015.00	224,691.96	17,323.04	7.16%
2250 - Fire Relief	37,323.50	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Fire State Aid	37,323.50	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Total Fire Relief									

Due to FF rate change effective 1/1/2014
FF budgeted at normal 6.2%; Full time fire FF rate is zero

YTD includes Thermal Imaging camera from Jan

Firehall #2 charged to PW in error; reclassified in June

Emergency repair bill - \$11,500

Reimb segregated out for better tracking

Due to FF rate change effective 1/1/2014
FF budgeted at normal 6.29%; Full time fire FF rate is zero

YTD includes Thermal Imaging camera from Jan

Firehall #2 charged to PW in error; reclassified in June

Emergency repair bill - \$11,500

Reimb segregated out for better tracking

2400 - Building Inspection	Full Year BUDGET 2014	% to date	MONTH				YTD			
			BUDGET		ACTUAL		Variance (\$)	Month	Variance (%)	Month
			Month	Month	Month	Month				
FT Salaries	95,992.00	53.43%	7,384.00	6,892.90	491.10	6.65%				
PERA Contributions	6,959.42	53.43%	535.34	499.73	35.61	6.65%				
FICA Contributions	5,951.50	50.20%	457.81	401.65	56.16	12.27%				
Medicare Contributions	1,391.88	50.20%	107.07	93.94	13.13	12.26%				
Health/Dental Insurance	24,102.00	41.07%	1,896.00	1,414.00	482.00	25.42%				
Unemployment Benefits	0.00	0.00%	0.00	0.00	0.00	0.00%				
Workers Compensation	397.88	19.12%	0.00	0.00	0.00	0.00%				
Office Supplies	1,447.44	10.62%	100.00	17.93	82.07	82.07%				
Printed Forms	146.61	0.00%	0.00	0.00	0.00	0.00%				
Fuel, Oil & Fluids	465.56	23.50%	51.36	0.00	51.36	100.00%				
Engineering	10,000.00	50.42%	1,000.00	1,189.65	(189.65)	-18.97%				
Surcharge Prints	0.00	0.00%	0.00	0.00	0.00	0.00%				
Inspector Contract Services	3,281.50	65.23%	200.00	1,232.50	(1,032.50)	-516.25%				
Information Technology	4,180.00	348.98%	0.00	0.00	0.00	0.00%				
Software Programs	0.00	100.00%	0.00	0.00	0.00	0.00%				
Telephone	547.92	74.51%	45.66	62.73	(17.07)	-37.39%				
Mileage	600.00	42.30%	50.00	121.52	(71.52)	-143.04%				
Insurance	340.00	72.94%	0.00	0.00	0.00	0.00%				
Repairs/Maint Equip	300.00	71.09%	100.00	0.00	100.00	100.00%				
Uniforms	0.00	0.00%	0.00	0.00	0.00	0.00%				
Miscellaneous	500.00	23.47%	0.00	117.37	(117.37)	-100.00%				
Dues & Subscriptions	0.00	100.00%	0.00	0.00	0.00	0.00%				
Books	308.24	112.48%	100.00	0.00	100.00	100.00%				
Conferences & Training	690.00	95.58%	95.00	130.53	(35.53)	-37.40%				
Total Building Inspections	157,601.95	59.19%	12,122.24	12,174.45	(52.21)	-0.43%				
2500 - Emergency Communications										
Contract Services	5,800.00	58.16%	0.00	0.00	0.00	0.00%				
Total Emergency Communications	5,800.00	58.16%	0.00	0.00	0.00	0.00%				
2700 - Animal Control										
Printed Forms	0.00	0.00%	0.00	0.00	0.00	0.00%				
Contract Services	5,842.08	51.35%	500.00	500.00	0.00	0.00%				
Miscellaneous	440.00	172.50%	0.00	435.00	(435.00)	-100.00%				
Total Animal Control	6,282.08	59.84%	500.00	935.00	(435.00)	-87.00%				
Total Public Safety	1,157,663.35	30.55%	48,663.97	58,046.84	(9,382.87)	-19.28%				

	BUDGET	YTD	ACTUAL	Variance (\$)	YTD	Variance (%)	YTD
	YTD	YTD	YTD	YTD	YTD	YTD	YTD
	55,380.00	51,289.14	4,090.86	7.39%			
	4,015.05	3,718.40	296.65	7.39%			
	3,433.56	2,987.65	445.91	12.99%			
	803.01	698.67	104.34	12.99%			
	13,791.00	9,898.00	3,893.00	28.23%			
	0.00	0.00	0.00	0.00%			
	397.88	76.07	321.81	80.88%			
	947.44	153.73	793.71	83.77%			
	146.61	0.00	146.61	100.00%			
	208.76	109.42	99.34	47.59%			
	5,750.00	5,042.55	707.65	12.31%			
	0.00	0.00	0.00	0.00%			
	1,581.50	2,140.50	(559.00)	-35.35%			
	4,180.00	14,587.16	(10,407.16)	-248.98%			
	0.00	0.00	0.00	0.00%			
	319.62	408.23	(88.61)	-27.72%			
	350.00	253.78	96.22	27.49%			
	340.00	248.00	92.00	27.06%			
	100.00	213.28	(113.28)	-113.28%			
	86.38	121.98	(35.60)	-41.21%			
	300.00	177.37	182.63	60.88%			
	0.00	220.00	(220.00)	-100.00%			
	208.24	346.71	(138.47)	-66.50%			
	595.00	659.53	(64.53)	-10.85%			
	92,934.05	93,289.97	(355.92)	-0.38%			
	5,800.00	3,373.08	2,426.92	41.84%			
	5,800.00	3,373.08	2,426.92	41.84%			
	0.00	0.00	0.00	0.00%			
	3,342.08	3,000.00	342.08	10.24%			
	290.00	759.00	(469.00)	-161.72%			
	3,632.08	3,759.00	(126.92)	-3.49%			
	624,131.13	353,686.98	270,444.15	43.33%			

Animal impound fees, recovering funds where possible

DEPT 430 - PUBLIC WORKS

	Full Year BUDGET 2014	% to date	MONTH				YTD			
			BUDGET Month	ACTUAL Month	Variance (\$)	Variance (%)	BUDGET YTD	ACTUAL YTD	Variance (\$)	Variance (%)
3100 - Public Works	178,568.00	55.08%	13,736.00	12,005.29	1,730.71	12.60%	103,020.00	98,354.65	4,665.35	4.53%
FT Salaries	0.00	100.00%	0.00	2,825.45	(2,825.45)	-100.00%	0.00	12,769.42	(12,769.42)	-100.00%
PT Salaries	12,946.18	60.92%	995.86	983.92	11.94	1.20%	7,468.95	7,887.23	(418.28)	-5.60%
PERA Contributions	11,071.00	50.27%	851.63	876.08	(24.45)	-2.8%	6,387.24	6,562.12	(174.88)	-2.74%
Medicare Contributions	2,589.24	59.27%	199.17	204.87	(5.70)	-2.86%	1,493.79	1,534.66	(40.87)	-2.74%
Health/Dental Insurance	42,640.00	47.59%	3,280.00	2,899.00	381.00	11.62%	24,600.00	20,293.00	4,307.00	17.51%
Unemployment Benefits	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%
Workers Compensation	8,000.00	17.71%	0.00	0.00	0.00	0.00%	8,000.00	1,416.59	6,583.41	82.29%
Office Supplies	300.00	44.521%	25.00	21.38	3.62	14.48%	175.00	1,335.64	(1,160.64)	-663.22%
Shop Materials	600.00	25.75%	50.00	233.60	(183.60)	-367.20%	350.00	1,516.52	(1,166.52)	-333.29%
Building Repair Supplies	300.00	151.08%	25.00	0.00	25.00	100.00%	175.00	453.24	(278.24)	-158.99%
Small Tools and Minor Equip	2,400.00	28.89%	200.00	0.00	200.00	100.00%	1,400.00	693.29	706.71	50.48%
Engineering Services	9,000.00	82.15%	750.00	1,411.82	(661.82)	-88.24%	5,250.00	7,393.14	(2,143.14)	-40.82%
Contract Services	1,200.00	74.77%	100.00	294.45	(194.45)	-194.45%	700.00	897.20	(197.20)	-28.17%
Information Technology	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%
Telephone	7,661.16	51.93%	638.43	537.52	100.91	15.81%	4,469.01	3,978.48	490.53	10.98%
Radio	1,500.00	81.33%	0.00	0.00	0.00	0.00%	1,500.00	1,219.94	280.06	18.67%
Mileage	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%
Insurance	20,000.00	76.18%	0.00	0.00	0.00	0.00%	20,000.00	15,235.00	4,765.00	23.83%
Electric Utility	24,000.00	64.34%	2,000.00	887.01	1,112.99	55.65%	14,000.00	15,441.14	(1,441.14)	-10.29%
Refuse	2,493.84	50.75%	207.82	210.94	(3.12)	-1.50%	1,454.74	1,265.64	189.10	13.00%
Fuel, Oil, Fluids (ALL depis)	48,000.00	64.87%	4,000.00	5,654.18	(1,654.18)	-41.35%	28,000.00	31,139.38	(3,139.38)	-11.21%
Repair/Maint Bldg	1,200.00	285.53%	100.00	5,654.18	(4,454.18)	-445.42%	700.00	3,426.36	(2,726.36)	-389.48%
Repair/Maint NOT Bldg	600.00	107.98%	50.00	199.90	(149.90)	-299.80%	350.00	647.90	(297.90)	-85.11%
Repair/Maint Equip (cont)	3,600.00	0.97%	300.00	0.00	300.00	100.00%	2,100.00	34.96	2,065.04	98.34%
Equipment Parts	0.00	100.00%	0.00	0.00	0.00	0.00%	0.00	155.24	(155.24)	-100.00%
Uniforms	1,200.00	79.21%	100.00	179.99	(79.99)	-79.99%	700.00	950.46	(250.46)	-35.78%
Miscellaneous	600.00	112.79%	50.00	117.36	(67.36)	-134.72%	350.00	676.73	(326.73)	-93.35%
Landscaping Material	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%
Dues & Subscriptions	300.00	61.67%	0.00	0.00	0.00	0.00%	150.00	185.00	(35.00)	-23.33%
Conferences & Training	500.00	0.00%	0.00	0.00	0.00	0.00%	500.00	0.00	500.00	100.00%
Clean up Days	5,000.00	84.49%	0.00	0.00	0.00	0.00%	5,000.00	4,224.30	775.70	15.51%
Total Public Works	386,269.42	62.05%	27,658.91	29,542.76	(1,883.85)	-6.81%	238,293.73	239,687.23	(1,393.50)	-0.58%
3120 - Streets										
Equipment Parts	1,200.00	72.10%	100.00	0.00	100.00	100.00%	700.00	865.17	(165.17)	-23.60%
Street Maintenance Materials	12,000.00	68.38%	1,000.00	527.93	472.07	47.21%	7,000.00	8,206.04	(1,206.04)	-17.23%
Sign Repair Materials	0.00	100.00%	0.00	0.00	0.00	0.00%	0.00	1,479.55	(1,479.55)	-100.00%
Contract Services	1,200.00	776.33%	0.00	4,500.00	(4,500.00)	-100.00%	600.00	9,315.93	(8,715.93)	-1452.66%
Repairs/Maint Equipment	2,400.00	3.26%	200.00	0.00	200.00	100.00%	1,400.00	78.25	1,321.75	94.41%
Total Streets	16,800.00	118.77%	1,300.00	5,027.93	(3,727.93)	-286.76%	9,700.00	19,944.94	(10,244.94)	-105.62%

Extra staff for snow removal

Primarily ROW work; majority recovered by ROW fees

Firehall #2 lns charged to PW in error; reclassified in June

June clean up days; budgeted in July since paid later last year

Curbs for tapestry; water drainage issues

3125 - Ice & Snow Removal	Full Year BUDGET 2014	% to date	MONTH				YTD			
			BUDGET Month	ACTUAL Month	Variance (\$)		BUDGET YTD	ACTUAL YTD	Variance (\$)	
					Month	Month			YTD	Variance (%) YTD
Landscaping Material	0.00	100.00%	0.00	0.00	0.00	0.00%	0.00	11.09	(11.09)	-100.00%
Sand/Salt	70,000.00	64.88%	0.00	0.00	0.00	0.00%	55,000.00	45,416.16	9,583.84	17.43%
Contract Services	20,000.00	50.46%	0.00	432.50	(432.50)	-100.00%	4,500.00	10,092.50	(5,592.50)	-124.28%
Repairs/Maint Equipment	6,000.00	47.23%	500.00	579.26	(79.26)	-15.85%	3,500.00	2,833.50	666.50	19.04%
Total Ice & Snow Removal	96,000.00	60.78%	500.00	1,011.76	(511.76)	-102.35%	63,000.00	58,353.25	4,646.75	7.38%
3160 - Street Lighting										
Street Lighting	28,800.00	43.06%	2,400.00	1,892.79	507.21	21.13%	16,800.00	12,400.72	4,399.28	26.19%
Total Street Lighting	28,800.00	43.06%	2,400.00	1,892.79	507.21	21.13%	16,800.00	12,400.72	4,399.28	26.19%
3200 - Recycling										
Recycling Supplies	3,400.00	104.18%	0.00	251.23	(251.23)	-100.00%	3,400.00	3,542.08	(142.08)	-4.18%
Newsletter	0.00	0.00%	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00%
Miscellaneous	4,000.00	38.53%	0.00	0.00	0.00	0.00%	4,000.00	1,541.01	2,458.99	61.47%
Total Recycling	7,400.00	68.69%	0.00	251.23	(251.23)	-100.00%	7,400.00	5,083.09	2,316.91	31.31%
3250 - Tree Program										
Contract Services	5,000.00	19.00%	0.00	0.00	0.00	0.00%	5,000.00	950.00	4,050.00	81.00%
Total Tree Program	5,000.00	19.00%	0.00	0.00	0.00	0.00%	5,000.00	950.00	4,050.00	81.00%
Total Public Works	540,269.42	62.77%	31,858.91	37,726.47	(5,867.56)	-18.42%	340,193.73	336,419.23	3,774.50	1.11%

CFL bulbs for residents

DEPT 450 - CULTURE, RECREATION				Full Year			
				BUDGET	MONTH		
				2014	% to date	BUDGET	ACTUAL
						Month	Month
						Variance (\$)	Variance (%)
						Month	Month
5200 - Parks & Recreation							
FT Salaries	121,950.00	52.61%		15,150.00		8,118.86	
PT Salaries	20,000.00	57.87%		0.00		4,281.00	
PERA Contributions	9,566.38	49.56%		1,098.38		588.60	
FICA Contributions	8,180.90	55.38%		939.30		746.68	
Medicare Contributions	1,913.28	55.37%		219.68		174.59	
Health/Dental Insurance	14,376.00	14.13%		2,210.00		290.16	
Unemployment Benefits	0.00	0.00%		0.00		0.00	
Workers Compensation	4,500.00	17.47%		0.00		0.00	
Shop Materials	0.00	100.00%		0.00		0.00	
Chemicals	0.00	0.00%		0.00		81.97	
Equipment Parts	23.50	14184.72%		0.00		211.37	
Building Repair Supplies	0.00	100.00%		0.00		420.13	
Landscaping Materials	0.00	100.00%		0.00		0.00	
Small Tools and Minor Equip	1,888.10	52.62%		39.87		2,187.06	
Telephone	1,597.51	38.14%		180.86		189.58	
Mileage	0.00	0.00%		0.00		95.48	
Insurance	3,683.00	86.10%		0.00		0.00	
Electric Utility	9,839.82	46.03%		0.00		0.00	
Refuse	2,500.00	33.75%		919.64		741.24	
Repair/Maint Bldg	1,723.75	23.07%		246.25		0.00	
Repair/Maint NOT Bldg	274.39	1990.33%		27.25		67.96	
Repair/Maint Equip	0.00	100.00%		0.00		104.31	
Rental Buildings	3,600.00	95.68%		300.00		1,692.00	
Miscellaneous	1,220.00	53.26%		50.00		0.00	
Total Parks & Recreation	206,836.63	58.09%		21,637.23		19,990.99	
DEPT 460 - COMP ADJ	0.00	0.00%		0.00		0.00	
DEPT 490 - CONTINGENCY FUND	0.00	0.00%		0.00		0.00	
Transfer to City Projects (Streets)	160,000.00	0.00%		0.00		0.00	
To cover levy debt svc increase	21,637.00	0.00%		0.00		0.00	
DEPT 493 - OTH FINANCING	200,000.00	0.00%		0.00		0.00	
GRAND TOTAL ALL DEPTS	3,325,166.38			184,033.26		196,357.82	
Net Income over Expenses	(21,631.38)			1,259,992.24		1,171,335.95	

YTD

	BUDGET	ACTUAL	Variance (\$)		Variance (%)	
			YTD	YTD	YTD	YTD
81,475.00	64,162.87	17,312.13	21.25%			
0.00	11,573.30	(11,573.30)	-100.00%			
5,906.94	4,740.98	1,165.96	19.74%			
5,051.45	4,530.56	520.89	10.31%			
1,181.39	1,059.46	121.93	10.32%			
10,188.00	2,031.12	8,156.88	80.06%			
0.00	0.00	0.00	0.00%			
4,500.00	786.07	3,713.93	82.53%			
1,000.00	106.96	893.04	89.30%			
0.00	211.37	(211.37)	-100.00%			
1,023.50	3,333.41	(2,309.91)	-225.69%			
0.00	814.89	(814.89)	-100.00%			
2,000.00	4,412.19	(2,412.19)	-120.61%			
1,688.75	993.45	695.30	41.17%			
693.21	609.30	83.91	12.10%			
0.00	0.00	0.00	0.00%			
3,683.00	3,171.00	512.00	13.90%			
5,543.43	4,529.08	1,014.35	18.30%			
1,331.28	843.76	487.52	36.62%			
738.75	397.64	341.11	46.17%			
123.57	5,461.27	(5,337.70)	-4319.58%			
0.00	2,298.66	(2,298.66)	-100.00%			
2,100.00	3,444.34	(1,344.34)	-64.02%			
600.00	649.75	(49.75)	-8.29%			
128,828.27	120,161.43	8,666.84	6.73%			
0.00	0.00	0.00	0.00%			
0.00	0.00	0.00	0.00%			
0.00	0.00	0.00	0.00%			
0.00	0.00	0.00	0.00%			
0.00	0.00	0.00	0.00%			
0.00	0.00	0.00	0.00%			
1,719,349.61	1,423,942.82	295,406.79	17.18%			
11,620.97	252,520.38	240,899.41	-2072.97%			

Extra part time help

480D radiator repair/service

Annual ins premi; budgeted in May

Light repairs at Lions field, trail grooming at Sunfish Lake Park
Unforeseen repairs on 98 GMC



MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014
CONSENT
ITEM #4
MOTION

AGENDA ITEM: New Single Family Home Permit Report

SUBMITTED BY: Rick Chase, Building Official

THROUGH: Rick Chase, Building Official

REVIEWED BY: Kyle Klatt, Planning Director

SUGGESTED ORDER OF BUSINESS:

- Introduction of Item..... City Administrator
- Report/Presentation..... City Administrator
- Questions from Council to Staff..... Mayor Facilitates
- Call for Motion..... Mayor & City Council
- Discussion..... Mayor & City Council
- Action on Motion..... Mayor Facilitates

SUMMARY AND ACTION REQUESTED: As part of its Consent Agenda, the City Council is asked to accept the monthly new single family home permit report for through July, 2014. No specific motion is needed as this is recommended as part of the *Consent Agenda*.

LEGISLATIVE HISTORY/BACKGROUND INFORMATION:

	<u>2014</u>	<u>2013</u>	<u>2012</u>
New Homes	16	21	19
Total valuation	\$ 9,561,282	\$9,179,742	\$8,151,112
Average home value	597,580	437,130	429,000

- 2014 Pump house # 4 permitted but not included in valuation. (City Building)

RECOMMENDATION: Based on the aforementioned, the staff recommends the City Council accept the July, 2014 monthly building permit report.



MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014
CONSENT
ITEM #5

AGENDA ITEM: Monthly Assessor Report
SUBMITTED BY: Dan Raboin, City Assessor
THROUGH: Cathy Bendel, Finance Director
REVIEWED BY: Finance Committee

SUGGESTED ORDER OF BUSINESS:

- Introduction of Item City Administrator
- Report/Presentation.....City Administrator
- Questions from Council to Staff.....Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion..... Mayor & City Council
- Action on Motion.....Mayor Facilitates

SUMMARY AND ACTION REQUESTED: As part of its Consent Agenda, the City Council is asked to accept the monthly assessor report for through July 2014 outlining work performed on behalf of the City of Lake Elmo. No specific motion is needed as this is recommended as part of the *Consent Agenda*.

LEGISLATIVE HISTORY/BACKGROUND INFORMATION:

Property splits/plats – 1
Sales collected and viewed – 9
Taxpayer inquiries – 6
Miscellaneous inquiries - 5
Inspections – Residential – 320; Commercial - 43
Building permit reviews – 23
Pictures taken – 294

Other work performed included:

- Completed 2015 residential quintile
- Monthly meeting with County residential and commercial supervisors

- Input of all inspection and permit work
- Perform sales verifications and land value analysis using MLS and other resources
- Field telephone inquiries

RECOMMENDATION: Based on the aforementioned, the staff recommends the City Council accept the June 2014 monthly assessor report.



MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014
CONSENT
ITEM # 6

AGENDA ITEM: Pumphouse No. 4 – Pay Request No. 3

SUBMITTED BY: Chad Isakson, Project Engineer

THROUGH: Dean A. Zuleger, City Administrator

REVIEWED BY: Jack Griffin, City Engineer
Cathy Bendel, Finance Director

SUGGESTED ORDER OF BUSINESS *if removed from the Consent Agenda*:

- Questions from Council to Staff Mayor Facilitates
- Public Input, if Appropriate.....Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion..... Mayor & City Council
- Action on Motion..... Mayor Facilitates

POLICY RECOMMENDER: Engineering

FISCAL IMPACT:

None. Partial payment is proposed in accordance with the Contract for the project. Payment remains within the authorized scope and budget.

SUMMARY AND ACTION REQUESTED:

The City Council is respectfully requested to consider approving Pay Request No. 3 for the Pumphouse No. 4 project. If removed from the consent agenda, the recommended motion for the action is as follows:

“Move to approve Pay Request No. 3 to Total Mechanical Services, Inc. in the amount of \$72,798.50 for Pumphouse No. 4”.

LEGISLATIVE HISTORY/BACKGROUND INFORMATION:

Total Mechanical Services Inc., the Contractor for the project, has submitted Partial Pay Estimate No. 3 in the amount of \$72,798.50. The request has been reviewed and payment is recommended in the amount requested. In accordance with the contract documents, the City has retained 5% of the total work completed. The amount retained is \$9,571.80.

RECOMMENDATION:

Staff is recommending that the City Council consider approving, *as part of the Consent Agenda*, Pay Request No. 3 for the Pumphouse No. 4 project. If removed from the consent agenda, the recommended motion for the action is as follows:

“Move to approve Pay Request No. 3 to Total Mechanical Services, Inc. in the amount of \$72,798.50, for Pumphouse No. 4”.

ATTACHMENT(S):

1. Partial Pay Estimate No. 3

PROJECT PAY FORM

PARTIAL PAY ESTIMATE NO. 3

FOCUS ENGINEERING, inc.

PUMPHOUSE NO. 4
PROJECT NO. 2013.132

PERIOD OF ESTIMATE
FROM 7/1/2014 TO 7/31/2014

PROJECT OWNER:
CITY OF LAKE ELMO
3800 LAVERNE AVENUE NORTH
LAKE ELMO, MN 55042
ATTN: JACK GRIFFIN, P.E., CITY ENGINEER

CONTRACTOR:
TOTAL MECHANICAL SERVICES, INC.
420 BROADWAY AVE
ST. PAUL, MN 55071
ATTN: MARK DIESSNER

CONTRACT CHANGE ORDER SUMMARY

No.	Approval Date	Amount	
		Additions	Deductions
TOTALS		\$0.00	\$0.00
NET CHANGE		\$0.00	

PAY ESTIMATE SUMMARY

1. Original Contract Amount	\$748,640.00
2. Net Change Order Sum	\$0.00
3. Revised Contract (1+2)	\$748,640.00
4. *Work Completed	\$191,436.00
5. *Stored Materials	\$0.00
6. Subtotal (4+5)	\$191,436.00
7. Retainage* 5.0%	\$9,571.80
8. Previous Payments	\$109,065.70
9. Amount Due (6-7-8)	\$72,798.50

*Detailed Breakdown Attached

CONTRACT TIME

START DATE: 5/19/2014
SUBSTANTIAL COMPLETION: 10/10/2014
FINAL COMPLETION: 11/21/2014

ORIGINAL DAYS 186
REVISED DAYS 0
REMAINING 113

ON SCHEDULE

YES ☒

NO ☐

ENGINEER'S CERTIFICATION:

The undersigned certifies that the work has been reviewed and to the best of their knowledge and belief, the quantities shown in this estimate are correct and the work has been performed in accordance with the contract documents.

FOCUS Engineering, inc.


ENGINEER

8/4/2014
DATE

CONTRACTOR'S CERTIFICATION:

The undersigned Contractor certifies that to the best of their knowledge, information and belief the work covered by this payment estimate has been completed in accordance with the contract documents, that all amounts have been paid by the contractor for work for which previous payment estimates was issued and payments received from the owner, and that current payment shown herein is now due.

CONTRACTOR


BY

7/30/14
DATE

APPROVED BY OWNER: CITY OF LAKE ELMO, MINNESOTA

BY _____

DATE _____

BY _____

DATE _____

PARTIAL PAY ESTIMATE NO. 3

PUMPHOUSE NO. 4
CITY OF LAKE ELMO, MINNESOTA
PROJECT NO. 2013.132

FOCUS ENGINEERING, inc.

ITEM	DESCRIPTION OF PAY ITEM	UNIT	CONTRACT			THIS PERIOD		TOTAL TO DATE	
			QUANTITY	UNIT PRICE	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
1	DIV 1 - GENERAL CONDITIONS	LS	1	\$60,000.00	\$60,000.00	0.17	\$10,200.00	0.51	\$30,600.00
2	DIV 1 - MOBILIZATION	LS	1	\$10,000.00	\$10,000.00	0.25	\$2,500.00	1.00	\$10,000.00
3	DIV 2 - SITE WORK	LS	1	\$45,000.00	\$45,000.00	-	\$0.00	0.96	\$43,200.00
4	DIV 3 - CONCRETE	LS	1	\$30,000.00	\$30,000.00	0.50	\$15,000.00	0.67	\$20,100.00
5	DIV 4 - MASONRY	LS	1	\$59,000.00	\$59,000.00	0.25	\$14,750.00	0.75	\$44,250.00
6	DIV 5 - METALS	LS	1	\$3,000.00	\$3,000.00	-	\$0.00	0.17	\$510.00
7	DIV 6 - CARPENTRY	LS	1	\$19,000.00	\$19,000.00	0.80	\$15,200.00	0.80	\$15,200.00
8	DIV 7 - THERMAL PROTECTION	LS	1	\$13,000.00	\$13,000.00	0.15	\$1,950.00	0.23	\$2,990.00
9	DIV 8 - DOORS AND WINDOWS	LS	1	\$12,000.00	\$12,000.00	0.17	\$2,040.00	0.34	\$4,080.00
10	DIV 9 - FINISHES	LS	1	\$10,000.00	\$10,000.00	-	\$0.00	-	\$0.00
11	DIV 10 - SAFETY AND SIGNS	LS	1	\$5,000.00	\$5,000.00	-	\$0.00	-	\$0.00
12	DIV 11 - PROCESS EQUIPMENT	LS	1	\$60,000.00	\$60,000.00	-	\$0.00	-	\$0.00
13	DIV 15 - MECHANICAL	LS	1	\$137,900.00	\$137,900.00	0.10	\$13,790.00	0.14	\$19,306.00
14	DIV 16 - ELECTRICAL	LS	1	\$243,000.00	\$243,000.00	-	\$0.00	-	\$0.00
15	COMMON EXCAVATION (P)	CY	350	\$11.00	\$3,850.00	-	\$0.00	-	\$0.00
16	TYPE SP. 12.5 BITUMINOUS WEARING COURSE MIXTURE (2,B)	TN	130	\$108.00	\$14,040.00	-	\$0.00	-	\$0.00
17	BITUMINOUS MATERIAL FOR TACK COAT	GAL	35	\$6.00	\$210.00	-	\$0.00	-	\$0.00
18	AGGREGATE BASE CLASS 5, 100% CRUSHED	TN	190	\$20.00	\$3,800.00	-	\$0.00	-	\$0.00
19	SELECT GRANULAR BORROW (MODIFIED)	TN	380	\$13.50	\$5,130.00	-	\$0.00	-	\$0.00
20	5" CONCRETE SIDEWALK	SF	235	\$5.00	\$1,175.00	-	\$0.00	-	\$0.00
21	TRUNCATED DOME PANELS	SF	8	\$40.00	\$320.00	-	\$0.00	-	\$0.00
22	TOPSOIL BORROW (CV)	CY	15	\$65.00	\$975.00	-	\$0.00	-	\$0.00
23	TEMPORARY ROCK CONSTRUCTION ENTRANCE	EA	1	\$1,000.00	\$1,000.00	-	\$0.00	-	\$0.00
24	SILT FENCE, MACHINE SLICED	LF	400	\$3.00	\$1,200.00	400.00	\$1,200.00	400.00	\$1,200.00
25	STREET SWEEPER	HR	4	\$110.00	\$440.00	-	\$0.00	-	\$0.00
26	SOD	SY	2,400	\$4.00	\$9,600.00	-	\$0.00	-	\$0.00
TOTALS - BASE CONTRACT					\$748,640.00		\$76,630.00		\$191,436.00



MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014
CONSENT
ITEM # 7

AGENDA ITEM: 2014 Street Improvements – Pay Request No. 1

SUBMITTED BY: Ryan Stempski, Project Engineer

THROUGH: Dean A. Zuleger, City Administrator

REVIEWED BY: Jack Griffin, City Engineer
Cathy Bendel, Finance Director

SUGGESTED ORDER OF BUSINESS *if removed from the Consent Agenda*:

- Questions from Council to Staff..... Mayor Facilitates
- Public Input, if Appropriate..... Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion..... Mayor & City Council
- Action on Motion..... Mayor Facilitates

POLICY RECOMMENDER: Engineering

FISCAL IMPACT:

None. Partial payment is proposed in accordance with the Contract for the project. Payment remains within the authorized scope and budget.

SUMMARY AND ACTION REQUESTED:

The City Council is respectfully requested to consider approving Pay Request No. 1 for the 2014 Street Improvements project. If removed from the consent agenda, the recommended motion for the action is as follows:

“Move to approve Pay Request No. 1 to Hardrives, Inc. in the amount of \$116,998.97, for the 2014 Street Improvements”.

LEGISLATIVE HISTORY/BACKGROUND INFORMATION:

Hardrives, Inc., the Contractor for the project, has submitted Partial Pay Estimate No. 1 in the amount of \$116,998.97. The request has been reviewed and payment is recommended in the amount requested. In accordance with the contract documents, the City has retained 5% of the total work completed. The amount retained is \$6,157.84.

RECOMMENDATION:

Staff is recommending that the City Council consider approving, *as part of the Consent Agenda*, Pay Request No. 1 for the 2014 Street Improvements. If removed from the consent agenda, the recommended motion for the action is as follows:

“Move to approve Pay Request No. 1 to Hardrives, Inc. in the amount of \$116,998.97, for the 2014 Street Improvements”.

ATTACHMENT(S):

1. Partial Pay Estimate No. 1

PROJECT PAY FORM

PARTIAL PAY ESTIMATE NO. 1

FOCUS ENGINEERING, inc.

2014 STREET IMPROVEMENTS
PROJECT NO. 2013.135

PERIOD OF ESTIMATE
FROM 7/2/2014 TO 7/31/2014

PROJECT OWNER:
CITY OF LAKE ELMO
3800 LAVERNE AVENUE NORTH
LAKE ELMO, MN 55042
ATTN: JACK GRIFFIN, CITY ENGINEER

CONTRACTOR:
HARDRIVES, INC.
14478 QUIRAM DRIVE
ROGERS, MN 55374
ATTN: DAN LOBELLO, PROJECT MANAGER

CONTRACT CHANGE ORDER SUMMARY				PAY ESTIMATE SUMMARY	
No.	Approval Date	Amount			
		Additions	Deductions		
1	7/1/2014	\$7,988.30		1. Original Contract Amount	\$1,469,015.70
				2. Net Change Order Sum	\$7,988.30
				3. Revised Contract (1+2)	\$1,477,004.00
				4. *Work Completed	\$123,156.81
				5. *Stored Materials	\$0.00
				6. Subtotal (4+5)	\$123,156.81
				7. Retainage* 5.0%	\$6,157.84
				8. Previous Payments	\$0.00
TOTALS		\$7,988.30	\$0.00	9. Amount Due (6-7-8)	\$116,998.97
NET CHANGE		\$7,988.30		*Detailed Breakdown Attached	

CONTRACT TIME

START DATE: 7/2/2014
SUBSTANTIAL COMPLETION: 10/10/2014
FINAL COMPLETION: 11/21/2014

ORIGINAL DAYS 142
REVISED DAYS 0
REMAINING 113

ON SCHEDULE
YES ☒
NO ☐

ENGINEER'S CERTIFICATION:

The undersigned certifies that the work has been reviewed and to the best of their knowledge and belief, the quantities shown in this estimate are correct and the work has been performed in accordance with the contract documents.

FOCUS Engineering, Inc.

ENGINEER: [Signature]

DATE: 8-12-14

CONTRACTOR'S CERTIFICATION:

The undersigned Contractor certifies that to the best of their knowledge, information and belief the work covered by this payment estimate has been completed in accordance with the contract documents, that all amounts have been paid by the contractor for work for which previous payment estimates was issued and payments received from the owner, and that current payment shown herein is now due.

CONTRACTOR

BY: [Signature]

DATE: 8/13/14

APPROVED BY OWNER: CITY OF LAKE ELMO, MINNESOTA

BY

DATE

BY

DATE

PARTIAL PAY ESTIMATE NO. 1

2014 STREET IMPROVEMENTS
CITY OF LAKE ELMO, MINNESOTA
PROJECT NO. 2013.135

FOCUS ENGINEERING, inc.

ITEM	DESCRIPTION OF PAY ITEM	UNIT	REVISED CONTRACT			THIS PERIOD		TOTAL TO DATE	
			QUANTITY	UNIT PRICE	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
DIVISION 1 - PACKARD PARK AREA									
1	MOBILIZATION	LS	1	\$34,750.00	\$34,750.00	0.50	\$17,375.00	1	\$17,375.00
2	TRAFFIC CONTROL	LS	1	\$2,162.47	\$2,162.47	0.10	\$216.25	0.10	\$216.25
3	SILT FENCE, TYPE MACHINE SLICED	LS	3,188	\$2.03	\$6,471.64	0.00	\$0.00	0.00	\$0.00
4	INLET PROTECTION	EA	14	\$74.93	\$1,049.02	0.00	\$0.00	0.00	\$0.00
5	BIOROLL DITCH CHECK	EA	14	\$80.28	\$1,123.92	0.00	\$0.00	0.00	\$0.00
6	STREET SWEEPING	HR	35	\$151.26	\$5,294.10	0.00	\$0.00	0.00	\$0.00
7	TREE TRIMMING	LS	1	\$5,352.13	\$5,352.13	0.00	\$0.00	0.00	\$0.00
8	SALVAGE MAILBOX	EA	24	\$32.44	\$778.56	22.00	\$713.68	22.00	\$713.68
9	INSTALL SALVAGED MAILBOX	EA	24	\$37.84	\$908.16	0.00	\$0.00	0.00	\$0.00
10	SAWCUT BITUMINOUS PAVEMENT	LF	720	\$2.12	\$1,526.40	0.00	\$0.00	0.00	\$0.00
11	SAWCUT CONCRETE PAVEMENT	LF	130	\$3.13	\$406.90	0.00	\$0.00	0.00	\$0.00
12	REMOVE AND DISPOSE OF EXISTING BITUMINOUS PAVEMENT (DRIVEWAYS)	SY	410	\$5.35	\$2,193.50	0.00	\$0.00	0.00	\$0.00
13	REMOVE AND DISPOSE OF EXISTING CONCRETE PAVEMENT (DRIVEWAYS)	SY	150	\$8.56	\$1,284.00	0.00	\$0.00	0.00	\$0.00
14	REMOVE AND DISPOSE OF EXISTING CONCRETE PAVEMENT	SY	10	\$32.11	\$321.10	0.00	\$0.00	0.00	\$0.00
15	REMOVE AND DISPOSE OF EXISTING STORM SEWER PIPE	LF	230	\$10.81	\$2,486.30	157.00	\$1,697.17	157.00	\$1,697.17
16	SUBGRADE EXCAVATION - RECLAIM AREAS (CV)	CY	1,000	\$9.10	\$9,100.00	0.00	\$0.00	0.00	\$0.00
17	SELECT GRANULAR BORROW (CV)	CY	250	\$14.13	\$3,532.50	0.00	\$0.00	0.00	\$0.00
18	RECLAIM EXISTING BITUMINOUS AND BASE MATERIALS, 8" DEPTH	SY	21,500	\$0.91	\$19,565.00	0.00	\$0.00	0.00	\$0.00
19	HAUL EXCESS RECLAIMED MATERIAL OFF SITE (LV)	CY	300	\$8.62	\$2,586.00	0.00	\$0.00	0.00	\$0.00
20	SUBGRADE PREPARATION OF RECLAIMED SURFACE	RS	61	\$324.76	\$19,690.20	0.00	\$0.00	0.00	\$0.00
21	TYPE SP 9.5 BITUMINOUS NON WEARING COURSE MIXTURE (2.B) [SPNWA230B]	TN	1,905	\$60.76	\$115,747.80	0.00	\$0.00	0.00	\$0.00
22	TYPE SP 9.5 BITUMINOUS WEARING COURSE MIXTURE (2.B) [SPWEA240B]	TN	1,905	\$62.64	\$119,329.20	0.00	\$0.00	0.00	\$0.00
23	BITUMINOUS MATERIAL FOR TACK COAT	GAL	1,350	\$1.96	\$2,646.00	0.00	\$0.00	0.00	\$0.00
24	PATCH BITUMINOUS DRIVEWAY	SY	410	\$20.11	\$8,245.10	0.00	\$0.00	0.00	\$0.00
25	PATCH CONCRETE DRIVEWAY	SY	150	\$46.03	\$6,904.50	0.00	\$0.00	0.00	\$0.00
26	SAW & SEAL STREET (40' INTERVALS)	LF	2,900	\$2.61	\$7,569.00	0.00	\$0.00	0.00	\$0.00
27	8418 CONCRETE CURB & GUTTER	LF	7,660	\$9.63	\$73,765.80	0.00	\$0.00	0.00	\$0.00
28	CONCRETE RIBBON CURB	LF	930	\$14.50	\$13,585.00	0.00	\$0.00	0.00	\$0.00
29	6" CONCRETE FLUME	SF	500	\$6.74	\$3,370.00	0.00	\$0.00	0.00	\$0.00
30	REMOVE CB CASTING	EA	12	\$83.68	\$1,004.16	1.00	\$83.68	1.00	\$83.68
31	R-3250-1 CASTING	EA	12	\$779.82	\$9,357.84	0.00	\$0.00	0.00	\$0.00
32	2' X 3' CATCH BASIN WITH CASTING PER DETAIL 404	EA	1	\$1,838.10	\$1,838.10	0.00	\$0.00	0.00	\$0.00
33	4' DIA CBMH WITH SUMP AND CASTING PER DETAIL 405	EA	1	\$2,811.21	\$2,811.21	1.00	\$2,811.21	1.00	\$2,811.21
34	4' DIA MH WITH CASTING PER DETAIL 407	EA	2	\$1,946.23	\$3,892.46	2.00	\$3,892.46	2.00	\$3,892.46
35	15" RCP STORM SEWER, CLASS 5	LF	208	\$44.33	\$9,220.64	151.00	\$6,693.83	151.00	\$6,693.83
36	15" RCP FLARED END SECTION INCL TRASH GUARD	EA	4	\$1,243.42	\$4,973.68	1.00	\$1,243.42	1.00	\$1,243.42
37	CLASS 3 RIP RAP WITH FABRIC	CY	8	\$162.19	\$1,297.52	0.00	\$0.00	0.00	\$0.00
38	DITCH GRADING	LF	180	\$10.70	\$1,926.00	0.00	\$0.00	0.00	\$0.00
39	POND EXCAVATION (CV)	CY	70	\$21.41	\$1,498.70	0.00	\$0.00	0.00	\$0.00
40	JET AND CLEAN STORM SEWER	LF	135	\$15.14	\$2,043.90	0.00	\$0.00	0.00	\$0.00
41	IMPORT AND PLACE TOPSOIL BORROW (LV)	CY	800	\$15.00	\$12,000.00	0.00	\$0.00	0.00	\$0.00
42	SEEDING, FERTILIZER, AND EROSION CONTROL BLANKET	SY	1,500	\$2.94	\$4,410.00	0.00	\$0.00	0.00	\$0.00
43	SOODING	SY	8,800	\$4.28	\$37,664.00	0.00	\$0.00	0.00	\$0.00
44	SALVAGE SIGN	EA	10	\$27.03	\$270.30	1.00	\$27.03	1.00	\$27.03
45	INSTALL SALVAGED SIGN	EA	10	\$124.34	\$1,243.40	0.00	\$0.00	0.00	\$0.00
SUBTOTAL - DIVISION 1			\$561,296.21			\$34,753.73		\$34,753.73	
DIVISION 2 - 20TH STREET NORTH									
46	MOBILIZATION	LS	0	\$15,172.98	\$0.00	0.00	\$0.00	0	\$0.00
47	TRAFFIC CONTROL	LS	0	\$5,000.00	\$0.00	0.00	\$0.00	0	\$0.00
48	JOINT REPAIR	SY	0	\$20.00	\$0.00	0.00	\$0.00	0	\$0.00
49	PATCH BITUMINOUS STREET (PARTIAL DEPTH)	SY	0	\$20.00	\$0.00	0.00	\$0.00	0	\$0.00
50	PATCH BITUMINOUS STREET (FULL DEPTH)	SY	0	\$38.64	\$0.00	0.00	\$0.00	0	\$0.00
51	REMOVE PAVEMENT MARKINGS - 4" LINES	LF	0	\$0.65	\$0.00	0.00	\$0.00	0	\$0.00
52	3/4" OVERLAY	TN	0	\$68.06	\$0.00	0.00	\$0.00	0	\$0.00
53	3/8" MICROSURFACE	SY	0	\$3.21	\$0.00	0.00	\$0.00	0	\$0.00
54	CLASS 2 AGGREGATE SHOULDERING - 100% CRUSHED LIMEROCK	TN	0	\$21.39	\$0.00	0.00	\$0.00	0	\$0.00
55	4" DOUBLE SOLID YELLOW LINE - LATEX	LF	0	\$0.22	\$0.00	0.00	\$0.00	0	\$0.00
56	4" SOLID WHITE LINE - LATEX	LF	0	\$0.11	\$0.00	0.00	\$0.00	0	\$0.00
SUBTOTAL - DIVISION 2			\$0.00			\$0.00		\$0.00	

ITEM	DESCRIPTION OF PAY ITEM	UNIT	REVISED CONTRACT			THIS PERIOD		TOTAL TO DATE	
			QUANTITY	UNIT PRICE	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
DIVISION 3 - DEER POND TRAIL & COURT									
57	MOBILIZATION	LS	1	\$21,000.00	\$21,000.00	0.50	\$10,500.00	1	\$10,500.00
58	TRAFFIC CONTROL	LS	1	\$1,621.85	\$1,621.85	0.25	\$405.46	0	\$405.46
59	SILT FENCE, TYPE MACHINE SLICED	LF	2,150	\$2.03	\$4,364.50	225.00	\$456.75	225	\$456.75
60	INLET PROTECTION	EA	12	\$74.93	\$899.16	0.00	\$0.00	0	\$0.00
61	STREET SWEEPING	HR	10	\$151.26	\$1,512.60	0.00	\$0.00	0	\$0.00
62	BIOROLL DITCH CHECK	EA	5	\$80.28	\$401.40	0.00	\$0.00	0	\$0.00
63	CLEAR AND GRUB TREE	EA	6	\$588.73	\$3,532.38	7.00	\$4,121.11	7	\$4,121.11
64	GRUB EXISTING STUMP	EA	5	\$214.09	\$1,070.45	0.00	\$0.00	0	\$0.00
65	SALVAGE MAILBOX	EA	22	\$32.44	\$713.68	22.00	\$713.68	22	\$713.68
66	INSTALL SALVAGED MAILBOX	EA	22	\$37.84	\$832.48	0.00	\$0.00	0	\$0.00
67	SAWCUT BITUMINOUS PAVEMENT	LF	375	\$2.17	\$813.75	0.00	\$0.00	0	\$0.00
68	SAWCUT CONCRETE PAVEMENT	LF	100	\$4.07	\$407.00	0.00	\$0.00	0	\$0.00
69	REMOVE AND DISPOSE OF EXISTING BITUMINOUS PAVEMENT	SY	6,680	\$2.91	\$19,438.80	2,500.00	\$7,275.00	2,500	\$7,275.00
70	REMOVE AND DISPOSE OF EXISTING BITUMINOUS PAVEMENT (DRIVEWAYS)	SY	250	\$5.35	\$1,337.50	100.00	\$535.00	100	\$535.00
71	REMOVE AND DISPOSE OF EXISTING CONCRETE PAVEMENT (DRIVEWAYS)	SY	110	\$8.56	\$941.60	0.00	\$0.00	0	\$0.00
72	REMOVE AND DISPOSE OF EXISTING STORM SEWER PIPE	LF	190	\$10.81	\$2,053.90	190.00	\$2,053.90	190	\$2,053.90
73	REMOVE AND DISPOSE OF EXISTING STORM SEWER STRUCTURE	EA	2	\$432.50	\$865.00	2.00	\$865.00	2	\$865.00
74	COMMON EXCAVATION (P)	CY	3,575	\$8.56	\$30,602.00	0.00	\$0.00	0	\$0.00
75	SUBGRADE EXCAVATION - RECONSTRUCT AREAS (CV)	CY	325	\$8.56	\$2,782.00	0.00	\$0.00	0	\$0.00
76	SELECT GRANULAR BORROW (CV)	CY	2,390	\$12.31	\$29,420.90	0.00	\$0.00	0	\$0.00
77	AGGREGATE BASE CLASS 5	TN	2,600	\$10.17	\$26,442.00	0.00	\$0.00	0	\$0.00
78	TYPE SP 9.5 BITUMINOUS NON WEARING COURSE MIXTURE (2,B) [SPNWA230B]	TN	690	\$62.38	\$43,042.20	0.00	\$0.00	0	\$0.00
79	TYPE SP 9.5 BITUMINOUS WEARING COURSE MIXTURE (2,B) [SPWEA240B]	TN	520	\$63.49	\$33,014.80	0.00	\$0.00	0	\$0.00
80	BITUMINOUS MATERIAL FOR TACK COAT	GAL	405	\$1.96	\$793.80	0.00	\$0.00	0	\$0.00
81	PATCH BITUMINOUS DRIVEWAY	SY	250	\$20.55	\$5,137.50	0.00	\$0.00	0	\$0.00
82	PATCH CONCRETE DRIVEWAY	SY	110	\$46.03	\$5,063.30	0.00	\$0.00	0	\$0.00
83	PATCH GRAVEL DRIVEWAY	TN	20	\$27.54	\$550.80	0.00	\$0.00	0	\$0.00
84	SAW & SEAL STREET (40' INTERVALS)	LF	1,300	\$2.61	\$3,393.00	0.00	\$0.00	0	\$0.00
85	ADJUST EXISTING MANHOLE CASTING	EA	2	\$584.98	\$1,169.96	0.00	\$0.00	0	\$0.00
86	B612 CONCRETE CURB & GUTTER	LF	4,500	\$9.10	\$40,950.00	0.00	\$0.00	0	\$0.00
87	6" CONCRETE FLUME	SF	2	\$42.82	\$85.64	0.00	\$0.00	0	\$0.00
88	4" PVC PERF EDGE DRAIN W/BACKFILL & WRAP	LF	1,155	\$9.10	\$10,510.50	0.00	\$0.00	0	\$0.00
89	CONNECT DRAIN TILE TO STRUCTURE	EA	12	\$160.56	\$1,926.72	10.00	\$1,605.60	10	\$1,605.60
90	CONNECT TO EXISTING STORM SEWER MH	EA	2	\$540.62	\$1,081.24	2.00	\$1,081.24	2	\$1,081.24
91	2' X 3' CATCH BASIN WITH CASTING PER DETAIL 404	EA	2	\$1,838.10	\$3,676.20	1.00	\$1,838.10	1	\$1,838.10
92	4' DIA CBMH WITH CASTING PER DETAIL 402	EA	1	\$1,838.10	\$1,838.10	1.00	\$1,838.10	1	\$1,838.10
93	4' DIA CBMH WITH CASTING PER DETAIL 406	EA	6	\$2,108.41	\$12,650.46	6.00	\$12,650.46	6	\$12,650.46
94	4' DIA CBMH WITH SUMP AND CASTING PER DETAIL 405	EA	3	\$2,919.34	\$8,758.02	3.00	\$8,758.02	3	\$8,758.02
95	15" RCP STORM SEWER, CLASS 5	LF	382	\$42.17	\$16,108.94	382.00	\$16,108.94	382	\$16,108.94
96	18" RCP STORM SEWER, CLASS 5	LF	235	\$45.41	\$10,671.35	240.00	\$10,898.40	240	\$10,898.40
97	15" RCP FLARED END SECTION INCL TRASH GUARD	EA	2	\$1,243.42	\$2,486.84	2.00	\$2,486.84	2	\$2,486.84
98	18" RCP FLARED END SECTION INCL TRASH GUARD	EA	1	\$1,297.48	\$1,297.48	1.00	\$1,297.48	1	\$1,297.48
99	CLASS 3 RIP RAP WITH FABRIC	CY	15	\$162.19	\$2,432.85	11.40	\$1,848.97	11	\$1,848.97
100	DITCH GRADING	LF	100	\$10.70	\$1,070.00	0.00	\$0.00	0	\$0.00
101	IMPORT AND PLACE TOPSOIL BORROW (LV)	CY	300	\$15.00	\$4,500.00	0.00	\$0.00	0	\$0.00
102	SODDING	SY	5,000	\$4.28	\$21,400.00	0.00	\$0.00	0	\$0.00
103	SEEDING, FERTILIZER, AND EROSION CONTROL BLANKET	SY	400	\$2.94	\$1,176.00	0.00	\$0.00	0	\$0.00
104	4" DOUBLE SOLID YELLOW LINE - EPOXY	LF	1,440	\$0.79	\$1,137.60	0.00	\$0.00	0	\$0.00
105	REMOVE SIGN	EA	1	\$27.03	\$27.03	1.00	\$27.03	1	\$27.03
106	SIGN PANEL, TYPE C	SF	9	\$54.06	\$486.54	0.00	\$0.00	0	\$0.00
107	SALVAGE SIGN	EA	5	\$27.03	\$162.18	5.00	\$135.15	5	\$135.15
108	INSTALL SALVAGED SIGN	EA	5	\$124.34	\$746.04	0.00	\$0.00	0	\$0.00
SUBTOTAL - DIVISION 3					\$388,398.04	\$87,500.23		\$87,500.23	
DIVISION 4 - MANNING TRAIL NORTH									
109	MOBILIZATION	LS	1	\$3,500.00	\$3,500.00	0.00	\$0.00	0	\$0.00
110	TRAFFIC CONTROL	LS	1	\$2,324.66	\$2,324.66	0.00	\$0.00	0.00	\$0.00
111	SILT FENCE, TYPE MACHINE SLICED	LF	6,600	\$2.03	\$13,398.00	0.00	\$0.00	0.00	\$0.00
112	STREET SWEEPING	HR	25	\$151.26	\$3,781.50	0.00	\$0.00	0.00	\$0.00
113	BIOROLL DITCH CHECK	EA	20	\$80.28	\$1,605.60	0.00	\$0.00	0.00	\$0.00
114	CLEAR AND GRUB TREE	EA	15	\$588.73	\$8,830.95	0.00	\$0.00	0.00	\$0.00
115	SALVAGE MAILBOX	EA	12	\$32.44	\$389.28	12.00	\$389.28	12.00	\$389.28
116	INSTALL SALVAGED MAILBOX	EA	12	\$37.84	\$454.08	0.00	\$0.00	0.00	\$0.00
117	SAWCUT BITUMINOUS PAVEMENT	LF	375	\$2.17	\$813.75	0.00	\$0.00	0.00	\$0.00
118	REMOVE AND DISPOSE OF EXISTING BITUMINOUS PAVEMENT	SY	8,970	\$2.71	\$24,308.70	0.00	\$0.00	0.00	\$0.00

ITEM	DESCRIPTION OF PAY ITEM	UNIT	REVISED CONTRACT			THIS PERIOD		TOTAL TO DATE	
			QUANTITY	UNIT PRICE	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
119	REMOVE AND DISPOSE OF EXISTING BITUMINOUS PAVEMENT (DRIVEWAYS)	SY	130	\$5.35	\$695.50	0.00	\$0.00	0.00	\$0.00
120	REMOVE AND DISPOSE OF EXISTING STORM SEWER PIPE	LF	53	\$10.81	\$572.93	0.00	\$0.00	0.00	\$0.00
121	COMMON EXCAVATION (P)	CY	5,205	\$8.56	\$44,554.80	0.00	\$0.00	0.00	\$0.00
122	SUBGRADE EXCAVATION - RECONSTRUCT AREAS (CV)	CY	500	\$8.56	\$4,280.00	0.00	\$0.00	0.00	\$0.00
123	SELECT GRANULAR BORROW (CV)	CY	3,290	\$12.31	\$40,499.90	0.00	\$0.00	0.00	\$0.00
124	AGGREGATE BASE CLASS 5	TN	4,820	\$10.17	\$49,019.40	0.00	\$0.00	0.00	\$0.00
125	TYPE SP 12.5 BITUMINOUS NON-WEARING COURSE MIXTURE (2,B) [SPNWB230B]	TN	1,360	\$55.64	\$75,670.40	0.00	\$0.00	0.00	\$0.00
126	TYPE SP 9.5 BITUMINOUS WEARING COURSE MIXTURE (2,B) [SPWEA240B]	TN	820	\$61.67	\$50,569.40	0.00	\$0.00	0.00	\$0.00
127	BITUMINOUS MATERIAL FOR TACK COAT	GAL	640	\$1.96	\$1,254.40	0.00	\$0.00	0.00	\$0.00
128	PATCH BITUMINOUS DRIVEWAY	SY	130	\$20.27	\$2,635.10	0.00	\$0.00	0.00	\$0.00
129	PATCH GRAVEL DRIVEWAY	TN	30	\$27.02	\$810.60	0.00	\$0.00	0.00	\$0.00
130	CLASS 2 AGGREGATE SHOULDERING - 100% CRUSHED LIMESTONE	TN	345	\$20.84	\$7,189.80	0.00	\$0.00	0.00	\$0.00
131	4" PVC PERF EDGE DRAIN W/BACKFILL & WRAP	LF	3,000	\$11.77	\$35,310.00	0.00	\$0.00	0.00	\$0.00
132	PRECAST CONCRETE HEADWALL (DRAIN TILE)	EA	8	\$535.21	\$4,281.68	0.00	\$0.00	0.00	\$0.00
133	18" RCP STORM SEWER, CLASS 5	LF	48	\$62.71	\$3,010.08	0.00	\$0.00	0.00	\$0.00
134	18" RCP FLARED END SECTION INCL TRASH GUARD	EA	2	\$1,297.49	\$2,594.98	0.00	\$0.00	0.00	\$0.00
135	CLASS 3 RIP RAP WITH FABRIC	CY	5	\$162.19	\$810.95	0.00	\$0.00	0.00	\$0.00
136	IMPORT AND PLACE TOPSOIL BORROW (LV)	CY	500	\$15.00	\$7,500.00	0.00	\$0.00	0.00	\$0.00
137	SEEDING, FERTILIZER, AND EROSION CONTROL BLANKET	SY	7,850	\$2.94	\$23,079.00	0.00	\$0.00	0.00	\$0.00
138	4" DOUBLE SOLID YELLOW LINE - EPOXY	LF	3,300	\$0.79	\$2,607.00	0.00	\$0.00	0.00	\$0.00
139	4" SOLID WHITE LINE - EPOXY	LF	6,600	\$0.48	\$3,168.00	0.00	\$0.00	0.00	\$0.00
140	REMOVE SIGN	EA	5	\$27.03	\$135.15	5.00	\$135.15	5.00	\$135.15
141	SIGN PANEL, TYPE C	SF	21	\$54.06	\$1,106.23	0.00	\$0.00	0.00	\$0.00
142	SALVAGE SIGN	EA	14	\$27.03	\$378.42	14.00	\$378.42	14.00	\$378.42
143	INSTALL SALVAGED SIGN	EA	14	\$124.34	\$1,740.76	0.00	\$0.00	0.00	\$0.00
SUBTOTAL - DIVISION 4					\$422,883.00		\$902.85		\$902.85

TOTALS - BASE CONTRACT

\$1,372,577.25

\$123,156.81

\$123,156.81

CHANGE ORDER NO. 1

CO1-1	MOBILIZATION	LS	1.0	\$5,000.00	\$5,000.00		0.0	\$0.00
CO1-2	TRAFFIC CONTROL	LS	1.0	\$5,000.00	\$5,000.00		0.0	\$0.00
CO1-3	TYPE SP 9.5 BITUMINOUS WEARING COURSE MIXTURE (2,B) [SPWEA240B] -LEVELING COURSE	TN	300.0	\$68.06	\$20,418.00		0.0	\$0.00
CO1-4	TYPE SP 9.5 BITUMINOUS WEARING COURSE MIXTURE (2,B) [SPWEA240B]	TN	1,065.0	\$60.67	\$64,613.55		0.0	\$0.00
CO1-5	BITUMINOUS MATERIAL FOR TACK COAT	GAL	865.0	\$1.96	\$1,695.40		0.0	\$0.00
CO1-6	CLASS 2 AGGREGATE SHOULDERING - 100% CRUSHED LIMESTONE	TN	260.0	\$21.39	\$5,561.40		0.0	\$0.00
CO1-7	4" DOUBLE SOLID YELLOW LINE - LATEX	LF	4,860.0	\$0.22	\$1,069.20		0.0	\$0.00
CO1-8	4" SOLID WHITE LINE - LATEX	LF	9,720.0	\$0.11	\$1,069.20		0.0	\$0.00

TOTALS - CHANGE ORDER NO. 1

\$104,426.75

\$0.00

\$0.00

TOTALS - REVISED CONTRACT

\$1,477,004.00

\$123,156.81

\$123,156.81



MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014
CONSENT
ITEM # 8

AGENDA ITEM: Lake Elmo Avenue Trunk Watermain Improvements – Pay Request No. 1

SUBMITTED BY: Chad Isakson, Project Engineer

THROUGH: Dean A. Zuleger, City Administrator

REVIEWED BY: Jack Griffin, City Engineer
Cathy Bendel, Finance Director

SUGGESTED ORDER OF BUSINESS *if removed from the Consent Agenda*:

- Questions from Council to Staff Mayor Facilitates
- Public Input, if Appropriate.....Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion Mayor & City Council
- Action on Motion..... Mayor Facilitates

POLICY RECOMMENDER: Engineering

FISCAL IMPACT:

None. Partial payment is proposed in accordance with the Contract for the project. Payment remains within the authorized scope and budget.

SUMMARY AND ACTION REQUESTED:

The City Council is respectfully requested to consider approving Pay Request No. 1 for the Lake Elmo Avenue Trunk Watermain Improvements project. If removed from the consent agenda, the recommended motion for the action is as follows:

“Move to approve Pay Request No. 1 to GM Contracting Inc in the amount of \$772,877.65, for the Lake Elmo Avenue Trunk Watermain Improvements Project”

LEGISLATIVE HISTORY/BACKGROUND INFORMATION:

GM Contracting Inc., the Contractor for the project, has submitted Partial Pay Estimate No. 1 in the amount of \$772,877.65. The request has been reviewed and payment is recommended in the amount requested. In accordance with the contract documents, the City has retained 5% of the total work completed. The amount retained is \$40,677.77.

RECOMMENDATION:

Staff is recommending that the City Council consider approving, *as part of the Consent Agenda*, Pay Request No. 1 for the Lake Elmo Avenue Trunk Watermain Improvements project. If removed from the consent agenda, the recommended motion for the action is as follows:

“Move to approve Pay Request No. 1 to GM Contracting Inc. in the amount of \$772,877.65, for the Lake Elmo Avenue Trunk Watermain Improvements Project”

ATTACHMENT(S):

1. Partial Pay Estimate No. 1

PROJECT PAY FORM

PARTIAL PAY ESTIMATE NO. <u>1</u>		FOCUS ENGINEERING, inc.																			
LAKE ELMO AVENUE TRUNK WATERMAIN IMPROVEMENTS PROJECT NO. 2013.133		PERIOD OF ESTIMATE FROM <u>7/1/2014</u> TO <u>7/31/2014</u>																			
PROJECT OWNER: CITY OF LAKE ELMO 3800 LAVERNE AVENUE NORTH LAKE ELMO, MN 55042 ATTN: JACK GRIFFIN, CITY ENGINEER		CONTRACTOR: GM CONTRACTING INC. 19810 515TH AVE LAKE CRYSTAL, MN 56055 ATTN: MIKE URBAN, PROJECT MANAGER																			
CONTRACT CHANGE ORDER SUMMARY		PAY ESTIMATE SUMMARY																			
No.	Approval Date	Amount Additions	Deductions																		
TOTALS		\$0.00	\$0.00																		
NET CHANGE		\$0.00																			
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">1. Original Contract Amount</td> <td style="width: 50%; padding: 5px; text-align: right;">\$2,015,687.39</td> </tr> <tr> <td style="padding: 5px;">2. Net Change Order Sum</td> <td style="padding: 5px; text-align: right;">\$0.00</td> </tr> <tr> <td style="padding: 5px;">3. Revised Contract (1+2)</td> <td style="padding: 5px; text-align: right;">\$2,015,687.39</td> </tr> <tr> <td style="padding: 5px;">4. *Work Completed</td> <td style="padding: 5px; text-align: right;">\$505,842.85</td> </tr> <tr> <td style="padding: 5px;">5. *Stored Materials</td> <td style="padding: 5px; text-align: right;">\$307,712.58</td> </tr> <tr> <td style="padding: 5px;">6. Subtotal (4+5)</td> <td style="padding: 5px; text-align: right;">\$813,555.43</td> </tr> <tr> <td style="padding: 5px;">7. Retainage* <u>5.0%</u></td> <td style="padding: 5px; text-align: right;">\$40,677.77</td> </tr> <tr> <td style="padding: 5px;">8. Previous Payments</td> <td style="padding: 5px; text-align: right;">\$0.00</td> </tr> <tr> <td style="padding: 5px;">9. Amount Due (6-7-8)</td> <td style="padding: 5px; text-align: right;">\$772,877.65</td> </tr> </table>				1. Original Contract Amount	\$2,015,687.39	2. Net Change Order Sum	\$0.00	3. Revised Contract (1+2)	\$2,015,687.39	4. *Work Completed	\$505,842.85	5. *Stored Materials	\$307,712.58	6. Subtotal (4+5)	\$813,555.43	7. Retainage* <u>5.0%</u>	\$40,677.77	8. Previous Payments	\$0.00	9. Amount Due (6-7-8)	\$772,877.65
1. Original Contract Amount	\$2,015,687.39																				
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6. Subtotal (4+5)	\$813,555.43																				
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8. Previous Payments	\$0.00																				
9. Amount Due (6-7-8)	\$772,877.65																				
CONTRACT TIME																					
START DATE: <u>6/26/2014</u>		ORIGINAL DAYS <u>141</u>																			
SUBSTANTIAL COMPLETION: <u>10/17/2014</u>		REVISED DAYS <u>0</u>																			
FINAL COMPLETION: <u>11/14/2014</u>		REMAINING <u>106</u>																			
ON SCHEDULE		YES <input checked="" type="checkbox"/> X																			
		NO <input type="checkbox"/>																			
ENGINEER'S CERTIFICATION: The undersigned certifies that the work has been reviewed and to the best of their knowledge and belief, the quantities shown in this estimate are correct and the work has been performed in accordance with the contract documents.		FOCUS Engineering, inc. ENGINEER <u>8/4/2014</u> DATE																			
CONTRACTOR'S CERTIFICATION: The undersigned Contractor certifies that to the best of their knowledge, information and belief the work covered by this payment estimate has been completed in accordance with the contract documents, that all amounts have been paid by the contractor for work for which previous payment estimates was issued and payments received from the owner, and that current payment shown herein is now due.		CONTRACTOR BY <u>8/4/14</u> DATE																			
APPROVED BY OWNER: <u>CITY OF LAKE ELMO, MINNESOTA</u>																					
BY _____		BY _____																			
DATE _____		DATE _____																			

PARTIAL PAY ESTIMATE NO. 1

LAKE ELMO AVENUE TRUNK WATERMAIN IMPROVEMENTS
CITY OF LAKE ELMO, MINNESOTA
PROJECT NO. 2013.133

FOCUS ENGINEERING, inc.

ITEM	DESCRIPTION OF PAY ITEM	UNIT	CONTRACT			THIS PERIOD		TOTAL TO DATE	
			QUANTITY	UNIT PRICE	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
DIVISION 1 - GENERAL									
1	MOBILIZATION	LS	1	\$85,000.00	\$85,000.00	0.50	\$42,500.00	0.50	\$42,500.00
2	TRAFFIC CONTROL	LS	1	\$53,951.69	\$53,951.69	0.50	\$26,975.85	0.50	\$26,975.85
3	SILT FENCE	LF	461	\$2.50	\$1,152.50	0	\$0.00	0	\$0.00
4	TREE REMOVAL	EA	20	\$400.00	\$8,000.00	0	\$0.00	0	\$0.00
5	INLET PROTECTION	EA	3	\$152.58	\$457.74	0	\$0.00	0	\$0.00
6	6" TOPSOIL AND SOD	SY	267	\$6.30	\$1,682.10	0	\$0.00	0	\$0.00
7	TEMPORARY WATER SERVICE	LS	1	\$4,500.00	\$4,500.00	0	\$0.00	0	\$0.00
SUBTOTAL - DIVISION 1					\$154,744.03		\$69,475.85		\$69,475.85
DIVISION 2 - WATERMAIN									
1	REMOVE EXISTING WATERMAIN - ALL SIZES AND TYPES	LF	416	\$2.85	\$1,185.60	0	\$0.00	0	\$0.00
2	ABANDON EXISTING WATERMAIN IN PLACE - ALL SIZES AND TYPES	LF	970	\$2.85	\$2,764.50	0	\$0.00	0	\$0.00
3	SALVAGE EXISTING HYDRANT, LEAD, AND VALVE	EA	2	\$350.00	\$700.00	0	\$0.00	0	\$0.00
4	REMOVE/ABANDON EXISTING WATER SERVICE - ALL SIZES AND TYPES	EA	15	\$150.00	\$2,250.00	0	\$0.00	0	\$0.00
5	CONNECT TO EXISTING WATERMAIN	EA	1	\$1,448.16	\$1,448.16	0	\$0.00	0	\$0.00
6	6" GATE VALVE & BOX	EA	27	\$2,036.85	\$54,994.95	0	\$0.00	0	\$0.00
7	8" GATE VALVE & BOX	EA	4	\$2,530.54	\$10,122.16	0	\$0.00	0	\$0.00
8	12" GATE VALVE & BOX	EA	1	\$3,508.66	\$3,508.66	0	\$0.00	0	\$0.00
9	16" BUTTERFLY VALVE & BOX	EA	17	\$3,489.56	\$59,322.52	0	\$0.00	0	\$0.00
10	HYDRANT - 8" 6" BURY	EA	27	\$4,182.48	\$112,926.96	0	\$0.00	0	\$0.00
11	1" CORPORATION STOP	EA	6	\$425.90	\$2,555.40	0	\$0.00	0	\$0.00
12	1.5" CORPORATION STOP	EA	38	\$550.20	\$20,907.60	0	\$0.00	0	\$0.00
13	2" CORPORATION STOP	EA	2	\$647.35	\$1,294.70	0	\$0.00	0	\$0.00
14	1" CURB STOP AND BOX	EA	6	\$463.58	\$2,781.48	0	\$0.00	0	\$0.00
15	1.5" CURB STOP AND BOX	EA	38	\$600.53	\$22,820.14	0	\$0.00	0	\$0.00
16	2" CURB STOP AND BOX	EA	2	\$746.85	\$1,493.70	0	\$0.00	0	\$0.00
17	1" TYPE K COPPER WATER SERVICE PIPE	LF	204	\$28.59	\$5,832.36	0	\$0.00	0	\$0.00
18	1.5" TYPE K COPPER WATER SERVICE PIPE	LF	1,586	\$32.06	\$50,847.16	0	\$0.00	0	\$0.00
19	2" TYPE K COPPER WATER SERVICE PIPE	LF	52	\$37.35	\$1,942.20	0	\$0.00	0	\$0.00
20	CONNECT TO EXISTING WATER SERVICE -ALL SIZES AND TYPES	EA	15	\$500.00	\$7,500.00	0	\$0.00	0	\$0.00
21	6" DIP CL 52 WATERMAIN	LF	379	\$29.50	\$11,180.50	0	\$0.00	0	\$0.00
22	16" DIP CL 52 WATERMAIN	LF	387	\$74.63	\$28,881.81	0	\$0.00	0	\$0.00
23	8" HDPE DR 11 WATERMAIN	LF	174	\$70.93	\$12,341.82	0	\$0.00	0	\$0.00
24	12" HDPE DR 11 WATERMAIN	LF	74	\$81.80	\$6,053.20	0	\$0.00	0	\$0.00
25	16" HDPE DR 11 WATERMAIN	LF	11,152	\$89.00	\$992,528.00	4,328	\$385,192.00	4,328	\$385,192.00
26	16" HDPE DR11 WATERMAIN, EXTRA DEPTH (P)	LF	2,200	\$89.00	\$195,800.00	575	\$51,175.00	575	\$51,175.00
27	6"x45" BEND MJ DUCTILE IRON COMPACT FITTING	EA	32	\$362.03	\$11,584.96	0	\$0.00	0	\$0.00
28	16"x11-1/4" BEND MJ DUCTILE IRON COMPACT FITTING	EA	1	\$1,325.00	\$1,325.00	0	\$0.00	0	\$0.00
29	16"x45" BEND MJ DUCTILE IRON COMPACT FITTING	EA	2	\$1,337.00	\$2,674.00	0	\$0.00	0	\$0.00
30	8"x6" TEE MJ DUCTILE IRON COMPACT FITTING	EA	3	\$543.52	\$1,630.56	0	\$0.00	0	\$0.00
31	16"x6" TEE MJ DUCTILE IRON COMPACT FITTING	EA	23	\$1,498.00	\$34,454.00	0	\$0.00	0	\$0.00
32	16"x8" TEE MJ DUCTILE IRON COMPACT FITTING	EA	4	\$1,520.00	\$6,080.00	0	\$0.00	0	\$0.00
33	16"x12" TEE MJ DUCTILE IRON COMPACT FITTING	EA	1	\$1,589.00	\$1,589.00	0	\$0.00	0	\$0.00
34	16"x12" CROSS MJ DUCTILE IRON COMPACT FITTING	EA	2	\$1,657.77	\$3,315.54	0	\$0.00	0	\$0.00
35	12"x6" REDUCER MJ DUCTILE IRON COMPACT FITTING	EA	1	\$588.10	\$588.10	0	\$0.00	0	\$0.00
36	16"x8" REDUCER MJ DUCTILE IRON COMPACT FITTING	EA	1	\$762.51	\$762.51	0	\$0.00	0	\$0.00
37	8" PLUG MJ DUCTILE IRON COMPACT FITTING	EA	4	\$268.40	\$1,073.60	0	\$0.00	0	\$0.00
38	12" PLUG MJ DUCTILE IRON COMPACT FITTING	EA	4	\$322.24	\$1,288.96	0	\$0.00	0	\$0.00
39	16" PLUG MJ DUCTILE IRON COMPACT FITTING	EA	1	\$506.18	\$506.18	0	\$0.00	0	\$0.00
40	HORIZONTAL DIRECTIONAL DRILLING BORE PITS	LS	1	\$70,092.00	\$70,092.00	0	\$0.00	0	\$0.00
41	WATER SERVICE CONNECTION PITS	LS	1	\$55,577.00	\$55,577.00	0	\$0.00	0	\$0.00
42	OFF ROAD STRUCTURE MARKER	EA	27	\$57.70	\$1,557.90	0	\$0.00	0	\$0.00
43	4" POLYSTYRENE INSULATION	SF	96	\$7.37	\$707.52	0	\$0.00	0	\$0.00
SUBTOTAL - DIVISION 2					\$1,808,790.41		\$436,367.00		\$436,367.00
DIVISION 3 - STREETS									
1	SAWCUT BITUMINOUS PAVEMENT	LF	1,020	\$3.92	\$3,998.40	0	\$0.00	0	\$0.00
2	REMOVE & DISPOSE OF EXIST. BITUMINOUS PAVEMENT, ALL TYPES	SY	1,125	\$5.67	\$6,378.75	0	\$0.00	0	\$0.00
3	CL 5 AGGREGATE BASE	TN	410	\$29.93	\$12,271.30	0	\$0.00	0	\$0.00
4	DRIVEWAY RESTORATION	SY	62	\$39.21	\$2,431.02	0	\$0.00	0	\$0.00
5	SPNWB230B BITUMINOUS NON-WEAR COURSE, STREETS	TN	134	\$128.96	\$17,280.64	0	\$0.00	0	\$0.00
6	SPWEA240B BITUMINOUS WEAR COURSE, STREETS	TN	67	\$144.44	\$9,677.48	0	\$0.00	0	\$0.00
7	BITUMINOUS MATERIAL FOR TACK COAT	GA	56	\$2.06	\$115.36	0	\$0.00	0	\$0.00
SUBTOTAL - DIVISION 3					\$52,152.95		\$0.00		\$0.00

TOTALS

\$2,015,687.39

\$505,842.85

\$505,842.85



MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014
CONSENT
ITEM #9

AGENDA ITEM: Updated Purchasing Policy
SUBMITTED BY: Cathy Bendel, Finance Director
THROUGH: Cathy Bendel, Finance Director
REVIEWED BY: Finance Committee

SUGGESTED ORDER OF BUSINESS:

- Introduction of Item City Administrator
- Report/Presentation..... City Administrator
- Questions from Council to Staff..... Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion..... Mayor & City Council
- Action on Motion..... Mayor Facilitates

SUMMARY AND ACTION REQUESTED: As part of its Consent Agenda, the City Council is asked to consider approval of an updated policy related to purchasing activity for the City of Lake Elmo. No specific motion is needed as this is recommended as part of the *Consent Agenda*.

BACKGROUND INFORMATION: The City of Lake Elmo currently has a purchasing policy which the Finance Committee reviewed and found to be cumbersome and difficult to follow. As a result, suggestions were made resulting in a new streamlined policy. By approving the attached policy the City Council will strengthen the internal controls surrounding purchasing since the department heads will find it much easier to understand resulting in better adherence.

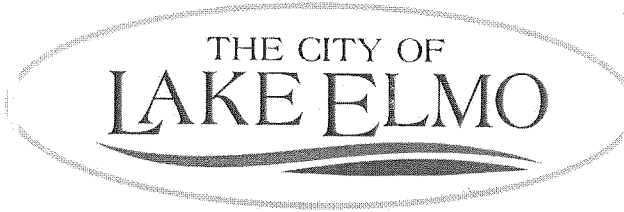
STAFF REPORT: Purchasing is a critical function for the City. As part of the Finance Department and Finance Committee's 2014 initiatives, reviewing and making suggestions for updating some outdated Finance related policies is very high on the list. This is one of those key policies.

This policy will ensure that the purchasing activity of the City is being done with the focus of providing the best value for the funds spent for the City of Lake Elmo.

RECOMMENDATION: It is recommended that the City Council consider approval of the proposed Purchasing Policy.

ATTACHMENTS:

1. Draft Purchasing Policy



Purchasing Policy

This policy applies to all purchasing activities of the City, and applies to all City Departments, employees, and authorized users and encompasses all purchases using City funds. Failure to comply with these policies and procedures could result in discipline up to and including termination.

Prior to making a purchase of new products, determine if used, recycled, repaired, refurbished or remanufactured products would be a more cost effective way to fulfill the need. Consideration of made in the USA, economic, environmental, and social factors should also be considered.

If an item or service is to be purchased new, determine whether the item or service is currently available through the cooperative purchasing process outline below:

The City and its purchasing agents are not only encouraged but mandated in some instances to consider purchasing through the state CPV (Cooperative Purchasing Venture). For all purchases estimated to exceed \$25,000 the purchasing agent must consider the price and quality available through the CPV

(<http://www.mmd.admin.state.mn.us/>) before buying through another source, and these findings must be documented on the purchase requisition.

When a CPV vendor is not available, the city may choose to enter into a Price Agreement Contract. Department Heads are the only staff authorized to enter into a Price Agreement Contract. A price agreement contract between the city and a merchant may be used to acquire items frequently purchased in small quantities. Under the agreement the merchant agrees to supply a specified commodity at a set price.

For purchases/contracts estimated to cost over \$50,000 the uniform municipal contracting law (competitive bidding law) guidelines (<http://www.mmd.admin.state.mn.us/>) must be followed (exceptions noted below). This applies to: contracts for the sale, purchase, or rental of supplies, materials, or equipment; and contracts for the construction, alteration, repair, or maintenance of real or personal property. The City Administrator will work with appropriate department staff to prepare necessary specifications, seek competitive bids, and formulate a recommendation to present for review and approval by the Council. If recommendations/bids are approved by the Council, then the City Administrator will sign the purchase requisition and have the authority to move ahead with the purchase/contract.

The competitive bidding process is not required:

- 1) When contracting for professional services such as those of doctors, engineers, lawyers, architects, accountants, or other services requiring technical, scientific, or professional training.
- 2) For insurance contracts; however, the city must seek RFPs for group insurance for 25 or more employees.
- 3) When electronic reverse auctions are used where vendors bid against each other to offer the lowest selling price (note: the city is prohibited from using a reverse auction procedure to contract for professional or technical services).
- 4) When purchasing from the national government, the state, or any political subdivision of the state.
- 5) For the purchase, lease, or sale of real estate

A purchase requisition form (Attachment A) must be completed for all purchases \$1,000 and over. All purchase requisitions must include documentation that the item is authorized in the budget and/or that sufficient funds are available.

Price quotes information must be noted on the purchase requisition form and must be obtained for all purchases except for those purchases where a state CPV vendor is used (and the contract is not estimated to cost more than \$50,000) or a price agreement is already in place, per the following guidelines:

Purchases at or below \$2,500.00:	Minimum of 1 price quote is required
Purchases between \$2,500.01 and \$25,000.00	Minimum of 2 price quotes are required
Purchases between \$25,000.01 and \$50,000.00	Competitive Bidding Process or direct negotiation
Purchases \$50,000.01 and over	Competitive Bidding Process must be used

The purchase requisition should be signed by the person who is requesting the purchase and who obtained the quotes, verified the funds, etc. If this person is not a Department Head, the purchase requisition will also need the Department Head signature of approval. When complete, the purchase requisition is submitted to the Finance Director for approval and verification that sufficient funds are available. After approval by the Finance Director the purchase requisition is signed and approved by the City Administrator.

City Council may authorize the use of credit cards by any city officer or employee otherwise authorized to make a purchase on behalf of the city.

Conflict of Interests

Employees – no employee will participate directly or indirectly in any contract or procurement of goods/services that the City makes when the employee or any member of the employee's immediate family has a financial interest related to the contract or procurement, including involvement with a business or organization related to the procurement. If a conflict of interest is deemed to exist, the employee shall not participate in the transaction.

Immediate family shall be defined as a spouse, domestic partner, parent, child, sibling, father-in-law or mother-in-law, son in-law or daughter in-law, sister in-law or brother in-law, step child, step sibling, and half sibling.

City Officials - no city official, elected or appointed, will participate directly or indirectly in any contract or procurement of goods/services that the City makes when the City officials or any member of the city official's immediate family has a financial interest to the contract or procurement, including involvement with a business or organization related to the procurement. This prohibition applies whether the official actually votes on a contract or not. There are limited exceptions to this prohibition, and the City Council should seek advice from the City Attorney before entering into any contract in which a council member or any other city official will have a financial interest. Conflicts of interest can also arise when a city official has a personal interest in a matter which is particularized and so distinct from the public interest that the official cannot be impartial or fairly represent the public interest. A city official who violates the conflict of interest law is guilty of a gross misdemeanor and can be fined up to \$3,000 and imprisoned up to one year. In addition, the other members of the council who knowingly authorized the unlawful contract may also be subject to criminal penalties. Furthermore, contracts that violate these statutes are generally void.

Immediate family shall be defined as a spouse, domestic partner, parent, child, sibling, father-in-law or mother-in-law, son in-law or daughter in-law, sister in-law or brother in-law, step child, step sibling, and half sibling.

Emergencies

Under Minnesota's Emergency Management Act, the city is given authority to enter into contracts without following normally required procedures. The governing body may waive compliance with the time-consuming procedures that concern: the performance of public work, contracting, incurring obligations, employing temporary workers, renting equipment, purchasing supplies and materials, limitations on tax levies and the appropriation and expenditure of public funds (uniform municipal contracting law).



MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014

REGULAR

ITEM 10

AGENDA ITEM: Village East Trunk Sanitary Sewer Improvements: Trunk Highway 5 to south of the Union Pacific Railroad – Public Improvement Hearing; Resolution Accepting the Amended Feasibility Report and Ordering the Improvement

SUBMITTED BY: Jack Griffin, City Engineer

THROUGH: Dean A. Zuleger, City Administrator

REVIEWED BY: Adam Bell, City Clerk
Cathy Bendel, Finance Director
Chad Isakson, Project Engineer
Dave Snyder, City Attorney

SUGGESTED ORDER OF BUSINESS:

- Introduction of Item City Engineer
- Report/Presentation..... City Engineer
- Questions from Council to Staff..... Mayor Facilitates
- Open Public Improvement Hearing; Public Input Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion..... Mayor & City Council
- Action on Motion..... Mayor Facilitates

POLICY RECOMMENDER: Engineering

FISCAL IMPACT: No additional fiscal impact.

The impact to the City for this request includes procedures to recover all costs as the improvements proceed forward. The trunk sewer improvements are being implemented as a joint venture between the City, property owners and developers; a project that has already been initiated by the City Council. By ordering the improvement (under this agenda report) and awarding a construction contract (under a separate agenda report) for the Village East Trunk Sanitary Sewer Improvements: TH5 to the UP Railroad, the Council is agreeing to amend the

portion of the overall improvements to be directly led by the City, thereby altering the project delivery process and incorporating additional improvements and properties to be assessed.

SUMMARY AND ACTION REQUESTED:

The City Council is respectfully requested to open the Public Improvement Hearing for the Village East Trunk Sanitary Sewer Improvements: Trunk Highway 5 to south of the Union Pacific Railroad. After closing the public hearing the Council is requested to consider accepting the amended feasibility report and ordering the improvements. The recommended motion for this action is:

“Move to adopt Resolution No. 2014-62 Accepting the Amended Feasibility Report and Ordering the Village East Trunk Sanitary Sewer Improvements: Trunk Highway 5 to south of the Union Pacific Railroad.”

LEGISLATIVE HISTORY/BACKGROUND INFORMATION:

Pursuant to Minnesota Statutes, Section 429.011 to 429.111, a Public Improvement Hearing was noticed for August 19, 2014, to consider making the following improvements:

- Extension of approximately 2,000-feet of trunk sanitary sewer from Trunk Highway 5 to south of the Union Pacific Railroad

Public notification: The attached notice was published in an official newspaper and individual notifications were sent to two property owners, representing three parcels that requested to have this portion of the project be publically bid and constructed as part of the 39th Street North: Street and Sanitary Sewer Improvements.

The feasibility report was authorized by the city council on June 17, 2014 in order to ready these improvements for 2014 construction. The report identified the necessary improvements, the estimated project costs, the assessment methodology and preliminary assessment amounts to be levied against properties adjacent to and benefitting from the improvements.

On July 10, 2014, Contractor Bids were received for the improvements with the low bid amount exceeding the estimated construction cost presented in the feasibility report. The feasibility report has therefore been amended to reflect the increased project costs and the preliminary assessment roll revised accordingly. A stakeholder meeting was held on July 21, 2014 to present to additional assessment amounts.

STAFF REPORT

The Village East Trunk Sanitary Sewer Improvements from Trunk Highway 5 to south of the Union Pacific Railroad will be built in conjunction with the 39th Street North: Street and Sanitary Sewer Improvement project in 2014. The Village Sewer project will extend trunk sanitary sewer from the new Village lift station near Reid Park to undeveloped properties in the north and

northwestern Village area. The Village area comprehensive sewer plan indicates the preferred alignment for this trunk sewer to be along 39th Street North.

This project will be partially funded by imposing special assessments against the 3 benefitting parcels abutting the improvements. Assessments will be proportioned based upon the projected sewage generation of each property within the trunk sewer service area in relation to the total contributing sewer service capacity.

The total estimated project cost for the additional improvements to bring sanitary sewer from the lift station through 39th Street will be paid in full by all properties benefitting from the extension less trunk oversizing costs, which will be paid through the City's sewer enterprise fund.

The plans and specifications for the Village East Trunk Sanitary Sewer Improvements: TH5 to UP Railroad have been incorporated with the 39th Street North: Street and Sanitary Sewer Improvements as an alternate bid. Award of a contract and consideration of including this portion of the work as a part of the 39th Street Improvements will be presented as a separate agenda report.

RECOMMENDATION:

Staff is recommending that the City Council adopt Resolution No. 2014-62, Accepting the Amended Feasibility Report and Ordering the Improvements for the Village East Trunk Sanitary Sewer Improvements: Trunk Highway 5 south of the Union Pacific Railroad. The recommended motion for this action is as follows:

“Move to adopt Resolution No. 2014-62 Accepting the Amended Feasibility Report and Ordering the Village East Trunk Sanitary Sewer Improvements: Trunk Highway 5 to south of the Union Pacific Railroad.”

ATTACHMENT(S):

1. Amended Feasibility Report, dated July 21, 2014.
2. Resolution 2014-62.
3. Notice of Hearing on Improvement.
4. Preliminary Assessment Roll.
5. Location Map.
6. Project Schedule.

CERTIFICATION

FEASIBILITY REPORT VILLAGE EAST SANITARY SEWER IMPROVEMENTS: TRUNK HIGHWAY 5 TO UNION PACIFIC RAILROAD

THE CITY OF LAKE ELMO, MINNESOTA

JUNE 2014

AMENDED JULY 21, 2014

Lake Elmo Project No: 2014.127

I hereby certify that this plan, specification, or report was prepared by me, or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



Chad J. Isakson | License No. **49028** | July 21, 2014
651.300.4283

FOCUS Engineering, inc.
www.FOCUSengineeringinc.com

**VILLAGE EAST SANITARY SEWER IMPROVEMENTS: TRUNK
HIGHWAY 5 TO UNION PACIFIC RAILROAD
CITY OF LAKE ELMO
Project No: 2014.127**

PROPOSED IMPROVEMENTS AND RECOMMENDATIONS

This document officially amends the Village East Trunk Sanitary Sewer Extension Feasibility Report dated June 2014 that was adopted by the Lake Elmo City Council on June 17, 2014. On July 14, 2014, contractor bids were received for the improvements with the low bid amount exceeding the estimated construction cost presented in the report. The purpose of this amendment is to revise the preliminary assessment roll to reflect the increased project costs accordingly. The revised assessment roll has been provided to the benefitting property owners by mail and at a stakeholder meeting held by the City. Acceptance of this report will provide the City the option to assess the improvements to the benefitting property owners at the higher cost reflected in contractor bids.

At the request of several property owners in the Village area, the City of Lake Elmo, property owners and developers are working collaboratively to complete the extension of trunk sanitary sewer from the new lift station in Reid Park to the intersection of 39th Street North and Trunk Highway 5, then along 39th Street North to CSAH 17 (Lake Elmo Avenue) with the sanitary sewer stubbed to the west side of the County Road.

To pursue this improvement, the project was split into two separate improvement projects, one to be completed as a public improvement project led by the City (the 39th Street: Street and Sanitary Sewer Improvements) and the other to be constructed privately by developers (the Village East Trunk Sanitary Sewer Improvements). In both cases the City would cover pipe oversize charges funded through the City Sewer Enterprise Fund. The City initiated the 39th Street: Street and Sanitary Sewer Improvements by authorizing the feasibility report on March 18, 2014. A public improvement hearing was then held on May 6, 2014 and the council ordered the preparation of plans and specifications.

Subsequent to the direction to proceed with the 39th Street: Street and Sanitary Sewer Improvements, two of the property owners, representing three parcels, requested to have a portion of the Village East Trunk Sanitary Sewer Improvements, that portion from Trunk Highway 5 to the south side of the Union

Pacific Railroad tracks, to be publicly bid and constructed as a part of the 39th Street North: Street and Sanitary Sewer Improvements with the costs to be assessed to the benefiting properties.

To accommodate this request, this feasibility report was prepared to satisfy the legal requirements of Minnesota State Statute 429. The report identifies the necessary improvements, the estimated project costs, the assessment methodology and preliminary assessment amounts to be levied against properties adjacent to and benefitting from the proposed improvements. The recommended assessment methodology is consistent with the City of Lake Elmo Special Assessment Policies and Procedures for Public Improvements, amended December 17, 2013.

The proposed improvement includes the extension of approximately 2,000 feet of 15-inch diameter trunk sanitary sewer line between the existing Union Pacific railroad tracks and Trunk Highway 5. Three (3) developable properties have been identified that will benefit from these improvements by providing them the opportunity to connect to the municipal sewer system.

The project is necessary, cost-effective, and feasible and will result in a benefit to the properties proposed to be assessed. It is recommended that the City Council accept this Report, hold the public hearing, and order the improvements.

RIGHT-OF-WAY AND EASEMENTS

To implement the proposed improvements permanent roadway and utility easements must be acquired from the adjacent property owners. Temporary construction easements are also needed for the duration of the construction activities and through the project's warranty period. This report assumes that the necessary easements will be dedicated to the City at no cost.

PERMITS AND APPROVALS

The following permits will be required to implement the proposed improvements. The UP Railroad utility crossing is a permit that must be acquired due to the added scope of work being requested:

- Union Pacific Railroad Utility Crossing Permit.
- Minnesota NPDES-SDS Construction Stormwater General Permit.
- Valley Branch Watershed District Permit for Erosion Control.
- Minnesota Department of Transportation Right-of-Way Permit.
- Minnesota Pollution Control Agency (MPCA) Permit for sanitary sewer extension.

SUMMARY OF ESTIMATED PROJECT COSTS

The total **amended** estimated project costs for the Trunk Sanitary Sewer Extension Improvements is **\$412,600**. The total project cost is based on contractor bids received and by incorporating engineering, geotechnical investigations, and contingences. Detailed estimates are attached to this report for reference. No allowance has been provided for easement and right-of-way. A 2.5% allowance is included for legal, fiscal and administration costs.

FINANCING OF IMPROVEMENTS

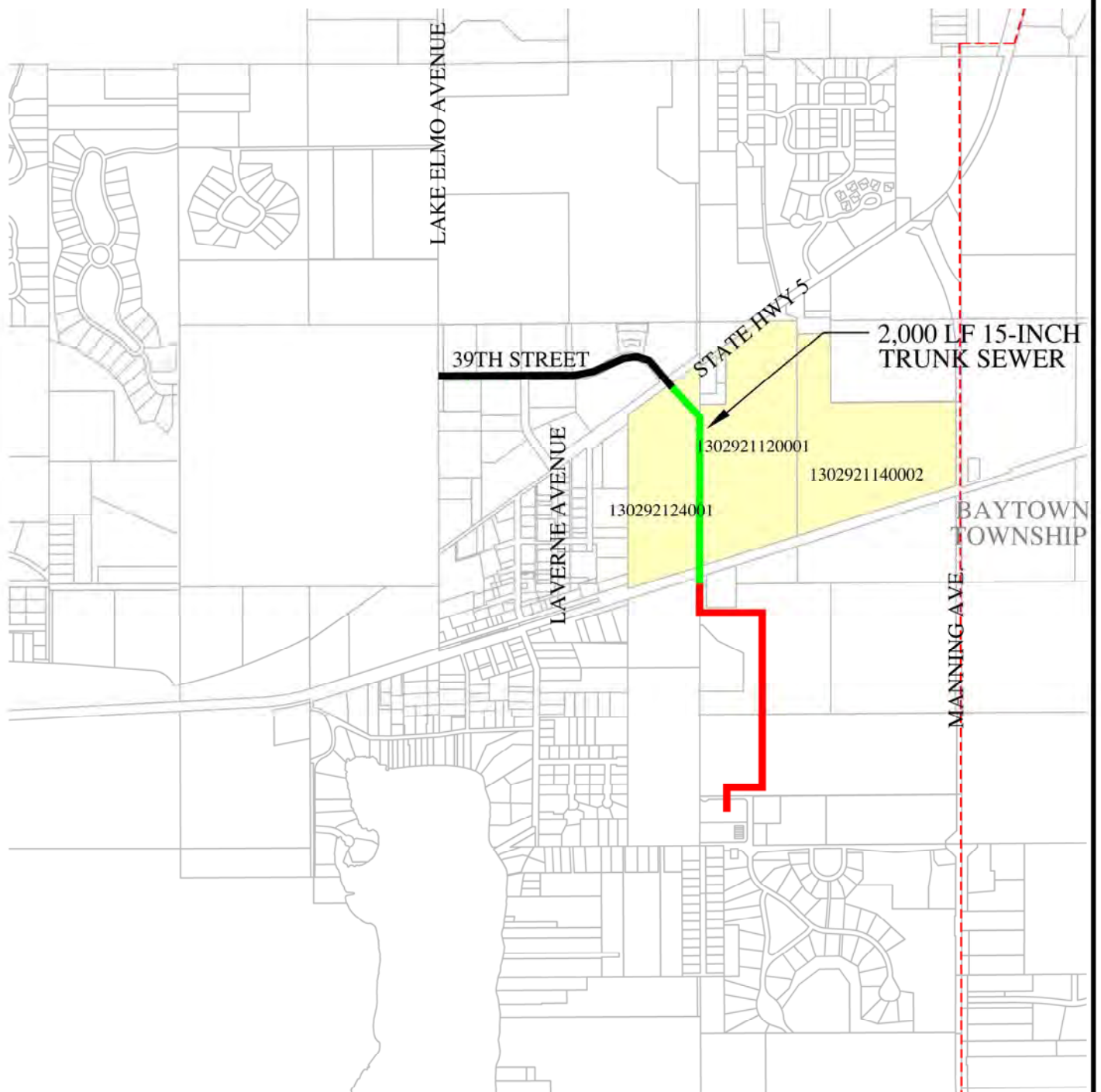
This project will be partially financed by levying special assessments against the benefiting properties. Special assessments are levied in accordance with Minnesota Statutes Chapter 429 and the City of Lake Elmo Special Assessment Policies and Procedures for Public Improvements, amended December 17, 2013. Assessments will be proportioned based upon the projected sewage generation of each property within the trunk sewer service area in relation to the total contributing sewer service capacity. To facilitate this allocation, each property is assigned a Residential Equivalent (REC) unit basis. The total cost for the overall extension of sanitary sewer from the lift station through 39th Street North was divided by the total number of RECs connecting to the sewer main. Each benefitting property's assessment was then determined based on how many RECs it contains.

A preliminary assessment roll has been prepared for the sanitary sewer improvements and is attached to this report. There are three properties comprising of 326 RECs that directly benefit from the proposed improvements, however there are an additional 833 RECs sharing in the total project costs for the combined trunk sewer extension, but paying their proportionate cost directly or assessed as a part of the 39th Street North Improvement project.

The City may use fund reserves or bonds for the improvements to pay the up-front project costs and to cover City cost participation. Special assessments would be levied against the benefiting properties with payment terms structured so that the City receives funds to meet debt obligations. Consistent with the City's adopted Special Assessment Policy, it is recommended that the sanitary sewer improvements be levied over a 15-year period. Assessments would be assigned an interest rate of 2% over the bond rate for the project. This will address the internal costs the City will incur associated with the bonding, documentation of the assessments, and dealing with delinquent assessment payments.

ATTACHMENTS

- Project Location Map – Scope of Proposed Improvements.
- Project Schedule.
- Preliminary Assessment Roll.
- Village East Trunk Sanitary Sewer Improvements – Summary of Total Project Costs.
- Detailed Estimated Project Costs – Trunk Sanitary Sewer Improvements.



LEGEND

- VILLAGE EASTERN TRUNK SEWER IMPROVEMENTS (PUBLIC)
- VILLAGE EASTERN TRUNK SEWER IMPROVEMENTS (PRIVATE)
- 39TH STREET - SANITARY SEWER IMPROVEMENTS (PUBLIC)



FOCUS
ENGINEERING

VILLAGE EAST SANITARY SEWER
IMPROVEMENTS: TRUNK HIGHWAY
5 TO UNION PACIFIC RAILROAD
PROJECT NO. 2014.127
JUNE, 2014

FIGURE NO. 1
LOCATION MAP
VILLAGE EAST TRUNK SANITARY
SEWER IMPROVEMENTS

PROJECT SCHEDULE
CITY OF LAKE ELMO

FOCUS ENGINEERING, inc.

VILLAGE EAST TRUNK SANITARY SEWER IMPROVEMENTS
PROJECT NO. 2014.131

Cara Geheren, P.E.	651.300.4261
Jack Griffin, P.E.	651.300.4264
Ryan Stempski, P.E.	651.300.4267
Chad Isakson, P.E.	651.300.4283

JULY 2014

June 17, 2014	Council Orders Preparation of Feasibility Report. Presentation of Feasibility Report. Council accepts Report and Calls Hearing. Council approves Plans and Specifications; Orders Advertisement for Bids. (project is added to the 39 th Street: Street and Sanitary Sewer Improvements as an add alternate bid).
July 10, 2014	Receive Contractor Bids
August 5, 2014	Public Improvement Hearing. Council Orders the Improvement, accepts bids and awards Contract.
August 12, 2014	Conduct Pre-construction Meeting and Issue Notice to Proceed.
November 28, 2014	Substantial completion (estimated 15 weeks).
June 5, 2015	Final Completion.

PRELIMINARY ASSESSMENTS - SANITARY SEWER IMPROVEMENTS

VILLAGE EAST SANITARY SEWER COSTS: TRUNK HIGHWAY 5 TO UP RAILROAD
 PROJECT NO. 2014.131
 CITY OF LAKE ELMO, MN.

VILLAGE EAST TRUNK SANITARY SEWER COSTS - TOTAL PROJECT	\$1,577,600
TRUNK OVERSIZE COSTS - CITY ENTERPRISE FUNDS	\$310,160
TOTAL SANITARY SEWER EXTENSION COSTS LESS TRUNK OVERSIZE	\$1,267,440
TOTAL NUMBER OF RECS (INCLUDES 833 RECS FROM GREATER PROJECT EXTENTS)	1159
COST PER REC	\$1,094

VILLAGE EAST SANITARY SEWER COSTS: TRUNK HIGHWAY 5 TO UP RAILROAD	\$412,600
---	-----------

JULY, 2014

NO.	PIN	OWNER	REC	FEASIBILITY COST PER REC	FEASIBILITY ASSESSMENT AMOUNT	POST BID COST PER REC	POST BID ASSESSMENT AMOUNT	DIFFERENCE IN ASSESSMENT
1	13.029.21.12.0001	EASTON VILLAGE LLC	128	\$835	\$107,000.00	\$1,094	\$141,000.00	\$34,000.00
2	13.029.21.14.0002	EASTON VILLAGE LLC	8	\$835	\$7,000.00	\$1,094	\$9,000.00	\$2,000.00
3	13.029.21.24.0001	SCHILTGEN PETER J	190	\$835	\$159,000.00	\$1,094	\$208,000.00	\$49,000.00
TOTALS			326		\$273,000		\$358,000	\$85,000

CITY OF LAKE ELMO
VILLAGE EAST TRUNK SEWER IMPROVEMENTS

PROJECT SEGMENT	Village East Trunk Sewer LS to RR		Village East Trunk Sewer RR to TH 5		39th Street: Trunk Sewer TH 5 to CSAH 17		TOTALS
To Parcel E	\$30,393.20						\$30,393.20
Parcel E	\$140,605.90						\$140,605.90
Easton Village	\$247,454.60						\$247,454.60
RR to Stillwater Blvd			\$345,597.00				\$345,597.00
Stillwater Blvd along 39th Street across CR17					\$514,411.00		\$514,411.00
39th Street to Parcel B	\$50,331.00						\$50,331.00
Total Construction Cost	\$468,784.70		\$345,597.00		\$514,411.00		\$1,328,792.70
 Contingencies	\$18,000.00	3.8%	\$13,500.00	3.9%	\$29,400.00	5.7%	\$60,900.00
Engineering Services	\$25,000.00	5.3%	\$31,500.00	9.1%	\$48,600.00	9.4%	\$105,100.00
Full Time Construction Observation	\$10,000.00	2.1%	\$6,000.00	1.7%	\$6,800.00	1.3%	\$22,800.00
Geotechnical Engineering	\$11,000.00	2.3%	\$10,000.00	2.9%	\$24,000.00	4.7%	\$45,000.00
Legal, Fiscal and Administration	\$0.00	0.0%	\$6,000.00	1.7%	\$9,000.00	1.7%	\$15,000.00
		13.7%		19.4%		22.9%	
Subtotal Project Cost	\$532,800		\$412,600		\$632,200		\$1,578,000
Less Private Service Stubs for Easton Village							(\$22,000)
Total Project Cost							\$1,556,000

Village East Trunk Sewer Improvements: Lift Station to RR	PRIVATE
Village East Trunk Sewer Improvements: RR to TH 5	PUBLIC
39th Street: Street and Sanitary Sewer Improvements	PUBLIC

Project: Lake Elmo - Village Planning Area					
Project No. 3120-047					
Prepared For: GW Land Development					
Prepared By: Sathre- Bergquist, Inc.					
Date: February 26, 2014					
Revised(5): April 21, 2014					
Subject: Lake Elmo Trunk Sanitary Sewer Proposal					
Stillwater Blvd along 39th Street across CR17					
SANITARY SEWER	Units	Estimated Quantity	Unit Price	Amount	
		Stillwater Blvd along 39th Street across CR17		\$514,411.00	Total construction costs base
39th Street to Parcel B					
250					
SANITARY SEWER	Units	Quantity	Unit Price	Amount	
Mobilization - Utility	L.S.	1.0	\$3,000.00	\$3,000.00	
Connect to Existing	L.S.	0.0	\$0.00	\$0.00	
Traffic Control (w/plan) (jersey barriers)	L.S.	0.0	\$0.00	\$0.00	
8" PVC	L.F.	40.0	\$35.00	\$1,400.00	
10" PVC (15-25 ft)	L.F.	690.0	\$40.00	\$27,600.00	
Manhole 0-8'	EACH	2.0	\$1,880.00	\$3,760.00	
Manhole Extra Depth	L.F.	27.0	\$113.00	\$3,051.00	
Manhole Seal Wrap	EACH	2.0	\$150.00	\$300.00	
Furnish & Install Castings	EACH	2.0	\$450.00	\$900.00	
8" Plug	EACH	2.0	\$50.00	\$100.00	
8"x4" Wyes	EACH	0.0	\$250.00	\$0.00	
4" PVC Risers	L.F.	0.0	\$14.00	\$0.00	
Improved Pipe Fndtn	L.F.	730.0	\$7.00	\$5,110.00	
Televise	L.F.	730.0	\$3.00	\$2,190.00	
Restoration	L.F.	730.0	\$4.00	\$2,920.00	
(No Dewatering Included)					
		39th Street to Parcel B		\$50,331.00	
Summary:		To Parcel E :		\$30,393.20	
		Parcel E :		\$140,605.90	
		Easton Village :		\$247,454.60	
		RR to Stillwater Blvd :		\$345,597.00	
		Stillwater Blvd along 39th Street across CR17 :		\$514,411.00	
		39th Street to Parcel B :		\$50,331.00	
		Construction Cost :		\$1,328,792.70	
		Total Length of Pipe:		8,979.0	
		Cost per Foot:		\$147.99	

Project: Lake Elmo - Village Planning Area						
Project No. 3120-047						
Prepared For: GW Land Development						
Prepared By: Sathre- Bergquist, Inc.						
Date: February 26, 2014						
Revised(5): April 21, 2014						
Subject: Lake Elmo Trunk Sanitary Sewer Proposal						
					Oversizing Cos	Oversizing
Total Pipe Quantity		Quantity	Unit Price	8" Unit Price	Difference	Cost
8" PVC		262.0	\$30.00	\$30.00	\$0.00	\$0.00
10" PVC (15-25 ft)		2,130.0	\$88.00	\$70.00	\$18.00	\$38,340.00
12" PVC (15-25 ft)		1,250.0	\$95.00	\$70.00	\$25.00	\$31,250.00
15" PVC (15-25 ft)		3,716.1	\$86.00	\$35.00	\$51.00	\$189,521.10
18" PVC (0-15 ft)		594.9	\$57.00	\$35.00	\$22.00	\$13,087.80
18" PVC (15-25 ft)		1,026.0	\$75.00	\$38.00	\$37.00	\$37,962.00
Total:		8,979.0				\$ 310,160.90

**CITY OF LAKE ELMO
WASHINGTON COUNTY
STATE OF MINNESOTA**

RESOLUTION NO. 2014-62

**A RESOLUTION ACCEPTING THE AMENDED FEASIBILITY REPORT AND ORDERING
THE IMPROVEMENT FOR THE VILLAGE EAST TRUNK SANITARY SEWER
IMPROVEMENTS: TRUNK HIGHWAY 5 TO SOUTH OF THE UNION PACIFIC RAILROAD**

WHEREAS, pursuant a resolution of the city council adopted the 17th day of June, 2014, the council accepted a feasibility report and ordered a hearing on Improvement for the Village East Trunk Sanitary Sewer Improvements: TH 5 to south of UP Railroad; and

WHEREAS, the feasibility report and preliminary assessment roll was amended and dated July 21, 2014 to reflect increased project costs following contractor bids and a stakeholder meeting was held to present the amended preliminary assessment rolls; and

WHEREAS, ten days' mailed notice and two weeks published notice of the hearing was given, and the hearing was held thereon on the 19th day of August, 2014, at which all persons desiring to be heard were given the opportunity to be heard thereon; and

WHEREAS, the amended feasibility report prepared by FOCUS Engineering, Inc., and dated July 21, 2014 provides information regarding whether the proposed improvement is necessary, cost-effective, and feasible; whether it should best be made as proposed or in connection with some other improvement; the estimated cost of the improvements as recommended; and a description of the methodology used to calculate individual assessments for affected parcels.

NOW, THEREFORE, BE IT RESOLVED,

1. That the City Council accepts the amended Feasibility Report dated July 21, 2014 and will consider the improvements in accordance with the report and the assessments of the abutting properties for all or a portion of the cost of the improvements pursuant to Minnesota Statutes, Chapter 429 at an estimated total project cost of \$412,000 for the sanitary sewer improvements.
2. Such improvement is deemed necessary, cost-effective, and feasible as detailed in the Feasibility Report dated July 21, 2014.
3. Such improvement is hereby ordered as proposed in the council resolution adopted this 19th day of August, 2014.
4. Assessments shall be levied to the benefiting properties identified in the Report for Sanitary Sewer Improvements as presented in the Report.
5. The city council declares its official intent to reimburse itself for the costs of the improvement from the proceeds of tax exempt bonds.

ADOPTED BY THE LAKE ELMO CITY COUNCIL ON THE NINETEENTH DAY OF AUGUST, 2014.

CITY OF LAKE ELMO

By: _____
Mike Pearson
Mayor

(Seal)
ATTEST:

Adam Bell
City Clerk

CITY OF LAKE ELMO
NOTICE OF HEARING ON IMPROVEMENT
VILLAGE EAST TRUNK SANITARY SEWER IMPROVEMENTS

Notice is hereby given that the City Council of Lake Elmo will meet in the council chambers of the city hall at or approximately after 7:00 P.M. on Tuesday, August 19, 2014, to consider the making of the following improvements, pursuant to Minnesota Statutes, Sections 429.011 to 429.111;

The improvements will consist of the extension of municipal sanitary sewer service along the property line of PID 13.029.21.12.0001 and PID 13.029.21.24.001 between Trunk Highway 5 and the Union Pacific Railroad Tracks.

The area proposed to be assessed for these improvements include the two properties referenced above along with PID 13.029.21.14.0002. The estimated total cost of the sanitary sewer improvements is \$412,600. A reasonable estimate of the impact of the assessment will be available at the hearing. Such persons as desiring to be heard with reference to the proposed improvements will be heard at this meeting.

DATED: August 7, 2014

BY ORDER OF THE LAKE ELMO CITY COUNCIL

Mike Pearson, Mayor

Published in the St. Paul - Pioneer Press on August 8, 2014 and August 15, 2014.

PRELIMINARY ASSESSMENTS - SANITARY SEWER IMPROVEMENTS

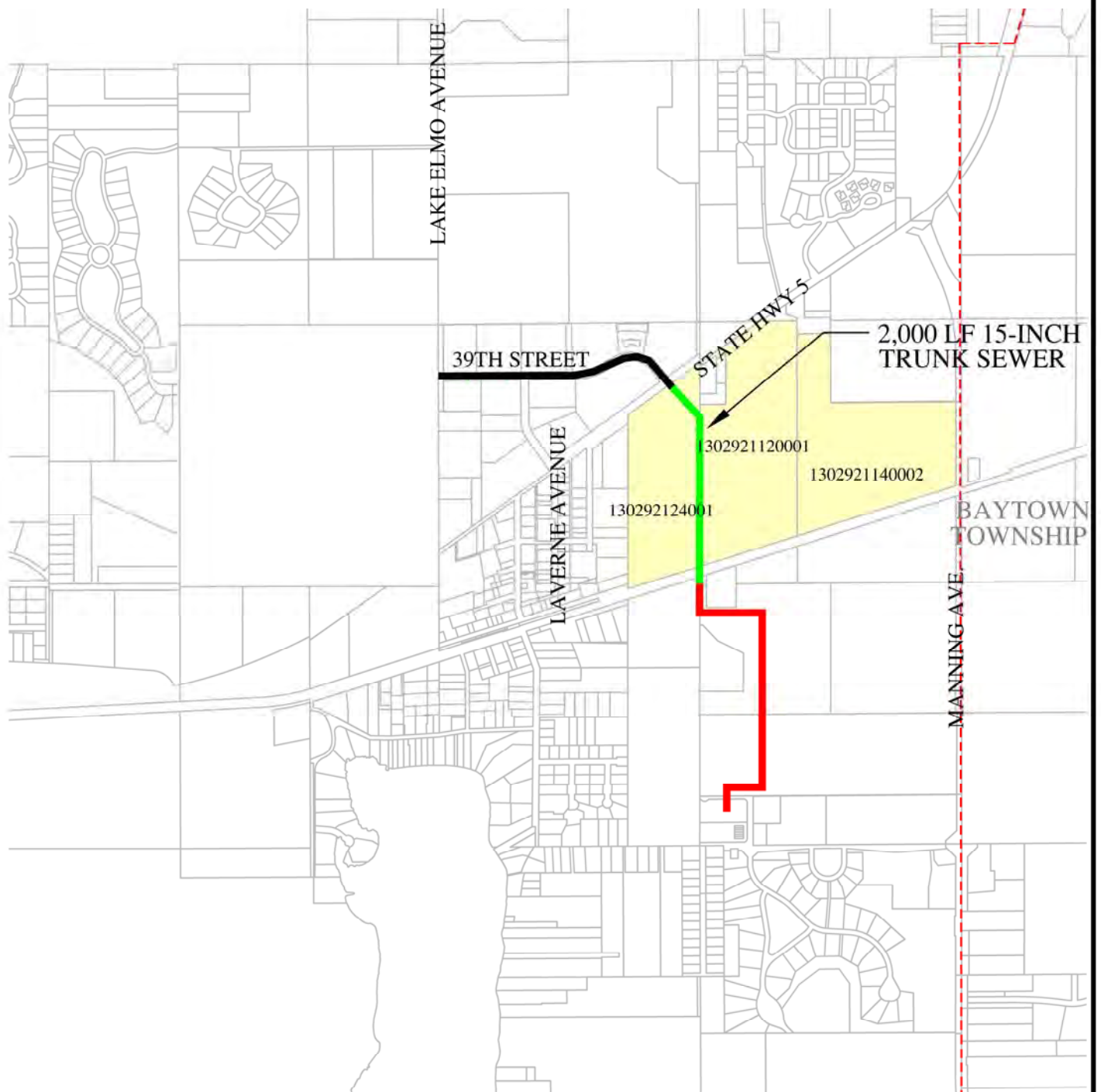
VILLAGE EAST SANITARY SEWER COSTS: TRUNK HIGHWAY 5 TO UP RAILROAD
 PROJECT NO. 2014.131
 CITY OF LAKE ELMO, MN.

VILLAGE EAST TRUNK SANITARY SEWER COSTS - TOTAL PROJECT	\$1,577,600
TRUNK OVERSIZE COSTS - CITY ENTERPRISE FUNDS	\$310,160
TOTAL SANITARY SEWER EXTENSION COSTS LESS TRUNK OVERSIZE	\$1,267,440
TOTAL NUMBER OF RECS (INCLUDES 833 RECS FROM GREATER PROJECT EXTENTS)	1159
COST PER REC	\$1,094

VILLAGE EAST SANITARY SEWER COSTS: TRUNK HIGHWAY 5 TO UP RAILROAD	\$412,600
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JULY, 2014

NO.	PIN	OWNER	REC	FEASIBILITY COST PER REC	FEASIBILITY ASSESSMENT AMOUNT	POST BID COST PER REC	POST BID ASSESSMENT AMOUNT	DIFFERENCE IN ASSESSMENT
1	13.029.21.12.0001	EASTON VILLAGE LLC	128	\$835	\$107,000.00	\$1,094	\$141,000.00	\$34,000.00
2	13.029.21.14.0002	EASTON VILLAGE LLC	8	\$835	\$7,000.00	\$1,094	\$9,000.00	\$2,000.00
3	13.029.21.24.0001	SCHILTGEN PETER J	190	\$835	\$159,000.00	\$1,094	\$208,000.00	\$49,000.00
TOTALS			326		\$273,000		\$358,000	\$85,000



LEGEND

- VILLAGE EASTERN TRUNK SEWER IMPROVEMENTS (PUBLIC)
- VILLAGE EASTERN TRUNK SEWER IMPROVEMENTS (PRIVATE)
- 39TH STREET - SANITARY SEWER IMPROVEMENTS (PUBLIC)



FIGURE NO. 1

LOCATION MAP

VILLAGE EAST TRUNK SANITARY
SEWER IMPROVEMENTS

FOCUS
ENGINEERING

VILLAGE EAST SANITARY SEWER
IMPROVEMENTS: TRUNK HIGHWAY
5 TO UNION PACIFIC RAILROAD

PROJECT NO. 2014.127

JUNE, 2014

PROJECT SCHEDULE
CITY OF LAKE ELMO

FOCUS ENGINEERING, inc.

VILLAGE EAST TRUNK SANITARY SEWER IMPROVEMENTS
PROJECT NO. 2014.131

Cara Geheren, P.E. 651.300.4261
Jack Griffin, P.E. 651.300.4264
Ryan Stempski, P.E. 651.300.4267
Chad Isakson, P.E. 651.300.4283

AUGUST 2014

June 17, 2014	Council Orders Preparation of Feasibility Report. Presentation of Feasibility Report. Council accepts Report and Calls Hearing. Council approves Plans and Specifications; Orders Advertisement for Bids. (project is added to the 39 th Street: Street and Sanitary Sewer Improvements as an add alternate bid).
July 10, 2014	Receive Contractor Bids
August 19, 2014	Public Improvement Hearing. Council Orders the Improvement, accepts bids and awards Contract.
September 2, 2014	Conduct Pre-construction Meeting and Issue Notice to Proceed.
November 28, 2014	Substantial completion (estimated 12 weeks).
June 5, 2015	Final Completion.



MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014
REGULAR
ITEM # 11

AGENDA ITEM: 39th Street North: Street and Sanitary Sewer Improvements – Accept Bids and Award Contract

SUBMITTED BY: Jack Griffin, City Engineer

THROUGH: Dean A. Zuleger, City Administrator

REVIEWED BY: Chad Isakson, Project Engineer
Cathy Bendel, Finance Director
Dave Snyder, City Attorney

SUGGESTED ORDER OF BUSINESS:

- Introduction of Item.....City Engineer
- Report/Presentation.....City Engineer
- Questions from Council to Staff..... Mayor Facilitates
- Public Input, if Appropriate.....Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion..... Mayor & City Council
- Action on Motion..... Mayor Facilitates

POLICY RECOMMENDER: Engineering

FISCAL IMPACT: \$1,711,300 for the 39th Street: Street and Sanitary Sewer Improvements; and \$412,600 for the alternate bid package for Village East Trunk Sanitary Sewer: from TH 5 to south of the UP Railroad.

Approval of this resolution commits the council to entering into a construction contract for the project in the amount of \$1,414,861.80 and incurring the other project related construction costs including engineering construction administration, staking, inspection, record drawings, geotechnical services, and contingency budget in the amount of \$296,400.

Bids were also received for construction of the Village East Trunk Sanitary Sewer from TH 5 to south of the UP Railroad as an alternative for the Council to consider awarding as a part of this contract for the amount of \$345,597.00. Other project related construction costs including

engineering construction administration, staking, inspection, record drawings, geotechnical services, and contingency budget in the amount of \$67,000.

The project will be financed by a combination of funding sources including the levy of special assessments against the benefitting properties, \$1,329,880; City general funds for street and sidewalk cost participation, \$179,820; Park Funds for the Trail, \$59,700; Sewer Enterprise Funds for pipe oversizing, \$434,200; and Water Enterprise Funds for water system improvements, \$120,300. Non-residential properties will be assessed 80% of the total street, sidewalk and storm sewer project costs proportioned on the abutting property's front footage in relation to the total improved front footage. Sanitary sewer improvements will be assessed to benefitting property owners based on the projected sewage generation of each property (REC unit) within the entire trunk sewer service area in relation to the total contributing sewer service capacity.

SUMMARY AND ACTION REQUESTED:

The City Council is respectfully requested to consider accepting contractor bids and award a contract for the 39th Street North: Street and Sanitary Sewer Improvements. The recommended motion for this action is as follows:

“Move to approve Resolution No. 2014-63, Accepting Bids and Awarding a Contract to Geislinger & Sons, Inc., in the amount of \$1,760,458.80 for the 39th Street North: Street and Sanitary Sewer Improvements including Add Alternate No. 1.”

LEGISLATIVE HISTORY/BACKGROUND INFORMATION:

Bids were received, publicly opened, and read aloud on Thursday July 10, 2014. The City Engineer and design consultant has prepared and attached the Tabulation of Bids and a letter of recommendation for the award of the contract. The City received four (4) bids for this project, with Geislinger & Sons, Inc. providing the lowest combination base bid and alternate bid in the total construction amount of \$1,760,458.80.

Bid amounts exceeded the feasibility report estimated construction costs. The higher pricing appears to be due to contractor availability relative to the growing volume of work available to contractors, in particular utility contractors. Due to the receipt of four competitive bids, it appears that rebidding the project will not result in lower costs.

A stakeholder meeting was held on July 21, 2014 to review the increased project costs and associated assessment amounts to each stakeholder. The consensus of the meeting was to proceed with award of the contract for construction in 2014. Agreements have been prepared and provided to property owners for review and signature to amend each property's assessment amount to cover the increased costs for the project. If signature is not received the original Waiver Agreement remains in effect in the lower assessment amount.

Contractor references for Geislinger & Sons, Inc. were reviewed and verified. The City Engineer and his consultant are therefore recommending that the Council award the contract to the lowest responsible bidder, Geislinger & Sons, Inc., as outlined in the attached letter.

The City Council approved the Plans and Specifications for the 39th Street North: Street and Sanitary Sewer Improvements on June 17, 2014, and authorized staff to advertise the Project for bids. The Village East Trunk Sanitary Sewer segment from TH5 to south of the UP Railroad was incorporated into this project as an add alternate bid package. The Project was advertised on QuestCDN.com and in the Oakdale-Lake Elmo Review in accordance with the Minnesota Competitive Bidding requirements. The improvements include:

- Reconstruction of 39th Street North from State Highway 5 to CSAH 17. The street improvements are proposed to be an extension of the Village Parkway street section as envisioned in the Village area plan.
- An 8-foot bituminous trail along the north boulevard and a 6-foot sidewalk along the south boulevard in order to maintain the extension of Village Parkway.
- Replacement of the existing storm sewer conveyance system along 39th Street North.
- Extension of 10 and 12-inch diameter trunk sanitary sewer in connection with the Village East Trunk Sanitary Sewer extension.
- Installation of 11 service stubs to existing properties along 39th Street North to provide owners with the opportunity to hook up to municipal sewer.
- An alternate bid package that includes the Village East Trunk Sanitary Sewer Improvements: Trunk Highway 5 to south of the Union Pacific Railroad; consisting of the installation of 2,000 feet of 15-inch trunk sanitary sewer.

RECOMMENDATION:

Staff is recommending that the city council approve Resolution No. 2014-63, thereby accepting contractor bids and award a contract for the 39th Street North: Street and Sanitary Sewer Improvements. The recommended motion for this action is as follows:

“Move to approve Resolution No. 2014-63, Accepting Bids and Awarding a Contract to Geislinger & Sons, Inc., in the amount of \$1,760,458.80 for the 39th Street North: Street and Sanitary Sewer Improvements including Add Alternate No. 1.”

ATTACHMENT(S):

1. Resolution No. 2014-63, Accepting Bids and Awarding a Contract.
2. Location Map.
3. Tabulation of Bids and Engineer's Letter of Award Recommendation.
4. Project Schedule.

**CITY OF LAKE ELMO
WASHINGTON COUNTY
STATE OF MINNESOTA**

RESOLUTION NO. 2014-63

**A RESOLUTION ACCEPTING BIDS AND AWARDING A CONTRACT
FOR THE 39TH STREET NORTH: STREET AND SANITARY SEWER
IMPROVEMENTS**

WHEREAS, pursuant to an advertisement for bids for the 39th Street North: Street and Sanitary Sewer Improvements, bids were received, opened, and tabulated according to law, and bids were received complying with the advertisement; and

WHEREAS, the Village East Trunk Sanitary Sewer Improvements: TH 5 to south of the UP Railroad was ordered by the council and made a part of the plans and specifications for the 39th Street North: Street and Sanitary Sewer Improvements project as an add alternative bid package; and

WHEREAS, bids were tabulated, checked and summarized to verify that all requirements of the submittals were met; and

WHEREAS, the project engineer reviewed the bids and has provided a letter recommending the award of the contract for both the base bid and Alternate No. 1 to the lowest responsible bidder, Geislinger & Sons, Inc., in the amount of \$1,760,458.80.

NOW, THEREFORE, IT IS HEREBY RESOLVED,

1. That the Mayor and City Clerk are hereby authorized and directed to enter into a Contract in the accordance with the above ordered Project, in the amount of the Contractor's lowest responsible bid, and according to the plans and specifications thereof approved by the City Council.
2. The City Clerk is hereby authorized and directed to return forthwith to all bidders the deposits made with their bids, except that the deposits of the successful bidder and the next two lowest bidders shall be retained until a contract has been signed.

**ADOPTED BY THE LAKE ELMO CITY COUNCIL ON THE NINETEENTH DAY OF AUGUST
2014.**

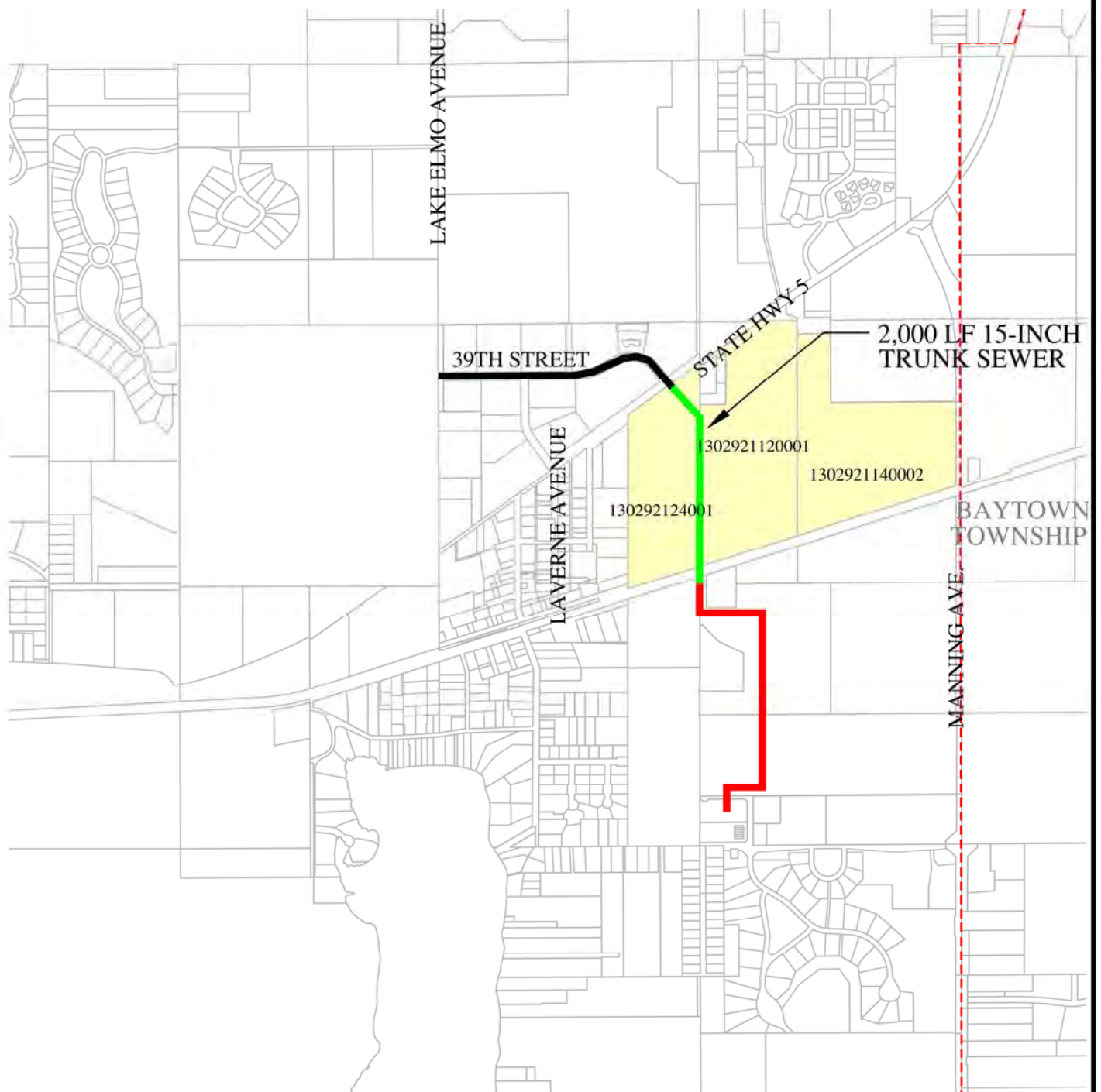
CITY OF LAKE ELMO

By: _____
Mike Pearson
Mayor

(Seal)

ATTEST:

Adam Bell
City Clerk



LEGEND

- VILLAGE EASTERN TRUNK SEWER IMPROVEMENTS (PUBLIC)
- VILLAGE EASTERN TRUNK SEWER IMPROVEMENTS (PRIVATE)
- 39TH STREET - SANITARY SEWER IMPROVEMENTS (PUBLIC)



FIGURE NO. 1

LOCATION MAP

VILLAGE EAST TRUNK SANITARY
SEWER IMPROVEMENTS

FOCUS
ENGINEERING

VILLAGE EAST SANITARY SEWER
IMPROVEMENTS: TRUNK HIGHWAY
5 TO UNION PACIFIC RAILROAD

PROJECT NO. 2014.127

JUNE, 2014

FOCUS ENGINEERING, inc.

July 29, 2014

Cara Geheren, P.E. 651.300.4261
Jack Griffin, P.E. 651.300.4264
Ryan Stempski, P.E. 651.300.4267
Chad Isakson, P.E. 651.300.4283

Honorable Mayor and City Council
City of Lake Elmo, Minnesota 55042

Re: Lake Elmo Ave Trunk Watermain Improvements
City of Lake Elmo
Project No. 2013.133

Dear Mayor and City Council:

Bids for the Lake Elmo Ave Trunk Watermain Improvements project were opened on Thursday, July 10, 2014 at 9:00 AM with the following results. A complete tabulation of bids is enclosed for your information.

Contractor	Base Bid	Alternate No. 1 Bid
Geislinger & Sons, Inc.	\$1,414,861.80	\$345,597.00
S.R. Weidema, Inc.	\$1,463,110.18	\$389,342.25
Northdale Construction Company, Inc.	\$1,610,600.70	\$356,158.73
Northwest Asphalt, Inc.	\$1,832,479.11	\$387,509.70

Recommendation

We recommend that you award the Contract to the lowest responsible bidder, Geislinger & Sons, Inc., for their base bid of \$1,414,861.80 and their Alternate No. 1 bid of \$345,597.00. Please do not hesitate to call me with any questions you may have.

Sincerely,



Chad J. Isakson, P.E.
Project Engineer

ABSTRACT OF BIDS

39TH STREET NORTH-STREET AND SANITARY SEWER IMPROVEMENTS

PROJECT NO. 2014.131

CITY OF LAKE ELMO, MN

BID OPENING: JULY 10, 2014

= TOTALS CORRECTED FROM THE SUBMITTED BID

1 CITY OF LAKE ELMO, MN				2 S.R. Weidema, Incorporated				3 Northdale Construction Company, Inc.				4 Northwest Asphalt, Inc.			
1 Geldinger & Sons, Inc.				2 S.R. Weidema, Incorporated				3 Northdale Construction Company, Inc.				4 Northwest Asphalt, Inc.			
No.	Item	Units	Qty	Unit Price	Total Price	Unit Price	Total Cost	Unit Price	Total Price	Unit Price	Total Cost				
PART 1 - SANITARY SEWER															
1	8" PVC SANITARY SEWER, SDR 26, 20' - 25' DEEP	LF	62	\$125.00	\$7,750.00	\$132.00	\$8,184.00	\$66.76	\$4,139.12	\$94.63	\$5,867.06				
2	10" PVC SANITARY SEWER, SDR 26, 15' - 20' DEEP	LF	1,025	\$87.00	\$89,175.00	\$113.00	\$115,825.00	\$85.54	\$87,678.50	\$88.77	\$90,989.25				
3	10" PVC SANITARY SEWER, SDR 26, 20' - 25' DEEP	LF	315	\$89.00	\$28,035.00	\$113.00	\$35,595.00	\$85.54	\$26,945.10	\$95.25	\$30,003.75				
4	12" PVC SANITARY SEWER, SDR 26, 15' - 20' DEEP	LF	500	\$92.00	\$46,000.00	\$122.00	\$61,000.00	\$97.79	\$48,895.00	\$92.48	\$46,240.00				
5	12" PVC SANITARY SEWER, SDR 26, 20' - 25' DEEP	LF	630	\$94.00	\$59,220.00	\$122.00	\$76,860.00	\$97.79	\$61,607.70	\$98.96	\$62,344.80				
6	10" PVC SANITARY SEWER, SDR 26, IN CASING	LF	100	\$40.00	\$4,000.00	\$7.00	\$700.00	\$34.06	\$3,406.00	\$16.97	\$1,697.00				
7	12" PVC SANITARY SEWER, SDR 26, IN CASING	LF	120	\$45.00	\$5,400.00	\$11.00	\$1,320.00	\$37.90	\$4,548.00	\$20.73	\$2,487.60				
8	20" STEEL CASING PIPE (JACK/AUGERED)	LF	100	\$525.00	\$52,500.00	\$710.00	\$71,000.00	\$694.40	\$69,440.00	\$644.00	\$64,400.00				
9	24" STEEL CASING PIPE (JACK/AUGERED)	LF	120	\$535.00	\$64,200.00	\$760.00	\$91,200.00	\$764.80	\$91,776.00	\$708.00	\$84,960.00				
10	PIPE FOUNDATION ROCK	LF	1,400	\$0.10	\$140.00	\$0.01	\$14.00	\$2.50	\$3,500.00	\$10.00	\$14,000.00				
11	TELEVISION	LF	2,850	\$2.00	\$5,700.00	\$2.25	\$6,412.50	\$1.82	\$5,187.00	\$2.00	\$5,700.00				
12	4" DIAMETER SANITARY SEWER MH	EA	12	\$3,000.00	\$36,000.00	\$2,520.00	\$30,240.00	\$2,381.22	\$28,574.64	\$2,942.00	\$35,304.00				
13	4" DIAMETER EXCESS MANHOLE DEPTH	LF	140	\$125.00	\$17,500.00	\$173.00	\$24,220.00	\$133.68	\$18,715.20	\$95.00	\$13,300.00				
14	10"x6" PVC WYE, SDR 26	EA	6	\$400.00	\$2,400.00	\$240.00	\$1,440.00	\$268.97	\$1,613.82	\$380.00	\$2,280.00				
15	12"x6" PVC WYE, SDR 26	EA	4	\$460.00	\$1,840.00	\$273.00	\$1,092.00	\$395.80	\$1,343.20	\$411.00	\$1,644.00				
16	6" PVC SCH 40 SANITARY SEWER RISER	LF	85	\$35.00	\$2,975.00	\$26.00	\$2,210.00	\$30.49	\$2,591.65	\$33.16	\$2,818.60				
17	6" PVC SCH 40 SANITARY SEWER SERVICE	LF	400	\$32.00	\$12,800.00	\$29.00	\$11,600.00	\$30.49	\$12,196.00	\$31.45	\$12,580.00				
18	PRECAST CONCRETE JERSEY BARRIERS AT HIGHWAY 5 JACKING PITS	LS	1	\$4,500.00	\$4,500.00	\$7,700.00	\$7,700.00	\$3,575.00	\$3,575.00	\$1,500.00	\$1,500.00				
19	PRECAST CONCRETE JERSEY BARRIERS AT HIGHWAY 17 JACKING PITS	LS	1	\$4,500.00	\$4,500.00	\$7,700.00	\$7,700.00	\$3,525.50	\$3,525.50	\$1,500.00	\$1,500.00				
20	CROSS EXISTING WATER SERVICE	EA	7	\$450.00	\$3,150.00	\$1,000.00	\$7,000.00	\$1,100.00	\$7,700.00	\$350.00	\$2,450.00				
21	EXPLORATORY DIGGING	HR	5	\$500.00	\$2,500.00	\$400.00	\$2,000.00	\$285.00	\$1,425.00	\$400.00	\$2,000.00				
TOTAL PART 1 - SANITARY SEWER					\$450,285.00		\$563,312.50		\$488,382.43		\$484,066.06				

PART 2 - WATER MAIN									
22	TEMPORARY WATER SYSTEM	15	1	\$1,500.00	\$1,500.00	\$11,700.00	\$11,700.00	\$5,720.00	\$5,000.00
23	CONNECT TO EXISTING 6" WATER MAIN	EA	3	\$900.00	\$2,700.00	\$1,260.00	\$1,260.00	\$4,809.48	\$3,000.00
24	CONNECT TO EXISTING 8" WATER MAIN	EA	1	\$950.00	\$950.00	\$1,260.00	\$1,260.00	\$1,635.41	\$1,000.00
25	CUT IN 8" X 8" TEE	EA	1	\$2,600.00	\$2,600.00	\$2,100.00	\$2,100.00	\$2,240.92	\$1,451.00
26	REMOVE AND DISPOSE OF EXISTING GATE VALVE & BOX	EA	3	\$1,500.00	\$4,500.00	\$585.00	\$585.00	\$275.00	\$900.00
27	REMOVE AND REPLACE 6" GATE VALVE & BOX	EA	4	\$3,400.00	\$13,600.00	\$1,816.00	\$1,816.00	\$3,971.94	\$12,752.56
28	REMOVE AND REPLACE 8" GATE VALVE & BOX	EA	11	\$3,900.00	\$42,900.00	\$2,184.00	\$2,184.00	\$4,662.69	\$3,555.14
29	REMOVE AND DISPOSE OF EXISTING HYDRANT	EA	5	\$760.00	\$3,800.00	\$700.00	\$700.00	\$925.00	\$2,000.00
30	6" DIP CL 52 WATER MAIN	LF	70	\$46.00	\$3,220.00	\$38.00	\$38.00	\$91.85	\$40.10
31	8" DIP CL 52 WATER MAIN	LF	30	\$53.00	\$1,590.00	\$43.00	\$43.00	\$99.05	\$1,363.80
32	6" GATE VALVE AND BOX	EA	4	\$1,450.00	\$5,800.00	\$1,417.00	\$1,417.00	\$5,795.08	\$4,828.00
33	HYDRANT	EA	5	\$4,000.00	\$20,000.00	\$3,770.00	\$3,770.00	\$4,098.58	\$26,035.70
34	VALVE BOX EXTENSION	LF	2	\$260.00	\$520.00	\$175.00	\$175.00	\$57.38	\$220.00
35	HYDRANT EXTENSION	LF	1	\$600.00	\$600.00	\$900.00	\$900.00	\$822.85	\$620.00
36	DUCTILE IRON FITTINGS	LB	100	\$10.00	\$1,000.00	\$12.00	\$12.00	\$647.00	\$400.00
TOTAL PART 2 - WATER MAIN				\$105,280.00	\$86,301.00			\$121,306.75	\$107,484.60
PART 3 - STORM SEWER									
37	REMOVE AND DISPOSE OF EXISTING STORM SEWER	LF	910	\$10.00	\$9,100.00	\$16.50	\$15,015.00	\$7.95	\$7,280.00
38	REMOVE AND DISPOSE OF EXISTING STORM SEWER MANHOLE	EA	8	\$400.00	\$3,200.00	\$375.00	\$3,000.00	\$450.00	\$3,200.00
39	POTHOLE EXISTING WATER MAIN	EA	7	\$450.00	\$3,150.00	\$600.00	\$4,200.00	\$265.00	\$2,450.00
40	12" RCP STORM SEWER, CLASS 5	LF	70	\$40.00	\$2,800.00	\$29.00	\$2,030.00	\$38.89	\$2,353.40
41	15" RCP STORM SEWER, CLASS 5	LF	891	\$42.00	\$37,422.00	\$30.50	\$27,175.50	\$41.19	\$27,656.64
42	18" RCP STORM SEWER, CLASS 5	LF	236	\$45.00	\$10,620.00	\$32.50	\$7,670.00	\$44.04	\$8,151.44
43	24" RCP STORM SEWER, CLASS 4	LF	369	\$62.00	\$22,878.00	\$62.70	\$23,136.30	\$52.80	\$14,217.57
44	12" RCP FLARED END SECTION INCL TRASH GUARD	EA	2	\$900.00	\$1,800.00	\$544.00	\$1,088.00	\$769.05	\$1,460.00
45	18" RCP FLARED END SECTION INCL TRASH GUARD	EA	2	\$1,050.00	\$2,100.00	\$665.00	\$1,330.00	\$892.26	\$1,740.00
46	24" RCP FLARED END SECTION INCL TRASH GUARD	EA	1	\$1,400.00	\$1,400.00	\$1,362.00	\$1,362.00	\$1,097.92	\$1,310.00

47	RIP RAP, CLASS 3	CY	8	\$115.00	\$920.00	\$122.00	\$976.00	\$125.00	\$1,000.00	\$90.00	\$720.00
48	2'x3' CATCH BASIN	EA	3	\$2,100.00	\$6,300.00	\$1,775.00	\$5,525.00	\$1,553.15	\$4,659.45	\$1,689.00	\$5,067.00
49	4' DIA CATCH BASIN/MANHOLE	EA	5	\$2,500.00	\$12,500.00	\$2,028.00	\$10,140.00	\$1,855.84	\$9,279.20	\$1,999.00	\$9,995.00
50	5' DIA CATCH BASIN/MANHOLE	EA	2	\$3,600.00	\$7,200.00	\$2,717.00	\$5,434.00	\$4,308.34	\$8,616.68	\$2,756.00	\$5,512.00
51	5' DIA CATCH BASIN/MANHOLE W/ SUMP	EA	1	\$4,350.00	\$4,350.00	\$3,061.00	\$3,061.00	\$4,747.63	\$4,747.63	\$3,169.00	\$3,169.00
52	BULKHEAD 15" RCP STORM SEWER	EA	1	\$125.00	\$125.00	\$245.00	\$245.00	\$113.15	\$113.15	\$150.00	\$150.00
53	BULKHEAD 18" RCP STORM SEWER	EA	1	\$150.00	\$150.00	\$245.00	\$245.00	\$140.20	\$140.20	\$200.00	\$200.00
54	BULKHEAD 36" RCP STORM SEWER	EA	1	\$125.00	\$225.00	\$365.53	\$365.53	\$249.86	\$249.86	\$300.00	\$300.00
55	INLET PROTECTION	EA	12	\$175.00	\$2,100.00	\$360.00	\$4,320.00	\$250.00	\$3,000.00	\$125.00	\$1,500.00
56	INSULATION	SY	30	\$30.00	\$900.00	\$27.00	\$810.00	\$21.82	\$654.60	\$24.00	\$720.00
57	POND EXCAVATION (P)	CY	420	\$10.00	\$4,200.00	\$11.70	\$4,914.00	\$11.00	\$4,620.00	\$12.00	\$5,040.00
58	INFILTRATION SWALE EXCAVATION (P)	CY	675	\$10.00	\$6,750.00	\$4.20	\$2,835.00	\$7.70	\$5,197.50	\$17.00	\$11,475.00
59	SEED MIX 330 AND HYDROMULCH	SY	1600	\$2.75	\$4,400.00	\$1.00	\$1,600.00	\$3.03	\$4,848.00	\$2.75	\$4,400.00
	TOTAL PART 3 - STORM SEWER				\$144,990.00		\$126,277.33		\$133,335.54		\$118,067.05
PART 4 - STREET IMPROVEMENTS											
60	MOBILIZATION	LS	1	\$90,000.00	\$90,000.00	\$20,000.00	\$70,000.00	\$187,287.50	\$187,287.50	\$400,000.00	\$400,000.00
61	TRAFFIC CONTROL	LS	1	\$9,000.00	\$9,000.00	\$6,800.00	\$6,800.00	\$36,670.00	\$36,670.00	\$2,200.00	\$2,200.00
62	TEMPORARY ROCK CONSTRUCTION ENTRANCE	EA	3	\$1,200.00	\$3,600.00	\$1,170.00	\$3,510.00	\$2,500.00	\$7,500.00	\$1,100.00	\$3,300.00
63	CLEAR AND GRUB TREES AND BRUSH	LS	1	\$4,500.00	\$4,500.00	\$2,000.00	\$2,000.00	\$6,750.00	\$6,750.00	\$5,000.00	\$5,000.00
64	TEMPORARY ACCESS GRADING	LS	1	\$2,000.00	\$2,000.00	\$1,090.00	\$1,090.00	\$2,200.00	\$2,200.00	\$2,500.00	\$2,500.00
65	TEMPORARY ACCESS AGGREGATE BASE CLASS 5	TN	60	\$30.00	\$1,800.00	\$18.00	\$1,080.00	\$22.00	\$1,320.00	\$25.00	\$1,500.00
66	TEMPORARY ACCESS MAINTENANCE	HR	10	\$125.00	\$1,250.00	\$212.00	\$2,120.00	\$132.00	\$1,320.00	\$100.00	\$1,000.00
67	REMOVE TEMPORARY ACCESS	LS	1	\$1,500.00	\$1,500.00	\$2,783.00	\$2,783.00	\$1,650.00	\$1,650.00	\$1,500.00	\$1,500.00
68	REMOVE AND DISPOSE OF EXISTING CONCRETE CURB AND GUTTER	LF	290	\$6.00	\$1,740.00	\$4.00	\$1,160.00	\$5.00	\$1,450.00	\$6.00	\$1,740.00
69	REMOVE AND DISPOSE OF EXISTING BITUMINOUS PAVEMENT	SY	9160	\$2.00	\$18,320.00	\$2.60	\$23,816.00	\$2.15	\$19,694.00	\$1.55	\$14,198.00
70	REMOVE AND DISPOSE OF EXISTING BITUMINOUS PAVEMENT (DRIVEWAYS)	SY	335	\$4.00	\$1,340.00	\$3.90	\$1,306.50	\$4.75	\$1,591.25	\$6.00	\$2,010.00
71	REMOVE AND DISPOSE OF EXISTING LIGHT BASE	EA	4	\$300.00	\$1,200.00	\$200.00	\$800.00	\$400.00	\$1,600.00	\$500.00	\$2,000.00
72	SALVAGE AND REINSTALL SIGN	EA	8	\$200.00	\$1,600.00	\$150.00	\$1,200.00	\$220.00	\$1,760.00	\$200.00	\$1,600.00

73	EA	1	\$250.00	\$250.00	\$500.00	\$495.00	\$495.00	\$200.00	\$200.00
73 SALVAGE AND REINSTALL MAIL DROPTOP									
74	LS	1	\$7,500.00	\$7,500.00	\$2,250.00	\$550.00	\$550.00	\$750.00	\$750.00
74 SALVAGE AND REINSTALL RETAINING WALL									
75	LF	200	\$3.00	\$600.00	\$5.50	\$4.25	\$4.25	\$3.50	\$700.00
75 SAWCUT BITUMINOUS PAVEMENT									
76	CY	7750	\$9.00	\$69,750.00	\$8.00	\$9.79	\$9.79	\$17.00	\$131,750.00
76 COMMON EXCAVATION (P)									
77	CY	340	\$12.00	\$4,080.00	\$11.50	\$9.79	\$9.79	\$17.00	\$5,780.00
77 SURGRADE CORRECTION (CV)									
78	RS	24	\$465.00	\$11,318.10	\$540.00	\$165.00	\$165.00	\$230.00	\$5,598.70
78 SURGRADE PREPARATION									
79	LF	1000	\$12.00	\$12,000.00	\$6.00	\$13.61	\$13.61	\$15.00	\$15,000.00
79 4" PERFORATED PVC DRAIN TILE WITH AGGREGATE AND WRAP									
80	TN	6380	\$10.50	\$66,990.00	\$13.00	\$10.45	\$10.45	\$13.63	\$86,959.40
80 AGGREGATE BASE CLASS 5									
81	CY	4090	\$10.00	\$40,900.00	\$17.50	\$11.00	\$11.00	\$16.50	\$67,485.00
81 SELECT GRANULAR BORROW (P)									
82	TN	800	\$66.50	\$53,200.00	\$67.60	\$73.16	\$73.16	\$66.25	\$53,000.00
82 TYPE SP 9.5 BITUMINOUS WEARING COURSE MIXTURE (2 R) [SPWEA230R] (2015)									
83	TN	1335	\$57.75	\$77,096.25	\$58.70	\$63.53	\$63.53	\$60.00	\$80,100.00
83 TYPE SP 12.5 BITUMINOUS NON-WEARING COURSE MIXTURE (2 R) [SPMWB230R]									
84	GAL	565	\$2.00	\$1,130.00	\$2.05	\$2.20	\$2.20	\$3.00	\$1,695.00
84 BITUMINOUS MATERIAL FOR TACK COAT									
85	EA	12	\$450.00	\$5,400.00	\$245.00	\$350.00	\$350.00	\$150.00	\$1,800.00
85 ADJUST MH CASTING - STEEL RING (2015)									
86	EA	20	\$250.00	\$5,000.00	\$340.00	\$245.00	\$245.00	\$200.00	\$4,000.00
86 ADJUST VALVE BOX (2015)									
87	LF	4310	\$10.77	\$46,418.70	\$12.65	\$11.85	\$11.85	\$12.65	\$54,521.50
87 B624 CONCRETE CURB AND GUTTER									
88	LF	105	\$14.80	\$1,554.00	\$17.00	\$16.28	\$16.28	\$17.50	\$1,837.50
88 B612 CONCRETE CURB AND GUTTER									
89	EA	12	\$420.00	\$5,040.00	\$445.00	\$462.00	\$462.00	\$450.00	\$5,400.00
89 CONCRETE PEDESTRIAN RAMP									
90	SF	13110	\$3.50	\$45,885.00	\$4.00	\$3.27	\$3.27	\$3.75	\$49,162.50
90 5" CONCRETE SIDEWALK									
91	SY	340	\$70.00	\$23,800.00	\$76.00	\$74.10	\$74.10	\$70.30	\$23,902.00
91 8" COMMERCIAL CONCRETE DRIVEWAY PAVEMENT (HIGH EARLY)									
92	SY	35	\$50.00	\$1,750.00	\$66.00	\$53.90	\$53.90	\$54.95	\$1,923.25
92 6" CONCRETE FLUME									
93	SF	168	\$42.00	\$7,056.00	\$44.50	\$46.20	\$46.20	\$36.00	\$6,048.00
93 TRUNCATED DOME PANELS									
94	SY	105	\$50.00	\$5,250.00	\$57.50	\$29.00	\$29.00	\$31.50	\$3,307.50
94 BITUMINOUS DRIVEWAY PAVEMENT									
95	TN	270	\$85.00	\$17,550.00	\$80.00	\$71.50	\$71.50	\$80.37	\$21,699.30
95 TYPE SP 9.5 BITUMINOUS WEARING COURSE MIXTURE - TRAIL (2 B) [SPWEA230R]									
96	SY	5000	\$4.25	\$21,250.00	\$4.10	\$4.68	\$4.68	\$4.25	\$21,250.00
96 SODDING									
97	CY	500	\$35.00	\$17,500.00	\$36.82	\$38.50	\$38.50	\$36.67	\$18,335.00
97 IMPORT AND PLACE TOPSOIL BORROW (CV)									
98	SY	2000	\$3.25	\$6,500.00	\$1.60	\$3.58	\$3.58	\$3.25	\$6,500.00
98 SEED & EROSION CONTROL BLANKET									
99	SY	5500	\$2.15	\$11,825.00	\$0.55	\$2.37	\$2.37	\$2.15	\$11,825.00
99 SEED & HYDROMULCH									
100	LF	1000	\$1.95	\$1,950.00	\$2.25	\$2.15	\$2.15	\$1.95	\$1,950.00
100 SILT FENCE, TYPE MACHINE SLICED									
101	LF	30	\$22.50	\$675.00	\$15.00	\$24.75	\$24.75	\$22.50	\$675.00
101 SILT FENCE, TYPE FLOATING									

102	DITCH CHECK - BIOROLL	LF	200	\$5.75	\$1,150.00	\$5.00	\$1,000.00	\$6.33	\$1,266.00	\$5.75	\$1,150.00
103	STREET SWEEPING	HR	15	\$125.00	\$1,875.00	\$135.00	\$2,025.00	\$155.00	\$2,325.00	\$110.00	\$1,650.00
104	SIGN PANELS, TYPE C	SF	6	\$45.00	\$281.25	\$40.00	\$250.00	\$49.50	\$309.38	\$45.00	\$281.25
105	4" DOUBLE SOLID YELLOW LINE, EPOXY	LF	2270	\$1.50	\$3,405.00	\$1.50	\$3,405.00	\$1.08	\$2,451.60	\$0.98	\$2,224.60
106	4" SOLID WHITE LINE, EPOXY	LF	110	\$0.75	\$82.50	\$0.75	\$82.50	\$0.53	\$58.30	\$0.48	\$52.80
107	RIGHT TURN ARROW, TAPE	EA	1	\$845.00	\$845.00	\$845.00	\$845.00	\$1,980.00	\$1,980.00	\$1,800.00	\$1,800.00
	TOTAL PART 4 - STREET IMPROVEMENTS				\$714,706.80		\$687,219.35		\$687,375.98		\$1,128,861.40
	BASE BID:										
	TOTAL PART 1 - SANITARY SEWER				\$450,285.00		\$563,312.50		\$488,382.43		\$484,066.06
	TOTAL PART 2 - WATER MAIN				\$105,280.00		\$86,301.00		\$121,306.75		\$101,484.60
	TOTAL PART 3 - STORM SEWER				\$144,590.00		\$126,277.33		\$133,535.54		\$118,067.05
	TOTAL PART 4 - STREET IMPROVEMENTS				\$714,706.80		\$687,219.35		\$687,375.98		\$1,128,861.40
	TOTAL BASE BID				\$1,414,861.80		\$1,463,110.18		\$1,610,600.70		\$1,832,479.11
	ALTERNATE NO. 1 - SANITARY SEWER SOUTH OF TH S										
1	CLEAR AND GRUB TREES AND BRUSH	LS	1	\$4,000.00	\$4,000.00	\$3,000.00	\$3,000.00	\$1,250.00	\$1,250.00	\$5,000.00	\$5,000.00
2	REMOVE AND DISPOSE OF EXISTING STORM SEWER	LF	20	\$10.00	\$200.00	\$46.00	\$920.00	\$7.50	\$150.00	\$20.00	\$400.00
3	PATCH GRAVEL DRIVEWAY	TN	200	\$20.00	\$4,000.00	\$25.00	\$5,000.00	\$22.00	\$4,400.00	\$17.50	\$3,500.00
4	18" CMP DRIVEWAY CULVERT	LF	20	\$45.00	\$900.00	\$88.00	\$1,760.00	\$35.50	\$710.00	\$38.40	\$768.00
5	18" CMP FLARED END SECTION	EA	2	\$480.00	\$960.00	\$475.00	\$950.00	\$175.00	\$350.00	\$195.00	\$390.00
6	15" PVC SANITARY SEWER, SDR 26, 15' - 20' DEEP	LF	625	\$94.00	\$58,750.00	\$105.00	\$65,625.00	\$81.77	\$51,106.25	\$89.61	\$56,006.25
7	15" PVC SANITARY SEWER, SDR 26, 20' - 25' DEEP	LF	1255	\$96.00	\$120,480.00	\$105.00	\$131,775.00	\$81.77	\$102,621.35	\$113.11	\$141,953.05
8	14" PVC SANITARY SEWER, C905 DR 25, IN CASING	LF	164	\$40.00	\$6,560.00	\$17.50	\$2,870.00	\$36.38	\$5,966.32	\$27.20	\$4,460.80
9	14" PVC SANITARY SEWER, C905 DR 25, 20' - 25' DEEP	LF	20	\$76.00	\$1,520.00	\$133.00	\$2,660.00	\$169.12	\$3,382.40	\$175.28	\$3,505.60
10	28" STEEL CASING PIPE (JACK/ALIGERED)	LF	164	\$565.00	\$92,660.00	\$760.00	\$124,640.00	\$793.58	\$130,147.12	\$717.00	\$117,588.00
11	PIPE FOUNDATION ROCK	LF	1000	\$0.01	\$10.00	\$0.01	\$10.00	\$2.45	\$2,450.00	\$10.00	\$10,000.00
12	TELEVISIONING	LF	2061	\$2.00	\$4,122.00	\$2.25	\$4,637.25	\$1.82	\$3,751.02	\$2.00	\$4,122.00
13	4" DIAMETER SANITARY SEWER MH	EA	8	\$3,200.00	\$25,600.00	\$2,590.00	\$20,720.00	\$2,696.24	\$21,569.92	\$2,427.00	\$19,416.00

14	4" DIAMETER EXCESS MANHOLE DEPTH	LF	115	\$125.00	\$14,375.00	\$180.00	\$20,700.00	\$130.69	\$15,029.35	\$95.00	\$10,925.00
15	SOIL DECOMPACTION	AC	5	\$1,200.00	\$6,000.00	\$200.00	\$1,000.00	\$1,350.00	\$6,750.00	\$800.00	\$4,000.00
16	SILT FENCE, TYPE MACHINE SLICED	LF	300	\$1.95	\$585.00	\$2.25	\$675.00	\$3.85	\$1,155.00	\$2.00	\$600.00
17	SEED AND BLANKET	SY	1500	\$3.25	\$4,875.00	\$1.60	\$2,400.00	\$3.58	\$5,370.00	\$3.25	\$4,875.00
TOTAL ALTERNATE NO. 1 - SANITARY SEWER SOUTH OF TH 5					\$345,597.00		\$389,342.25		\$386,158.73		\$387,509.70

**PROJECT SCHEDULE
CITY OF LAKE ELMO**

FOCUS ENGINEERING, inc.

39th Street North Street and Sanitary Sewer Schedule
PROJECT NO. 2014.131

Cara Geheren, P.E. 651.300.4261
Jack Griffin, P.E. 651.300.4264
Ryan Stempiski, P.E. 651.300.4267
Chad Isakson, P.E. 651.300.4283

AUGUST 2014

March 18, 2014	Council Declares Adequacy of Petition and Orders Preparation of Feasibility Report.
April 15, 2014	Presentation of Feasibility Report. Council accepts Report and Calls Hearing.
April 29, 2014	Property owner meeting. Presentation of Report findings and recommendations.
May 6, 2014	Public Improvement Hearing. Council orders Preparation of plans and specifications.
July 1, 2014	Council approves Plans and Specifications; Orders Advertisement for Bids.
July 31, 2014	Receive Contractor Bids.
August 19, 2014	Council accepts bids and awards Contract.
September 2, 2014	Conduct Pre-construction Meeting and Issue Notice to Proceed.
October 31, 2014	Substantial completion (estimated 8 weeks).
Summer, 2015	Final Completion.



MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014

REGULAR

ITEM # 12

AGENDA ITEM: Inwood Development (Hans Hagen Homes and Inwood 10, LLC) EAW – Specify RGU and Authorize for Distribution

SUBMITTED BY: Kyle Klatt, Community Development Director

THROUGH: Dean Zuleger, City Administrator

REVIEWED BY: Planning Commission
Nick Johnson, City Planner

SUGGESTED ORDER OF BUSINESS:

- Introduction of ItemCommunity Development Director
- Report/Presentation.....Community Development Director
- Questions from Council to Staff..... Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion..... Mayor & City Council
- Action on Motion..... Mayor Facilitates

POLICY RECCOMENDER: Staff is recommending that the City Council take the initial steps to action to begin the process of completing a mandatory environmental review for a proposed development that will be located on approximately 160 acres within the southeast quadrant of Inwood Avenue and 10th Street in Lake Elmo. The project applicants, Hans Hagen Homes and Inwood 10, LLC have prepared a draft Environmental Assessment Worksheet (EAW) in advance of the City's review of a concept plan for this project.

FISCAL IMPACT: None – Hans Hagen Homes is preparing the EAW in advance of their planning and zoning applications. Staff has been involved in reviewing the work of the developer's consultant.

SUMMARY AND ACTION REQUESTED: The City Council is being asked to take action to initiate a mandatory environmental review for a proposed 695-unit mixed-use development on 157 acres of land located at the southeast corner of Inwood Avenue and 10th Street in Lake Elmo. Specifically, the Council is asked to take action to:

- 1) Determine that an Environmental Assessment Worksheet (EAW) will need to be prepared prior to the approval of any plans for the development as proposed.
- 2) Designate the City of Lake Elmo as the RGU (Responsible Governing Unit) for the preparation of the EAW.
- 3) Authorize distribution of the Environmental Assessment Worksheet (EAW) that has been prepared for the proposed Inwood mixed-use development to be located within the I-94 Corridor planning area and within the southeast quadrant of Inwood Avenue and 10th Street.

Staff recommends the City Council authorize distribution of the mandatory EAW with the requested modifications from Staff, starting the 30-day EAW public comment period and take the following action / with the following motion:

“Motion to determine that an EAW is required, designate the City as the RGU, and authorize distribution of the draft EAW for the Inwood mixed-use development project starting the 30-day EAW public comment period.”

LEGISLATIVE HISTORY/PLANNING COMMISSION REPORT: Hans Hagen Homes has prepared the attached EAW and related traffic study in accordance with the guidelines of the Minnesota Environmental Quality Board, which is the organization that oversees the State’s environmental review program. Staff has reviewed the document and any requested modifications to the draft document are noted below.

Under State rules, an EAW must be published in the EQB Monitor as part of the review process. The EQB Monitor is a biweekly publication that announces environmental review documents, public comment periods, and other actions of the Environmental Quality Board. Once published in the EQB Monitor, there is a 30-day comment period during which public agencies and members of the public may comment on the proposed project. The City must further distribute the EAW to a mailing list containing all responsible parties required to receive a copy of an EAW or EIS.

At the end of the 30-day comment period, the City must adopt a resolution that finds an Environmental Impact Statement (EIS) is or is not required for the project. If an EIS is not found to be necessary, the environmental review process is complete and the developer can proceed with platting and development within the project area.

In this case, Hans Hagen Homes has already submitted a PUD Concept Plan application for the Inwood Development and recognizes that the City will not be able to take formal action on the plat application until the environmental review is complete. The Planned Unit Development application may proceed simultaneously with the EAW review.

STAFF REPORT: Staff has reviewed the EAW document and is recommending that the following changes be incorporated into the final draft of the document prior to submission to the EQB:

- 1) Section 11 – Water Resources should be updated to note that the City’s Comprehensive Plan depicts a new water tower on the subject property, and that the developer will be working with the City to determine the appropriate location for this facility as part of the City’s subdivision review process.
- 2) Subheading “iv” under Section 11 – Water Resources should include a description of each of the identified wetlands. There are some discrepancies concerning whether or not certain wetlands will be preserved or disturbed during development. This section should be updated to reflect the current plans for development and wetland impacts.
- 3) Section 15 – Visual Impacts should include a reference to potential visual impacts from a new water tower within the project area.
- 4) The general development site plan and the overall project description should be updated to reflect the most recent version of the PUD Concept Plan that will be considered by the Planning Commission on August 25, 2014.

During the course of the review, it was determined that a traffic impact study would be required, and this study has also been prepared and is attached for consideration by the City Council. Staff has found that the EAW is complete and addresses the minimum requirements for submission to the EQB.

Please note that the version of the draft EAW included in the Council packet includes the worksheet and exhibits though “Exhibit G”. All other exhibits, including the traffic study, are included in the on-line version of the Council packet.

Should the City Council take action to authorize the distribution of the EAW, the document could be published in the September 1, 2014 edition of the EQB Monitor, with the 30-day comment period ending on October 2, 2014.

BACKGROUND INFORMATION (SWOT):

- | | |
|----------------------|--|
| Strengths | <ul style="list-style-type: none">• The EAW will allow the City to consider any environmental impacts associated with the project as part of the PUD review process. |
| Weaknesses | <ul style="list-style-type: none">• None |
| Opportunities | <ul style="list-style-type: none">• All comments from reviewers may be included in the City’s review of future development plans for the property. |
| Threats | <ul style="list-style-type: none">• If an Environmental Impact Statement is required (which is unlikely given the project scope and location) it will add |

additional time to the review process.

RECOMMENDATION: Staff recommends the City Council authorize distribution of the mandatory EAW *with the requested modifications* by Staff, thereby starting the 30-day EAW public comment period and take the following action / with the following motion:

“Motion to determine that an EAW is required, designate the City as the RGU, and authorize distribution of the draft EAW for the Inwood mixed-use development project starting the 30-day EAW public comment period.”

ATTACHMENTS:

1. Draft Environmental Assessment Worksheet – Inwood EAW

NOTE: Exhibits “H, I and J (Traffic Study)” are not included but available by accessing the on-line version of the agenda packet.

ENVIRONMENTAL ASSESSMENT WORKSHEET (EAW)

Inwood Creek - Lake Elmo

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EXHIBITS

- A. Location Map
- B. US Geological Map
- C. Site Survey (2 pages)
- D. Proposed Site Plan
- E. Existing Land Use Plan
- F. City Land Use Plan
- G. Property Contour Map
- H. Wetland Delineation Report
- I. Watershed Map
- J. Traffic Impact Study

ENVIRONMENTAL ASSESSMENT WORKSHEET

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at:

<http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm>. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item, or can be addresses collectively under EAW Item 19.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. Project title: Inwood Creek – Lake Elmo

2. Proposer: Hans Hagen Homes

Contact person: John Rask
Title: Vice President Land Development
Address: 941 NE Hillwind Road #300
City, State, ZIP: Fridley, MN 55432
Phone: 763-586-7202
Fax: 763-572-9417
Email: jrask@hanshagenhomes.com

3. RGU: City of Lake Elmo

Contact person: Kyle Klatt
Title: Planning Director
Address: 3800 Laverne Avenue N
City, State, ZIP: Lake Elmo, MN 55042
Phone: 651-747-3911
Fax: 651-747-3901
Email: kklatt@lakeelmo.org

4. Reason for EAW Preparation: (check one)

Required:

- EIS Scoping
☒ Mandatory EAW

Discretionary:

- Citizen petition
RGU discretion
Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

5. Project Location:

County: Washington County, Minnesota
City/Township: Lake Elmo
PLS Location (NE1/4, Section 33, T29N, R21W):
Watershed (81 major watershed scale): South Washington
GPS Coordinates: 44°57'34.1"N 92°55'57.4"W
Tax Parcel Number: 33-029-21-12-0001, 33-029-21-12-0003, 33-029-21-11-0002, 33-029-21-11-0001

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project; **See Exhibit A**
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and **See Exhibit B**
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan. **See Exhibit C and Exhibit D.**

6. Project Description:

- a. Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

Hans Hagen Homes and Inwood 10 LLC are proposing to develop a 157-acre property located in the southern portion of Lake Elmo. The project will be known as Inwood Creek. This mixed use neighborhood will contain detached single family homes, multi-family, and commercial land uses.

- b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

Hans Hagen Homes and Inwood 10, LLC are proposing to construct a mixed use development consisting of commercial, multi-family, and single family homes on approximately 157 acres. The proposed land uses are consistent with the City's Comprehensive Plan. The detached single family neighborhood occupies approximately 90 acres and will include 278 single family lots. The multi-family will include an additional 458 units consisting of: 1) 176 rental townhomes, 2) 120 senior housing units, 3) 150 multifamily units, and 4) 12 townhomes. The commercial land uses will consist of approximately 73,000 square feet of office and retail uses.

Project development will convert approximately 157 acres of agricultural fields to a new mixed use neighborhood that includes streets, homes, retail goods and services, offices, lawns, landscaping, parkland, trails, and stormwater ponding. Public streets will serve the development including the construction of a minor collector roadway, which will be known as 5th Street.

The City's approved Comprehensive Land Use Plan provides for an additional 6,600 Residential Equivalent Connections (RECs) of regional sewer service by 2030. The subject property is guided for a mix of Urban High Density, Urban Low Density, and Commercial. Development of the subject property will be consistent with the total level of density guided by the Land Use Plan.

Development of the property will occur in multiple phases with the first phase expected to begin in 2014. Full build-out is anticipated in 2020; however, construction timing will ultimately depend upon market conditions.

Project magnitude:

Total Project Acreage	157 acres
Linear project length	2,640 feet
Number and type of residential units	278 single family units 458 attached units
Commercial building area (in square feet)	73,000
Industrial building area (in square feet)	n/a
Institutional building area (in square feet)	n/a
Other uses – specify (in square feet)	n/a
Structure height(s)	35 feet on single family 50 feet on multi-family

- d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of this mixed use neighborhood is to meet the demand for additional residential housing and commercial goods and services within the City of Lake Elmo. This development is consistent with the City's Comprehensive plan.

- e. Are future stages of this development including development on any other property planned or likely to happen? Yes ☒ No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

There are currently no planned future stages of the Inwood Creek neighborhood.

- f. Is this project a subsequent stage of an earlier project? Yes ☒ No

If yes, briefly describe the past development, timeline and any past environmental review.

Inwood Creek is not a subsequent stage of an earlier development project

7. **Cover types:** Estimate the acreage of the site with each of the following cover types before and after development:

	Before	After		Before	After
Wetlands	.28	.10	Lawn/landscaping	0	52
Deep water/streams	.20	.20	Impervious surface	0	60
Wooded/forest	14.7	5.0	Stormwater Pond	0	7.7
Brush/Grassland	0	0	Other (describe)	0	41.5
Cropland	142.8				
			TOTAL	157	157

Cover types identified as “Others” include road right-of-way, infiltration basins, park, berms, open space, and undeveloped property.

- 8. Permits and approvals required:** List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Unit of Government	Type of Application	Status
City of Lake Elmo	Concept Plan Approval	To be applied for
City of Lake Elmo	Preliminary Plat Approval	To be applied for
City of Lake Elmo	Final Plat Approval	To be applied for
City of Lake Elmo	EAW Negative Declaration	To be applied for
City of Lake Elmo	Grading Permit	To be applied for
City of Lake Elmo	Building Permit	To be applied for
City of Lake Elmo	Municipal Water Connection Permit	To be applied for
City of Lake Elmo	Sanitary Sewer Connection Permit	To be applied for
City of Lake Elmo	Rezoning	To be applied for
City of Lake Elmo	Wetland Delineation Confirmation	Applied for
City of Lake Elmo	Wetland Conservation Act No-Loss Determination	Applied for
Washington County	Right-of-Way Permit	To be applied for
Washington County	Access Permit	To be applied for
Washington County	Obstruction Permit	To be applied for (if needed)
Washington County	Transportation Permit	To be applied for (if needed)
Metropolitan Council	Sanitary Sewer Connection Permit	To be applied for
Minnesota Department of Health	Water Main Extension Approval	To be applied for
Minnesota DNR Division of Waters	Water Appropriation Permit	To be applied for (if needed)
Minnesota Pollution Control Agency	NPDES/SDS	To be applied for
Minnesota Pollution Control Agency	Sanitary Sewer Extension Approval	To be applied for
U. S. Army Corps of Engineers	Section 404I Letter of No Jurisdiction	Applied for
MN DNR Division of Waters	Water Appropriation Permit	To be applied for (if needed)

MN Pollution Control Agency	NPDES/SDS General Permit	Covered under general permit; submit NOI prior to construction
South Washington Watershed District	Watershed Review/Permit	To be applied for

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 19

9. Land use:

a. Describe:

- i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

The subject property consists primarily of tilled agricultural land with a few small stands of trees. A small City park exists near the southeast corner of the site. Surrounding land use as depicted in **Exhibit E** consists of 1) tilled agricultural land to the north, 2) office uses to the south, 3) large lot residential to the east, and 4) a golf course to the west. As described in the City's Comprehensive Land Use Plan, this portion of the City is guided as an "urbanized zone" that will feature higher density residential development and commercial uses. A natural buffer strip, located adjacent to existing rural development, is proposed along the east property line.

Some of the soils in this area of Lake Elmo are classified as prime farmland. Because adjacent land uses are urban in nature, or planned for future development, no farmland preservation measures were considered.

- ii. Plans, describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

The planned land uses of the property consist of low density residential, multi-family, and commercial. These uses are consistent with the City's Comprehensive Plan for the property, see attached **Exhibit F**. Surrounding land uses in the City's Comprehensive Land Use Plan consist of Rural Development Area to the north, Business Park to the south, Residential Estate to the east, and a public golf course and office uses to the west located in the City of Oakdale.

The City of Lake Elmo's Comprehensive Plan was reviewed by the Metropolitan Council, adjacent communities, and other governmental agencies with review authority. The City's Land Use Plan was found to be consistent with these other local and regional plans.

Because Inwood Creek is consistent with the City's Land Use Plan, no impacts to other local or regional plans are anticipated.

- iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The subject property is in a sewer holding district and will be rezoned concurrently with the submission of a preliminary plat. The Development will be zoned PUD with commercial and residential land uses. The property includes an unnamed creek that is within the shoreland overlay zoning district. A portion of the northwest corner of the property is also located in the shoreland district of Armstrong Lake. Armstrong Lake is located in the City of Oakdale. There is no floodplain established for the unnamed creek or Armstrong Lake.

The use and development of the Inwood Creek neighborhood would be consistent with the shoreland regulations of the City.

- b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The project will consist of a mix of residential, multi-family, and commercial uses as identified in the City's Comprehensive Plan. The subject property is bounded by 10th Street to the north, an office park to the south, a 100-foot wide buffer and large lot residential to the east, and Inwood Avenue to the west. The planned use of the property is consistent with the City's Comprehensive Plan and will not have any negative environmental effects on nearby land uses that cannot be mitigated.

- c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

The project is compatible with the City's Comprehensive Plan and is not incompatible with surrounding land uses, or future land uses identified in the City's Plan. The Inwood Creek neighborhood is designed to provide the appropriate land use transitions both within the project itself, as well as with surrounding land uses. Specifically, the site provides the following transitions to eliminate any potential incompatibilities that would have negative environmental effects:

- The Inwood Creek detached single family lots will be located adjacent to the large lot residential lots to the east. Residential use of this property is consistent with the adjacent residential uses, and will be separated by a vegetative buffer that at a minimum is 100 feet wide.
- The Inwood Creek neighborhood includes multi-family development along the southern edge of the property, which is adjacent to the existing office park. The multi-family development is compatible with nearby office uses and will not have any negative environmental impacts. Conversely, the office use will not adversely impact the multi-family uses of the property.
- The proposed commercial land uses are on the west side of the property adjacent to Inwood Avenue. Across the street from Inwood Creek is a public golf course. The

planned commercial is separated from the single family portion of Inwood Creek by a large stormwater pond.

- North of the property is tilled agricultural fields. The agricultural fields are separated from the project site by 10th Street (CSAH 10). Berms will be constructed on the south side of 10th Street to buffer the single family homes from the road.

10. Geology, soils and topography/land forms:

- a. Geology - Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

American Engineering and Testing conducted soil borings on the subject property. The borings identified a plowed section of topsoil overlying alluvial sands, silty sands, lean clays, and glacial till.

Coarse alluvial soils exist below the topsoil and are interbedded within the mixed alluvium, fine alluvium and till. They consist of silty sands, sands with silt and sands. The coarse alluvium contains variable amounts of gravel and could also contain cobbles or boulders.

The Geologic Atlas of Washington County, Minnesota (1990) C-5, Plate 1 indicates there are no known sinkholes, exposed bedrock, springs, or seeps on or near the site. If such features are encountered on the site, actions will be taken to mitigate potential effects such as stormwater routing, soil stabilization, and groundwater protection practices.

- b. Soils and topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 11 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 10.

The Soil Survey Geographic (SSURGO) digital database for Washington County (USDA NRCS, Accessed 2013) indicates the soils that occur within the project area are predominantly non-hydric silty and sandy loams.

Soils Classification

Map Symbol	Soil Classification	Hydric
264	Freeon silt loam, 1 to 4 percent slopes	Not hydric
153B	Santiago silt loam, 2 to 6 percent slopes	Not hydric
153C	Santiago silt loam, 6 to 15 percent slopes	Not hydric
120	Brill silt loam, 0 to 2 percent	Not hydric
266	Freer silt loam, 0 to 2 percent	Not hydric
1847	Barronett silt loam, 0 to 2 percent	Hydric
342B	Kingsley sandy loam, 2 to 6 percent slopes	Not hydric
49B	Antigo silt loam, 2 to 6 percent slopes	Not hydric
49	Antigo sil loam, 0 to 2 percent slopes	Not hydric

¹ Based on the NRCS List of Hydric Soils of Minnesota (1995).

Acres: Approximately 150 acres will be graded for streets, house and commercial pads, and stormwater features.

Cubic Yards: Approximately 1,500,000 cubic yards of soil will be moved. The soils are generally suitable for urban development and require very little correction. Furthermore, the proposed site plan works with natural grade and topography and will not significantly alter the current topography of this 157 acre site. Most of the earth work is the result of stripping top soil, digging ponds, and constructing berms for buffers.

The Highly Erodible Land (HEL) List for Washington County, Minnesota (USDA NRCS, 2006) indicates there are no highly erodible soil within the study area.

According to the USDA NRCS SSURGO database for Washington County (Accessed 2014), there are no substantial areas that contain steep slopes (12 percent or greater) associated with the soil mentioned above. Contour mapping indicates that the majority of the surface topography is gently undulating. Elevations range from 1,040 feet in the northern portion of the site to 996 feet in the southern portion of

the site **Exhibit G**. The majority of the site drains from north to south. With the majority of the project area being over 1,000 above mean sea level, the site contains some of the highest elevations in the City.

Because the project will involve disturbance of more than one acre of land, application for coverage under the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) General Permit will be submitted to the MPCA prior to initiating earthwork on the site. This permit is required for discharge of stormwater during construction activity and requires that Best Management Practices (BMPs) be used to control erosion, and that all erosion controls be inspected after each rainfall exceeding 0.5 inches in 24 hours. Erosion control practices that will be implemented on the site include:

1. Construction of temporary sediment basins in the locations proposed for stormwater ponding, and development of these basins for permanent use following construction.
2. Silt fence and other erosion control features installed prior to earthwork and maintained until ground cover is established on exposed areas.
3. Periodic street cleaning and installation of a rock construction entrance to reduce tracking of dirt onto public streets.
4. Stabilization of exposed soils, phased with grading, within 7 days for slopes steeper than 3:1, 14 days for slopes less than 3:1 but greater than 10:1, and 21 days for slopes flatter than 10:1.
5. Energy dissipation, such as riprap, installed at storm sewer outfalls.
6. Use of cover crops, native seed mixes, sod, and landscaping to stabilize exposed surface soils after final grading.

Erosion control plans must be reviewed and accepted by the City of Lake Elmo and applicable South Washington County Watershed District prior to project construction. Because the above BMPs will be implemented during and after construction, potential adverse effects from construction-related sediment and erosion on water quality will be minimized.

11. Water Resources:

Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.

- i. Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

The subject property contains an unnamed creek (07010206-745) that is on the current MPCA 303d Impaired Waters List. Excessive levels of chloride (salt) is found in the creek which has an impact on fish and other aquatic organisms. The Inwood Creek neighborhood would comply with the application City shoreland regulations.

A small portion of the subject property also lies within the shoreland overlay district of Armstrong Lake. None of the subject property drains toward Armstrong Lake. The Inwood Creek property is on the opposite side of a divided 4-lane highway from Armstrong Lake, and is separated by a commercial/office development. As such, any development on the subject property will not impact Armstrong Lake.

Both Armstrong Lake and the unnamed creek are regulated under the City's Shoreland Ordinance. The shoreland district extends 300 feet from the ordinary high water elevation of the creek and 1,000 feet from the ordinary high water elevation of Armstrong Lake. The proposed development would comply with the City's Shoreland Ordinance. If flexibility to any standards is necessary, the Developer would identify these in the PUD application, and will take the appropriate actions to mitigate any potential negative impacts.

A farmed wetland basin will be impacted as part of the site development. In May of 2014, Kjolhaug Environmental Services evaluated the project area for wetlands and other jurisdictional waters. Three jurisdictional wetlands were identified within the project boundary as depicted in the Wetland Delineation Report attached as **Exhibit H**. Wetland 1 is listed on the National Wetland Inventory Map and is classified as a Type 1 (PEMAf) palustrine emergent temporary flooded farmed wetland. Wetland 2 is a Type 1 (PEMA) fresh meadow wetland dominated by green ash saplings and inundated with reed canary grass. Wetland 3 is a Type 1 (PEMAf) farmed, seasonally flooded wetland dominated by witch grass.

A review of the Flood Insurance Rate Maps, published by the Federal Emergency Management Agency, was performed. According to Panel Number 27163C0335E dated February 3, 2010, the Property is located in Flood Zone X. Flood Zone X consists of regions outside of the 100-year and 500-year flood zones.

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

Groundwater elevations within the vicinity of the site are around 875 feet above sea level based on The Geologic Atlas of Washington County, Minnesota (1990) C-5, Plate 5. Topographic mapping indicates that elevations on the site range from approximately 1,070 above mean sea level in the northwest corner of the site to 980 above mean sea level towards the eastern border of the site. Consequently, the maximum depth to groundwater is estimated at about 195 feet. Because surficial groundwater is sometimes encountered in seasonally wet areas, the minimum depth to groundwater is estimated at 0 feet. The approximate average depth to groundwater was calculated by averaging the topographic elevations on the site (1,025) and subtracting the anticipated depth shown on the Washington County Atlas (875).

Depth to bedrock was estimated from the record of Unique Well No. 523649 (County Well Index, 2012) The well and boring record completed for this new well in April 1993 indicates that Platteville Formation was reached at 60 feet below grade. The Geologic Atlas of Washington County, Minnesota (1990) C-5, Plate 4 indicates that the distance to bedrock ranges between approximately 50 and 200 feet below grade.

The City of Lake Elmo has a Part 1 and Part II MDH Wellhead Protection Plan. The plan does not identify any well draw areas on the subject property.

Nova Consulting reviewed well log records provided by the Minnesota Department of Health (MDH) County Well Index for the Property. No wells were identified. Further, no evidence of wells or septic systems were observed by Nova at the time of the Phase I in May of 2014. If wells and septic systems are discovered during any future construction activities, they will be abandoned according to applicable regulations.

The Geologic Atlas of Washington County, Minnesota (1990) pollution sensitivity map indicates that the sensitivity of groundwater to pollution in the project areas is generally moderate. Sensitivity of groundwater systems to pollution is defined as the approximate time it takes from the moment contaminant infiltrates the land surface until it reaches an aquifer. Although shallow groundwater is highly susceptible to contamination, moderately permeable soils with finer textures will slow or restrict the movement of water, which extends the time needed for chemicals to break down before reaching the water table. As stated in Item 19, the average depth to groundwater on the site is estimated at approximately 150 feet below ground surface, providing a significant buffer between the soil surface and the groundwater aquifer.

Because development will be typical of residential and commercial uses, no unusual wastes or chemicals are anticipated to be spread or spilled that would cause significant groundwater contamination. The proposed project will provide continued groundwater protection by providing adequate stormwater treatment and vegetated infiltration areas such as rain gardens, and buffers to help capture runoff and filter pollutants.

Groundwater Protection and Mitigation Measures

The Inwood Creek residential development will offer a higher level of groundwater protection than exists under current conditions. Chemical applications can be high in agriculturally-dominated landscapes. The conversion of the site to urban uses will ensure greater protection of groundwater by: (1) covering exposed soils with turf and landscape plants to reduce infiltration of nutrients and pesticides; (2) reducing hazardous materials on the property to include only household quantities; (3) providing 27 acres of park, woodland, and open space; (4) providing stormwater treatment systems.

- b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.
 - i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.
 - 1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

According to the City's approved Comprehensive Plan, the project area is situated within a designated sewer service area (see Future Land Use - Sewer Plan, 2012). Current plans call for the

proposed development site to be served by municipal sewer extended from the Eagle Point Business Park along Hudson Boulevard. All wastewater from the proposed project will be discharged to the Woodbury, Oakdale, Northdale, and East Oakdale (WONE) Interceptor. From the WONE Interceptor, wastewater from the development would flow to the Metropolitan Wastewater Treatment Plant in St. Paul. This facility currently treats approximately 215 million gallons of wastewater each day, and has the capacity to treat up to 250 million gallons per day. The Metropolitan Council projects ample capacity at this plant through 2030. Consequently, no wastewater facility or treatment capacity issues are anticipated (MCES 2007).

Both the MPCA and the Metropolitan Council Environmental Services (MCES) have compiled and documented extensive data that relates wastewater flow generation to population and land use. Sanitary wastewater production for the proposed development was estimated based on the methods outlined in the Service Availability Charge (SAC) Procedure Manual (MCES, 2012). The MCES has established 274 gallons per day (gpd) to be the average daily wastewater production from a typical residential connection. One SAC unit is defined as 274 gallons of wastewater flow volume, which is based on the assumption of 2.74 persons per unit and 100 gallons per capita day (gpcd) of wastewater production.

Each single family residence and townhome was assigned one SAC unit. The estimated maximum potential daily wastewater production for the entire development is 85,488 gpd. The following table provides information on wastewater production based on land use.

Wastewater Production Predicted

Proposed Use	SAC Rate	Units	SAC Units	Wastewater (gallons/day)
Single Family Homes	1/Unit	272	272	52,060
Townhomes	1/Unit	188	188	33,428
Apartments*	1/unit	150	120	32,880
Senior Housing	1/2.5unit	120	48	23,016
Commercial**	1/3,000	21	21	5,754
		Total	649	147,138

*Includes a 20 percent reduction per SAC manual

**Includes 15 percent reduction in square footage for restroom, mechanical rooms, storage, etc.

- 2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.

There will be no wastewater discharge to a subsurface treatment system.

- 3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.

Wastewater from the development would flow to the Metropolitan Wastewater Treatment Plant in St. Paul, Minnesota for treatment.

- ii. Stormwater - Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

The project must meet the requirements of the City's Stormwater Ordinance. The project also must meet the requirements of the South Washington Watershed Districts (e.g. infiltration, erosion), where applicable.

The City's Stormwater Ordinance is available on the City's website. Lake Elmo is also a mandatory small MS4 (Municipal Separate Storm Sewer System) city, and is required by federal and state law to obtain and implement a NPDES Stormwater permit administered by the MPCA. MS4s are also required to develop and implement a stormwater pollution prevention plan program (SWPPP), and submit an annual report to the MPCA

Pre-Development Site Runoff

Existing site runoff likely contains pesticides, herbicides, and fertilizer residues due to the presence of agricultural fields. There is also likely a minor amount of runoff that flows to the site from north of 10th Street. However, because the property is higher than most of the surrounding properties, runoff primarily drains away from the site to the south. It is expected that a portion of the runoff infiltrates into the site's permeable, silty and sandy soils and some likely reaches existing onsite stormwater ponds located in the Eagle Point Business Park.

Post-Development Site Runoff

The change in land use will decrease the amount of agricultural chemicals and suspended solids, and increase other components typical of urban runoff. It is expected that the volume of runoff will increase during significant storm events as a result of the increase in impervious surface area. It is anticipated that only extreme conditions such as those occurring in connection with 50- or 100-year storm events will result in measurable increases in runoff volume and associated pollutant transport. The preservation and creation of open space in the form of buffers, parks, woodlands, infiltration/filtration, and ponds will help to mitigate potential adverse effects from the increase in impervious surface. The project proposer also plans to utilize a storm water reuse system to irrigate open space areas with storm water, which will help to reduce runoff volumes.

Runoff water quality will be typical of residential and commercial developments found throughout the state of Minnesota. Similar to current conditions, sediment, nutrient, and other pollutant removal will occur when much of the stormwater filters through upland vegetation, vegetated drainage swales, stormwater ponds, and other best management practices, including infiltration. Preserved and newly seeded vegetation will provide filter strips to help remove

sediment and nutrients before runoff discharges to area wetlands and surface waters, mitigating potential effects on water quality.

Potential adverse effects of runoff volume and quality will be further mitigated by the construction of approximately seven acres of stormwater ponds, which will be designed to reduce peak runoff rates and meet all requirements of the City of Lake Elmo and South Washington Watershed Districts. The design of ponding areas and the quality of stormwater discharging from the development will meet the requirements of the MPCA General Stormwater Permit for Construction Activity (Minnesota Stormwater Manual), and applicable local regulations. In a storm event, stormwater will be retained in the ponds and discharged at or below existing peak runoff rates.

BMPs will be employed during construction to reduce erosion and sediment loading of stormwater runoff. Inspection and maintenance of BMPs during construction will be consistent with NPDES/SDS General Permit requirements, including site inspection after rainfall events, perimeter sediment control maintenance, and sediment removal.

The project site is located within the South Washington Watershed District as depicted on **Exhibit I**. Surface waters generally flow north to south towards an unnamed creek which connects Armstrong Lake to Wilmes Lake. The site also receives some surface water runoff from the north via a culvert located underneath 10th Street

The goal of the project will be to maintain peak discharge rates at or below the existing condition. Post-construction drainage will follow similar pathways, with minor differences in drainage routes and increases in the volume of road ditches and swale flows. Post-development stormwater runoff will either travel overland, into stormwater ponds, or through storm sewers prior to discharging to ponds or infiltration basins.

For the following reasons, it is anticipated that site development will have minimal effects on receiving water quality:

- Impervious services will cover approximately 60 acres of the property, or 38% of the site. Open space areas consisting of buffers, parks, infiltration areas, and other landscaped areas will reduce runoff.
 - Hydraulic storage within sediment basins will be designed, and BMPs implemented, in accordance with the General NPDES/SDS Permit for Construction Activities to protect water quality and control erosion.
- iii. Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

Dewatering

Dewatering will become necessary if groundwater is encountered during utility installation; however, it is unlikely that dewatering will be necessary because the depth to groundwater exceeds the planned depth of sanitary sewer, municipal water, and storm sewer. The quantity and duration of potential construction dewatering is not known at this time, but it is expected that any necessary dewatering for construction will be temporary. If groundwater is encountered during utility installation, it will be discharged to temporary sediment basins located within the project site.

If construction dewatering and pumping from the proposed development exceeds the 10,000-gallon per day or 1,000,000 gallons per year thresholds, a DNR Water Appropriation Permit will be obtained. If it becomes apparent that construction dewatering will not exceed 50 million gallons in total and duration of one year from the start of pumping, the contractor or project proposer will apply to the DNR Division of Waters for coverage under the amended DNR General Permit 97-0005 for temporary water appropriations. It is not anticipated that construction dewatering or pumping from the proposed development will be extensive or continue long enough to impact domestic or municipal wells.

Connection to a public water supply system

The City of Lake Elmo currently operates two wells, which are permitted under DNR Water Appropriations Permit No. 611031. The two wells range in depth from 285 to 808 feet deep, and draw water from the Jordan-Mt. Simon and Prairie Du Chien-Jordan aquifers (2010 Drinking Water Report). The City's DNR water appropriations permit allows a total system pumping capacity of 260 million gallons per year (MGY).

According to DNR Water Appropriation records as of 2010, the city reported pumping 103 MGY (average 282,192 gallons per day). The estimated water demand for the proposed development is 34.3 MGY (94,037 gallons per day) based on the assumption that consumption is approximately 110 percent of wastewater generation (see Item 18). Consequently, there are no water supply issues anticipated as a result of adding the development to the city's water supply system. According to the City Engineer, water may be supplied to the development either through an existing services agreement with the City of Oakdale or via the Lake Elmo municipal water supply system.

The current Comprehensive Plan calls for municipal water facilities to be extended from the southeast corner of the Eagle Point Business Park along Hudson Boulevard to service this portion of the City.

iv. Surface Waters

- a) Wetlands - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.

Kjolhaug Environmental evaluated the subject property for wetlands and other jurisdictional water. Three wetland basins were found as depicted on **Exhibit** . Wetland 1 is a 8,161 square foot PEMAf farmed wetland that is seasonally saturated. Wetland 2 is a 8,895 PFO1C wetland that will be preserved within a future park/buffer area. Wetland 3 is approximately 4,000 square feet PEMAf farmed wetland that may be preserved as part of an open space area.

Wetland 2 will be impacted and mitigated off site. This wetland has been physically altered and impacted by annual production crops. The primary source of hydrology to this wetland basin is a culvert that drains water from 10th Street. Any development of the northern portion of the site will result in the rerouting of the surface water from the culvert away from the wetland; thereby causing an impact to this wetland basin. The project proposer will either create wetland mitigation in the same watershed or purchase wetland credits.

- b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

The subject property contains an unnamed creek (07010206-745) that is on the current MPCA 303d Impaired Waters List. Excessive levels of chloride (salt) is found in the creek which has an impact on fish and other aquatic organisms.

The unnamed creek is also regulated under the City's Shoreland Ordinance, which extends 300 feet from the high water elevation of the creek.

The project will not involve the physical or hydrologic alteration of the unnamed creek or other natural surface waters. The project site does not include any surface waters used by watercraft.

12. Contamination/Hazardous Materials/Wastes:

- a. Pre-project site conditions - Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

Nova Consulting conducted a Phase I ESA of the property. The assessment found no evidence of Recognized Environmental Conditions (REC), controlled Recognized Environmental Conditions (CREC), or Historical Recognized Environmental Conditions (HREC) in connection with the Property.

The City of Lake Elmo is the home to two land disposal sites that contain Perfluorochemical (PFC) waste. The two sites are the 3M - Oakdale Disposal Site in Oakdale and the former Washington County Landfill in Lake Elmo. The Oakdale disposal site is located approximately 3 miles northwest of the project area, and the Washington County Landfill is located approximately 4 miles to the north.

PFCs were released from the two facilities resulting in contamination of groundwater and nearby drinking water wells as outlined in a Public Health Assessment prepared by the U.S. Department of Health and Human Services (August 29, 2008), and the Agency for Toxic Substances and Disease Registry (ATSDR). The Minnesota Department of Health (MDH) has detected PFCs in several surface water bodies in the Lake Elmo, Oakdale, and Woodbury area through various sampling studies. Surface water bodies north of the project area that have been found to contain PFCs include: Raleigh Creek, Eagle Point Lake, and Lake Elmo. PFCs are suspected to infiltrate into the groundwater from these water body sources. Sunfish Lake was found to contain perfluorobutanoate (PFBA). Goose Lake, located 1.25-miles north of the project area, was sampled by the MDH in 2010 and was found to contain no PFCs.

According to this Public Health Assessment, PFCs have been detected in public and private wells across a wide area of Oakdale and Lake Elmo. In Lake Elmo, approximately 200 homes were connected to municipal water to mitigate exposure to PFCs in the groundwater. Additional homes, approximately 55, have had in home granular activated carbon filter systems installed to mitigate exposure to PFCs in the groundwater. These homes have also been offered bottled drinking water. Groundwater monitoring of PFCs is an ongoing program. The proposed project will mitigate risks to new residents by providing access to municipal drinking water.

- b. Project related generation/storage of solid wastes - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

Construction activities will generate wastes typical of residential development operations. No solid or hazardous wastes, including solid animal manure, sludge, and ash, will be produced during

construction and/or operation. The contractor will dispose of wastes generated at the site in an approved method by using commercial dumpsters and disposing construction wastes at an MPCA-permitted landfill. The contractor will recycle construction waste that can be recycled, when feasible.

Following project construction, solid waste generation will be typical of occupied residential and commercial developments of this size. It is not anticipated that the proposed project will generate significant amounts of wastes that would be considered hazardous aside from typical household cleaners, paints, lubricants, and fuel storage for small power equipment. The majority of the solid waste generated will include materials such as paper, organics (food wastes, wood, and rubber products), yard waste, and inert solids. The remaining wastes will likely include plastics, metals, and glass.

Residents and businesses within the new development will contract individually with waste haulers for solid waste collection and recycling services under the city's open trash and recycling collection system. According to the City's web page, there are currently five licensed waste haulers. Curbside recycling, including paper, plastics, glass, and metals is available to Lake Elmo residents through their solid waste collector. Participation in the recycling program by future residents of the project area is expected to reduce costs for solid waste trucking and disposal.

Waste generated in Washington County is delivered to the Resource Recovery Facility in Newport, Minnesota. The majority of the waste is processed into Refuse Derived Fuel (RDF). This fuel is burned in place of coal at Xcel's power plants in either Red Wing or Mankato, Minnesota.

The commercial portion of the project could contain a gas/convenience store. If above or below ground tanks are proposed on the site, they will be installed according to MPCA regulations, and consideration will be given to spill and leak detection and prevention technologies, as well as double-walled tank construction.

- c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

Only normal construction and household hazardous wastes are anticipated from the residential and commercial portions of the site. Toxic or hazardous material such as fuel for construction equipment and materials used during the normal construction process of residential units (paint, adhesives, stains, acids, bases, herbicides, and pesticides) will not involve quantities typically found during site preparation and unit construction. Builders and contractors are responsible for proper management and disposal of wastes generated during construction, which is typically handled by using construction dumpsters and the appropriate certified landfills. No known hazardous materials are currently located onsite. Use of toxic or hazardous materials, outside of vehicle fuels, standard household cleaners, and lawn care chemicals, is not anticipated within the project area in conjunction with the proposed residential and commercial development

The commercial portion of the project will likely include a gas station as well as other retail businesses. Other than petroleum storage for the gas station, no other toxic or hazardous materials are anticipated with the future use of the commercial property. The gas station will need to comply with all applicable rules and regulations for the storage of petroleum products.

- d. Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

Construction activities will generate wastes typical of residential and commercial development operations. No solid or hazardous wastes, including solid animal manure, sludge, and ash, will be produced during construction process, and/or operation/use of the residential properties. No commercial hazardous waste is anticipated at this time.

Residents and business owners within the new development will contract individually with waste haulers for solid waste collection and recycling services under the City's open trash and recycling collection system. According to the city's web page, there are currently five licensed waste haulers. Curbside recycling, including paper, plastics, glass, and metals, is available to Lake Elmo residents through their solid waste collector. Participation in the recycling program by future residents of the project area is expected to reduce costs for solid waste trucking and disposal.

13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features):

- a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

Fish and wildlife resources on and near the site consist of those typically found in developed suburban communities. The subject property consists primarily of tilled agricultural fields with some smaller strands of trees located around a former home site, as well as fence lines and drainage ways. These habitats are used by a variety of animals common to central Minnesota. Wildlife resources that exist throughout the site likely include those species that have adapted to open lands and cropland habitats such as pheasant, meadowlark, field sparrow, cottontail, red fox, and white-tailed deer. The open fields provide seasonal food and cover for these species.

- b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (ERDB _____) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The applicant has requested that the Minnesota DNR Natural Heritage Program conduct a database search of the Minnesota Natural Heritage Information System (NHIS) to determine if there are listed plants and animals; native plant communities; wildlife aggregations; geological features; or state rare features that are known to occur within or near the project site. It is not anticipated that the database search will identify rare features within an approximate one-mile radius of the proposed project. The DNR Natural Heritage Review response letter will be provided once complete.

- c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

Conversion of agricultural fields and small strands of trees to residential development is expected to result in some local decline in wildlife abundance. Populations of species that depend upon cropland, woodland and fields, such as ring-necked pheasants, wild turkey, and meadowlarks, will likely be displaced. Some songbirds that readily adapt to suburban habitats may become more numerous.

There are no known threatened or endangered species on the property or within close proximity.

- d. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

The project is not expected to result in a regionally significant decline in wildlife abundance or species diversity. Measures to reduce the effects on wildlife include preservation of buffers and adjacent woodland integrated with open space and parkland, and construction of stormwater ponding. These measures are expected to provide additional habitat for wildlife and help mitigate adverse effects on some wildlife.

14. Historic properties:

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

The Minnesota State Historic Preservation Office (SHPO) conducted a search of the Minnesota Archaeological Inventory and Historic Structure Inventory for the project area. Based on its review, no previously-recorded archaeological sites or historic structures were identified in the database for the project area. Consequently, no further review of archaeological, historical, or architectural resources is considered warranted at this time.

15. Visual:

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

The project will not create adverse visual impacts. The proposed residential and commercial uses are consistent with other established uses in the area, and therefore will not create a significant change in visual aesthetics. Measures to soften visual transitions include providing buffers between existing homes, landscaping, and berming between collector streets and other adjacent land uses

16. Air:

- a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

Because development of heavy industrial facilities is not proposed on this site, no stationary source air emissions are anticipated as a result of this project.

- b. Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

Increased traffic will generate a relatively small corresponding increase in carbon monoxide levels and other vehicle-related air emissions. The project is expected to have a negligible impact on air quality. Consequently, baseline air quality monitoring, or predictive air quality modeling, has not been scheduled at this time, and no measures to mitigate air quality impacts have been considered.

- c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

Project development will not generate odors, noise or dust in excess of levels emitted during typical construction practices of suburban developments. Any odors, noise, or dust produced during construction will meet the requirements of the MPCA and applicable local regulations.

The project will not generate significant odors during construction or operation. The emission of odor by any use shall be in compliance with City Code Section 96.03, 4(a).

The construction process is expected to generate some dust. Consideration will be given to suppression of airborne dust by application of water, if significant dust generation occurs during site grading and equipment operation. In general, incidental dust emissions generated during site construction will be consistent with City Code Section 96.03, 4(a).

17. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

The project will be constructed in accordance with the City's established noise ordinance as outlined in City Code Sections 130.45 to 130.47. It is anticipated that noise levels will temporarily increase locally during project construction, but are expected to return to normal levels following project completion. Noise levels on and adjacent to the site will vary considerably during construction depending on the pieces of construction equipment being operated simultaneously, the percent of time in operation, and the distance from the equipment to the receptors. The nearest receptors to the proposed project are several single-family residences located to the east, and commercial businesses to the south. In accordance with Section 130.47 of the City Code, construction equipment will not be operated between the hours of 6:00 p.m. and 7:00 a.m.

18. Transportation

- a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.
- b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. *If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.* Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: <http://www.dot.state.mn.us/accessmanagement/resources.html>) or a similar local guidance,
- c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

A traffic study was completed for the proposed project in July 2014. The traffic study examined the potential traffic-related impacts of the proposed project on the adjacent roadway system and key intersections near the site. A copy of the traffic study is included in **Exhibit J**, and summarized below.

Access and Trip Assignment

Access for the proposed project will be provided via a newly constructed collector roadway (5th Street North) which will then intersect with Inwood Avenue (CSAH 13). The newly constructed roadway was originally identified in the City of Lake Elmo's Comprehensive Transportation Plan. The Transportation Plan identified a new east-west roadway between 10th Street (CSAH 10) and the 1-94 frontage road. This new roadway alignment has been incorporated into the site plan of the proposed project. Designated as a minor collector, this route would allow local traffic to access the north-south county roads. Rather than a straight shot between points, this roadway curves between new developments to provide access." According to the City's Transportation Plan, this new east-west roadway is expected to handle approximately 5,000 vpd by the year 2030 between Keats Avenue and Inwood Avenue to the west. This new east-west roadway will also likely reduce the traffic volumes along 10th Street to levels where capacity improvements will not likely be needed by the year 2030.

Future Conditions

As shown in Table 2 of **Exhibit J**, the intersections near the project site will operate acceptably in the 2019 study scenarios with the exceptions of the CSAH 13/Eagle Point Boulevard intersection in the p.m. peak hour and the CSAH 13/5th Street intersection in both peak hours. It can be noted that the movement at LOS F at the CSAH 13/9th Street intersection in the p.m. peak hour Build scenario is the eastbound left turns out of the existing residential area. This movement has less than 10 vehicles in the peak hour and a 95th percentile queue length of less than one vehicle, and the future access of the road will likely be restricted by Washington County. Other than CSAH 13/Eagle Point Boulevard and CSAH 13/5th Street intersections, the LOS results between the No-Build and Build scenarios are similar. This means the development will not have a significant enough impact on the other study intersections to warrant improvements.

Table 2 shows that the side street stop sign controlled CSAH 13/Eagle Point Boulevard and CSAH 13/5th Street intersections are forecast to operate at LOS F in the 2019 p.m. peak hour build scenario with the CSAH 13/5th Street intersection also forecast to operate at LOS F in the 2019 a.m. peak hour Build scenario. One or both of these intersections will likely need to be signalized by the time the development is fully built and operational. Due to the close spacing of these two intersections it is not recommended that both of them be signalized. Since the CSAH 13/5th Street intersection is forecast to have higher turning volumes in the future build scenarios, that intersection was analyzed with a signal. These results can be seen in Table 3 of **Exhibit J**.

Conclusions

The traffic impacts of the proposed development on the study intersections were analyzed in the 2019 build-out conditions. The principal findings are:

- i. All study intersections will operate acceptably through the 2019 build-out condition except the CSAH 13/Eagle Point Boulevard and CSAH 13/5th Street intersections.
- ii. The CSAH 13/5th Street intersection will likely need a signal before the development is fully built and occupied and should be monitored as construction occurs to determine when a signal should be installed.
- iii. The CSAH 13/5th Street intersection should be built with an exclusive southbound left turn lane, a northbound right turn lane, a westbound left turn lane and a westbound right turn lane.
- iv. The traffic signal at the CSAH 13/5th Street intersection as well as alternate routes should allow the CSAH 13/Eagle Point Boulevard intersection to operate acceptably. The County should monitor the intersection, however, in case the traffic balancing does not occur and a traffic signal is needed at the intersection. The need for improvements to the CSAH 13/Eagle Point Boulevard intersection are not due to the proposed development. The site access at CSAH 13/9th Street and the CSAH 10/Western Site Access should be built as ¾ intersections with vehicles exiting the development only able to make right turns.
- vi. The Eastern Site Access on CSAH 10 should be built as a full access intersection.

19. Cumulative potential effects: (Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

- a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.
- b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.
- c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

The changes in regional land use in the Lake Elmo area from open agricultural land to more urbanized uses is expected to have a cumulative impact on the area. Cumulative effects of this and future projects on natural resources and infrastructure are expected to be roughly proportional to the impacts discussed in this EAW. The City of Lake Elmo has planned for future growth and development in this particular area as part of its Comprehensive Plan, and administration of zoning ordinances. These efforts will ensure that the cumulative impacts of future growth and development to the environment, and to the City's service capacity, are anticipated and mitigated.

Development of surrounding parcels will also result in cumulative impacts to City infrastructure such as roads, sewer, and water. These cumulative impacts have been thoughtfully contemplated and addressed in the City's Comprehensive, Transportation, Wastewater, and Water Plans. As the surrounding properties develop, they will be evaluated under the Minnesota Environmental Policy Act (MEPA) rules, and will adhere to guidelines presented in the city's approved zoning and comprehensive plans for the area.

20. Other potential environmental effects: If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

No other adverse environmental impacts are anticipated as a result of this project. Potential environmental impacts have been addressed in Items I through 19.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature _____

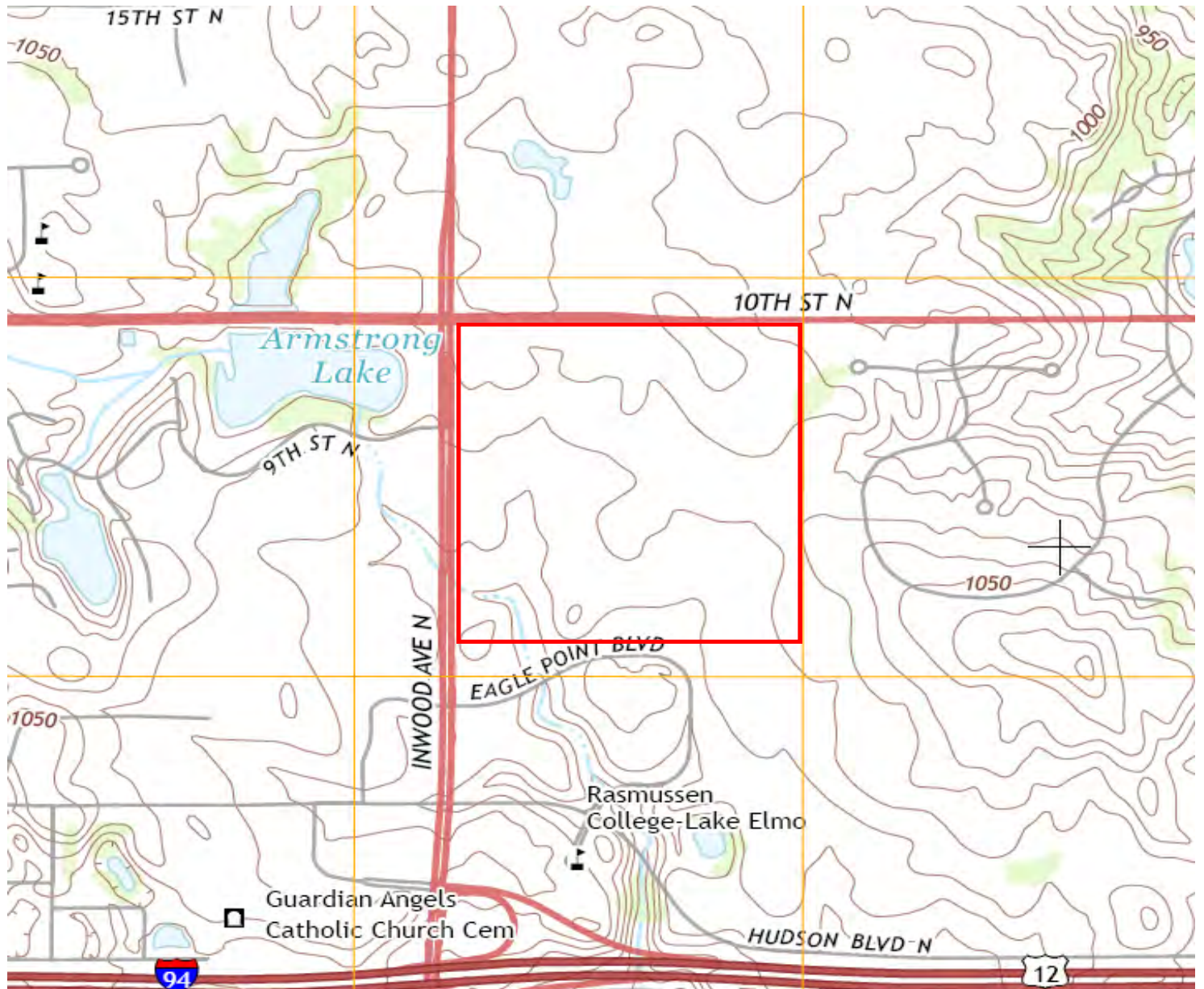
Date _____

Title _____

EXHIBIT A



EXHIBIT B



CERTIFICATE OF SURVEY

~for~ INWOOD 10, LLC
~of~ LAKE ELMO PARCEL

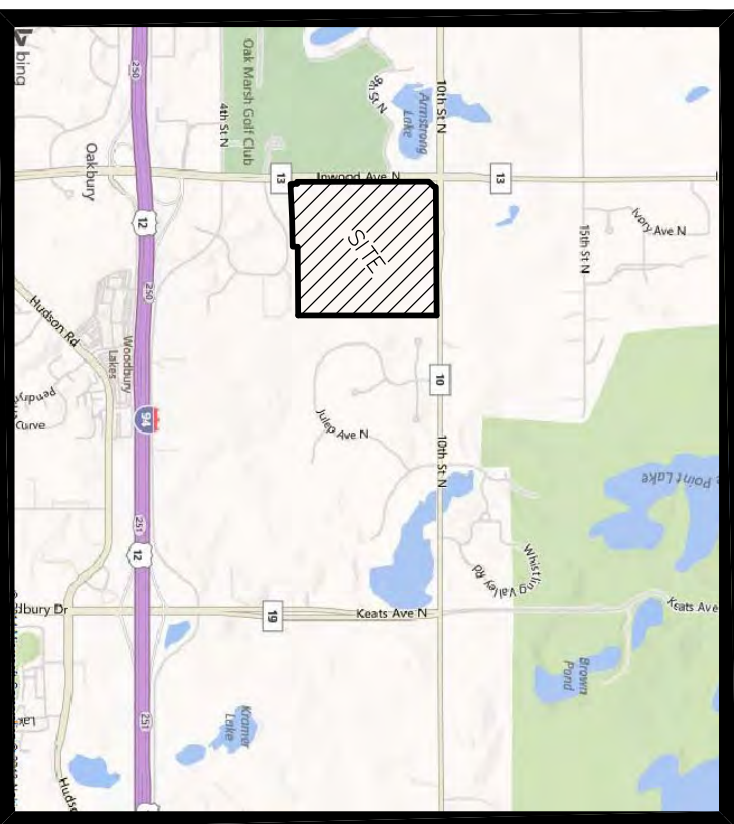
EXHIBIT C

LEGEND

- DENOTES IRON MONUMENT FOUND AS LABELED
- ⊙ DENOTES IRON MONUMENT SET, MARKED RIS# 19421
- ⊙ DENOTES ELECTRIC MANHOLE
- ⊙ DENOTES CATCH BASIN
- ⊙ DENOTES STORM SEWER MANHOLE
- ⊙ DENOTES HYDRANT
- ⊙ DENOTES GATE VALVE
- ⊙ DENOTES POWER POLE AND OVERHEAD WIRES
- ⊙ DENOTES EXISTING SPOT ELEVATION
- ⊙ DENOTES UTILITY BOX
- ⊙ DENOTES FIBER OPTIC BOX
- ⊙ DENOTES ELECTRICAL BOX
- ⊙ DENOTES TELEPHONE PEDESTAL
- ⊙ DENOTES GUY WIRE
- ⊙ DENOTES STORM SEWER APRON
- ⊙ DENOTES EXISTING CONTOURS
- ⊙ DENOTES TREE LINE
- ⊙ DENOTES EXISTING STORM SEWER
- ⊙ DENOTES BITUMINOUS SURFACE

VICINITY MAP

PART OF SEC. 33, TWP. 29, R1G. 21



WASHINGTON COUNTY, MINNESOTA
(NO SCALE)

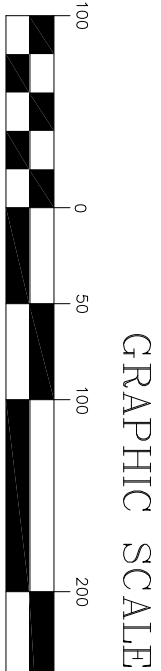


PROPERTY DESCRIPTION:

The West Half of the Southeast Quarter of Section 33, Township 29 North, Range 21 West, lying north of the north right of way line as shown on State Highway Right-of-way Plot No. 4 of 12, State Project 8282 (94=392), 902, Washington County, Minnesota.
(Abstract)

AND

The Northeast Quarter of Section 33, Township 29, Range 21, less and except: Parcel No. 4 of Washington County Highway Right-of-way Plot No. 41; and Parcel No. 3 of Washington County Highway Right-of-way Plot No. 42; Washington County, Minnesota.
(Torrens)



NOTES

- Field survey was completed by E.G. Rud and Sons, Inc. on 4/10/14.
- Beddings shown are on the Washington County Coordinate System.
- Curb shots are taken at the top and back of curbs.
- This survey was prepared without the benefit of title work. Additional easements, restrictions and/or encumbrances may exist other than those shown hereon. Survey subject to revision upon receipt of a current title commitment or an attorney's title opinion.
- Parcel ID Nos. 33-029-21-11-0001, 33-029-21-11-0002, 33-029-21-12-0001, 33-029-21-12-0003, 33-029-21-42-0002.
- Total parcel area = 157.18 acres.
- BENCHMARK: MNDOT Station: NYGAARD MNDT. Elevation = 1010.83 (NGVD 29)

NORTH

DRAWN BY: EGR	JOB NO: 140271P	DATE: 4/22/14
CHECK BY: BLR	ISSUED: <input type="checkbox"/>	
NO.	DATE	DESCRIPTION
1		
2		
3		

E.G. RUD & SONS, INC.
Professional Land Surveyors
6776 Lake Drive NE, Suite 110
Lino Lakes, MN 55014
Tel. (651) 361-8200 Fax (651) 361-8701
www.egrud.com

I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Minnesota.

BLR
BLAKE L. RIVARD
Date: 4-28-14 License No. 19421

CERTIFICATE OF SURVEY

~for~ INWOOD 10, LLC
~of~ LAKE ELMO PARCEL

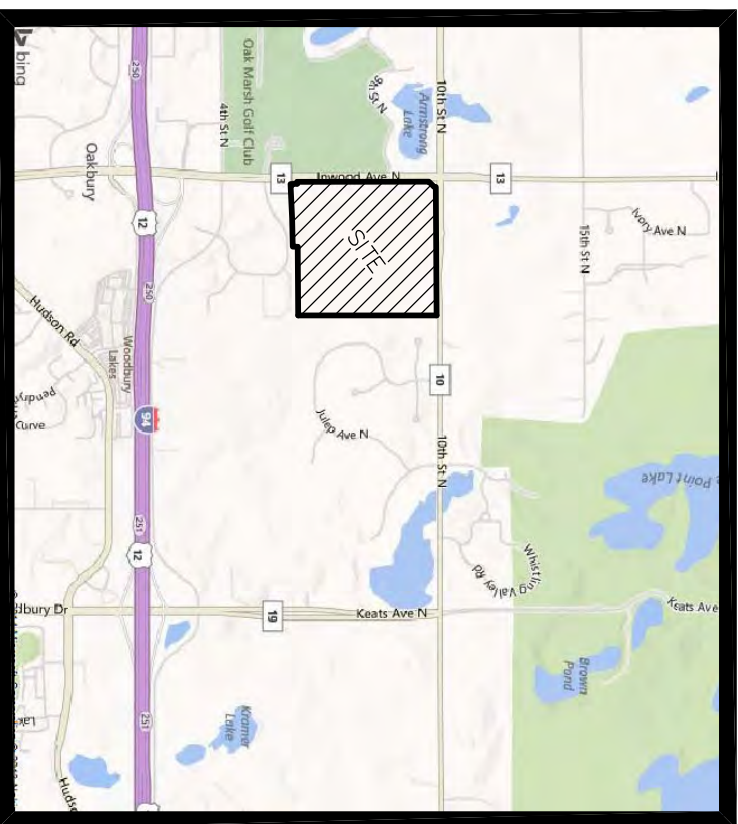
EXHIBIT C

LEGEND

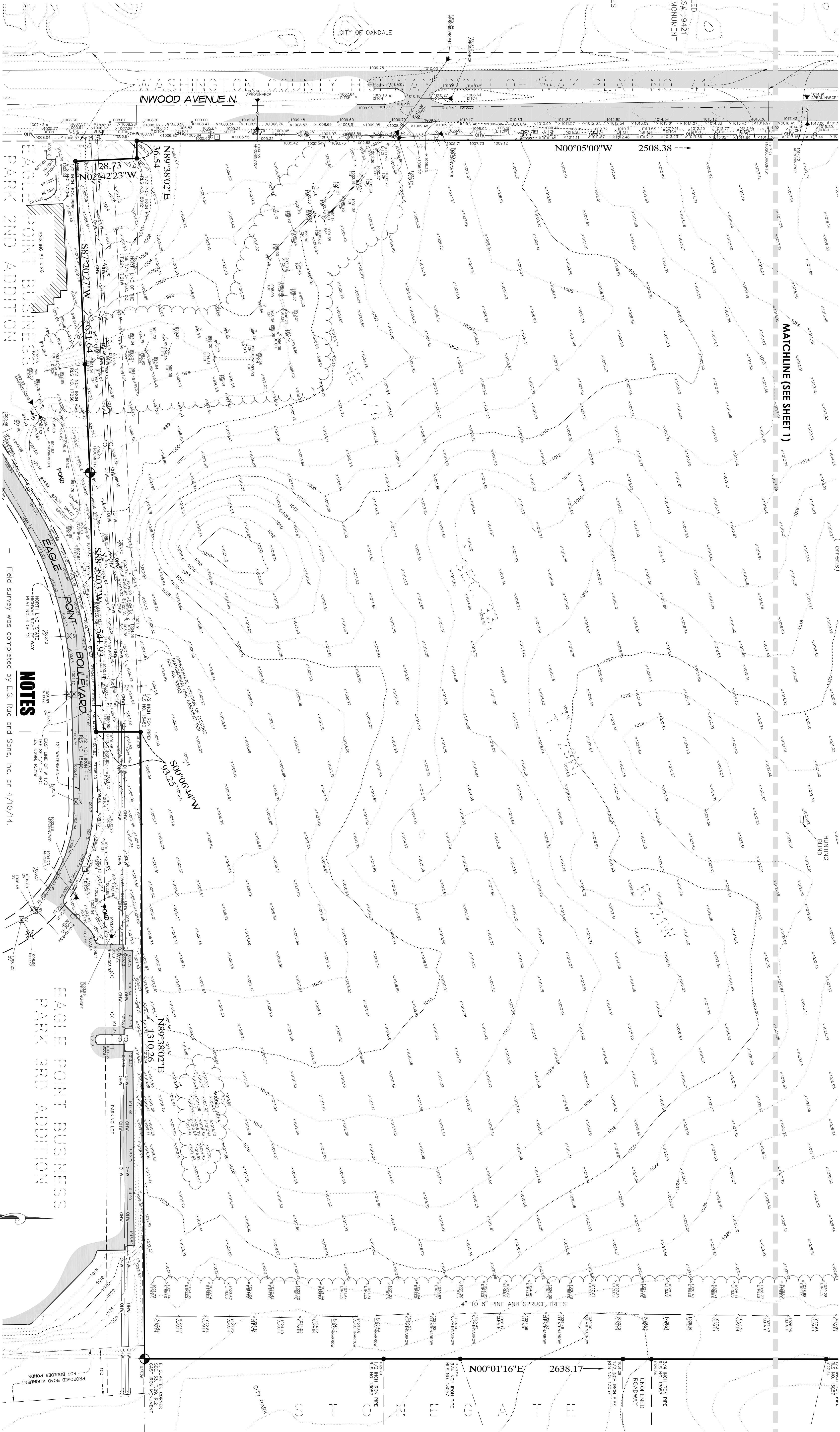
- DENOTES IRON MONUMENT FOUND AS LABELED
- ◉ DENOTES IRON MONUMENT SET, MARKED RIS# 19421
- ◉ DENOTES ELECTRIC MANHOLE
- ◉ DENOTES CATCH BASIN
- ◉ DENOTES STORM SEWER MANHOLE
- ⊠ DENOTES HYDRANT
- ⊠ DENOTES GATE VALVE
- ⊠ DENOTES POWER POLE AND OVERHEAD WIRES
- ⊠ DENOTES EXISTING SPOT ELEVATION
- ⊠ DENOTES LIGHT POLE
- ⊠ DENOTES UTILITY POLE
- ⊠ DENOTES FIBER OPTIC BOX
- ⊠ DENOTES ELECTRICAL BOX
- ⊠ DENOTES TELEPHONE PEDESTAL
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- ⊠ DENOTES EXISTING CONTOURS
- ⊠ DENOTES TREE LINE
- ⊠ DENOTES EXISTING STORM SEWER
- ⊠ DENOTES BITUMINOUS SURFACE

VICINITY MAP

PART OF SEC. 33, TWP. 29, R16, 21



WASHINGTON COUNTY, MINNESOTA
(NO SCALE)



PROPERTY DESCRIPTION:

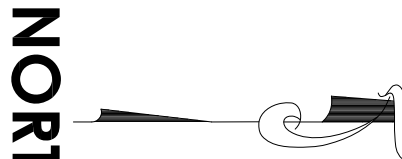
The West Half of the Southeast Quarter of Section 33, Township 29 North, Range 21 West, lying north of the north right of way line as shown on State Highway Right-of-way Plat No. 4 of 12, State Project 8282 (94=392) 902, Washington County, Minnesota.
(Abstract)

AND
The Northeast Quarter of Section 33, Township 29, Range 21, less and except:
Parcel No. 4 of Washington County Highway Right-of-way Plat No. 41; and
Parcel No. 3 of Washington County Highway Right-of-way Plat No. 42,
Washington County, Minnesota.
(Torens)

NOTES

- Field survey was completed by E.G. Rud and Sons, Inc. on 4/10/14.
- Bearings shown are on the Washington County Coordinate System.
- Curb shots are taken at the top and back of curb.
- This survey was prepared without the benefit of title work. Additional easements, restrictions and/or encumbrances may exist other than those shown hereon. Survey subject to revision upon receipt of a current title commitment or an attorney's title opinion.
- Parcel ID Nos. 33-029-21-11-0001, 33-029-21-11-0002, 33-029-21-12-0001, 33-029-21-12-0003, 33-029-21-42-0002.
- Total parcel area = 157.18 acres.
- BENCHMARK: MNDOT Station: NYGAARD MNDT. Elevation = 1010.83 (NGVD 29)

GRAPHIC SCALE



NORTH

DRAWN BY: EGR	JOB NO: 14027P	DATE: 4/22/14
CHECK BY: BLR	ISSUED	
NO.	DATE	DESCRIPTION
1		
2		
3		

I hereby certify that this survey, plan or report was prepared by me, under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Minnesota.

BLAKE L. RIVARD

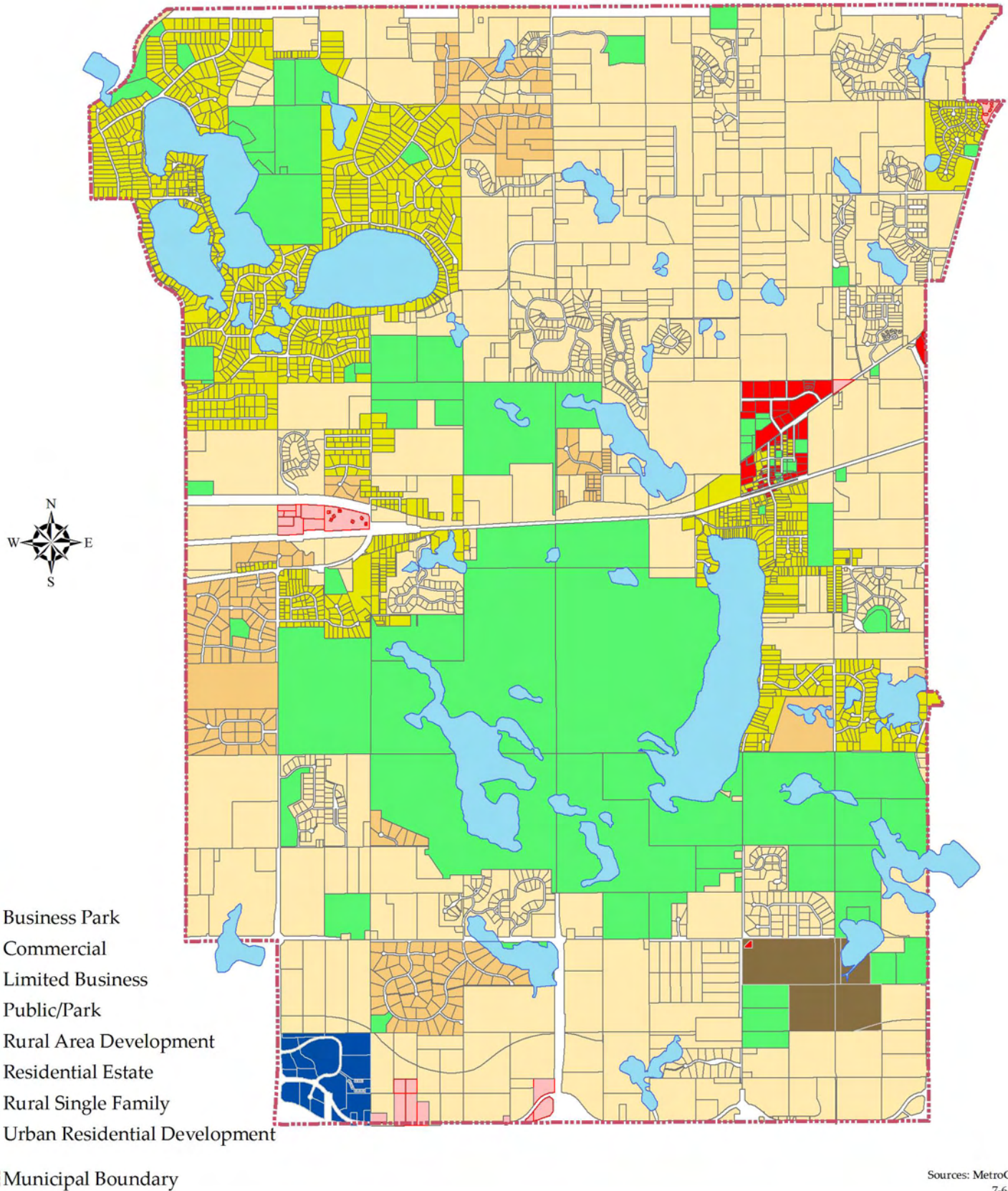
Date: 4-28-14 License No. 19421

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Tel. (651) 361-8200 Fax (651) 361-8701
www.egrud.com



Hans
Hagen
Homes

This is a graphic illustration only and subject to change without notice.
Please refer to record plans for lot sizes, easements,
landscaping, water levels, and topography.



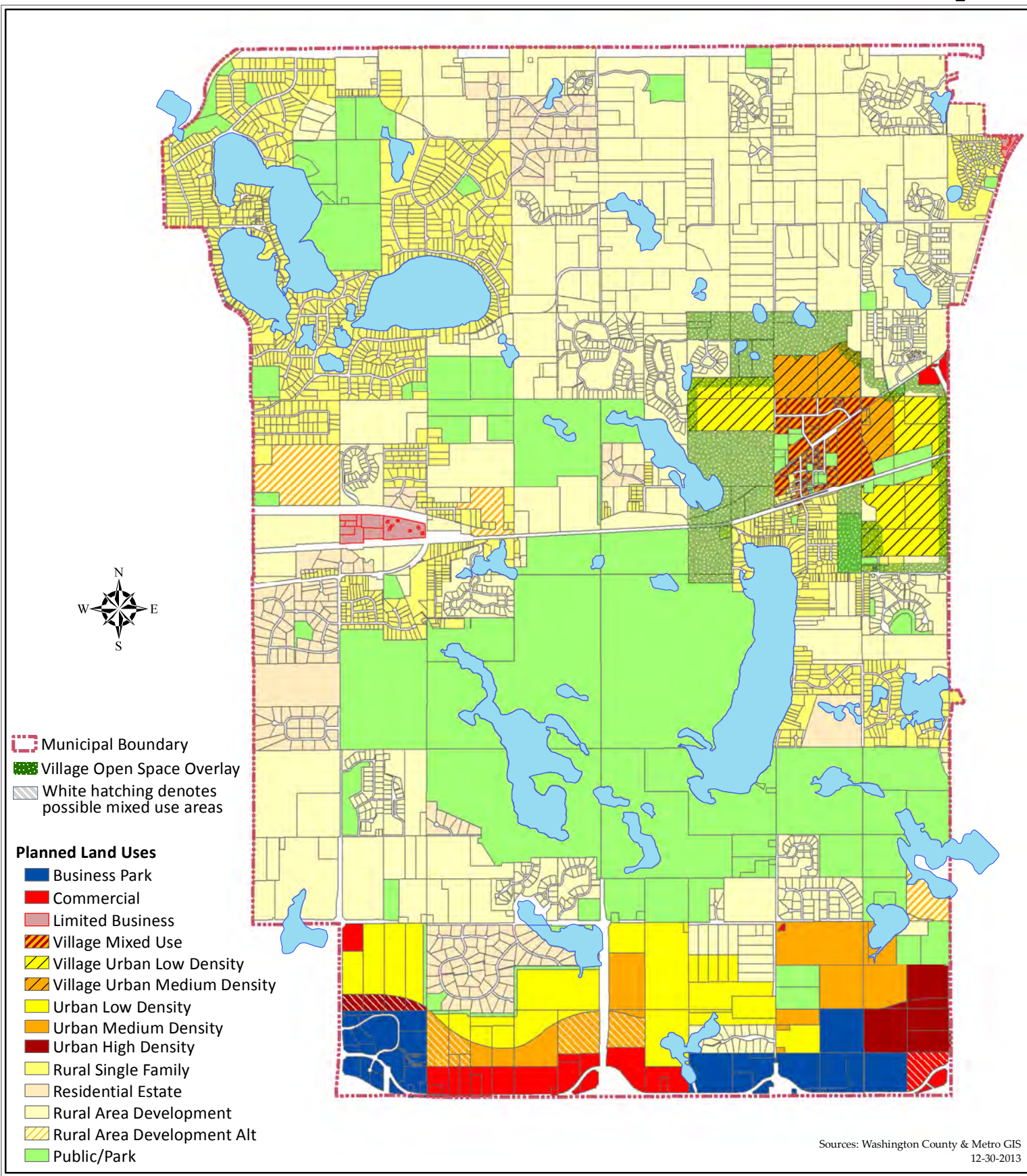
Sources: MetroGIS
7-6-12

Existing Land Use

Lake Elmo Comprehensive Plan 2030



This map was created using MFRA's Geographic Information Systems (GIS). It is a compilation of information and data from various sources. This map is not a surveyed or legally recorded map and is intended to be used as a reference. MFRA is not responsible for any inaccuracies contained herein.

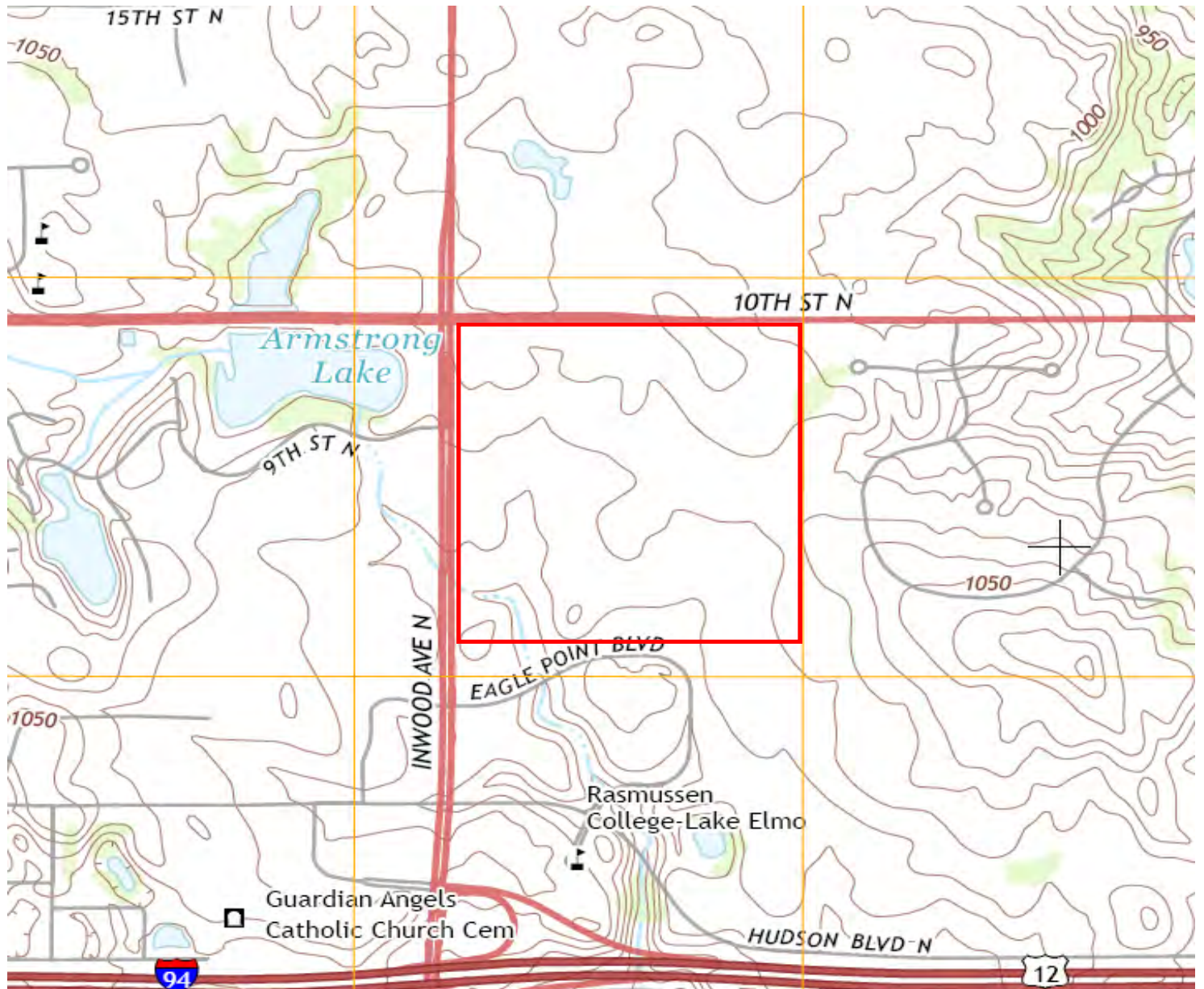


Planned Land Use

Lake Elmo Comprehensive Plan 2030



EXHIBIT G



Inwood Ave North

Lake Elmo, Minnesota

Wetland Delineation Report

Prepared for
Hans Hagen Homes

by
Kjolhaug Environmental Services Company, Inc.
(KES Project No. 2014-032)

July 3, 2014

WETLAND DELINEATION SUMMARY

- The Inwood Ave N site was inspected on June 17, 2014 for the presence and extent of wetland.
- The NWI map showed 3 wetlands within site boundaries.
- The soil survey showed Barronett silt loam as the hydric soils present within site boundaries.
- The DNR Protected Waters map showed a DNR Protected Waterway within the southwest corner of the site boundaries.
- Two Type 1 (PEMAf) farmed, seasonally flooded wetland, and one Type 1 (PEMA) fresh meadow wetland were delineated within site boundaries.

Inwood Avenue North

Lake Elmo, Minnesota

Wetland Delineation Report

I. INTRODUCTION

The Inwood Avenue North site was examined on June 17, 2014 for the presence and extent of wetland. The 154-acre site was located in Section 33, Township 29N, Range 21W, City of Lake Elmo, Washington County, Minnesota. Generally the site was located east of the terminus of Inwood Avenue North and south of 10th Street N (**Figure 1**). Site limits were comprised of Washington County PID 3302921110001, 3302921110002, 3302921120001 and 3302921120003.

The site consists primarily of cropland. For the 2014 growing season the site was planted with corn (**Figure 2**). Two wetlands were located in the north area of the cropland. Along the eastern 300 feet of the property exists a woodland of various planted conifer and deciduous species. A wetland was located in the northeast corner of the site within the woodland. An abandoned farmstead site is located within the northwest corner of the site. In the southwest corner of the site is a DNR Protected Waterway (Unnamed).

Generally topography was higher on the north half of the site. The site topo sloped gradually downhill toward the west and south.

Adjacent to the eastern boundary of the site is a single family residential development. On the western boundary is the Oak Marsh Golf Course. To the south is commercial industrial facility. North of the site north of 10th Street North is additional cropland.

II. METHODS

Wetlands were identified using Routine Determination methodology described in the *Corps of Engineers Wetlands Delineation Manual* (Waterways Experiment Station, 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North Central-Northeast Region (Version 2.0) as required by Section 404 of the Clean Water Act and the Minnesota Wetland Conservation Act.

Wetland boundaries were identified as the upper-most extent of wetlands, which met criteria for hydric soils, hydrophytic vegetation, and wetland hydrology. Wetland-upland boundaries were marked with pin flags and were located by E.G. Rudd.

Soils, vegetation, and hydrology were documented at representative locations along the wetland-upland boundary. Plant species dominance was estimated based on the percent aerial or basal coverage visually estimated within a 30-foot radius for trees and vines, 15-foot radius for the

shrub layer, and a 5-foot radius for the herbaceous layer within the community type being sampled.

Soils were characterized to a minimum depth of 18-20 inches (unless otherwise noted) utilizing Munsell Soil Color Charts and standard soil texturing methodology. Hydric soil indicators used in reporting are from the NTCHS Field Indicators of Hydric Soils in the United States (USDA Natural Resources Conservation Service Version 7, 2010) which are commonly found in the Midwest.

Plants were identified using standard regional plant keys. Taxonomy and indicator status of plant species was taken from the 2012 National Wetland Plant List (Lichvar, R.W. and Kartesz, J.T. 2009. North American Digital Flora: National Wetland Plant List, version 2.4.0 (https://wetland_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC.).

A review of available Farm Service (FSA) Agency photographs followed the protocol outlined in the document - Atypical Procedure: Offsite Hydrology Determination by Using Rainfall Data with Farm Service Agency Imagery, Adapted from NRCS-Minnesota Guidance (August, 1994).

III. RESULTS

Review of Soils, NWI, and DNR Information

The *National Wetland Inventory Map (NWI)* (Lake Elmo Quadrangle, U.S. Fish & Wildlife Service 1991) showed 3 wetlands within site boundaries (**Figure 3**).

The Soil Survey of Washington County, Minnesota

(<http://soils.usda.gov/survey/geography/ssurgo/>) showed the following soil types within or near site boundaries (**Figure 4**). For information regarding soil series present on site, refer to **Table 1** below.

The *DNR Protected Waters Map, Washinton County* (<http://deli.dnr.state.mn.us/>) showed a DNR Protected Waterway within site boundaries (**Figure 5**).

Table 1. Soil Series Information

SMU	Map Unit Name	Acres in AOI	Percentage of AOI	Hydric Percent of Map Unit	Hyric Category
49	Antigo silt loam, 0 to 2 percent slopes	0.8	0.55%	1	Predominantly Nonhydric
49B	Antigo silt loam, 2 to 6 percent slopes	26.8	17.74%	1	Predominantly Nonhydric
120	Brill silt loam	6.8	4.53%	5	Predominantly Nonhydric
153B	Santiago silt loam, 2 to 6 percent slopes	41.5	27.49%	0	Nonhydric
153C	Santiago silt loam, 6 to 15 percent slopes	11.0	7.26%	0	Nonhydric
264	Freeon silt loam, 1 to 4 percent slopes	55.4	36.71%	2	Predominantly Nonhydric
266	Freer silt loam	2.5	1.68%	5	Predominantly Nonhydric
342B	Kingsley sandy loam, 2 to 6 percent slopes	4.5	2.99%	3	Predominantly Nonhydric
342C	Kingsley sandy loam, 6 to 12 percent slopes	0.2	0.11%	0	Nonhydric
1847	Barronett silt loam, sandy substratum	1.4	0.95%	90	Predominantly Hydric

Wetland Determinations and Delineations

Potential wetlands were evaluated in greater detail during field observations on June 17, 2014. Two wetlands were identified on the subject site (**Figure 2**). Corresponding data forms are included in **Appendix A**. The following description of the wetlands and adjacent upland reflects conditions observed at the time of the field visit. At that date, herbaceous vegetation and crops were actively growing and climatic/hydrologic conditions were assumed to be normal based on available precipitation data (**Appendix B**). A survey of the wetland boundaries is included as **Appendix C**.

Wetland 1 was a Type 1 (PEMAf) farmed, seasonally flooded wetland dominated by witch grass with lesser amounts of velvetleaf and smartweed. The majority of the wetland had shallow standing water with a saturated fringe.

Adjacent upland was cropped with healthy corn and had lamb's quarter in between the rows.

The delineated boundary followed a change in vegetation composition, cropping patterns and landscape position was supported by signatures on aerial photos. Wetland 1 corresponded to a PEM1Af wetland on the NWI map, but mapped in a non-hydric soil (Freeon) on the soil survey.

Wetland 2 was a Type 1 (PEMA) fresh meadow wetland dominated by a green ash saplings and inundated with reed canary grass, Kentucky bluegrass, red-osier dogwood and giant goldenrod.

Adjacent upland at the sample location were cropped with corn and had giant goldenrod, thistle and horsetail between the rows near the wetland boundary.

The delineated boundary followed a flat and gradual change in vegetation composition. Wetland 2 corresponded to a mapped PEM1A wetland on the NWI-map. However it was mapped in a non-hydric soil (Freeon) on the soil survey.

Wetland 3 was a Type 1 (PEMAf) farmed, seasonally flooded wetland dominated by witch grass with lesser amounts of smartweed. The majority of the wetland had shallow standing water with a saturated fringe.

Adjacent upland was cropped with healthy corn and had lamb's quarter in between the rows.

The delineated boundary followed a change in vegetation composition, cropping patterns and landscape position was supported by signatures on aerial photos. Wetland 3 corresponded to a PEM1Af wetland on the NWI map, but mapped in a non-hydric soil (Freeon) on the soil survey.

FSA Photography Review

FSA photos from the years 1979 through 2000, 2003, 2006, 2008, 2009, and 2010 were available for review. Each year was assessed for wet/normal/dry climatic conditions using the online Minnesota Climatology Working Group, Wetland Delineation Precipitation Data Retrieval from a Gridded Database using a date of July 1 for the year assessed. Using this tool, only the years 1983, 1989, 1992, 1995, 1996, 1997, 2000, 2006 and 2008 were calculated have normal precipitation during the 3 months preceding the assumed photo date. Areas showing wetland signatures in normal precipitation years were included in the FSA review.

Wetland 1 and 3, as well as three (3) additional areas exhibiting potential wetland signatures were reviewed (**Figure 6**) and results of the review are included in **Table 1** below. Area A is within the delineated boundary of Wetland 3 and Area B is within the delineated boundary of Wetland 1. None of the reviewed areas are located within hydric soils.

Table 1. FSA Review Inwood Avenue North

Normal Precipitation Year	Area A	Area B	Area C	Area D	Area E
1983	C	SW	C	AP	AP
1989	DO	DO	C	AP	AP
1992	DO	DO	C	AP	AP
1995	SW	DO	C	AP	AP
1996	C	CS	C	AP	AP
1997	CS	DO	C	AP	AP
2000	CS	CS	C	AP	AP
2006	C	DO	C	AP	AP
2008	C	DO	C	AP	AP
Number of Significant Signatures	5	9	0	0	0
Percent Signatures in Normal Years	56%	100%	0%	0%	0%
Determination	Wetland	Wetland	Upland	Upland	Upland

Note:

Area D is a vegetative swale with steep sloped sides.

Area E is a hilltop covered in trees.

According to protocol, areas exhibiting wetland signatures in 50% or more of normal climatic years meet wetland hydrology criteria, and areas with wetland signatures in 30% to 50% of normal climatic years must be field investigated. Based on FSA aerial photo review for this site, only Areas A and B meet wetland hydrology criteria. Area A is encompassed within the delineated boundary of Wetland 3 and Area B is encompassed within the delineated boundary of Wetland 1.

Other Areas

A DNR Protected Waterway is located within the southwest corner of the site. This waterway is an unnamed creek that flows to Wilmes Lake. The banks of the waterway are steep sloped and lacked wetland fringe.

No other areas with wetland vegetation or hydrology were observed on the site. No other areas were shown with hydric soil on the soil survey map, or as wetland on the NWI map.

V. CERTIFICATION OF DELINEATION

The procedures utilized in the described delineation are based on the COE 1987 Wetland Delineation Manual as required by Section 404 of the Clean Water Act and the Minnesota Wetland Conservation Act. Both the delineation and report were conducted in compliance with regulatory standards in place at the time the work was completed.

All site boundaries indicated on figures within this report are approximate and do not constitute an official survey product.

Delineation Completed by:

Melissa Lauterbach-Barrett, Soil Scientist
Certified Wetland Delineator No. 1085
Professional Soil Scientist No. 45067



Report reviewed by: _____ Date: July 3, 2013

Mark Kjolhaug, Professional Wetland Scientist No. 000845

Inwood Avenue North

Wetland Delineation Report

Figures:

- Figure 1 – Site Location Map
- Figure 2 – Aerial Photograph
- Figure 3 – NWI Map
- Figure 4 – Soil Survey Map
- Figure 5 – DNR Protected Waters Map
- Figure 6 – FSA Review Areas
- Figure 7 – FSA Aerial Wetland Signatures

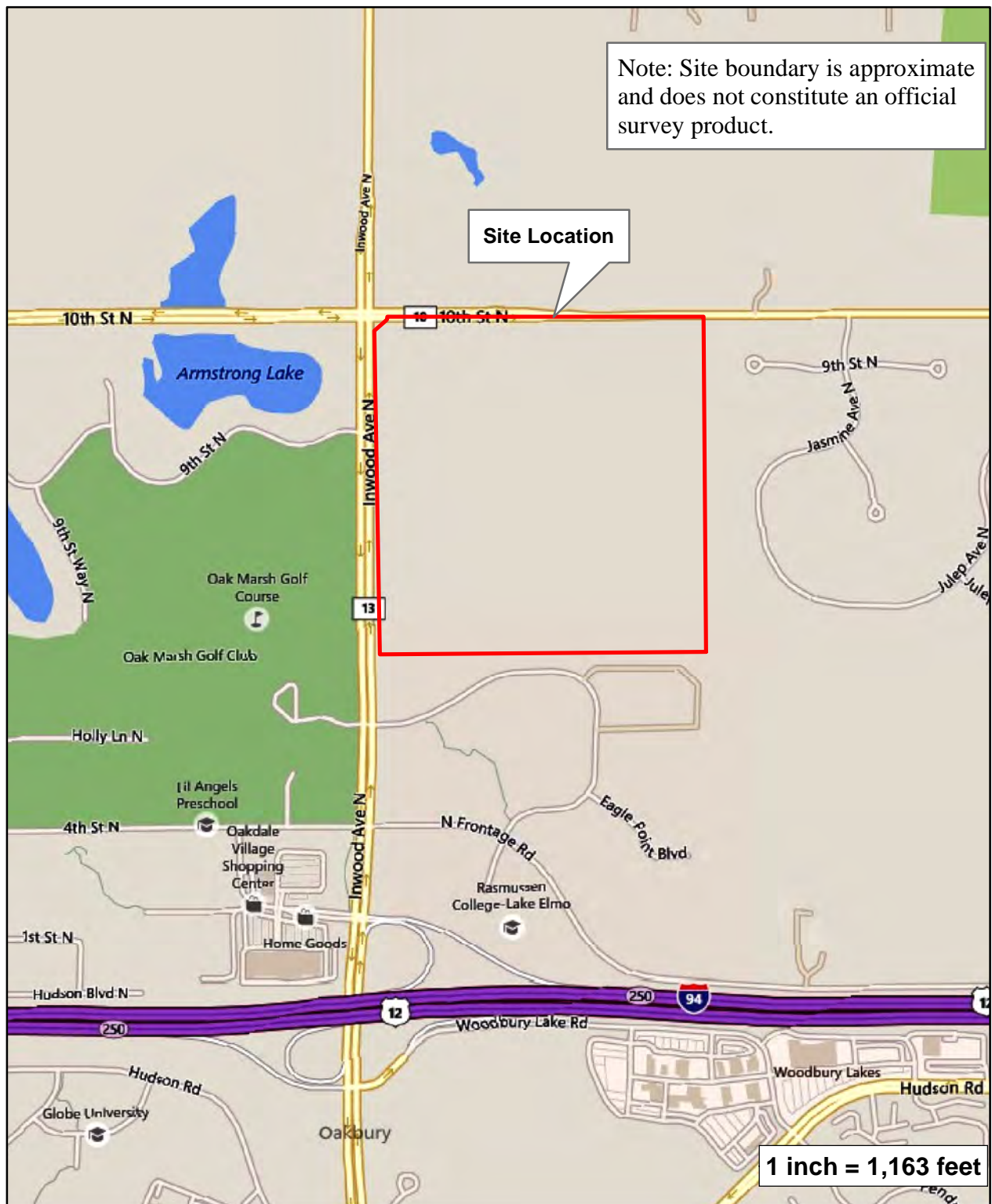


Figure 1 - Site Location Map (Bing Maps)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

**Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota**



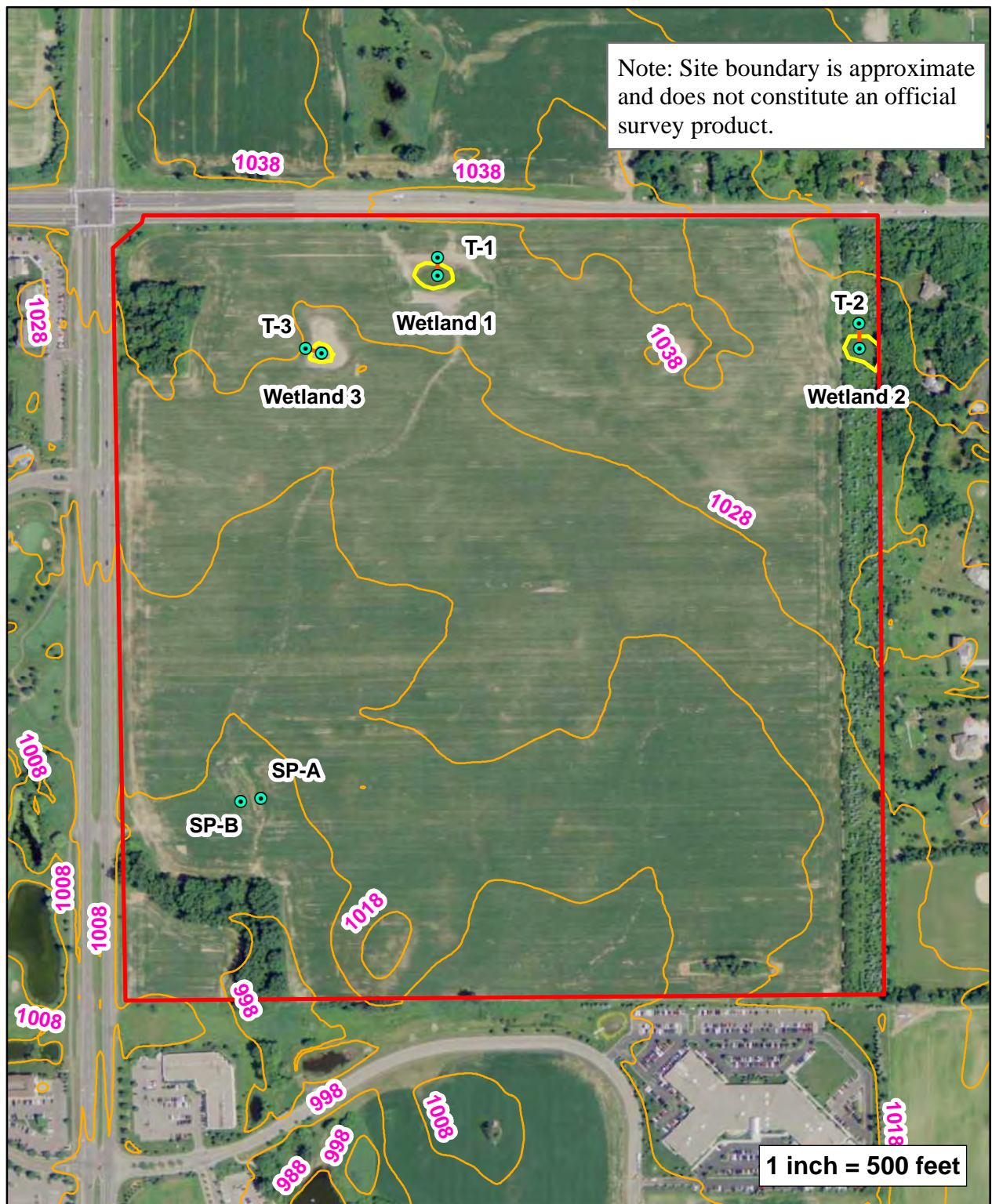


Figure 2 - Property Boundary Map (2013 FSA Photograph)

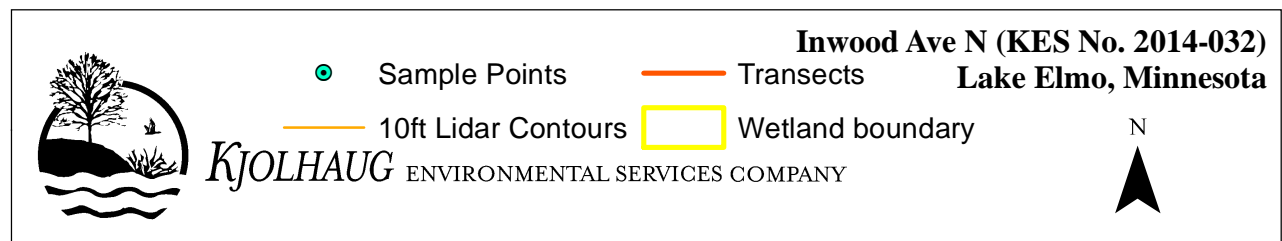




Figure 3 - NWI Map (2013 MN DNR)

	<p>Legend</p> <p><i>KJOLHAUG</i> ENVIRONMENTAL SERVICES COMPANY</p>	<p>Inwood Ave N (KES No. 2014-032) Lake Elmo, Minnesota</p> <p>N</p>
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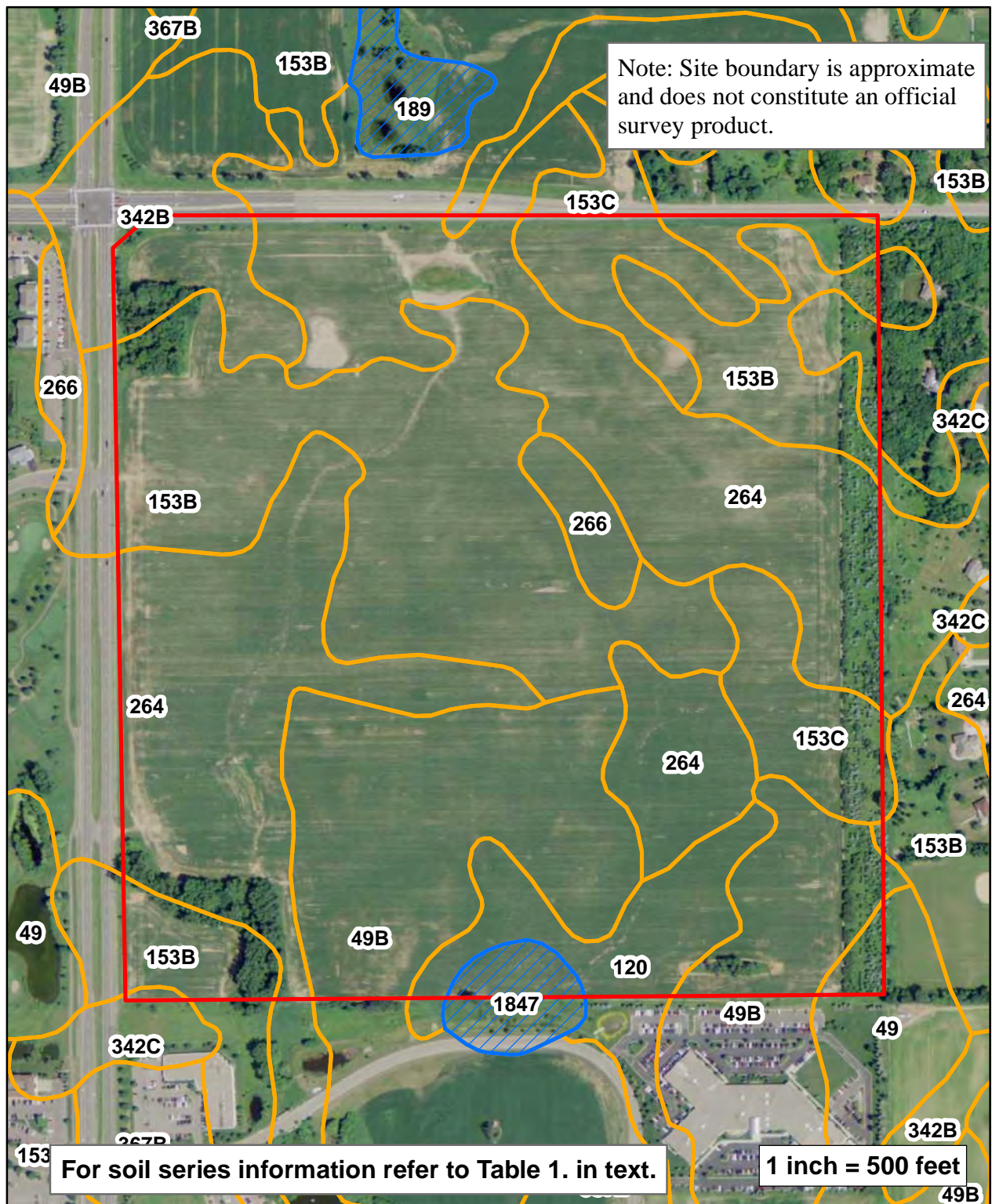


Figure 4 - Soil Survey Map

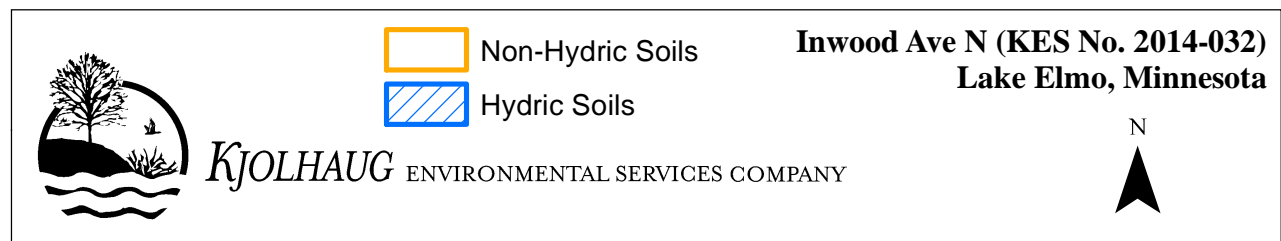




Figure 5 - DNR Protected Waters Map

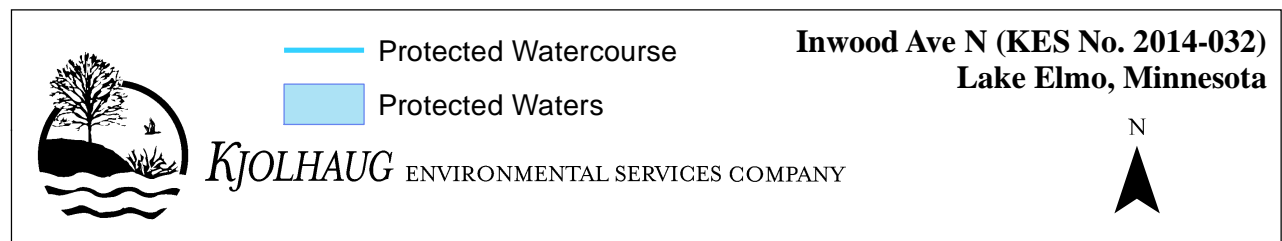
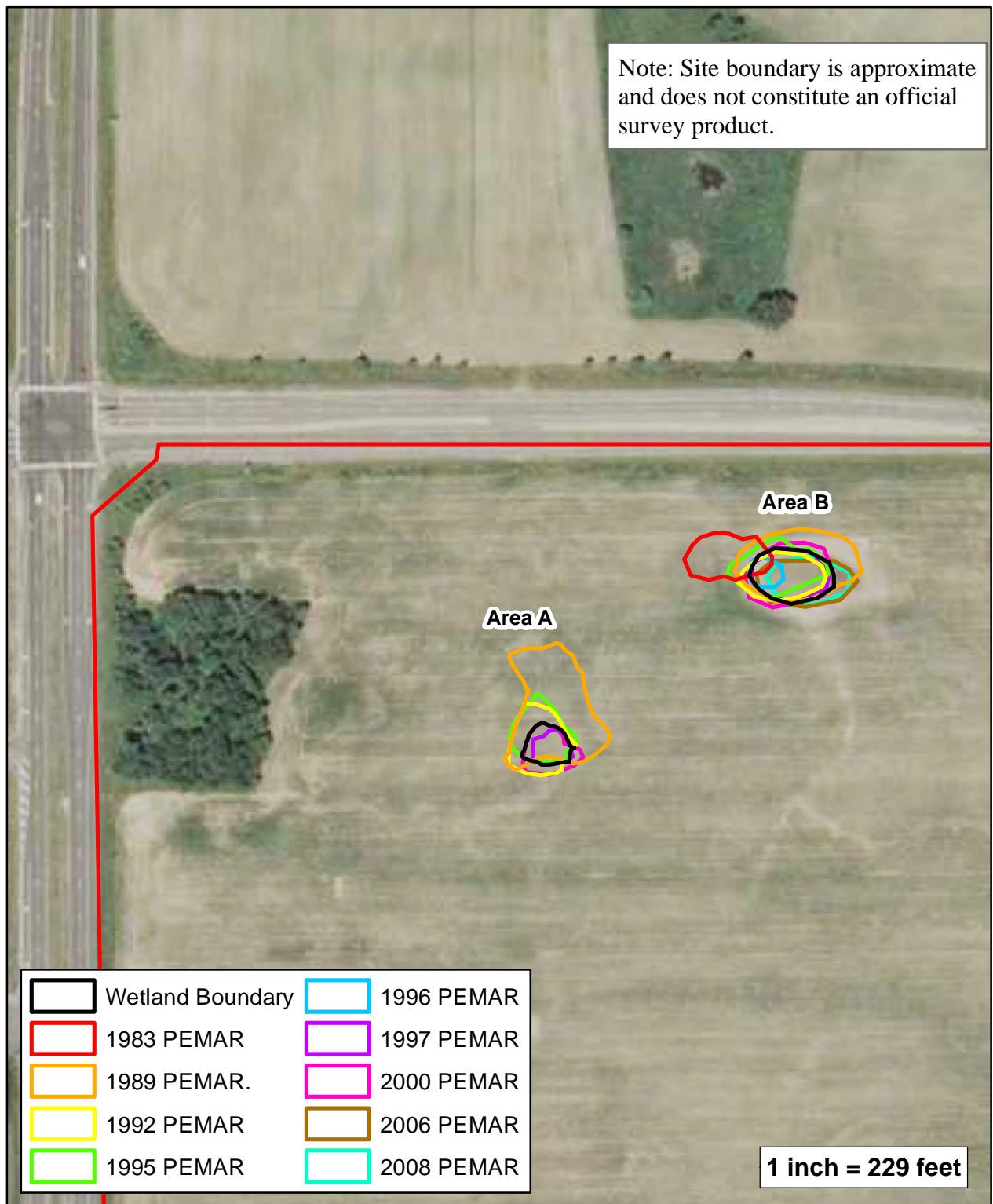




Figure 6 - FSA Review Areas (2013 FSA Photograph)



FSA Aerial Wetland Signatures - (2013 FSA Photograph)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota



Inwood Ave North

Wetland Delineation Report

Appendix A: Data Forms

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Inwood Ave N City/County: Lake Elmo Sampling Date: 6/17/14
Applicant/Owner: Hans Hagen State: MN Sampling Point: 1-1U
Investigator(s): M Lauterbach-Barrett, A Krinke Section, Township, Range: S33 T29 R21
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None
Slope (%): 2 to 3 Lat.: _____ Long.: _____ Datum: _____
Soil Map Unit Name: Freeon silt loam NWI Classification: PEM1A1
Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
Are vegetation X, soil _____, or hydrology _____ significantly disturbed? Are "normal
Are vegetation _____, soil _____, or hydrology _____ naturally problematic? circumstances" present? No
(If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	<u>N</u>	Is the sampled area within a wetland? <u>N</u>
Hydric soil present?	<u>N</u>	
Indicators of wetland hydrology present?	<u>N</u>	
Remarks: (Explain alternative procedures here or in a separate report.)		
Climatic conditions wetter than normal based on 30-day rolling precipitation average. Cropping considered not normal circumstances, hence vegetation is disturbed.		

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living	<input type="checkbox"/> Clayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Inundation Visible on Aerial	<input type="checkbox"/> Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
Field Observations:		Indicators of wetland hydrology present? <u>N</u>
Surface water present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Water table present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	(includes capillary fringe)	
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION - Use scientific names of plants

Sampling Point: <u>1-1U</u>				
50/20 Thresholds				
Tree Stratum	Plot Size (<u>30</u>)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10		<u>0</u> = Total Cover		
Sapling/Shrub Stratum	Plot Size (<u>15</u>)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10		<u>0</u> = Total Cover		
Herb Stratum	Plot Size (<u>5</u>)	Absolute % Cover	Dominant Species	Indicator Status
1	<u>Panicum virgatum</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>
2	<u>Chenopodium album</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15		<u>45</u> = Total Cover		
Woody Vine Stratum	Plot Size (<u>30</u>)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		<u>0</u> = Total Cover		
Remarks: (Include photo numbers here or on a separate sheet)				

50/20 Thresholds	
Tree Stratum	20% 50%
Sapling/Shrub Stratum	0 0
Herb Stratum	9 23
Woody Vine Stratum	0 0

Dominance Test Worksheet	
Number of Dominant Species that are OBL, FACW, or FAC: <u>1</u> (A)	
Total Number of Dominant Species Across all Strata: <u>2</u> (B)	
Percent of Dominant Species that are OBL, FACW, or FAC: <u>50.00%</u> (A/B)	

Prevalence Index Worksheet	
Total % Cover of:	
OBL species	0 x 1 = 0
FACW species	0 x 2 = 0
FAC species	30 x 3 = 90
FACU species	15 x 4 = 60
UPL species	0 x 5 = 0
Column totals	45 (A) 150 (B)
Prevalence Index = B/A = <u>3.33</u>	

Hydrophytic Vegetation Indicators:	
Rapid test for hydrophytic vegetation	
Dominance test is >50%	
Prevalence index is <3.0*	
Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)	
Problematic hydrophytic vegetation* (explain)	
*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic	

Definitions of Vegetation Strata:	
Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
Woody vines - All woody vines greater than 3.28 ft in height.	

Hydrophytic vegetation present?	<u>N</u>
---------------------------------	----------

SOIL

Sampling Point: 1-1U

[illegible]

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

Indicators for Problematic Hydric Soils:

- | | | |
|--------------------------------------|------------------------------|---|
| Histosoil (A1) | Polyvalue Below Surface (S8) | 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| Histic Epipedon (A2) | (S8) (LRR R, MLRA 149B) | Coast Prairie Redox (A16) (LRR K, L, R) |
| Black Histic (A3) | Thin Dark Surface (S9) | 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| Hydrogen Sulfide (A4) | (LRR R, MLRA 149B) | Dark Surface (S7) (LRR K, L) |
| Stratified Layers (A5) | Loamy Mucky Mineral (F1) | Polyvalue Below Surface (S8) (LRR K, L) |
| Depleted Below Dark Surface (A11) | (LRR K, L) | Thin Dark Surface (S9) (LRR K, L) |
| Thick Dark Surface (A12) | Loamy Gleyed Matrix (F2) | Iron-Manganese Masses (F12) (LRR K, L, R) |
| Sandy Mucky Mineral (S1) | Depleted Matrix (F3) | Piedmont Floodplain Soils (F19) (MLRA 149B) |
| Sandy Gleyed Matrix (S4) | Redox Dark Surface (F6) | Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| Sandy Redox (S5) | Depleted Dark Surface (F7) | Red Parent Material (F21) |
| Stripped Matrix (S6) | Redox Depressions (F8) | Very Shallow Dark Surface (TF12) |
| Dark Surface (S7) (LRR R, MLRA 149B) | | Other (Explain in Remarks) |

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Inwood Ave N City/County: Lake Elmo Sampling Date: 6/17/14
 Applicant/Owner: Hans Hagen State: MN Sampling Point: 1-1W
 Investigator(s): M Lauterbach-Barrett, A Krinke Section, Township, Range: S33 T29 R21
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave
 Slope (%): 1 to 2 Lat.: Long.: Datum:
 Soil Map Unit Name: Freeon silt loam NWI Classification: PEM1A1
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation X, soil , or hydrology significantly disturbed? Are "normal
 Are vegetation , soil , or hydrology naturally problematic? circumstances" present? No
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	<u>Y</u>	Is the sampled area within a wetland? <u>Y</u>
Hydric soil present?	<u>Y</u>	
Indicators of wetland hydrology present?	<u>Y</u>	
Remarks: (Explain alternative procedures here or in a separate report.)		
Climatic conditions wetter than normal based on 30-day rolling precipitation average. Cropping considered not normal circumstances, hence vegetation is disturbed.		

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Roots (C3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Recent Iron Reduction in Tilled <input type="checkbox"/> Inundation Visible on Aerial <input type="checkbox"/> Soils (C6) <input type="checkbox"/> Imagery (B7) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Sparsely Vegetated Concave <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface (B8)		Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)
Field Observations: Surface water present? Yes <u></u> No <u>X</u> Depth (inches): <u></u> Water table present? Yes <u>X</u> No <u></u> Depth (inches): <u>4</u> Saturation present? Yes <u>X</u> No <u></u> Depth (inches): <u>6</u> (includes capillary fringe)		Indicators of wetland hydrology present? <u>Y</u>
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION - Use scientific names of plants

					Sampling Point: <u>1-1W</u>
					50/20 Thresholds Tree Stratum <u>20%</u> <u>50%</u> Sapling/Shrub Stratum <u>0</u> <u>0</u> Herb Stratum <u>14</u> <u>35</u> Woody Vine Stratum <u>0</u> <u>0</u>
Tree Stratum	Plot Size (<u>30</u>)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across all Strata: <u>1</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1					Prevalence Index Worksheet Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>70</u> x 3 = <u>210</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>70</u> (A) <u>210</u> (B) Prevalence Index = B/A = <u>3.00</u>
2					
3					
4					
5					
6					
7					
8					
9					
10		<u>0</u> = Total Cover			
Sapling/Shrub Stratum	Plot Size (<u>15</u>)	Absolute % Cover	Dominant Species	Indicator Status	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10		<u>0</u> = Total Cover			
Herb Stratum	Plot Size (<u>5</u>)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators: Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) Problematic hydrophytic vegetation* (explain) <small>*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic</small>
1	<u>Panicum capillare</u>	<u>65</u>	<u>Y</u>	<u>FAC</u>	
2	<u>Populus deltoides</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15		<u>70</u> = Total Cover			
Woody Vine Stratum	Plot Size (<u>30</u>)	Absolute % Cover	Dominant Species	Indicator Status	Definitions of Vegetation Strata: Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines - All woody vines greater than 3.28 ft in height.
1					
2					
3					
4					
5		<u>0</u> = Total Cover			
Remarks: (Include photo numbers here or on a separate sheet)					Hydrophytic vegetation present? <u>Y</u>

SOIL

Sampling Point: 1-1W

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Inwood Ave N City/County: Lake Elmo Sampling Date: 6/17/14
 Applicant/Owner: Hans Hagen State: MN Sampling Point: 2-1U
 Investigator(s): M Lauterbach-Barrett, A Krinke Section, Township, Range: S33 T29 R21
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None
 Slope (%): 1 to 3 Lat.: Long.: Datum:
 Soil Map Unit Name: Freeson silt loam NWI Classification: PEM1A
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation X, soil, or hydrology significantly disturbed? Are "normal
 Are vegetation, soil, or hydrology naturally problematic? circumstances" present? No
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	Is the sampled area within a wetland?	N
Hydric soil present?	N		
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	
Remarks: (Explain alternative procedures here or in a separate report.)			
Climatic conditions wetter than normal based on 30-day rolling precipitation average. Cropping considered not normal circumstances, hence vegetation is disturbed.			

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
Surface Water (A1)	Water-Stained Leaves (B9)	Surface Soil Cracks (B6)	
High Water Table (A2)	Aquatic Fauna (B13)	Drainage Patterns (B10)	
Saturation (A3)	Marl Deposits (B15)	Moss Trim Lines (B16)	
Water Marks (B1)	Hydrogen Sulfide Odor (C1)	Dry-Season Water Table (C2)	
Sediment Deposits (B2)	Oxidized Rhizospheres on Living	Crayfish Burrows (C8)	
Drift Deposits (B3)	Roots (C3)	Saturation Visible on Aerial Imagery	
Algal Mat or Crust (B4)	Presence of Reduced Iron (C4)	(C9)	
Iron Deposits (B5)	Recent Iron Reduction in Tilled	Stunted or Stressed Plants (D1)	
Inundation Visible on Aerial	Soils (C6)	Geomorphic Position (D2)	
Imagery (B7)	Thin Muck Surface (C7)	Shallow Aquitard (D3)	
Sparsely Vegetated Concave	Other (Explain in Remarks)	FAC-Neutral Test (D5)	
Surface (B8)		Microtopographic Relief (D4)	
Field Observations:		Indicators of wetland hydrology present? N	
Surface water present?	Yes No X Depth (inches):		
Water table present?	Yes No X Depth (inches):		
Saturation present?	Yes No X Depth (inches): 14		
(includes capillary fringe)			
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION - Use scientific names of plants

Tree Stratum Plot Size (30) Absolute % Cover Dominant Species Indicator Status					Sampling Point: 2-1U		
1	Picea pungens	15	Y	FACU	50/20 Thresholds		
2	Populus tremuloides	5	Y	FAC	Tree Stratum	20%	50%
3					Sapling/Shrub Stratum	5	13
4					Herb Stratum	31	78
5					Woody Vine Stratum	1	3
6					Dominance Test Worksheet		
7					Number of Dominant Species that are OBL,		
8					FACW, or FAC: 4 (A)		
9					Total Number of Dominant Species Across all Strata: 7 (B)		
10		20	=	Total Cover	Percent of Dominant Species that are OBL, FACW, or FAC: 57.14% (A/B)		
Sapling/Shrub Stratum Plot Size (15) Absolute % Cover Dominant Species Indicator Status					Prevalence Index Worksheet		
1	Fraxinus pennsylvanica	15	Y	FACW	Total % Cover of:		
2	Cornus alba	10	Y	FACW	OBL species 0 x 1 = 0		
3					FACW species 35 x 2 = 70		
4					FAC species 10 x 3 = 30		
5					FACU species 160 x 4 = 640		
6					UPL species 0 x 5 = 0		
7					Column totals 205 (A) 740 (B)		
8					Prevalence Index = B/A = 3.61		
9					Hydrophytic Vegetation Indicators:		
10		25	=	Total Cover	Rapid test for hydrophytic vegetation		
Herb Stratum Plot Size (5) Absolute % Cover Dominant Species Indicator Status					X Dominance test is >50%		
1	Poa pratensis	90	Y	FACU	Prevalence index is ≤3.0"		
2	Solidago canadensis	50	Y	FACU	Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)		
3	Phalaris arundinacea	10	N	FACW	Problematic hydrophytic vegetation* (explain)		
4	Trifolium pratense	5	N	FACU	*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic		
5					Definitions of Vegetation Strata:		
6					Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.		
7					Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.		
8					Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.		
9					Woody vines - All woody vines greater than 3.28 ft in height.		
10					Hydrophytic vegetation present? Y		
Remarks: (Include photo numbers here or on a separate sheet)							

SOIL

Sampling Point: 2-1U

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Inwood Ave N City/County: Lake Elmo Sampling Date: 6/17/14
 Applicant/Owner: Hans Hagen State: MN Sampling Point: 2-1W
 Investigator(s): M Lauterbach-Barrett, A Krinke Section, Township, Range: S33 T29 R21
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): None
 Slope (%): 0 to 1 Lat.: Long.: Datum:
 Soil Map Unit Name: Freon silt loam NWI Classification: PEM1A
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation, soil, or hydrology significantly disturbed? Are "normal"
 Are vegetation, soil, or hydrology naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	<u>Y</u>	Is the sampled area within a wetland? <u>Y</u>
Hydric soil present?	<u>Y</u>	
Indicators of wetland hydrology present?	<u>Y</u>	
Remarks: (Explain alternative procedures here or in a separate report.)		
Climatic conditions wetter than normal based on 30-day rolling precipitation average.		

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living	<input type="checkbox"/> Clayfish Burrows (C8)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Inundation Visible on Aerial	<input type="checkbox"/> Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Sparsely Vegetated Concave	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)	
Field Observations:		Indicators of wetland hydrology present? <u>Y</u>	
Surface water present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u>Surface</u>		
Water table present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>Surface</u>		
Saturation present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>Surface</u>		
(includes capillary fringe)			
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION - Use scientific names of plants

Tree Stratum					Plot Size (30)	Absolute % Cover	Dominant Species	Indicator Status	Sampling Point: 2-1W
1	<i>Fraxinus pennsylvanica</i>	20	Y	FACW	50/20 Thresholds				
2					Tree Stratum 20% 50%				
3					Sapling/Shrub Stratum 4 10				
4					Herb Stratum 3 8				
5					Woody Vine Stratum 1 3				
6					Dominance Test Worksheet				
7					Number of Dominant Species that are OBL,				
8					FACW, or FAC: <u>4</u> (A)				
9					Total Number of Dominant Species Across all Strata: <u>6</u> (B)				
10		20	=	Total Cover	Percent of Dominant Species that are OBL, FACW, or FAC: <u>66.67%</u> (A/B)				
Sapling/Shrub Stratum					Plot Size (15)	Absolute % Cover	Dominant Species	Indicator Status	
1	<i>Fraxinus pennsylvanica</i>	15	Y	FACW	Prevalence Index Worksheet				
2					Total % Cover of:				
3					OBL species 0 x 1 = 0				
4					FACW species 110 x 2 = 220				
5					FAC species 0 x 3 = 0				
6					FACU species 50 x 4 = 200				
7					UPL species 0 x 5 = 0				
8					Column totals 160 (A) 420 (B)				
9					Prevalence Index = B/A = <u>2.63</u>				
10		15	=	Total Cover	Hydrophytic Vegetation Indicators:				
Herb Stratum					Plot Size (5)	Absolute % Cover	Dominant Species	Indicator Status	
1	<i>Poa pratensis</i>	45	Y	FACU	Rapid test for hydrophytic vegetation				
2	<i>Phalaris arundinacea</i>	40	Y	FACW	<input checked="" type="checkbox"/> Dominance test is >50"				
3	<i>Solidago gigantea</i>	30	Y	FACW	<input checked="" type="checkbox"/> Prevalence index is ≤3.0"				
4	<i>Equisetum pratense</i>	5	N	FACW	Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)				
5					Problematic hydrophytic vegetation* (explain)				
6					*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic				
7					Definitions of Vegetation Strata:				
8					Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.				
9					Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.				
10					Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.				
11					Woody vines - All woody vines greater than 3.28 ft in height.				
12					Hydrophytic vegetation present? <u>Y</u>				
13					Remarks: (Include photo numbers here or on a separate sheet)				
14									
15		120	=	Total Cover					
Woody Vine Stratum					Plot Size (30)	Absolute % Cover	Dominant Species	Indicator Status	
1	<i>Parthenocissus vitacea</i>	5	Y	FACU					
2									
3									
4									
5		5	=	Total Cover					

SOIL

Sampling Point: 2-1W

[illegible]

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

Indicators for Problematic Hydric Soils:

- | | | | |
|---|--------------------------------------|------------------------------|---|
| — | Histosoil (A1) | Polyvalue Below Surface (S8) | 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| — | Histic Epipedon (A2) | (S8) (LRR R, MLRA 149B) | Coast Prairie Redox (A16) (LRR K, L, R) |
| — | Black Histic (A3) | Thin Dark Surface (S9) | 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| — | Hydrogen Sulfide (A4) | (LRR R, MLRA 149B) | Dark Surface (S7) (LRR K, L) |
| — | Stratified Layers (A5) | Loamy Mucky Mineral (F1) | Polyvalue Below Surface (S8) (LRR K, L) |
| X | Depleted Below Dark Surface (A11) | (LRR K, L) | Thin Dark Surface (S9) (LRR K, L) |
| — | Thick Dark Surface (A12) | Loamy Gleyed Matrix (F2) | Iron-Manganese Masses (F12) (LRR K, L, R) |
| — | Sandy Mucky Mineral (S1) | Depleted Matrix (F3) | Piedmont Floodplain Soils (F19) (MLRA 149B) |
| — | Sandy Gleyed Matrix (S4) | Redox Dark Surface (F6) | Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| — | Sandy Redox (S5) | Depleted Dark Surface (F7) | Red Parent Material (F21) |
| — | Stripped Matrix (S6) | Redox Depressions (F8) | Very Shallow Dark Surface (TF12) |
| — | Dark Surface (S7) (LRR R, MLRA 149B) | | Other (Explain in Remarks) |

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches):

Hydric soil present? Y

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Inwood Ave N City/County: Lake Elmo Sampling Date: 7/2/14
Applicant/Owner: Hans Hagen State: MN Sampling Point: 3-1U
Investigator(s): M Lauterbach-Barrett, A Krinke Section, Township, Range: S33 T29 R21
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None
Slope (%): 1 to 2 Lat.: Long.: Datum:
Soil Map Unit Name: Freeson silt loam NWI Classification: PEM1A
Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
Are vegetation X, soil, or hydrology significantly disturbed? Are "normal
Are vegetation, soil, or hydrology naturally problematic? circumstances" present? No
(If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	N	Is the sampled area within a wetland?	N
Hydric soil present?	N		
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Climatic conditions wetter than normal based on 30-day rolling precipitation average. Cropping considered not normal circumstances, hence vegetation is disturbed.

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9)	Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13)	Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B15)	Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1)	Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living	Crayfish Burrows (C8)
Drift Deposits (B3) Roots (C3)	Saturation Visible on Aerial Imagery
Algal Mat or Crust (B4) Presence of Reduced Iron (C4)	(C9)
Iron Deposits (B5) Recent Iron Reduction in Tilled	Stunted or Stressed Plants (D1)
Inundation Visible on Aerial	Soils (C6)
Imagery (B7) Thin Muck Surface (C7)	Geomorphic Position (D2)
Sparsely Vegetated Concave	Shallow Aquitard (D3)
Surface (B8) Other (Explain in Remarks)	FAC-Neutral Test (D5)
	Microtopographic Relief (D4)

Field Observations:		Indicators of wetland hydrology present?	N
Surface water present? Yes No X Depth (inches):			
Water table present? Yes No X Depth (inches):			
Saturation present? Yes No X Depth (inches):			
(includes capillary fringe)			

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants

Sampling Point: 3-1U				
50/20 Thresholds				
Tree Stratum	Plot Size (30)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10		0 = Total Cover		
Sapling/Shrub Stratum	Plot Size (15)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10		0 = Total Cover		
Herb Stratum	Plot Size (5)	Absolute % Cover	Dominant Species	Indicator Status
1	Chenopodium album	15	Y	FACU
2	Panicum capillare	5	Y	FAC
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15		20 = Total Cover		
Woody Vine Stratum	Plot Size (30)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		0 = Total Cover		

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: 3-1U

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Inwood Ave N City/County: Lake Elmo Sampling Date: 7/2/14
Applicant/Owner: Hans Hagen State: MN Sampling Point: 3-1W
Investigator(s): M Lauterbach-Barrett, A Krinke Section, Township, Range: S33 T29 R21
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave
Slope (%): 1 to 3 Lat.: Long.: Datum:
Soil Map Unit Name: Freeson silt loam NWI Classification: PEM1A
Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
Are vegetation X, soil, or hydrology significantly disturbed? Are "normal
Are vegetation, soil, or hydrology naturally problematic? circumstances" present? No
(If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	Is the sampled area within a wetland? Y
Hydric soil present?	Y	
Indicators of wetland hydrology present?	Y	
Remarks: (Explain alternative procedures here or in a separate report.)		
Climatic conditions wetter than normal based on 30-day rolling precipitation average. Cropping considered not normal circumstances, hence vegetation is disturbed.		

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
Surface Water (A1)	Water-Stained Leaves (B9)	Surface Soil Cracks (B6)	
X High Water Table (A2)	Aquatic Fauna (B13)	Drainage Patterns (B10)	
X Saturation (A3)	Marl Deposits (B15)	Moss Trim Lines (B16)	
Water Marks (B1)	Hydrogen Sulfide Odor (C1)	Dry-Season Water Table (C2)	
Sediment Deposits (B2)	Oxidized Rhizospheres on Living	Crayfish Burrows (C8)	
Drift Deposits (B3)	Roots (C3)	Saturation Visible on Aerial Imagery	
Algal Mat or Crust (B4)	Presence of Reduced Iron (C4)	(C9)	
Iron Deposits (B5)	Recent Iron Reduction in Tilled	Stunted or Stressed Plants (D1)	
Inundation Visible on Aerial	Soils (C6)	X Geomorphic Position (D2)	
Imagery (B7)	Thin Muck Surface (C7)	Shallow Aquitard (D3)	
Sparsely Vegetated Concave	Other (Explain in Remarks)	FAC-Neutral Test (D5)	
Surface (B8)		Microtopographic Relief (D4)	
Field Observations:		Indicators of wetland hydrology present? Y	
Surface water present?	Yes No X Depth (inches):		
Water table present?	Yes X No Depth (inches): 12		
Saturation present?	Yes X No Depth (inches): Surface		
(includes capillary fringe)			
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION - Use scientific names of plants

Sampling Point: 3-1W				
50/20 Thresholds				
Tree Stratum	Plot Size (30)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10		0 = Total Cover		
Sapling/Shrub Stratum	Plot Size (15)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10		0 = Total Cover		
Herb Stratum	Plot Size (5)	Absolute % Cover	Dominant Species	Indicator Status
1	Panicum capillare	60	Y	FAC
2	Populus deltoides	5	N	FAC
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15		65 = Total Cover		
Woody Vine Stratum	Plot Size (30)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		0 = Total Cover		
Remarks: (Include photo numbers here or on a separate sheet)				

50/20 Thresholds		
Tree Stratum	20%	50%
Sapling/Shrub Stratum	0	0
Herb Stratum	13	33
Woody Vine Stratum	0	0
Dominance Test Worksheet		
Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)		
Total Number of Dominant Species Across all Strata: 1 (B)		
Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)		
Prevalence Index Worksheet		
Total % Cover of:		
OBL species	0 x 1 =	0
FACW species	0 x 2 =	0
FAC species	65 x 3 =	195
FACU species	0 x 4 =	0
UPL species	0 x 5 =	0
Column totals	65 (A)	195 (B)
Prevalence Index = B/A = 3.00		
Hydrophytic Vegetation Indicators:		
Rapid test for hydrophytic vegetation		
X Dominance test is >50%		
X Prevalence index is ≤3.0*		
Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)		
Problematic hydrophytic vegetation* (explain)		
*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic		
Definitions of Vegetation Strata:		
Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.		
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.		
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.		
Woody vines - All woody vines greater than 3.28 ft in height.		
Hydrophytic vegetation present? Y		

SOIL

Sampling Point: 3-1W

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Inwood Ave N City/County: Lake Elmo Sampling Date: 6/17/14
Applicant/Owner: Hans Hagen State: MN Sampling Point: SP-A
Investigator(s): M Lauterbach-Barrett, A Krinke Section, Township, Range: S33 T29 R21
Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave
Slope (%): 0 to 1 Lat.: Long.: Datum:
Soil Map Unit Name: Freeson silt loam NWI Classification: None
Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
Are vegetation X, soil, or hydrology significantly disturbed? Are "normal
Are vegetation, soil, or hydrology naturally problematic? circumstances" present? No
(If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	N	Is the sampled area within a wetland?	N
Hydric soil present?	N		
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	
Remarks: (Explain alternative procedures here or in a separate report.)			
Climatic conditions wetter than normal based on 30-day rolling precipitation average. Cropping considered not normal circumstances, hence vegetation is disturbed.			

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9)	Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13)	Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B15)	Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1)	Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living	Crayfish Burrows (C8)
Drift Deposits (B3) Roots (C3)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Presence of Reduced Iron (C4)	Stunted or Stressed Plants (D1)
Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7)	Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) Other (Explain in Remarks)	FAC-Neutral Test (D5)
	Microtopographic Relief (D4)
Field Observations:	Indicators of wetland hydrology present? N
Surface water present? Yes No X Depth (inches):	
Water table present? Yes No X Depth (inches):	
Saturation present? Yes No X Depth (inches): (includes capillary fringe)	
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION - Use scientific names of plants

Sampling Point: SP-A				
50/20 Thresholds				
Tree Stratum	Plot Size (30)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10		0 = Total Cover		
Sapling/Shrub Stratum	Plot Size (15)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10		0 = Total Cover		
Herb Stratum	Plot Size (5)	Absolute % Cover	Dominant Species	Indicator Status
1	Panicum virgatum	50	Y	FAC
2	Arctium minus	35	Y	FACU
3	Urtica dioica	20	N	FAC
4	Chenopodium album	10	N	FACU
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15		115 = Total Cover		
Woody Vine Stratum	Plot Size (30)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		0 = Total Cover		
Remarks: (Include photo numbers here or on a separate sheet)				

50/20 Thresholds		
Tree Stratum	20%	50%
Sapling/Shrub Stratum	0	0
Herb Stratum	23	58
Woody Vine Stratum	0	0
Dominance Test Worksheet		
Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)		
Total Number of Dominant Species Across all Strata: 2 (B)		
Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)		
Prevalence Index Worksheet		
Total % Cover of:		
OBL species	0 x 1 =	0
FACW species	0 x 2 =	0
FAC species	70 x 3 =	210
FACU species	45 x 4 =	180
UPL species	0 x 5 =	0
Column totals	115 (A)	390 (B)
Prevalence Index = B/A = 3.39		
Hydrophytic Vegetation Indicators:		
Rapid test for hydrophytic vegetation		
Dominance test is >50%		
Prevalence index is <3.0*		
Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)		
Problematic hydrophytic vegetation* (explain)		
*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic		
Definitions of Vegetation Strata:		
Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.		
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.		
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.		
Woody vines - All woody vines greater than 3.28 ft in height.		
Hydrophytic vegetation present? N		

SOIL

Sampling Point: SP-A

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Inwood Ave N City/County: Lake Elmo Sampling Date: 6/17/14
Applicant/Owner: Hans Hagen State: MN Sampling Point: SP-B
Investigator(s): M Lauterbach-Barrett, A Krinke Section, Township, Range: S33 T29 R21
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex
Slope (%): 2 to 3 Lat.: Long.: Datum:
Soil Map Unit Name: Freeson silt loam NWI Classification: None
Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
Are vegetation X, soil, or hydrology significantly disturbed? Are "normal
Are vegetation, soil, or hydrology naturally problematic? circumstances" present? No
(If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	N	Is the sampled area within a wetland?	N
Hydric soil present?	N		
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	
Remarks: (Explain alternative procedures here or in a separate report.)			
Climatic conditions wetter than normal based on 30-day rolling precipitation average. Cropping considered not normal circumstances, hence vegetation is disturbed.			

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
Surface Water (A1)	Water-Stained Leaves (B9)
High Water Table (A2)	Aquatic Fauna (B13)
Saturation (A3)	Marl Deposits (B15)
Water Marks (B1)	Hydrogen Sulfide Odor (C1)
Sediment Deposits (B2)	Oxidized Rhizospheres on Living
Drift Deposits (B3)	Roots (C3)
Algal Mat or Crust (B4)	Presence of Reduced Iron (C4)
Iron Deposits (B5)	Recent Iron Reduction in Tilled
Inundation Visible on Aerial	Soils (C6)
Imagery (B7)	Thin Muck Surface (C7)
Sparsely Vegetated Concave	Other (Explain in Remarks)
Surface (B8)	

Field Observations:	
Surface water present? Yes No X Depth (inches):	Indicators of wetland hydrology present? N
Water table present? Yes No X Depth (inches):	
Saturation present? Yes No X Depth (inches): (includes capillary fringe)	

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants

Sampling Point: SP-B				
50/20 Thresholds				
Tree Stratum	Plot Size (30)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10		0 = Total Cover		
Sapling/Shrub Stratum	Plot Size (15)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10		0 = Total Cover		
Herb Stratum	Plot Size (5)	Absolute % Cover	Dominant Species	Indicator Status
1	Chenopodium album	10	Y	FACU
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15		10 = Total Cover		
Woody Vine Stratum	Plot Size (30)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		0 = Total Cover		
Remarks: (Include photo numbers here or on a separate sheet)				

SOIL

Sampling Point: SP-B

[illegible]

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

Indicators for Problematic Hydric Soils:

- | | | |
|--------------------------------------|------------------------------|---|
| Histosoil (A1) | Polyvalue Below Surface (S8) | 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| Histic Epipedon (A2) | (S8) (LRR R, MLRA 149B) | Coast Prairie Redox (A16) (LRR K, L, R) |
| Black Histic (A3) | Thin Dark Surface (S9) | 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| Hydrogen Sulfide (A4) | (LRR R, MLRA 149B) | Dark Surface (S7) (LRR K, L) |
| Stratified Layers (A5) | Loamy Mucky Mineral (F1) | Polyvalue Below Surface (S8) (LRR K, L) |
| Depleted Below Dark Surface (A11) | (LRR K, L) | Thin Dark Surface (S9) (LRR K, L) |
| Thick Dark Surface (A12) | Loamy Gleyed Matrix (F2) | Iron-Manganese Masses (F12) (LRR K, L, R) |
| Sandy Mucky Mineral (S1) | Depleted Matrix (F3) | Piedmont Floodplain Soils (F19) (MLRA 149B) |
| Sandy Gleyed Matrix (S4) | Redox Dark Surface (F6) | Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| Sandy Redox (S5) | Depleted Dark Surface (F7) | Red Parent Material (F21) |
| Stripped Matrix (S6) | Redox Depressions (F8) | Very Shallow Dark Surface (TF12) |
| Dark Surface (S7) (LRR R, MLRA 149B) | | Other (Explain in Remarks) |

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches):

Hydric soil present? N

Remarks:

Inwood Ave North

Wetland Delineation Report

Appendix B: Precipitation Data

Inwood Ave, Lake Elmo: Precipitation Summary

Source: Minnesota Climatology Working Group

Monthly Totals: 2014

Target: T29 R21 S33, Lat: 44.95597 Lon: 92.93401

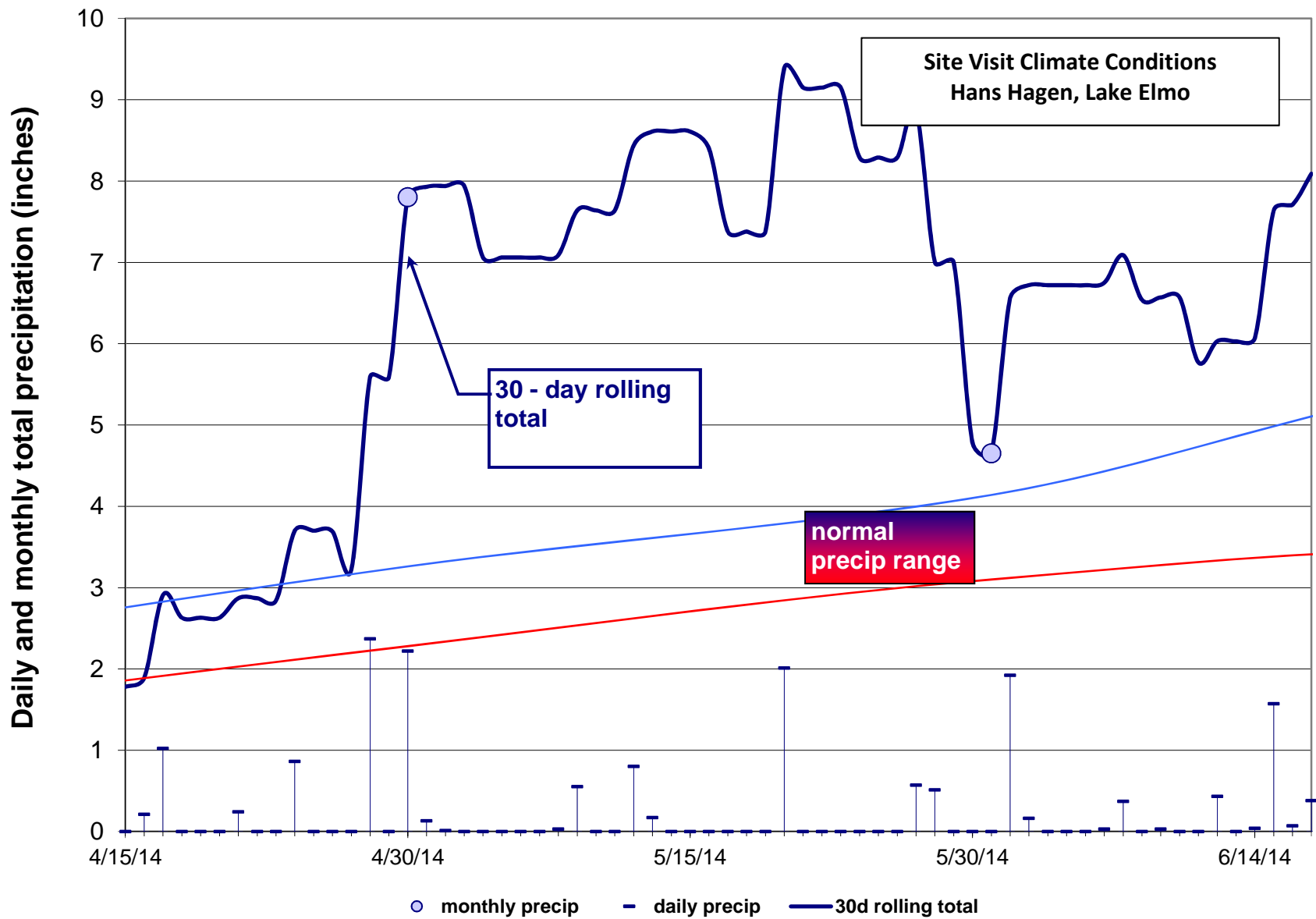
mon	year	cc	tttN	rrW	ss	nnnn	oooooooo	pre
Jan	2014	82	29N	21W	32	SWCD		1.31
Feb	2014	82	29N	21W	32	SWCD		1.10
Mar	2014	82	29N	21W	32	SWCD		.90
Apr	2014	82	29N	21W	32	SWCD		7.80
May	2014	82	29N	21W	32	SWCD		4.78

April/May/June Daily Records

Date	Precip.	Date	Precip.	Date	Precip.
Apr 1, 2014	T	May 1, 2014	.13	Jun 1, 2014	1.92
Apr 2, 2014	0	May 2, 2014	.01	Jun 2, 2014	.16
Apr 3, 2014	T	May 3, 2014	-	Jun 3, 2014	0
Apr 4, 2014	.88	May 4, 2014	-	Jun 4, 2014	0
Apr 5, 2014	0	May 5, 2014	T	Jun 5, 2014	0
Apr 6, 2014	0	May 6, 2014	0	Jun 6, 2014	.03
Apr 7, 2014	0	May 7, 2014	0	Jun 7, 2014	.37
Apr 8, 2014	0	May 8, 2014	.03	Jun 8, 2014	0
Apr 9, 2014	0	May 9, 2014	.55	Jun 9, 2014	.03
Apr 10, 2014	0	May 10, 2014	-	Jun 10, 2014	0
Apr 11, 2014	0	May 11, 2014	-	Jun 11, 2014	0
Apr 12, 2014	-	May 12, 2014	.80	Jun 12, 2014	.43
Apr 13, 2014	-	May 13, 2014	.17	Jun 13, 2014	0
Apr 14, 2014	-	May 14, 2014	0	Jun 14, 2014	.04
Apr 15, 2014	-	May 15, 2014	0	Jun 15, 2014	1.57
Apr 16, 2014	.21	May 16, 2014	0	Jun 16, 2014	.07
Apr 17, 2014	1.02	May 17, 2014	0	Jun 17, 2014	.38 site visit
Apr 18, 2014	0	May 18, 2014	0		
Apr 19, 2014	-	May 19, 2014	0		
Apr 20, 2014	-	May 20, 2014	2.01		
Apr 21, 2014	.24	May 21, 2014	0		
Apr 22, 2014	0	May 22, 2014	0		
Apr 23, 2014	-	May 23, 2014	0		
Apr 24, 2014	.86	May 24, 2014	0		
Apr 25, 2014	0	May 25, 2014	0		
Apr 26, 2014	-	May 26, 2014	0		
Apr 27, 2014	-	May 27, 2014	.57		
Apr 28, 2014	2.37	May 28, 2014	.51		
Apr 29, 2014	-	May 29, 2014	0		
Apr 30, 2014	2.22	May 30, 2014	0		
		May 31, 2014	-		

1981-2010 Summary Statistics

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
30%	0.56	0.55	1.43	2.28	3.10	3.44	2.47	3.29	2.55	1.74	1.14	0.72	18.88	30.90	29.16
70%	1.34	1.05	2.22	3.26	4.14	5.61	4.73	5.21	4.31	3.55	2.42	1.62	21.59	35.13	35.44
mean	0.99	0.85	1.92	2.80	3.79	4.58	4.00	4.43	3.54	2.90	1.94	1.30	20.34	33.04	32.84



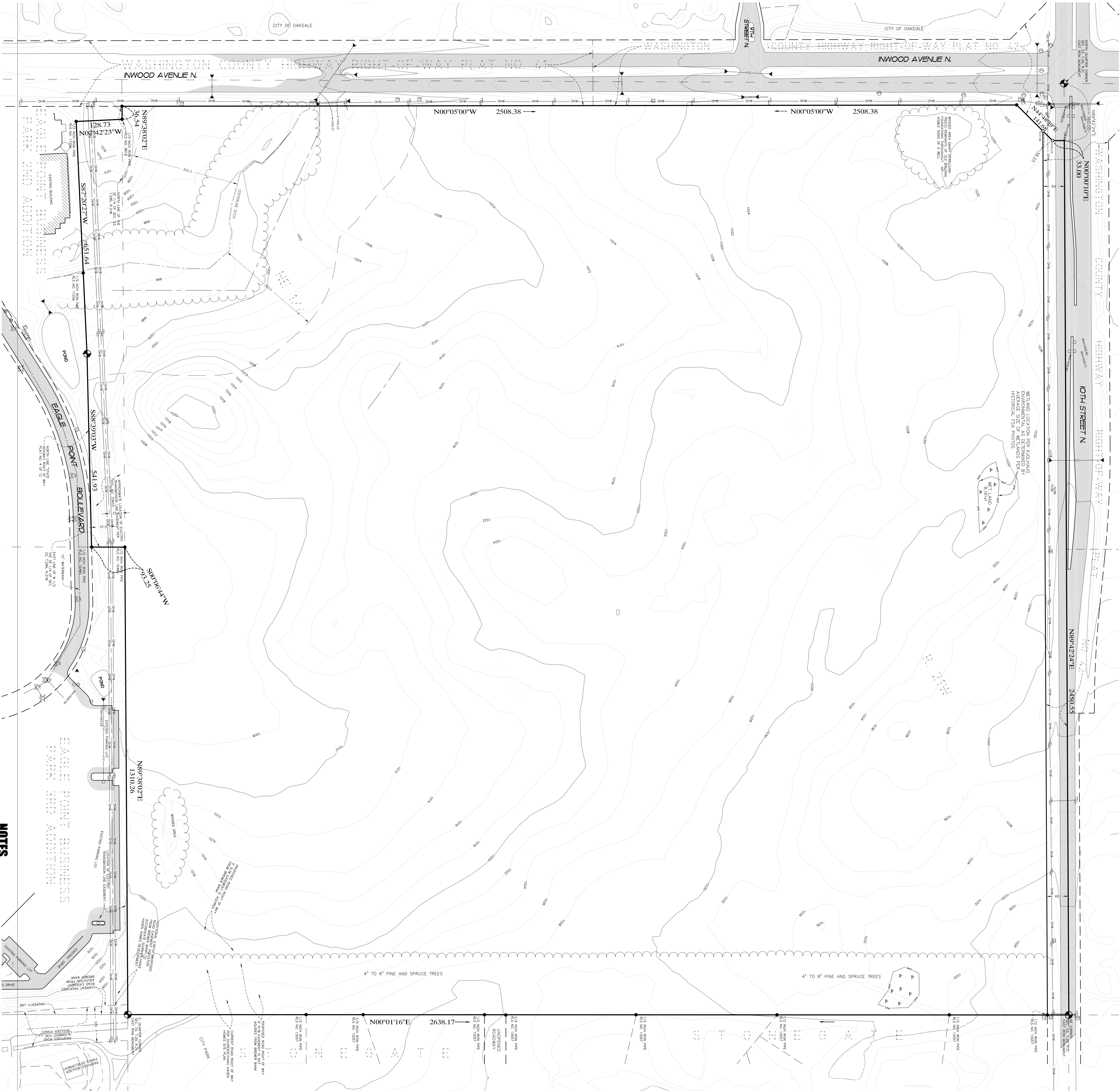
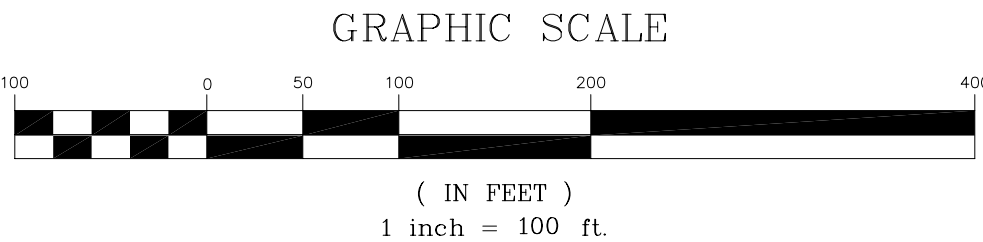
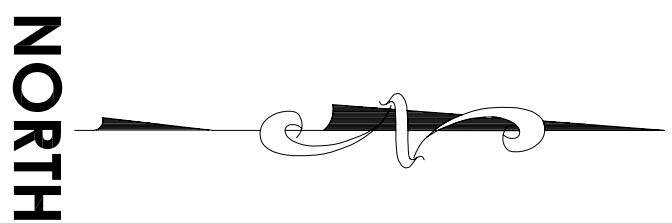
Inwood Ave North

Wetland Delineation Report

Appendix C: Wetland Boundary Survey

CONCEPTUAL LAYOUT

~for~ HANS HAGEN HOMES, INC.



PROPERTY DESCRIPTION:

The West Half of the Southeast Quarter of Section 33, Township 29 North, Range 21 West, No. 4 of 12, State Project 8282 (84-392) 902, Washington County, Minnesota. (Abstract)
The Northeast Quarter of Section 33, Township 29, Range 21, less one except:
Portion No. 4 of Washington County Highway Right-of-way Plat No. 41, and
Portion No. 3 of Washington County Highway Right-of-way Plat No. 42, Washington County, Minnesota.
(Towns)

DRAWN BY: DMD	JOB NO: 13777P	DATE: 6/4/14
CHECKED BY: DMD	REVISED: 6/4/14	ADD: COLLAGE ARCH DESIGN
2	6/20/14	REVISE: COLLAGE ARCH DESIGN
3	6/26/14	GREEN SACS RE-DESIGN
4	7/23/14	NEW LAYOUT STREET 'C'
NO. 1	DATE	DESCRIPTION
DMD		BY:

NOTES

- Field survey was completed by E.G. Ruid and Sons, Inc. on 4/12/14.
- Boundary survey was completed by Washington County Coordinate System.
- City shots are taken at the top and back of curb, away. Additional easements, restrictions and/or encroachments may exist other than those shown herein. Survey subject to revision upon receipt of a current title commitment.
- Parcel ID Nos. 33-029-21-11-0001, 33-029-21-11-0002, 33-029-21-12-0001, 33-029-21-12-0003, 33-029-21-12-0002.
- BENCHMARK: MNDOT Station: INWOOD MNT. Elevation = 1010.83 (NGD 29)

I hereby certify that this survey, plan or map was prepared by me or under my direct supervision and that I am a duly Licensed Professional Land Surveyor in the State of Minnesota.
E.G. Ruid
EAGLE POINT BUSINESS PARK
DATE: 6/23/14 License No. 25341

E.G. RUID & SONS, INC.
Professional Land Surveyors
6776 Lake Drive NE Suite 110
Lino Lakes, MN 55014
Tel. (651) 361-8200 Fax (651) 361-8701
www.egruid.com

Inwood Ave North

Wetland Delineation Report

Appendix D: FSA Review Photographs



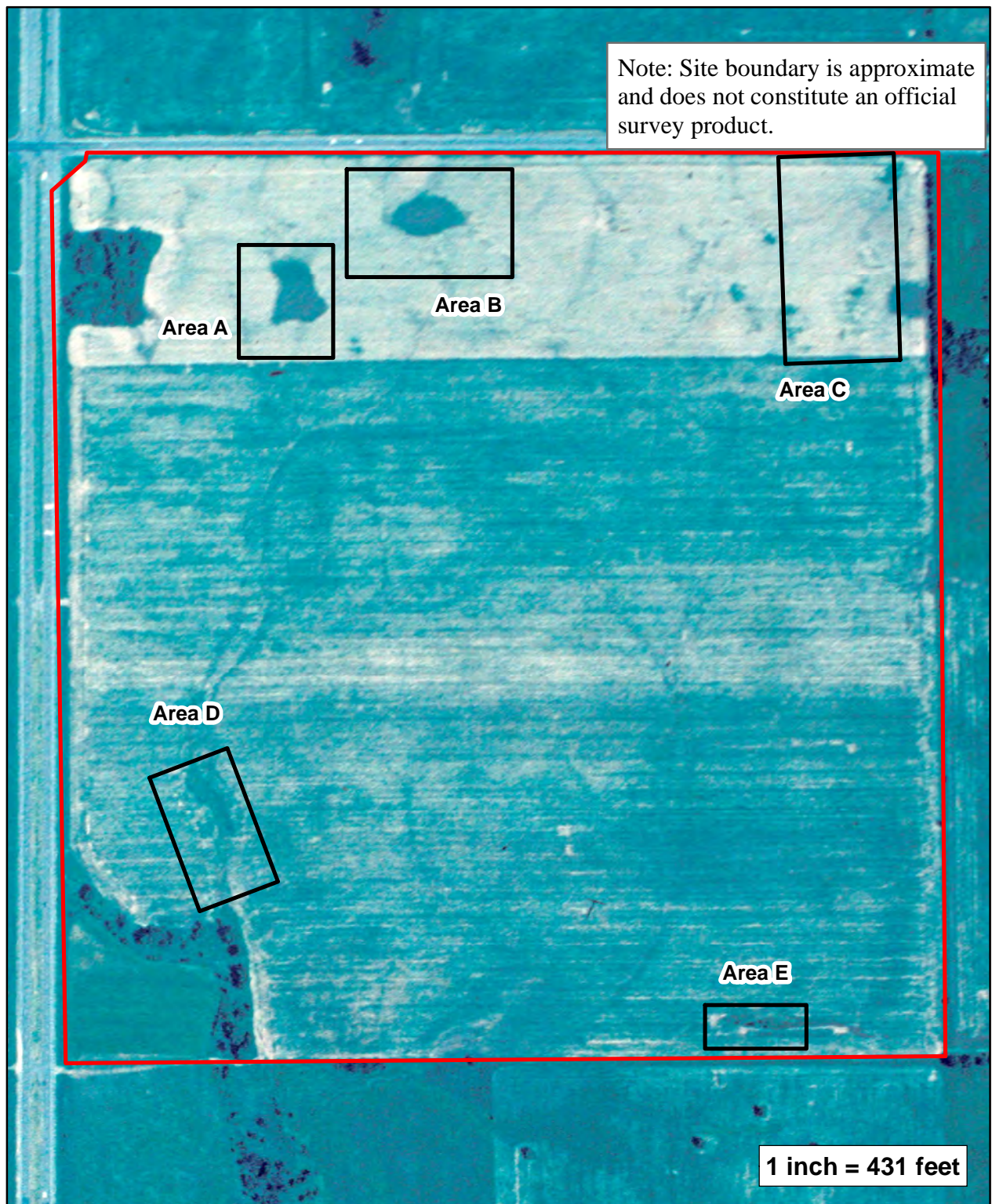
Appendix D: FSA Photo Review - (1983 FSA Photograph)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota





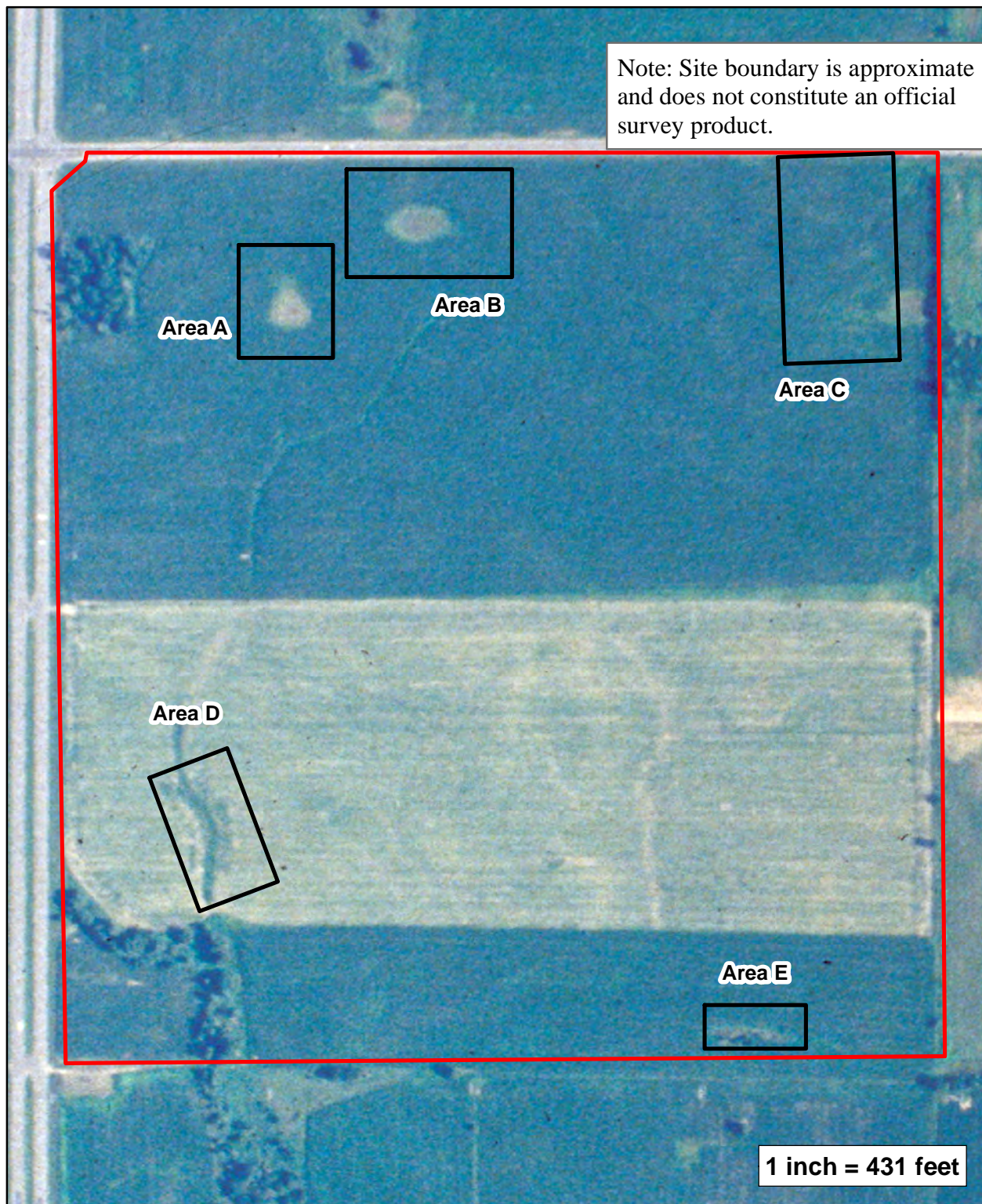
Appendix D: FSA Photo Review - (1989 FSA Photograph)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota





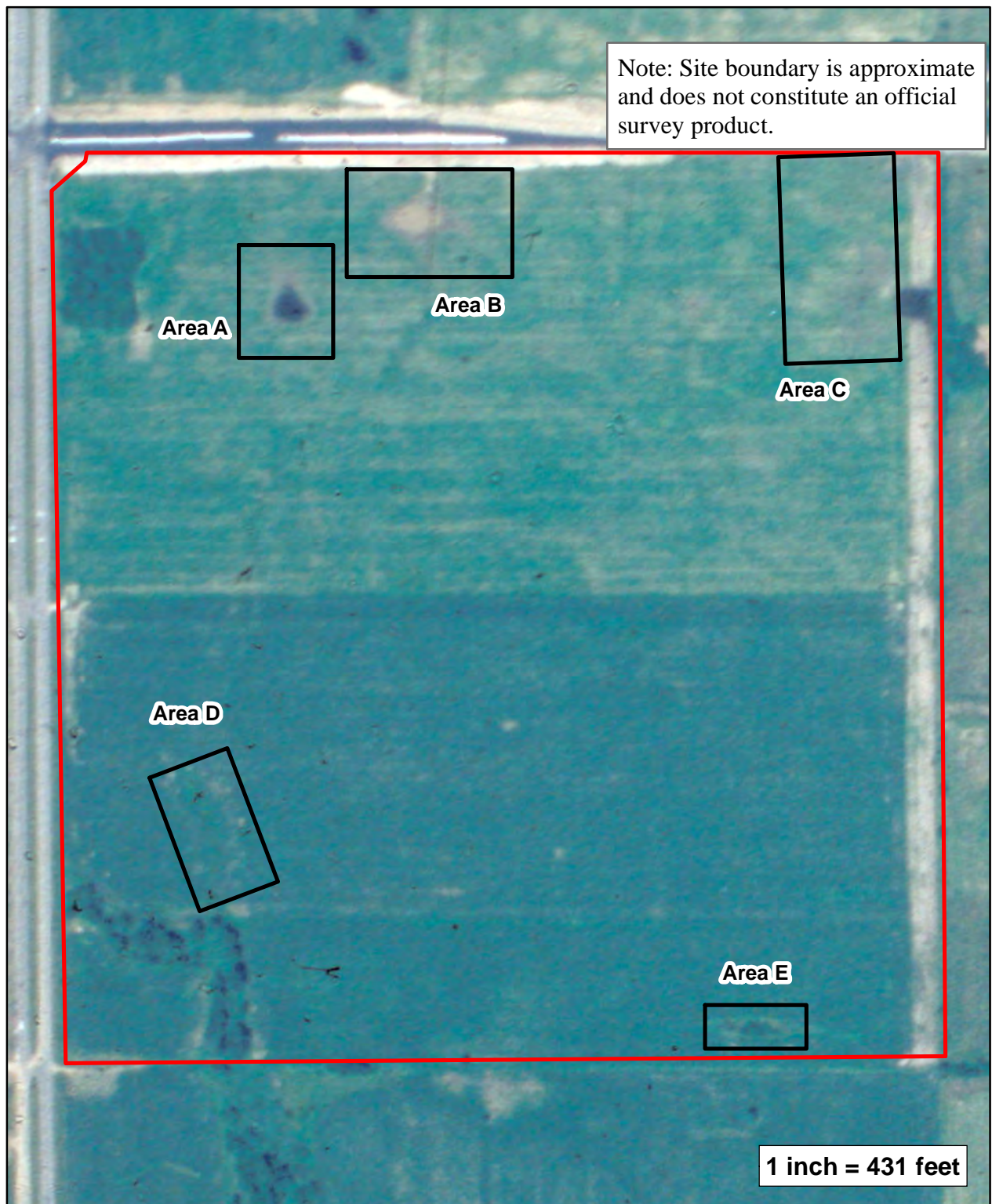
Appendix D: FSA Photo Review - (1992 FSA Photograph)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota





Appendix D: FSA Photo Review - (1995 FSA Photograph)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

**Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota**





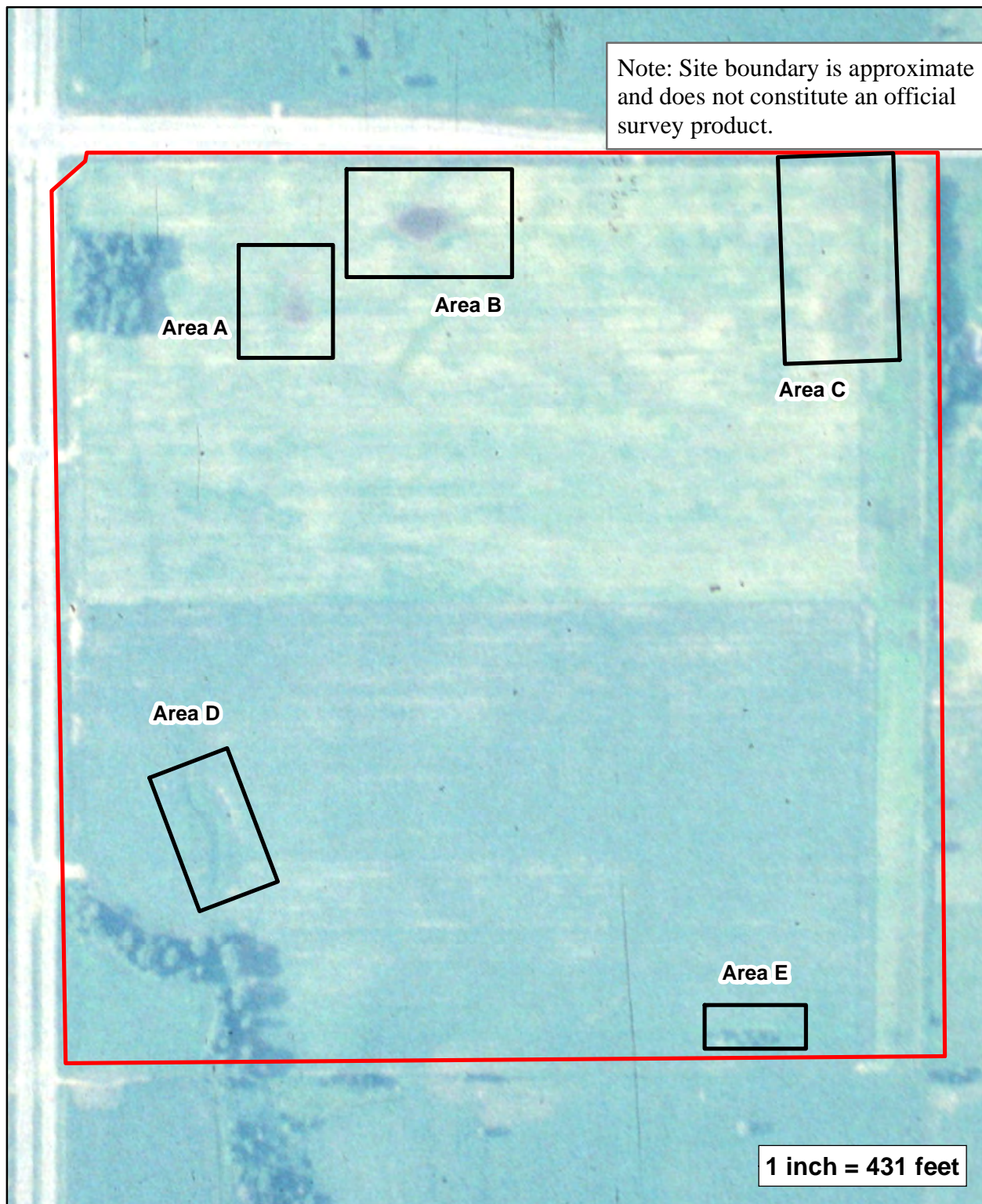
Appendix D: FSA Photo Review - (1996 FSA Photograph)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota





Appendix D: FSA Photo Review - (1997 FSA Photograph)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota





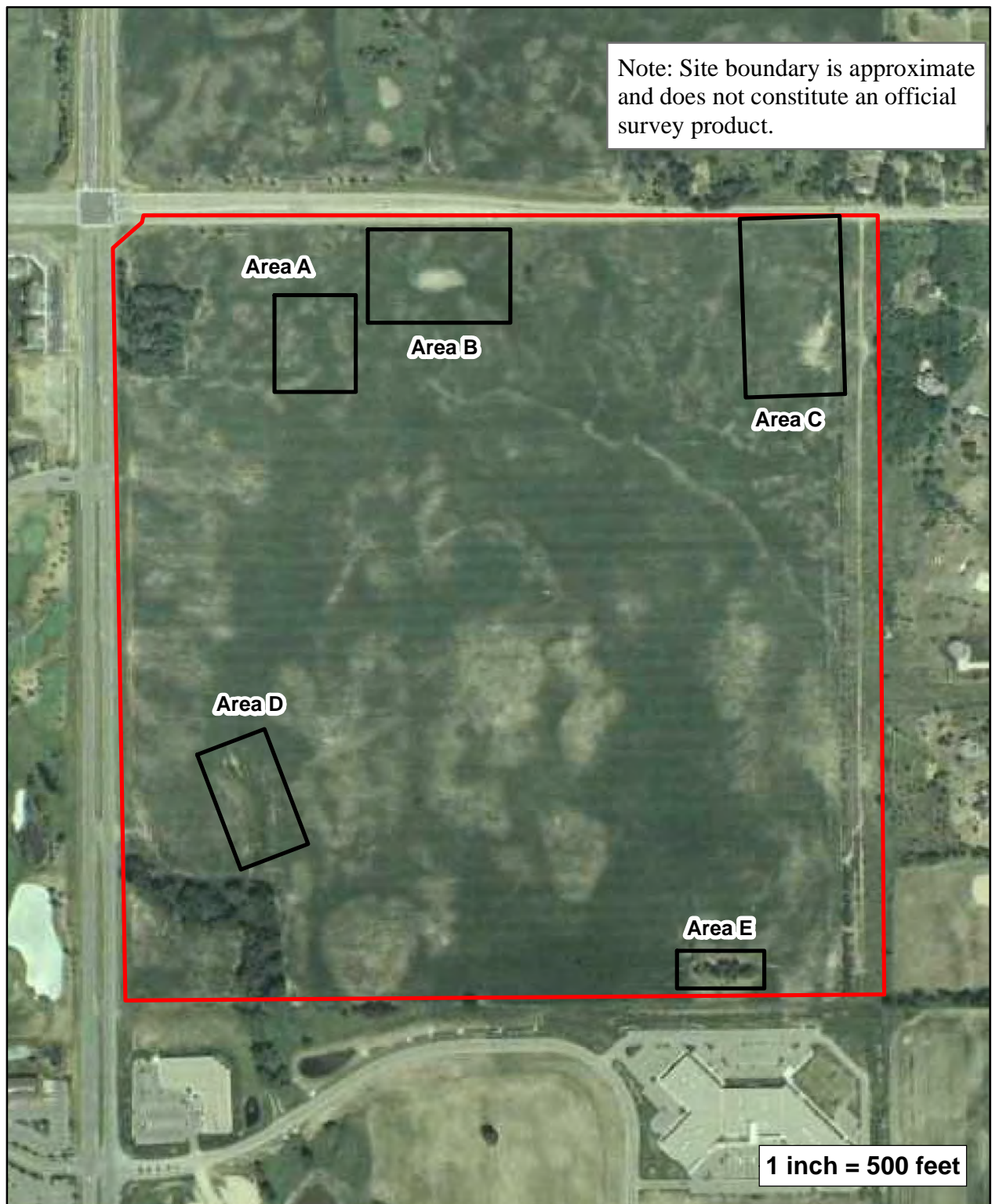
Appendix D: FSA Photo Review - (2000 FSA Photograph)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota





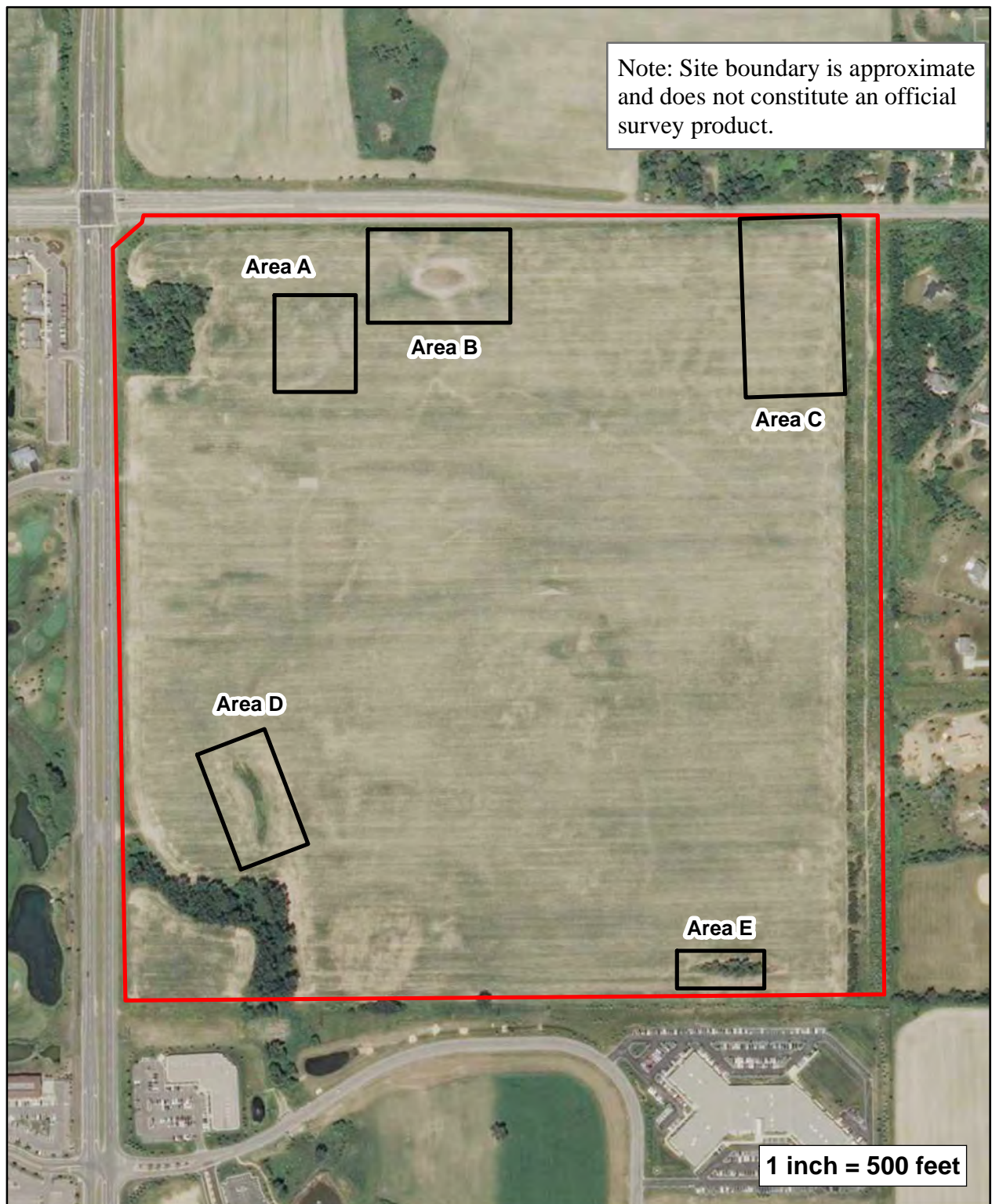
Appendix D: FSA Photo Review - (2006 FSA Photograph)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota





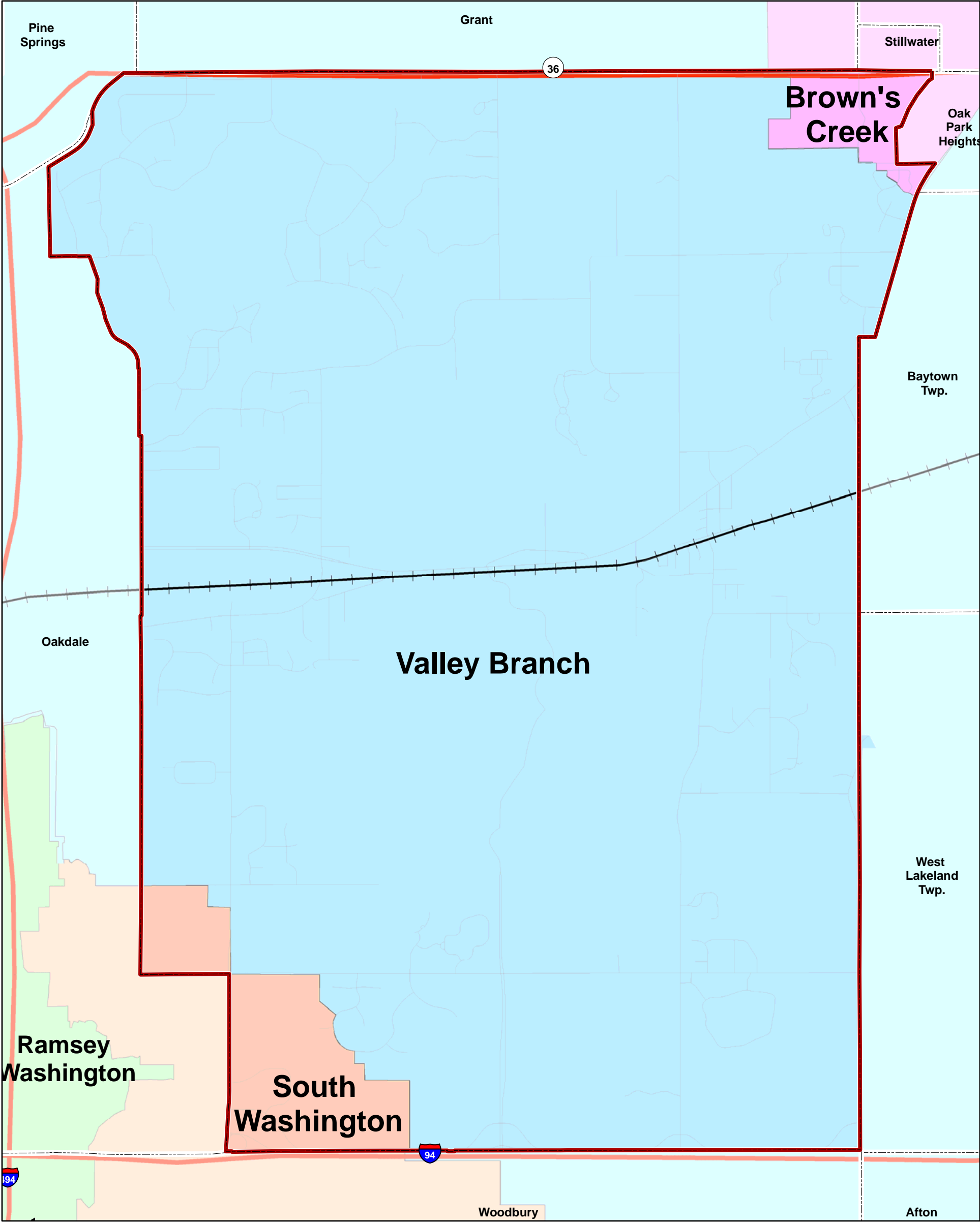
Appendix D: FSA Photo Review - (2008 FSA Photograph)



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

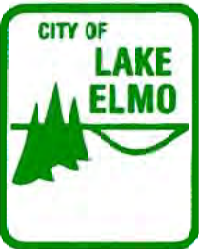
**Inwood Ave N (KES No. 2014-032)
Lake Elmo, Minnesota**



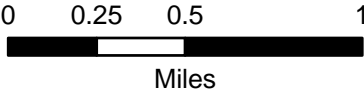
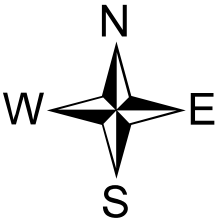


K:\gis\LAKEELMO\PROJECTS\2009 SWMP\Maps\Figure 19-WatershedAuthoritiesMap.mxd

FIGURE 19:
WATERSHED AUTHORITY
Surface Water Management Plan
2030 Comprehensive Plan
City of Lake Elmo, Minnesota



Map date: January 2009
Prepared by:



LIMITATION OF LIABILITY
This document is not a legally recorded map or survey and is not intended to be used as one. This map is a compilation of records and information from various state, county, and city offices, and other sources.

Legend

- City Boundary
- Brown's Creek
- Ramsey Washington
- South Washington
- Valley Branch

Sources: VBWD, Metropolitan Council, TKDA



Traffic Impact Study

Inwood Creek Lake Elmo, MN

I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By:

Michael P. Spack, P.E., P.T.O.E.
License No. 40936

Date: July 8, 2014

Executive Summary

Background: Hans Hagen Homes is proposing to develop the plot of land on the southeast corner of the CSAH 13 & CSAH 10 intersection in Lake Elmo, MN. The development will consist of a mix of residential and commercial uses. This study analyzed the potential traffic impacts of the built out development on key intersections surrounding the site.

Results: The traffic impacts of the proposed development on the study intersections were analyzed in the 2019 build-out conditions. The principal findings are that all study intersections will operate acceptably through the 2019 build-out condition except the CSAH 13/Eagle Point Boulevard and CSAH 13/5th Street intersections.

Recommendations:

- i. The CSAH 13/5th Street intersection will likely need a signal before the development is fully built and occupied and should be monitored as construction occurs to determine when a signal should be installed.
- ii. The CSAH 13/5th Street intersection should be built with an exclusive southbound left turn lane, a northbound right turn lane, a westbound left turn lane and a westbound right turn lane.
- iii. The traffic signal at the CSAH 13/5th Street intersection as well as alternate routes should allow the CSAH 13/Eagle Point Boulevard intersection to operate acceptably. The County should monitor the intersection, however, in case the traffic balancing does not occur and a traffic signal is needed at the intersection. The need for improvements to the CSAH 13/Eagle Point Boulevard intersection are not due to the proposed development.
- iv. The site access at CSAH 13/9th Street and the CSAH 10/Western Site Access should be built as $\frac{3}{4}$ intersections with vehicles exiting the development only able to make right turns.
- v. The Eastern Site Access on CSAH 10 should be built as a full access intersection.

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1. Introduction

a. Purpose of Study

Hans Hagen Homes is proposing to develop the plot of land on the southeast corner of the CSAH 13 & CSAH 10 intersection in Lake Elmo, MN. The development will consist of a mix of residential and commercial uses. The purpose of this study is to determine if improvements are needed to nearby intersections that may be impacted by traffic from the built out development.

b. Study Objectives

The objectives of this study are:

- i. Document how the study intersections currently operate.
- ii. Forecast the amount of traffic expected to be generated by the proposed development.
- iii. Determine how the study intersections will operate in the year 2019 with no development traffic.
- iv. Determine how the study intersections will operate in the year 2019 with development traffic.
- v. Determine how the surrounding roadways will operate in the year 2030 with development traffic added.
- vi. Recommend improvements, if needed.

The study intersections are:

- i. CSAH 13 & I-94 Southern Ramp
- ii. CSAH 13 & I-94 Northern Ramp
- iii. CSAH 13 & Hudson Boulevard
- iv. CSAH 13 & Eagle Point Road
- v. CSAH 13 & 5th Street Access Road
- vi. CSAH 13 & 9th Street
- vii. CSAH 13 & CSAH 10
- viii. CSAH 10 & Western Site Access Road
- ix. CSAH 10 & Eastern Site Access Road
- x. Eagle Point Road & Site Access Road

2. Proposed Development

a. Site Location

The site is located southeast of the CSAH 10/CSAH 13 intersection in Lake Elmo, Minnesota (see Figure 1 in the Appendix).

b. Land Use Intensity and Development Timing

The proposed site is planned to have a mix of residential and commercial uses. The residential uses are proposed to be 272 single family homes, 12 townhome units, 176 rental townhome units, 120 senior housing units in one building and 150 apartment units in two other buildings. The commercial uses are proposed to be a 6,000 square foot office, a 12,000 square foot pharmacy, a 2,000 square foot coffee/food shop, a 3,000 square foot gas station, a 5,000 square foot daycare, two 12,500 square foot retail buildings and a 20,000 square foot office showroom. In total, there are 730 residential units and 73,000 square feet of commercial space proposed. A conceptual site plan is shown in Figure 2 in the Appendix.

The development is planned to have access to CSAH 13 via a 9th Street extension as well as via 5th Street, which is to be constructed south of 9th Street. There are also two planned accesses from CSAH 10 and an access from Eagle Point Boulevard.

For the purposes of this study, the full development is anticipated to be built out by 2019.

3. Analysis of Existing Conditions

a. Transportation Network Characteristics

Washington County State Aid Highway 10, also known as 10th Street North, is a four lane, divided road that transitions to a two lane, undivided road east of CSAH 13. CSAH 10 has a 55 mph speed limit near the site.

Washington County State Aid Highway 13 (CSAH 13) is known as Radio Drive south of Interstate 94 and as Inwood Avenue north of Interstate 94. It is a four lane, divided road with a 55 mph speed limit north of Eagle Point Road and a 45 mph speed limit south.

Interstate 94 is a six lane, divided freeway with a 65 mph speed limit near the site. It is a major east-west corridor through the Twin Cities region.

Woodbury Lakes Road is east of CSAH 13 and lines up with the eastbound Interstate 94 ramps at CSAH 13. East of the ramps, it is a local, one lane, one-way eastbound road.

3rd Street North is west of CSAH 13 and lines up with the westbound Interstate 94 ramps at CSAH 13. It is a local, four lane, divided road with a 30 mph speed limit.

Hudson Boulevard is Lake Elmo Municipal State Aid Street 120 east of CSAH 13. East of the CSAH 13 intersection it is a two lane, undivided road with a 40 mph speed limit near the site. West of CSAH 13 it is known as 4th Street North and is Oakdale Municipal State Aid Street 239. There it is a partially divided, four lane road with a 40 mph speed limit that transitions to an undivided, two lane road further west.

Eagle Point Boulevard is Lake Elmo Municipal State Aid Street 112 east of CSAH 13. It is a two lane, undivided road with a 30 mph speed limit near the site. West of CSAH 13 it is a local City of Oakdale road known as Oak Marsh. It is a two lane, undivided road with a 30 mph speed limit.

9th Street North is a local City of Oakdale road. It is a two lane, undivided road with a 30 mph speed limit near the site.

Existing traffic control and travel lanes are shown in Figure 3 in the Appendix for each study intersection.

b. Traffic Volumes

Intersection video was collected at each of the study intersections under normal weekday conditions on Thursday, May 29, 2014 when there was clear weather. Using these videos, a turning movement count was collected from 6:00 a.m. to 7:00 p.m. at the CSAH 10/CSAH 13 intersection. Based on the peak hours for that intersection, turning movement counts were collected at each of the other existing study intersections from 6:45 to 8:45 a.m. and 4:15 to 6:15 p.m. The peak hours for each intersection were found to be:

- CSAH 13/I-94 Southern Ramp: 7:15 - 8:15 a.m. & 4:45 - 5:45 p.m.
- CSAH 13/I-94 Northern Ramp: 7:15 - 8:15 a.m. & 4:45 - 5:45 p.m.
- CSAH 13/Hudson Boulevard: 7:45 - 8:45 a.m. & 4:30 - 5:30 p.m.
- CSAH 13/Eagle Point Road: 7:15 - 8:15 a.m. & 4:30 - 5:30 p.m.
- CSAH 13/9th Street: 7:15 - 8:15 a.m. & 4:30 - 5:30 p.m.
- CSAH 13/CSAH 10: 7:15 - 8:15 a.m. & 4:45 - 5:45 p.m.

The turning movement count data from the counts are contained in fifteen minute intervals in the Appendix.

c. Level of Service



Source: City of San Jose, CA

An intersection capacity analysis was conducted for the existing intersections per the *Highway Capacity Manual, 2010*. Intersections are assigned a “Level of Service” letter grade for the peak hour of traffic based on the number of lanes at the intersection, traffic volumes, and traffic control. Level of Service A (LOS A) represents light traffic flow (free flow conditions) while Level of Service F (LOS F) represents heavy traffic flow (over capacity conditions). LOS D at intersections is typically considered acceptable in the Twin Cities region. Individual movements are also assigned LOS grades. One or more individual movements typically operate at LOS F when the overall intersection is operating acceptably at LOS D. The pictures on the left represent some of the LOS grades (from a signal controlled intersection in San Jose, CA). These LOS grades represent the overall intersection operation, not individual movements.

The LOS results for the existing study hours are shown in Table 1. These are based on the existing traffic control and lane configurations as shown in Figure 3 in the Appendix. The existing turning movement volumes from the Appendix were used in the LOS calculations. The LOS calculations were done in accordance with the *Highway Capacity Manual 2010* using VISTRO™ software. Signal timings were provided by Washington County except for the CSAH 13/CSAH 10 intersection which was estimated. The complete LOS calculations, which include grades for individual movements, are included in the Appendix.

Table 1 – Existing Peak Hour Level of Service (LOS)¹

Intersection	A.M. Peak	P.M. Peak
CSAH 13 & Southern I-94 Ramp	B (d)	C (e)
CSAH 13 & Northern I-94 Ramp	C (d)	D (e)
CSAH 13 & Hudson Blvd	C (e)	C (e)
CSAH 13 & Eagle Point Blvd	A (d)	C (f)
CSAH 13 & 9 th St	A (c)	A (d)
CSAH 13 & CSAH 10	B (c)	C (c)

¹The first letter is the Level of Service for the intersection. The second letter (in parentheses) is the Level of Service for the worst operating movement.

The study intersections currently operate acceptably at LOS D or better. The eastbound and westbound left turns at the CSAH 13/Eagle Point Boulevard intersection operate at LOS F in the p.m. peak hour.

4. Projected Traffic

a. Site Traffic Forecasting

A trip generation analysis was performed for the development site based on the methods and rates published in the *ITE Trip Generation Manual, 9th Edition* and the *ITE Trip Generation Handbook, 2nd Edition*. The resultant trip generation is shown in Table A1 in the Appendix.

There are three different types of trips that will visit a development located in the proposed site; new trips, pass-by trips and internal trips. New trips are trips that visit the site specifically to go to a location in the site and then return from where they came. Pass-by trips are trips that are passing by the site when they decide to turn and go into the site. When these vehicles leave the site they then continue in the direction they were originally heading. Internal trips are trips to or from a location within the site to or from a different location within the site. These would be vehicles that visit two or more locations within the site and therefore do not generate a new trip at the surrounding study intersections for each place they visit. For this site, internal trips could include many different kinds of trips such as residents of the site going to the coffee shop or people at the pharmacy on site going to the gas station. Internal trips are a reduction from the overall number of generated trips.

The site generated trips were then added to the study roadways through the use of a trip distribution pattern. This pattern is based partially on the trip distribution for the nearby Savona development (as shown in the Traffic Impact Study completed in 2013 by Westwood) as well as taking into account site access and access to the regional transportation system. The trip distribution pattern is:

- 20% to/from the south on CSAH 13
- 35% to/from the west on I-94
- 20% to/from the east on I-94
- 2% to/from the west on 4th Street
- 15% to/from the west on CSAH 10
- 5% to/from the north on CSAH 13
- 3% to/from the east on CSAH 10

This trip distribution pattern can be seen in Figure 4 in the Appendix. The traffic generated by the site development was assigned to the area roadways per this distribution pattern. The resultant peak hour traffic volumes due to the development are shown in the Appendix under the capacity analysis section for the Build scenarios.

b. Non-site Traffic Forecasting

Traffic forecasts were developed for the year 2019 No-Build Scenario based on the growth rate assigned to Washington County by MnDOT. This compound growth rate is 1.7% per year which is taken from a 20 year factor of 1.4. This growth rate was applied to all movements and the resultant 2019 No-Build peak hour forecasts are shown in the Appendix under the capacity analysis section for the No-Build scenarios.

c. Total Traffic

Traffic forecasts were developed for the year 2019 Build Scenarios by adding the traffic generated by the proposed development to the 2019 No-Build volumes. The resultant 2019 Build peak hour forecasts are shown in the Appendix under the capacity analysis section for the Build scenarios.

5. Traffic and Improvement Analysis for 2019 Scenarios

a. Level of Service Analysis

The LOS results for the 2019 Scenario study hours are shown in Table 2. These are based on the existing traffic control and lane configurations at the study intersections with the addition of an eastern leg into the development at the CSAH 13/9th Street intersection as well as a site access at CSAH 13/5th Street, a site access at Eagle Point Boulevard and two site accesses on CSAH 10. The site access at CSAH 13/5th Street, the CSAH 10/Eastern Site access and the site access on Eagle Point Boulevard are modeled as full access intersections. The site access at CSAH 13/9th Street and the CSAH 10/Western Site Access are modeled as $\frac{3}{4}$ access intersections. A $\frac{3}{4}$ intersection means vehicles can turn into the site from either direction, but can only make right turns exiting the site. The west leg of the CSAH 13/9th Street intersection is left as full movement to be able to service the existing residential area. See Figure 5 in the Appendix for the intersection configurations assumed to be in place for the Build Scenario.

The forecast turning movement volumes for the 2019 peak hour scenarios as shown in the Appendix were used in the LOS calculations. The LOS calculations were done in accordance with the 2010 *Highway Capacity Manual* using VISTROTM software. Signal splits were optimized for each scenario. The complete LOS calculations, which include queue lengths and grades for individual movements, are included in the Appendix.

Table 2 – 2019 Level of Service (LOS)¹

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	No-Build	Build	No-Build	Build
CSAH 13 & Southern I-94 Ramp	B (d)	B (d)	C (e)	C (e)
CSAH 13 & Northern I-94 Ramp	C (d)	C (e)	D (e)	D (f)
CSAH 13 & Hudson Blvd	C (e)	C (e)	D (e)	D (e)
CSAH 13 & Eagle Point Blvd	A (d)	A (f)	D (f)	F (f)
CSAH 13 & 5 th St	n/a	F (f)	n/a	F (f)
CSAH 13 & 9 th St	A (c)	A (d)	A (e)	A (f)
CSAH 13 & CSAH 10	B (c)	C (c)	C (d)	C (d)
CSAH 10 & Western Site Access	n/a	A (c)	n/a	A (b)
CSAH 10 & Eastern Site Access	n/a	A (c)	n/a	A (e)
Eagle Point Blvd & Site Access	n/a	A (a)	n/a	A (a)

¹The first letter is the Level of Service for the intersection. The second letter (in parentheses) is the Level of Service for the worst operating movement.

As shown in Table 2, the study intersections will operate acceptably in the 2019 study scenarios with the exceptions of the CSAH 13/Eagle Point Boulevard intersection in the p.m. peak hour and the CSAH 13/5th Street intersection in both peak hours. It can be noted that the movement at LOS F at the CSAH 13/9th Street intersection in the p.m. peak hour Build scenario is the eastbound left turns out of the existing residential area. This movement has less than 10 vehicles in the peak hour and a 95th percentile queue length of less than one vehicle.

Other than CSAH 13/Eagle Point Boulevard and CSAH 13/5th Street intersections, the LOS results between the No-Build and Build scenarios are similar. This means the development will not have a significant enough impact on the other study intersections to warrant improvements.

b. Improvement Analysis

Table 2 shows that the side street stop sign controlled CSAH 13/Eagle Point Boulevard and CSAH 13/5th Street intersections are forecast to operate at LOS F in the 2019 p.m. peak hour build scenario with the CSAH 13/5th Street intersection also forecast to operate at LOS F in the 2019 a.m. peak hour Build scenario.

One or both of these intersections will likely need to be signalized by the time the development is fully built and operational. Due to the close spacing of these two intersections it is not recommended that both of them be signalized. Since the CSAH 13/5th Street intersection is forecast to have higher turning volumes in the future build scenarios, that intersection was analyzed with a signal. The layout was also modified to include an exclusive southbound left turn lane, a northbound right turn lane, a

westbound left turn lane and a westbound right turn lane. This new layout without a signal was also analyzed. These results can be seen in Table 3.

Placing a signal at the CSAH 13/5th Street intersection may affect the driving behaviors of some vehicles. Most notably, some vehicles that may leave the development by taking the connection down to Eagle Point Boulevard and accessing CSAH 13 there may reroute themselves to access CSAH 13 at the 5th Street access if that intersection is signalized. This is especially the case if there are long delays for vehicles turning from Eagle Point Boulevard onto CSAH 13.

To see if the CSAH 13/5th Street intersection will be able to handle additional traffic if a signal is placed there, that intersection was analyzed with all of the development traffic that was entering/exiting at Eagle Point Boulevard now going through the 5th Street access. The CSAH 13/Eagle Point Boulevard intersection was also analyzed in this scenario. These results can be seen in Table 3.

The forecast turning movement volumes for the 2019 p.m. peak hour Build scenario as shown in the Appendix were used in the LOS calculations for the various improvements. The p.m. peak hour was chosen over the a.m. peak hour because there were worse operating conditions in the p.m. peak hour. Any improvements that work in the p.m. peak hour should also work in the a.m. peak hour. The LOS calculations were done in accordance with the 2010 *Highway Capacity Manual* using VISTROTM software. Signal cycles and splits were optimized for each scenario as needed. The complete LOS calculations, which include queue lengths and grades for individual movements, are included in the Appendix.

Table 3 – 2019 PM Peak Hour Improvement Level of Service (LOS)¹

Intersection	P.M. Peak Hour
	Build
CSAH 13 & 5 th St - Stop Controlled with Turn Lanes	F (f)
CSAH 13 & 5 th St - Signalized	B (c)
CSAH 13 & Eagle Point Blvd – Without Eagle Point Connection	F (f)
CSAH 13 & 5 th St - Signalized Without Eagle Point Connection	B (c)

¹The first letter is the Level of Service for the intersection. The second letter (in parentheses) is the Level of Service for the worst operating movement.

As can be seen in Table 3, only adding turn lanes to the CSAH 13/5th Street intersection does not allow it to operate better than LOS F. Placing a signal at the intersection allows it to operate acceptably at LOS B with all movements at LOS C or better. Even with the additional traffic that may use the Eagle Point Boulevard access to CSAH 13, CSAH 13/5th Street operates acceptably with a signal.

The CSAH 13/Eagle Point Boulevard intersection is forecast to operate at LOS F with the site traffic rerouted to 5th Street. The eastbound and westbound left turns are the movements operating at LOS F. If the queuing and delay become too large at this intersection for these movements, both approaches do have the option to take alternate routes. Eastbound left turns can go down to 4th Street and make a left to get to CSAH 13 while westbound left turns can go up to 5th Street or down around to Hudson Boulevard to be able to access CSAH 13 at a signalized intersection. If a signal is placed at the CSAH 13/5th Street intersection, it is not recommended that a signal be placed at the CSAH 13/Eagle Point Boulevard intersection as well due to the close proximity of the signals on CSAH 13 at 4th Street and 5th Street.

c. Improvement Timeframe

It is recommended that a signal be placed at the CSAH 13/5th Street intersection by the time the proposed development is built and fully occupied. In order to determine when the signal should be installed, an iterative analysis was performed for the intersection. This analysis looked at how much of the development needs to be built for the peak hour signal warrant at CSAH 13/5th Street to be fulfilled.

An iterative peak hour warrant analysis was done at this intersection for the p.m. peak hour Build scenario. This was done by iterating the development traffic generation and background growth rate and performing peak hour warrant analyses with VISTROTM software. The background growth rate iteration was tied to the development traffic iteration (e.g., for 50% of development traffic, 50% of the final growth rate was used). The intersection was modeled with free flowing traffic on CSAH 13 and a stop sign on 5th Street with an exclusive southbound left turn lane, a northbound right turn lane, a westbound left turn lane and a westbound right turn lane.

It was found the CSAH 13/5th Street intersection will meet the peak hour warrant for a traffic signal with 30% of the full forecast site traffic accessing the development. The full results for the different iterations can be seen in the capacity analysis section of the Appendix.

It is recommended the CSAH 13/5th Street intersection be monitored as construction occurs to determine when the peak hour warrant will be met and a signal is needed at the intersection. The intersection should be built with an exclusive southbound left turn lane, a northbound right turn lane, a westbound left turn lane and a westbound right turn lane to provide safe access and facilitate the future construction of the traffic signal.

d. Daily Traffic Volumes

The City of Lake Elmo 2030 Comprehensive Plan lists forecast traffic volumes on the roadways in the city for the year 2030. These volumes are estimated using existing data and forecasts based on the planned land uses in the city. The proposed development includes more commercial space and less residential space than the Lake Elmo 2030 plan. In order to be able to estimate the amount of traffic on the roadways surrounding the site, the Lake Elmo 2030 plan volumes were adjusted to account for the extra commercial space proposed on the site.

Comparing the concept plan shown in Figure 2 in the Appendix to the City of Lake Elmo's proposed land use, there are approximately 20 acres of land the city had planned as residential that this development is planning as commercial. Assuming the residential area was planned to be single family homes and estimating five homes per acre, that leads to 100 single family homes. Using the *ITE Trip Generation Manual, 9th Edition*, this leads to approximately 950 vehicles per day using this portion of the site. Using the trip generation for the site shown in Table A1 in the Appendix, there are approximately 2,860 new trips using the commercial spaces in this portion of the site. That means that there are approximately 1,900 additional vehicles accessing the site with the added commercial space than if the space was residential.

These additional 1,900 vehicles were added to the surrounding roadways and the forecast 2030 volumes can be seen in Figure 6 in the Appendix.

6. Conclusions and Recommendations

The traffic impacts of the proposed development on the study intersections were analyzed in the 2019 build-out conditions. The principal findings are:

- i. All study intersections will operate acceptably through the 2019 build-out condition except the CSAH 13/Eagle Point Boulevard and CSAH 13/5th Street intersections.
- ii. The CSAH 13/5th Street intersection will likely need a signal before the development is fully built and occupied and should be monitored as construction occurs to determine when a signal should be installed.
- iii. The CSAH 13/5th Street intersection should be built with an exclusive southbound left turn lane, a northbound right turn lane, a westbound left turn lane and a westbound right turn lane.
- iv. The traffic signal at the CSAH 13/5th Street intersection as well as alternate routes should allow the CSAH 13/Eagle Point Boulevard intersection to operate acceptably. The County should monitor the intersection, however, in case the traffic balancing does not occur and a traffic signal is needed at the intersection. The need for improvements to the CSAH 13/Eagle Point Boulevard intersection are not due to the proposed development.

- v. The site access at CSAH 13/9th Street and the CSAH 10/Western Site Access should be built as $\frac{3}{4}$ intersections with vehicles exiting the development only able to make right turns.
- vi. The Eastern Site Access on CSAH 10 should be built as a full access intersection.

Other than constructing the roadways per the concept plan and the above recommendations, no modifications are needed to be made by the developer to the existing study intersections.

7. Appendix

A. Trip Generation Table

B. Figures 1-6

C. Traffic Counts

D. Capacity Analysis Backup

- AM Existing
- PM Existing
- AM 2019 No-Build
- PM 2019 No-Build
- AM 2019 Build
- PM 2019 Build
- PM 2019 Build - CSAH 13/5th Street with Turn Lanes
- PM 2019 Build - CSAH 13/5th Street with Turn Lanes & Signal
- PM 2019 Build - CSAH 13/5th Street with Turn Lanes & Signal minus Eagle Point Connection and CSAH 13/Eagle Point Blvd minus Eagle Point Connection
- Iterative Signal Warrant Analysis - 25% of Development Traffic
- Iterative Signal Warrant Analysis - 30% of Development Traffic

Appendix A - Trip Generation Table



Table A1
Forecast Trip Generation

Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS (GFA)	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	INTERNAL PERCENT	INTERNAL TRIPS	PASSBY PERCENT	PASSBY TRIPS	NEW TRIPS	
											ENTER	EXIT
Single Family Homes	210	Dwelling Units	272.0	9.52	50%	50%	14%	363	0%	0	1,113	1,113
Apartments	220	Dwelling Units	150.0	6.65	50%	50%	14%	140	0%	0	429	429
Rental Townhomes	224	Dwelling Units	176.0	5.81	50%	50%	14%	143	0%	0	440	440
Townhomes	230	Dwelling Units	12.0	5.81	50%	50%	14%	10	0%	0	30	30
Senior Housing	252	Dwelling Units	120.0	3.44	50%	50%	14%	58	0%	0	178	178
Daycare Center	565	1,000 GFA	5.0	74.06	50%	50%	12%	44	0%	0	163	163
Office	710	1,000 GFA	6.0	11.03	50%	50%	28%	19	0%	0	24	24
Office Showroom	710	1,000 GFA	20.0	11.03	50%	50%	28%	62	0%	0	79	79
Shopping Center	820	1,000 GFA	25.0	42.70	50%	50%	12%	128	34%	363	288	288
Pharmacy	881	1,000 GFA	12.0	96.91	50%	50%	12%	140	49%	570	227	227
Coffee/Donut Shop w/ Drive Thru	937	1,000 GFA	2.0	818.58	50%	50%	12%	196	50%	819	311	311
Gas Station w/ Convenience Market	945	Fueling Positions	16.0	162.78	50%	50%	12%	313	56%	1,459	417	417
TOTALS								1,614		3,210	3,699	3,699

AM Peak Hour

LAND USE	ITE CODE #	DEVELOPMENT UNITS (GFA)	QUANTITY	AM RATE	ENTER PERCENT	EXIT PERCENT	INTERNAL PERCENT	INTERNAL TRIPS	PASSBY PERCENT	PASSBY TRIPS	NEW TRIPS	
											ENTER	EXIT
Single Family Homes	210	Dwelling Units	272.0	0.75	25%	75%	12%	24	0%	0	39	141
Apartments	220	Dwelling Units	150.0	0.51	20%	80%	12%	9	0%	0	11	57
Rental Townhomes	224	Dwelling Units	176.0	0.70	33%	67%	12%	15	0%	0	33	75
Townhomes	230	Dwelling Units	12.0	0.44	17%	83%	12%	1	0%	0	1	4
Senior Housing	252	Dwelling Units	120.0	0.20	34%	66%	12%	3	0%	0	7	14
Daycare Center	565	1,000 GFA	5.0	12.18	53%	47%	12%	7	0%	0	29	25
Office	710	1,000 GFA	6.0	1.56	88%	12%	20%	2	0%	0	7	0
Office Showroom	710	1,000 GFA	20.0	1.56	88%	12%	20%	6	0%	0	24	1
Shopping Center	820	1,000 GFA	25.0	0.96	62%	38%	12%	3	34%	8	9	4
Pharmacy	881	1,000 GFA	12.0	3.45	52%	48%	12%	5	49%	20	9	7
Coffee/Donut Shop w/ Drive Thru	937	1,000 GFA	2.0	100.58	51%	49%	12%	24	50%	101	40	36
Gas Station w/ Convenience Market	945	Fueling Positions	16.0	10.16	50%	50%	12%	20	56%	91	26	26
TOTALS								52		220	235	390

PM Peak Hour

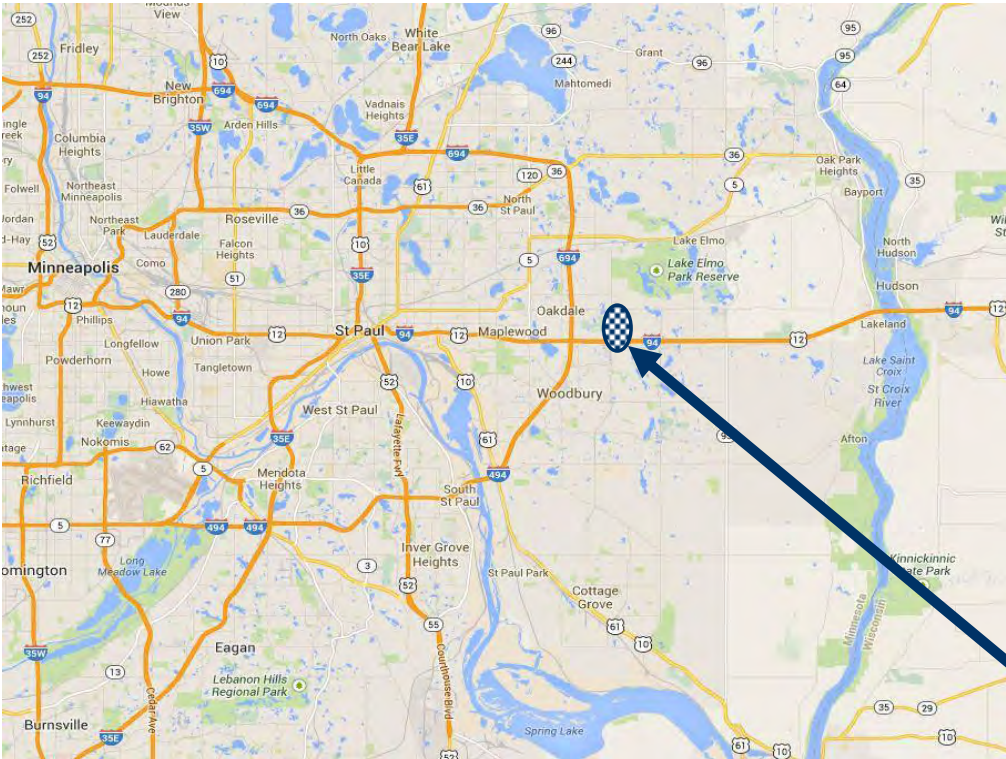
LAND USE	ITE CODE #	DEVELOPMENT UNITS (GFA)	QUANTITY	PM RATE	ENTER PERCENT	EXIT PERCENT	INTERNAL PERCENT	INTERNAL TRIPS	PASSBY PERCENT	PASSBY TRIPS	NEW TRIPS	
											ENTER	EXIT
Single Family Homes	210	Dwelling Units	272.0	1.00	63%	37%	12%	33	0%	0	155	84
Apartments	220	Dwelling Units	150.0	0.62	65%	35%	12%	11	0%	0	55	27
Rental Townhomes	224	Dwelling Units	176.0	0.72	51%	49%	12%	15	0%	0	57	54
Townhomes	230	Dwelling Units	12.0	0.52	67%	33%	12%	1	0%	0	4	2
Senior Housing	252	Dwelling Units	120.0	0.25	54%	46%	12%	4	0%	0	14	12
Daycare Center	565	1,000 GFA	5.0	12.34	47%	53%	12%	7	0%	0	25	29
Office	710	1,000 GFA	6.0	1.49	17%	83%	23%	2	0%	0	0	6
Office Showroom	710	1,000 GFA	20.0	1.49	17%	83%	23%	7	0%	0	2	21
Shopping Center	820	1,000 GFA	25.0	3.71	48%	52%	12%	11	34%	32	23	27
Pharmacy	881	1,000 GFA	12.0	9.91	50%	50%	12%	14	49%	58	23	23
Coffee/Donut Shop w/ Drive Thru	937	1,000 GFA	2.0	42.80	50%	50%	12%	10	50%	43	16	16
Gas Station w/ Convenience Market	945	Fueling Positions	16.0	13.51	50%	50%	12%	26	56%	121	35	35
TOTALS								63		254	409	336

NOTES:

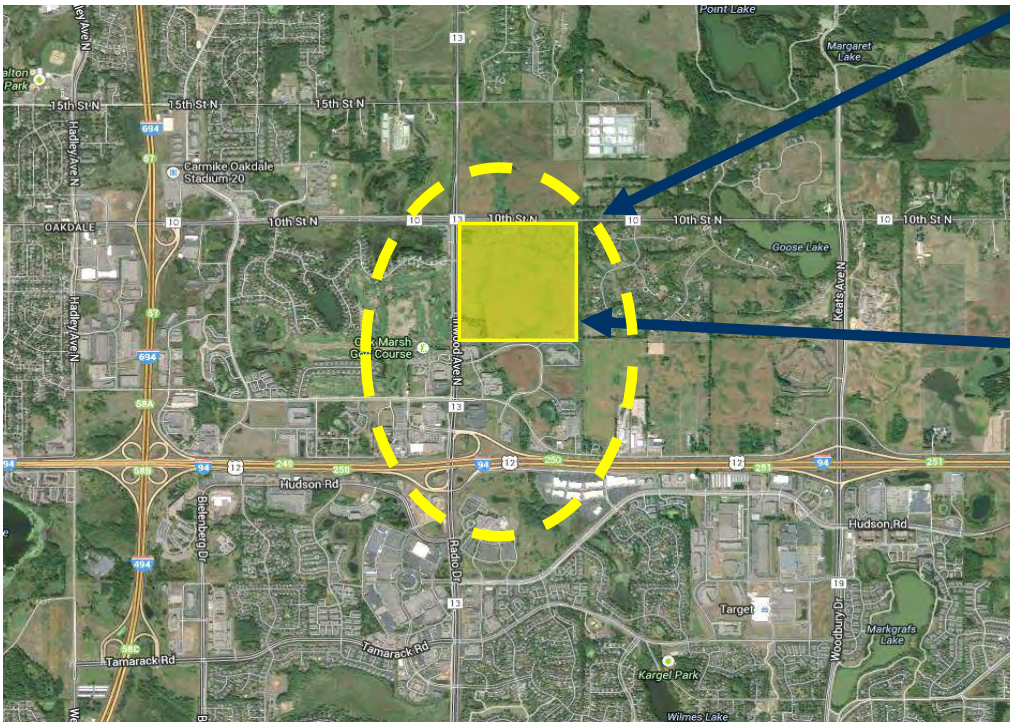
1. GFA = Gross Floor Area
2. All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition.
3. Reduction for internal trips (Internal Percent) is based on "Trip Generation Handbook", Institute of Transportation Engineers, 2nd Edition.
4. Reduction for pass-by trips (Passby Percent) is based on "Trip Generation Handbook", Institute of Transportation Engineers, 2nd Edition.
5. A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).
6. P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).
7. No data is available in "Trip Generation" for the daily rate for the rental townhomes. The daily rate for Townhomes was used.
8. The Coffee/Donut Shop w/ Drive Thru (ITE code 937) does not have a pass-by percentage in "Trip Generation." A 50% pass-by rate was used. This is the same as a fast food w/ drive thru.

Figure 1
Location Maps

↑
North
No Scale



Study Area



Proposed Site

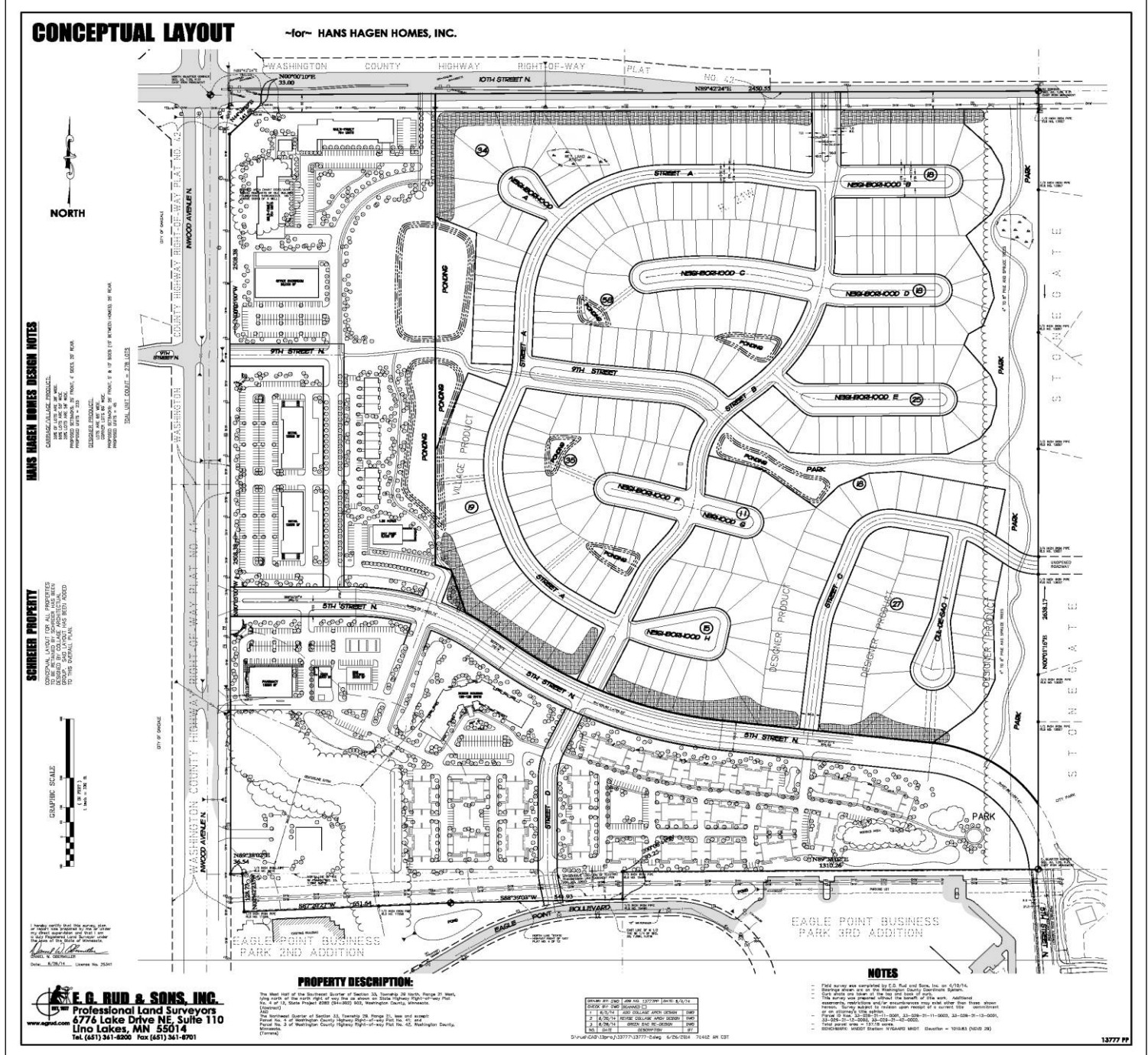


Figure 3
Existing Lanes & Traffic Control

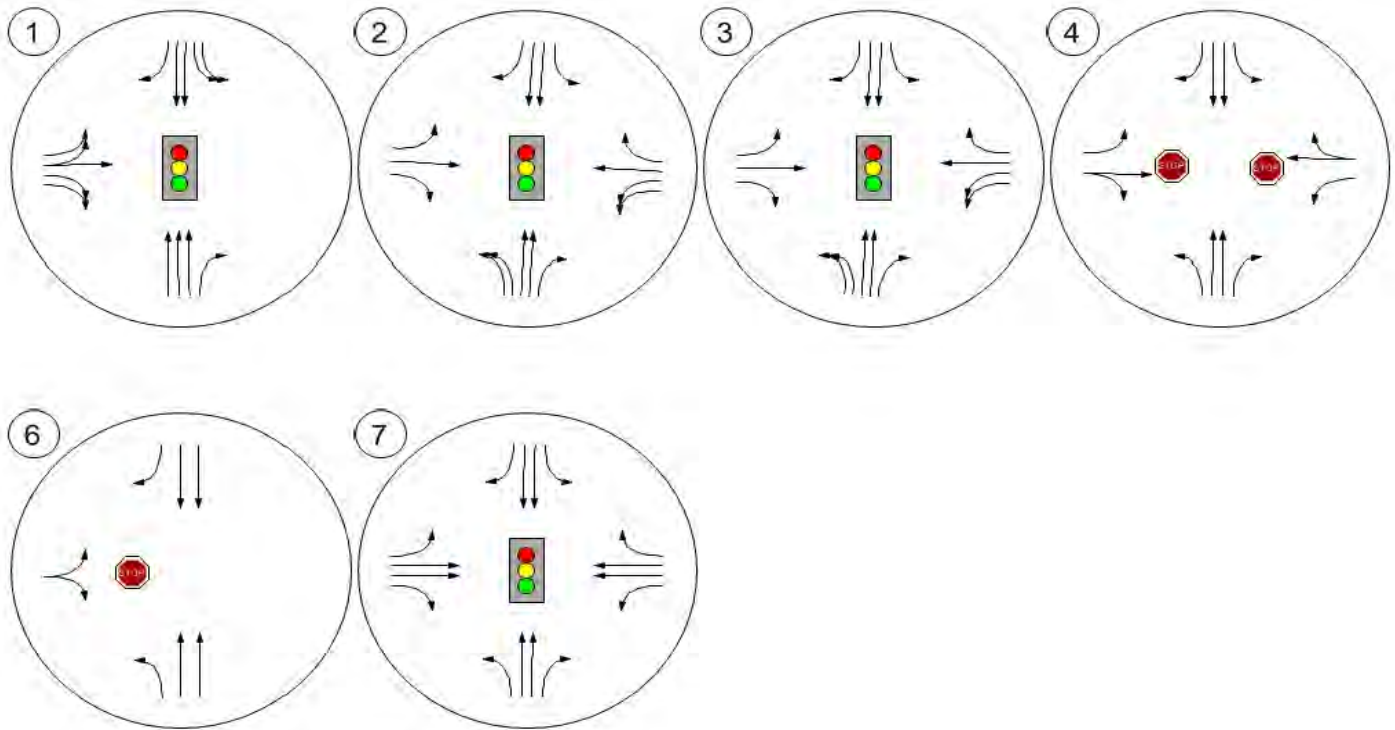


Figure 4
Trip Distribution

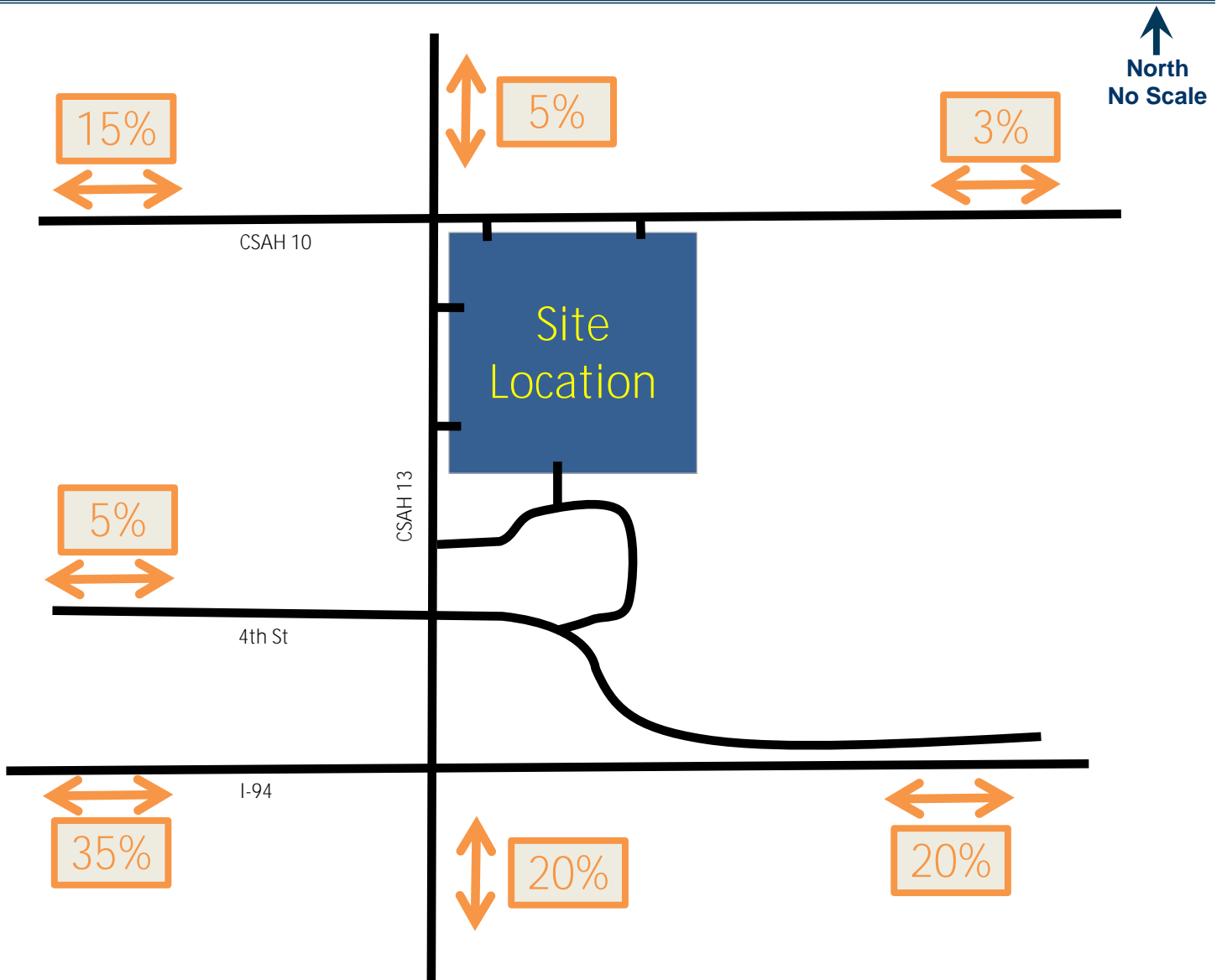


Figure 5
Site Access Configurations

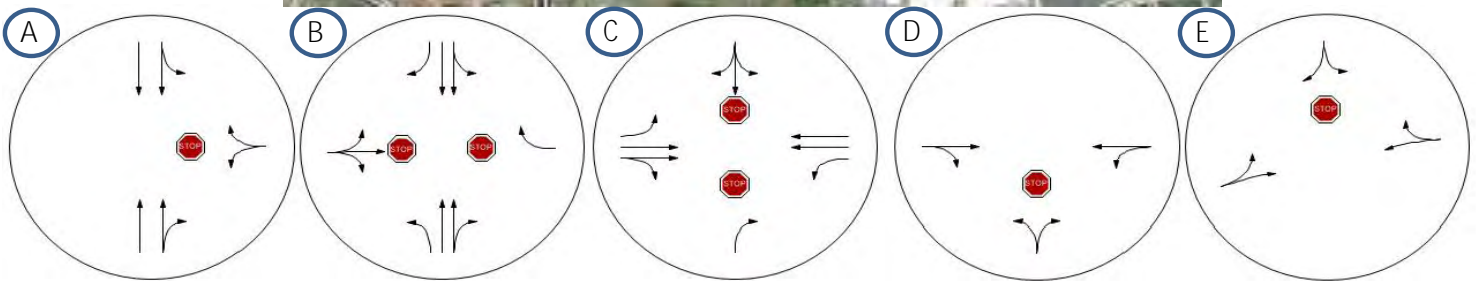
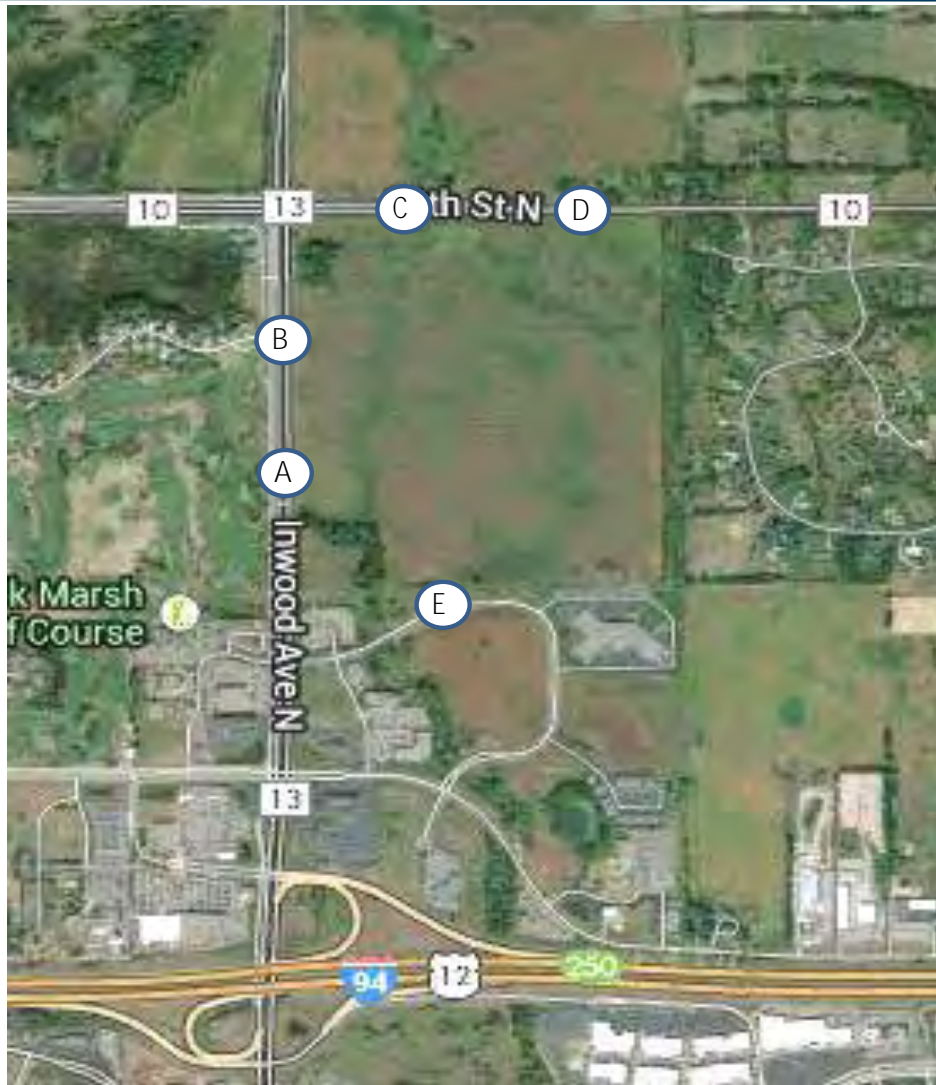
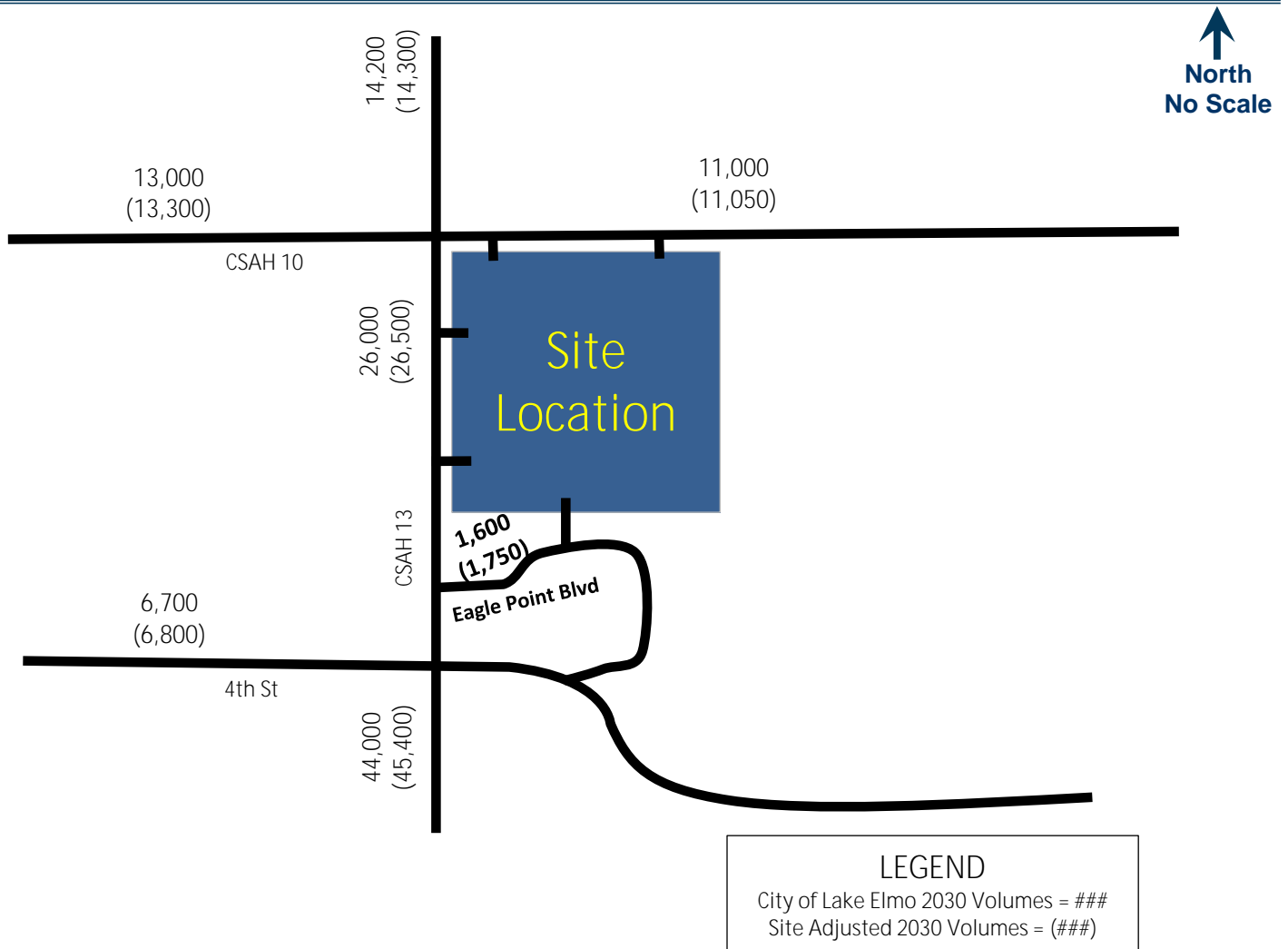


Figure 6
Daily Volumes





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Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 1 - Radio Dr & Southern I-94 Ramp, 5-29-14, 645-845am, 415-615pm

Site Code : 1

Start Date : 5/29/2014

Page No : 1

Radio Dr & Southern I-94 Ramp
Woodbury, MN

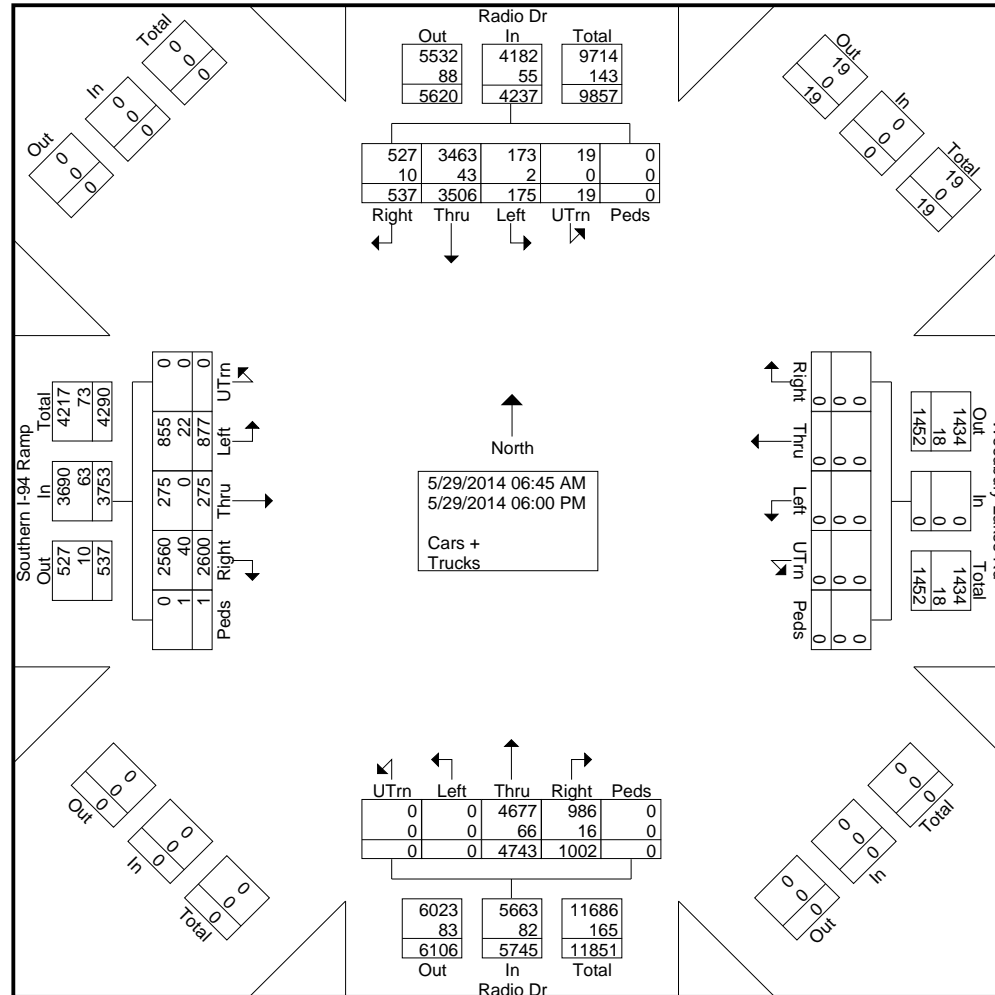
Groups Printed- Cars + - Trucks

	Radio Dr Southbound						Woodbury Lakes Rd Westbound						Radio Dr Northbound						Southern I-94 Ramp Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
06:45 AM	1	2	115	10	0	128	0	0	0	0	0	0	0	0	225	24	0	249	0	35	14	66	0	115	492
Total	1	2	115	10	0	128	0	0	0	0	0	0	0	0	225	24	0	249	0	35	14	66	0	115	492
07:00 AM	0	0	113	13	0	126	0	0	0	0	0	0	0	0	242	15	0	257	0	36	1	56	0	93	476
07:15 AM	0	0	128	16	0	144	0	0	0	0	0	0	0	0	290	21	0	311	0	68	3	71	0	142	597
07:30 AM	1	0	131	14	0	146	0	0	0	0	0	0	0	0	282	17	0	299	0	69	4	83	0	156	601
07:45 AM	1	6	180	7	0	194	0	0	0	0	0	0	0	0	300	18	0	318	0	88	8	142	0	238	750
Total	2	6	552	50	0	610	0	0	0	0	0	0	0	0	1114	71	0	1185	0	261	16	352	0	629	2424
08:00 AM	1	3	174	18	0	196	0	0	0	0	0	0	0	0	300	20	0	320	0	61	5	114	0	180	696
08:15 AM	0	4	159	14	0	177	0	0	0	0	0	0	0	0	241	20	0	261	0	54	9	94	0	157	595
08:30 AM	1	1	172	13	0	187	0	0	0	0	0	0	0	0	206	17	0	223	0	43	6	103	0	152	562
Total	2	8	505	45	0	560	0	0	0	0	0	0	0	0	747	57	0	804	0	158	20	311	0	489	1853
04:15 PM	0	19	266	68	0	353	0	0	0	0	0	0	0	0	349	114	0	463	0	54	33	252	0	339	1155
04:30 PM	2	21	339	57	0	419	0	0	0	0	0	0	0	0	309	94	0	403	0	48	35	252	0	335	1157
04:45 PM	1	26	267	71	0	365	0	0	0	0	0	0	0	0	307	92	0	399	0	59	36	252	0	347	1111
Total	3	66	872	196	0	1137	0	0	0	0	0	0	0	0	965	300	0	1265	0	161	104	756	0	1021	3423
05:00 PM	1	22	361	59	0	443	0	0	0	0	0	0	0	0	362	138	0	500	0	59	25	190	0	274	1217
05:15 PM	1	19	278	60	0	358	0	0	0	0	0	0	0	0	352	125	0	477	0	53	42	244	1	340	1175
05:30 PM	3	17	314	64	0	398	0	0	0	0	0	0	0	0	346	111	0	457	0	62	16	230	0	308	1163
05:45 PM	6	24	272	24	0	326	0	0	0	0	0	0	0	0	306	75	0	381	0	42	26	243	0	311	1018
Total	11	82	1225	207	0	1525	0	0	0	0	0	0	0	0	1366	449	0	1815	0	216	109	907	1	1233	4573
06:00 PM	0	11	237	29	0	277	0	0	0	0	0	0	0	0	326	101	0	427	0	46	12	208	0	266	970
Grand Total	19	175	3506	537	0	4237	0	0	0	0	0	0	0	0	4743	1002	0	5745	0	877	275	2600	1	3753	13735
Apprch %	0.4	4.1	82.7	12.7	0		0	0	0	0	0		0	0	82.6	17.4	0		0	23.4	7.3	69.3	0		
Total %	0.1	1.3	25.5	3.9	0	30.8	0	0	0	0	0	0	0	0	34.5	7.3	0	41.8	0	6.4	2	18.9	0	27.3	
Cars +	19	173	3463	527	0	4182	0	0	0	0	0	0	0	0	4677	986	0	5663	0	855	275	2560	0	3690	13535
% Cars +	100	98.9	98.8	98.1	0	98.7	0	0	0	0	0	0	0	0	98.6	98.4	0	98.6	0	97.5	100	98.5	0	98.3	98.5
Trucks	0	2	43	10	0	55	0	0	0	0	0	0	0	0	66	16	0	82	0	22	0	40	1	63	200
% Trucks	0	1.1	1.2	1.9	0	1.3	0	0	0	0	0	0	0	0	1.4	1.6	0	1.4	0	2.5	0	1.5	100	1.7	1.5

PO Box 16296
St. Louis Park, MN 55416

File Name : 1 - Radio Dr & Southern I-94 Ramp, 5-29-14, 645-845am, 415-615pm
Site Code : 1
Start Date : 5/29/2014
Page No : 2

Radio Dr & Southern I-94 Ramp
Woodbury, MN





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Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 1 - Radio Dr & Southern I-94 Ramp, 5-29-14, 645-845am, 415-615pm
Site Code : 1
Start Date : 5/29/2014
Page No : 3

Radio Dr & Southern I-94 Ramp
Woodbury, MN

	Radio Dr Southbound						Woodbury Lakes Rd Westbound						Radio Dr Northbound						Southern I-94 Ramp Eastbound							
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total	
Peak Hour Analysis From 06:45 AM to 12:30 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:15 AM																										
07:15 AM	0	0	128	16	0	144	0	0	0	0	0	0	0	0	290	21	0	311	0	68	3	71	0	142	597	
07:30 AM	1	0	131	14	0	146	0	0	0	0	0	0	0	0	282	17	0	299	0	69	4	83	0	156	601	
07:45 AM	1	6	180	7	0	194	0	0	0	0	0	0	0	0	300	18	0	318	0	88	8	142	0	238	750	
08:00 AM	1	3	174	18	0	196	0	0	0	0	0	0	0	0	300	20	0	320	0	61	5	114	0	180	696	
Total Volume	3	9	613	55	0	680	0	0	0	0	0	0	0	0	1172	76	0	1248	0	286	20	410	0	716	2644	
% App. Total	0.4	1.3	90.1	8.1	0		0	0	0	0	0		0	0	93.9	6.1	0		0	39.9	2.8	57.3	0			
PHF	.750	.375	.851	.764	.000	.867	.000	.000	.000	.000	.000	.000	.000	.000	.977	.905	.000	.975	.000	.813	.625	.722	.000	.752	.881	

Peak Hour Analysis From 12:45 PM to 06:00 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:45 PM

04:45 PM	1	26	267	71	0	365	0	0	0	0	0	0	0	0	307	92	0	399	0	59	36	252	0	347		1111
05:00 PM	1	22	361	59	0	443	0	0	0	0	0	0	0	0	362	138	0	500	0	59	25	190	0	274		1217
05:15 PM	1	19	278	60	0	358	0	0	0	0	0	0	0	0	352	125	0	477	0	53	42	244	1	340		1175
05:30 PM	3	17	314	64	0	398	0	0	0	0	0	0	0	0	346	111	0	457	0	62	16	230	0	308		1163
Total Volume	6	84	1220	254	0	1564	0	0	0	0	0	0	0	0	1367	466	0	1833	0	233	119	916	1	1269		4666
% App. Total	0.4	5.4	78	16.2	0		0	0	0	0	0		0	0	74.6	25.4	0		0	18.4	9.4	72.2	0.1			
PHF	.500	.808	.845	.894	.000	.883	.000	.000	.000	.000	.000	.000	.000	.000	.944	.844	.000	.917	.000	.940	.708	.909	.250	.914		.959



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Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 2 - Inwood Ave & Northern I-94 Ramp, 5-29-14, 645-845am, 415-615pm

Site Code : 2

Start Date : 5/29/2014

Page No : 1

Inwood Ave & Northern I-94 Ramp
Lake Elmo, MN

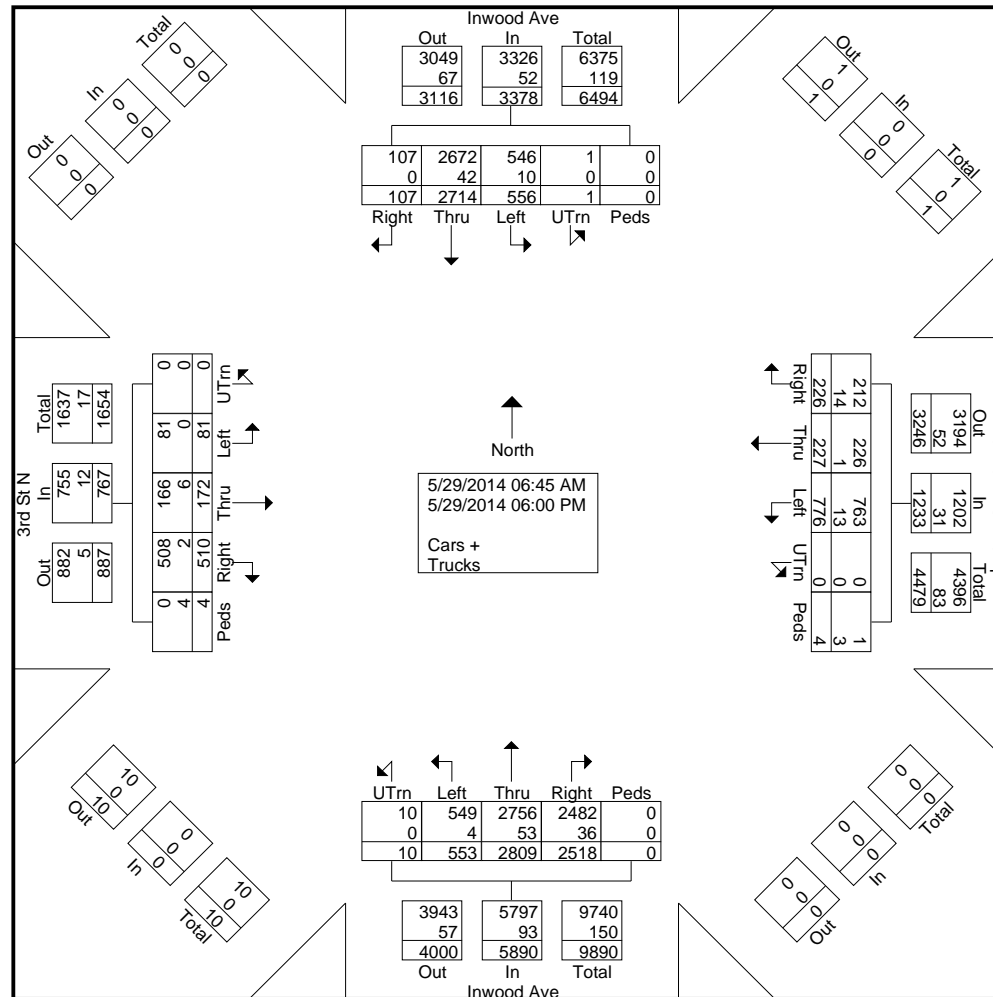
Groups Printed- Cars + - Trucks

	Inwood Ave Southbound						Northern I-94 Ramp Westbound						Inwood Ave Northbound						3rd St N Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
06:45 AM	0	15	75	3	0	93	0	43	36	16	0	95	0	14	78	158	0	250	0	1	5	6	1	13	451
Total	0	15	75	3	0	93	0	43	36	16	0	95	0	14	78	158	0	250	0	1	5	6	1	13	451
07:00 AM	0	15	70	4	0	89	0	41	26	9	1	77	0	14	83	176	0	273	0	1	6	3	0	10	449
07:15 AM	0	12	107	0	0	119	0	33	20	8	0	61	0	20	152	177	0	349	0	3	4	7	0	14	543
07:30 AM	0	14	98	2	0	114	0	29	19	9	0	57	0	18	151	186	0	355	0	2	7	11	0	20	546
07:45 AM	1	22	128	4	0	155	0	41	8	23	0	72	0	23	168	175	0	366	0	1	6	5	0	12	605
Total	1	63	403	10	0	477	0	144	73	49	1	267	0	75	554	714	0	1343	0	7	23	26	0	56	2143
08:00 AM	0	42	129	3	0	174	0	57	6	17	0	80	0	19	165	172	0	356	0	2	4	2	0	8	618
08:15 AM	0	42	106	1	0	149	0	52	5	15	0	72	2	23	122	145	0	292	0	3	5	9	0	17	530
08:30 AM	0	30	127	6	0	163	0	39	9	15	1	64	2	10	128	147	0	287	0	1	10	17	0	28	542
Total	0	114	362	10	0	486	0	148	20	47	1	216	4	52	415	464	0	935	0	6	19	28	0	53	1690
04:15 PM	0	42	215	18	0	275	0	66	17	17	0	100	1	52	232	120	0	405	0	9	15	43	0	67	847
04:30 PM	0	61	268	8	0	337	0	59	8	11	0	78	0	40	217	167	0	424	0	7	11	43	0	61	900
04:45 PM	0	40	251	12	0	303	0	50	14	15	0	79	0	35	184	152	0	371	0	15	11	61	0	87	840
Total	0	143	734	38	0	915	0	175	39	43	0	257	1	127	633	439	0	1200	0	31	37	147	0	215	2587
05:00 PM	0	68	270	7	0	345	0	61	10	21	0	92	2	54	262	160	0	478	0	8	26	79	2	115	1030
05:15 PM	0	46	214	13	0	273	0	55	14	10	0	79	1	60	252	129	0	442	0	6	20	70	1	97	891
05:30 PM	0	38	274	6	0	318	0	65	13	15	0	93	2	67	235	136	0	440	0	10	16	48	0	74	925
05:45 PM	0	40	201	6	0	247	0	35	12	13	0	60	0	49	193	148	0	390	0	8	13	60	0	81	778
Total	0	192	959	32	0	1183	0	216	49	59	0	324	5	230	942	573	0	1750	0	32	75	257	3	367	3624
06:00 PM	0	29	181	14	0	224	0	50	10	12	2	74	0	55	187	170	0	412	0	4	13	46	0	63	773
Grand Total	1	556	2714	107	0	3378	0	776	227	226	4	1233	10	553	2809	2518	0	5890	0	81	172	510	4	767	11268
Apprch %	0	16.5	80.3	3.2	0		0	62.9	18.4	18.3	0.3		0.2	9.4	47.7	42.8	0		0	10.6	22.4	66.5	0.5		
Total %	0	4.9	24.1	0.9	0	30	0	6.9	2	2	0	10.9	0.1	4.9	24.9	22.3	0	52.3	0	0.7	1.5	4.5	0	6.8	
Cars +	1	546	2672	107	0	3326	0	763	226	212	1	1202	10	549	2756	2482	0	5797	0	81	166	508	0	755	11080
% Cars +	100	98.2	98.5	100	0	98.5	0	98.3	99.6	93.8	25	97.5	100	99.3	98.1	98.6	0	98.4	0	100	96.5	99.6	0	98.4	98.3
Trucks	0	10	42	0	0	52	0	13	1	14	3	31	0	4	53	36	0	93	0	0	6	2	4	12	188
% Trucks	0	1.8	1.5	0	0	1.5	0	1.7	0.4	6.2	75	2.5	0	0.7	1.9	1.4	0	1.6	0	0	3.5	0.4	100	1.6	1.7

PO Box 16296
St. Louis Park, MN 55416

File Name : 2 - Inwood Ave & Northern I-94 Ramp, 5-29-14, 645-845am, 415-615pm
Site Code : 2
Start Date : 5/29/2014
Page No : 2

Inwood Ave & Northern I-94 Ramp
Lake Elmo, MN





Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 2 - Inwood Ave & Northern I-94 Ramp, 5-29-14, 645-845am, 415-615pm

Site Code : 2

Start Date : 5/29/2014

Page No : 3

Inwood Ave & Northern I-94 Ramp
Lake Elmo, MN

	Inwood Ave Southbound						Northern I-94 Ramp Westbound						Inwood Ave Northbound						3rd St N Eastbound							
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total	
Peak Hour Analysis From 06:45 AM to 12:30 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:15 AM																										
07:15 AM	0	12	107	0	0	119	0	33	20	8	0	61	0	20	152	177	0	349	0	3	4	7	0	14	543	
07:30 AM	0	14	98	2	0	114	0	29	19	9	0	57	0	18	151	186	0	355	0	2	7	11	0	20	546	
07:45 AM	1	22	128	4	0	155	0	41	8	23	0	72	0	23	168	175	0	366	0	1	6	5	0	12	605	
08:00 AM	0	42	129	3	0	174	0	57	6	17	0	80	0	19	165	172	0	356	0	2	4	2	0	8	618	
Total Volume	1	90	462	9	0	562	0	160	53	57	0	270	0	80	636	710	0	1426	0	8	21	25	0	54	2312	
% App. Total	0.2	16	82.2	1.6	0		0	59.3	19.6	21.1	0		0	5.6	44.6	49.8	0		0	14.8	38.9	46.3	0			
PHF	.250	.536	.895	.563	.000	.807	.000	.702	.663	.620	.000	.844	.000	.870	.946	.954	.000	.974	.000	.667	.750	.568	.000	.675	.935	

Peak Hour Analysis From 12:45 PM to 06:00 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:45 PM

04:45 PM	0	40	251	12	0	303	0	50	14	15	0	79	0	35	184	152	0	371	0	15	11	61	0	87	840
05:00 PM	0	68	270	7	0	345	0	61	10	21	0	92	2	54	262	160	0	478	0	8	26	79	2	115	1030
05:15 PM	0	46	214	13	0	273	0	55	14	10	0	79	1	60	252	129	0	442	0	6	20	70	1	97	891
05:30 PM	0	38	274	6	0	318	0	65	13	15	0	93	2	67	235	136	0	440	0	10	16	48	0	74	925
Total Volume	0	192	1009	38	0	1239	0	231	51	61	0	343	5	216	933	577	0	1731	0	39	73	258	3	373	3686
% App. Total	0	15.5	81.4	3.1	0		0	67.3	14.9	17.8	0		0.3	12.5	53.9	33.3	0		0	10.5	19.6	69.2	0.8		
PHF	.000	.706	.921	.731	.000	.898	.000	.888	.911	.726	.000	.922	.625	.806	.890	.902	.000	.905	.000	.650	.702	.816	.375	.811	.895



Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 3 - Inwood Ave & Hudson Blvd, 5-29-14, 645-845am, 415-615pm

Site Code : 3

Start Date : 5/29/2014

Page No : 1

Inwood Ave & Hudson Blvd
Lake Elmo, MN

Groups Printed- Cars + - Trucks

	Inwood Ave Southbound						Hudson Blvd Westbound						Inwood Ave Northbound						4th St Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
06:45 AM	0	5	53	13	0	71	0	9	22	2	0	33	0	27	49	10	0	86	0	2	5	28	2	37	227
Total	0	5	53	13	0	71	0	9	22	2	0	33	0	27	49	10	0	86	0	2	5	28	2	37	227
07:00 AM	0	2	62	25	0	89	0	6	15	4	1	26	0	31	48	16	0	95	0	3	3	20	0	26	236
07:15 AM	0	5	76	18	0	99	0	10	16	4	1	31	0	48	79	13	0	140	0	3	5	36	1	45	315
07:30 AM	0	4	87	20	1	112	0	6	25	7	1	39	0	42	88	28	0	158	0	11	9	32	0	52	361
07:45 AM	0	13	117	12	7	149	0	20	45	10	1	76	0	54	94	43	0	191	0	4	3	31	0	38	454
Total	0	24	342	75	8	449	0	42	101	25	4	172	0	175	309	100	0	584	0	21	20	119	1	161	1366
08:00 AM	0	8	98	16	0	122	0	40	37	7	0	84	0	57	77	42	0	176	0	1	9	45	0	55	437
08:15 AM	0	4	53	11	1	69	0	44	43	10	1	98	0	34	68	30	0	132	0	5	5	42	0	52	351
08:30 AM	0	8	105	13	3	129	0	33	42	21	1	97	0	31	75	24	0	130	0	4	5	31	0	40	396
Total	0	20	256	40	4	320	0	117	122	38	2	279	0	122	220	96	0	438	0	10	19	118	0	147	1184
04:15 PM	0	4	141	8	4	157	0	49	12	14	3	78	0	39	169	36	0	244	0	12	35	90	0	137	616
04:30 PM	0	6	228	11	0	245	0	51	14	9	0	74	0	30	160	30	0	220	0	10	25	87	1	123	662
04:45 PM	0	6	183	8	0	197	0	24	6	7	0	37	0	52	130	23	0	205	0	18	26	81	2	127	566
Total	0	16	552	27	4	599	0	124	32	30	3	189	0	121	459	89	0	669	0	40	86	258	3	387	1844
05:00 PM	0	7	181	10	0	198	0	48	6	10	0	64	0	67	161	19	1	248	0	14	37	113	0	164	674
05:15 PM	0	10	153	8	4	175	0	33	7	4	0	44	1	57	195	24	5	282	0	17	40	103	1	161	662
05:30 PM	0	10	217	14	0	241	0	36	11	7	0	54	0	42	150	24	1	217	0	16	24	82	0	122	634
05:45 PM	0	3	183	9	0	195	0	22	13	9	0	44	0	53	163	19	1	236	0	17	16	75	0	108	583
Total	0	30	734	41	4	809	0	139	37	30	0	206	1	219	669	86	8	983	0	64	117	373	1	555	2553
06:00 PM	1	3	156	9	3	172	0	28	12	6	0	46	0	33	140	13	0	186	0	15	12	41	0	68	472
Grand Total	1	98	2093	205	23	2420	0	459	326	131	9	925	1	697	1846	394	8	2946	0	152	259	937	7	1355	7646
Apprch %	0	4	86.5	8.5	1		0	49.6	35.2	14.2	1		0	23.7	62.7	13.4	0.3		0	11.2	19.1	69.2	0.5		
Total %	0	1.3	27.4	2.7	0.3	31.7	0	6	4.3	1.7	0.1	12.1	0	9.1	24.1	5.2	0.1	38.5	0	2	3.4	12.3	0.1	17.7	
Cars +	1	96	2071	203	16	2387	0	446	326	130	8	910	1	670	1821	390	0	2882	0	151	258	928	3	1340	7519
% Cars +	100	98	98.9	99	69.6	98.6	0	97.2	100	99.2	88.9	98.4	100	96.1	98.6	99	0	97.8	0	99.3	99.6	99	42.9	98.9	98.3
Trucks	0	2	22	2	7	33	0	13	0	1	1	15	0	27	25	4	8	64	0	1	1	9	4	15	127
% Trucks	0	2	1.1	1	30.4	1.4	0	2.8	0	0.8	11.1	1.6	0	3.9	1.4	1	100	2.2	0	0.7	0.4	1	57.1	1.1	1.7



Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 3 - Inwood Ave & Hudson Blvd, 5-29-14, 645-845am, 415-615pm
Site Code : 3
Start Date : 5/29/2014
Page No : 3

Inwood Ave & Hudson Blvd
Lake Elmo, MN

	Inwood Ave Southbound						Hudson Blvd Westbound						Inwood Ave Northbound						4th St Eastbound							
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total	
Peak Hour Analysis From 06:45 AM to 12:30 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:45 AM																										
07:45 AM	0	13	117	12	7	149	0	20	45	10	1	76	0	54	94	43	0	191	0	4	3	31	0	38	454	
08:00 AM	0	8	98	16	0	122	0	40	37	7	0	84	0	57	77	42	0	176	0	1	9	45	0	55	437	
08:15 AM	0	4	53	11	1	69	0	44	43	10	1	98	0	34	68	30	0	132	0	5	5	42	0	52	351	
08:30 AM	0	8	105	13	3	129	0	33	42	21	1	97	0	31	75	24	0	130	0	4	5	31	0	40	396	
Total Volume	0	33	373	52	11	469	0	137	167	48	3	355	0	176	314	139	0	629	0	14	22	149	0	185	1638	
% App. Total	0	7	79.5	11.1	2.3		0	38.6	47	13.5	0.8		0	28	49.9	22.1	0		0	7.6	11.9	80.5	0			
PHF	.000	.635	.797	.813	.393	.787	.000	.778	.928	.571	.750	.906	.000	.772	.835	.808	.000	.823	.000	.700	.611	.828	.000	.841	.902	

Peak Hour Analysis From 12:45 PM to 06:00 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:30 PM

04:30 PM	0	6	228	11	0	245	0	51	14	9	0	74	0	30	160	30	0	220	0	10	25	87	1	123	662
04:45 PM	0	6	183	8	0	197	0	24	6	7	0	37	0	52	130	23	0	205	0	18	26	81	2	127	566
05:00 PM	0	7	181	10	0	198	0	48	6	10	0	64	0	67	161	19	1	248	0	14	37	113	0	164	674
05:15 PM	0	10	153	8	4	175	0	33	7	4	0	44	1	57	195	24	5	282	0	17	40	103	1	161	662
Total Volume	0	29	745	37	4	815	0	156	33	30	0	219	1	206	646	96	6	955	0	59	128	384	4	575	2564
% App. Total	0	3.6	91.4	4.5	0.5		0	71.2	15.1	13.7	0		0.1	21.6	67.6	10.1	0.6		0	10.3	22.3	66.8	0.7		
PHF	.000	.725	.817	.841	.250	.832	.000	.765	.589	.750	.000	.740	.250	.769	.828	.800	.300	.847	.000	.819	.800	.850	.500	.877	.951



Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 4 - Inwood Ave & Eagle Point Blvd, 5-29-14, 645-845am, 415-615pm

Site Code : 4

Start Date : 5/29/2014

Page No : 1

Inwood Ave & Eagle Point Blvd
Lake Elmo, MN

Groups Printed- Cars + - Trucks

	Inwood Ave Southbound						Eagle Point Blvd Westbound						Inwood Ave Northbound						Oak Marsh Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
06:45 AM	0	8	69	5	0	82	0	0	0	0	0	0	0	11	36	9	0	56	0	1	0	2	1	4	142
Total	0	8	69	5	0	82	0	0	0	0	0	0	0	11	36	9	0	56	0	1	0	2	1	4	142
07:00 AM	0	14	87	6	0	107	0	1	0	0	1	2	0	10	27	10	0	47	0	2	0	4	1	7	163
07:15 AM	0	17	99	11	0	127	0	0	0	0	0	0	0	14	63	19	0	96	0	1	0	2	2	5	228
07:30 AM	0	16	110	5	0	131	0	0	0	1	0	1	0	21	66	17	0	104	0	1	0	2	0	3	239
07:45 AM	0	26	142	10	0	178	0	0	0	2	0	2	0	14	82	25	0	121	0	3	0	2	1	6	307
Total	0	73	438	32	0	543	0	1	0	3	1	5	0	59	238	71	0	368	0	7	0	10	4	21	937
08:00 AM	0	33	123	6	0	162	0	3	0	1	0	4	0	12	65	23	0	100	0	3	0	3	0	6	272
08:15 AM	0	14	70	6	0	90	0	1	0	0	0	1	0	12	46	21	0	79	0	1	0	3	0	4	174
08:30 AM	0	23	100	9	0	132	0	3	0	1	0	4	0	14	78	14	0	106	0	1	0	6	0	7	249
08:45 AM	0	0	2	0	0	2	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3
Total	0	70	295	21	0	386	0	7	0	2	0	9	0	38	190	58	0	286	0	5	0	12	0	17	698
04:15 PM	0	3	141	5	0	149	0	17	2	13	0	32	0	15	185	3	0	203	0	3	0	9	0	12	396
04:30 PM	0	4	170	13	0	187	0	35	0	21	0	56	0	22	178	0	0	200	0	7	0	14	0	21	464
04:45 PM	0	5	168	12	0	185	0	23	0	19	0	42	0	21	160	1	0	182	0	6	0	16	2	24	433
Total	0	12	479	30	0	521	0	75	2	53	0	130	0	58	523	4	0	585	0	16	0	39	2	57	1293
05:00 PM	0	4	153	18	0	175	0	19	0	24	0	43	0	31	176	2	0	209	0	13	0	22	0	35	462
05:15 PM	0	2	140	26	0	168	0	12	0	14	0	26	0	21	220	0	0	241	0	12	0	16	1	29	464
05:30 PM	0	0	183	14	0	197	0	18	0	9	1	28	1	18	164	1	0	184	0	12	0	8	0	20	429
05:45 PM	0	1	163	14	0	178	0	9	1	16	0	26	0	22	166	1	0	189	0	7	0	8	1	16	409
Total	0	7	639	72	0	718	0	58	1	63	1	123	1	92	726	4	0	823	0	44	0	54	2	100	1764
06:00 PM	0	2	131	6	1	140	0	6	0	6	0	12	0	17	147	0	0	164	0	4	0	9	1	14	330
Grand Total	0	172	2051	166	1	2390	0	147	3	127	2	279	1	275	1860	146	0	2282	0	77	0	126	10	213	5164
Apprch %	0	7.2	85.8	6.9	0		0	52.7	1.1	45.5	0.7		0	12.1	81.5	6.4	0		0	36.2	0	59.2	4.7		
Total %	0	3.3	39.7	3.2	0	46.3	0	2.8	0.1	2.5	0	5.4	0	5.3	36	2.8	0	44.2	0	1.5	0	2.4	0.2	4.1	
Cars +	0	171	2035	165	1	2372	0	147	3	127	0	277	1	273	1840	146	0	2260	0	76	0	125	4	205	5114
% Cars +	0	99.4	99.2	99.4	100	99.2	0	100	100	100	0	99.3	100	99.3	98.9	100	0	99	0	98.7	0	99.2	40	96.2	99
Trucks	0	1	16	1	0	18	0	0	0	0	2	2	0	2	20	0	0	22	0	1	0	1	6	8	50
% Trucks	0	0.6	0.8	0.6	0	0.8	0	0	0	0	100	0.7	0	0.7	1.1	0	0	1	0	1.3	0	0.8	60	3.8	1



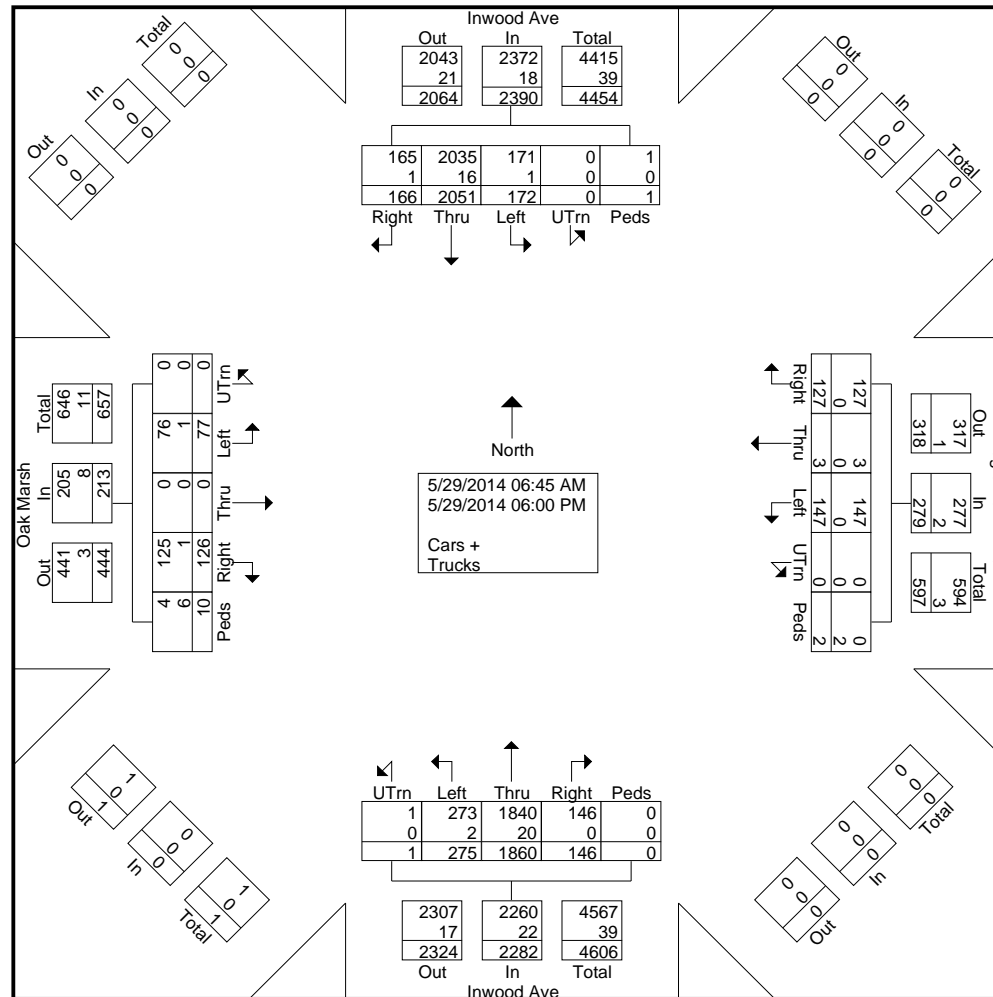
Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 4 - Inwood Ave & Eagle Point Blvd, 5-29-14, 645-845am, 415-615pm
Site Code : 4
Start Date : 5/29/2014
Page No : 2

Inwood Ave & Eagle Point Blvd
Lake Elmo, MN





Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 4 - Inwood Ave & Eagle Point Blvd, 5-29-14, 645-845am, 415-615pm
Site Code : 4
Start Date : 5/29/2014
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Inwood Ave & Eagle Point Blvd
Lake Elmo, MN

	Inwood Ave Southbound						Eagle Point Blvd Westbound						Inwood Ave Northbound						Oak Marsh Eastbound							
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total	
Peak Hour Analysis From 06:45 AM to 12:30 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:15 AM																										
07:15 AM	0	17	99	11	0	127	0	0	0	0	0	0	0	14	63	19	0	96	0	1	0	2	2	5	228	
07:30 AM	0	16	110	5	0	131	0	0	0	1	0	1	0	21	66	17	0	104	0	1	0	2	0	3	239	
07:45 AM	0	26	142	10	0	178	0	0	0	2	0	2	0	14	82	25	0	121	0	3	0	2	1	6	307	
08:00 AM	0	33	123	6	0	162	0	3	0	1	0	4	0	12	65	23	0	100	0	3	0	3	0	6	272	
Total Volume	0	92	474	32	0	598	0	3	0	4	0	7	0	61	276	84	0	421	0	8	0	9	3	20	1046	
% App. Total	0	15.4	79.3	5.4	0		0	42.9	0	57.1	0		0	14.5	65.6	20	0		0	40	0	45	15			
PHF	.000	.697	.835	.727	.000	.840	.000	.250	.000	.500	.000	.438	.000	.726	.841	.840	.000	.870	.000	.667	.000	.750	.375	.833	.852	

Peak Hour Analysis From 12:45 PM to 06:00 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:30 PM

04:30 PM	0	4	170	13	0	187	0	35	0	21	0	56	0	22	178	0	0	200	0	7	0	14	0	21	464
04:45 PM	0	5	168	12	0	185	0	23	0	19	0	42	0	21	160	1	0	182	0	6	0	16	2	24	433
05:00 PM	0	4	153	18	0	175	0	19	0	24	0	43	0	31	176	2	0	209	0	13	0	22	0	35	462
05:15 PM	0	2	140	26	0	168	0	12	0	14	0	26	0	21	220	0	0	241	0	12	0	16	1	29	464
Total Volume	0	15	631	69	0	715	0	89	0	78	0	167	0	95	734	3	0	832	0	38	0	68	3	109	1823
% App. Total	0	2.1	88.3	9.7	0		0	53.3	0	46.7	0		0	11.4	88.2	0.4	0		0	34.9	0	62.4	2.8		
PHF	.000	.750	.928	.663	.000	.956	.000	.636	.000	.813	.000	.746	.000	.766	.834	.375	.000	.863	.000	.731	.000	.773	.375	.779	.982



Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 5 - Inwood Ave & 9th St, 5-29-14, 645-845am, 415-615pm

Site Code : 5

Start Date : 5/29/2014

Page No : 1

Inwood Ave & 9th St
Lake Elmo, MN

Groups Printed- Cars + - Trucks

	Inwood Ave Southbound						Westbound						Inwood Ave Northbound						9th St N Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
06:45 AM	0	0	90	0	0	90	0	0	0	0	0	0	0	0	37	0	0	37	0	2	0	1	0	3	130
Total	0	0	90	0	0	90	0	0	0	0	0	0	0	0	37	0	0	37	0	2	0	1	0	3	130
07:00 AM	0	0	96	2	0	98	0	0	0	0	1	1	0	1	35	0	0	36	0	1	0	1	0	2	137
07:15 AM	0	0	125	2	0	127	0	0	0	0	0	0	0	0	69	0	0	69	0	3	0	3	1	7	203
07:30 AM	0	0	137	0	0	137	0	0	0	0	0	0	0	1	68	0	0	69	0	2	0	2	0	4	210
07:45 AM	0	0	168	1	0	169	0	0	0	0	0	0	0	1	78	0	0	79	1	0	0	4	1	6	254
Total	0	0	526	5	0	531	0	0	0	0	1	1	0	3	250	0	0	253	1	6	0	10	2	19	804
08:00 AM	0	0	135	1	0	136	0	0	0	0	0	0	1	2	63	0	0	66	0	0	0	6	2	8	210
08:15 AM	0	0	86	1	0	87	0	0	0	0	0	0	0	0	45	0	0	45	0	0	0	4	0	4	136
08:30 AM	0	0	128	0	0	128	0	0	0	0	0	0	0	2	77	0	0	79	1	0	0	4	2	7	214
08:45 AM	0	0	11	0	0	11	0	0	0	0	0	0	1	0	11	0	0	12	0	0	0	0	0	0	23
Total	0	0	360	2	0	362	0	0	0	0	0	0	2	4	196	0	0	202	1	0	0	14	4	19	583
03:45 PM	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	2	0	0	0	2	4
Total	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	2	0	0	0	2	4
04:15 PM	1	0	142	1	0	144	0	0	0	0	0	0	2	7	187	0	0	196	0	0	0	4	0	4	344
04:30 PM	1	0	191	3	0	195	0	0	0	0	0	0	0	6	219	0	0	225	0	0	0	1	0	1	421
04:45 PM	1	0	195	2	0	198	0	0	0	0	0	0	0	5	175	0	0	180	0	3	0	3	1	7	385
Total	3	0	528	6	0	537	0	0	0	0	0	0	2	18	581	0	0	601	0	3	0	8	1	12	1150
05:00 PM	1	0	170	3	0	174	0	0	0	0	0	0	2	6	210	0	0	218	0	2	0	4	0	6	398
05:15 PM	0	0	171	4	0	175	0	0	0	0	0	0	2	2	228	0	0	232	0	1	0	5	1	7	414
05:30 PM	0	0	180	3	0	183	0	0	0	0	1	1	1	5	173	0	0	179	0	1	0	4	1	6	369
05:45 PM	1	0	160	4	0	165	0	0	0	0	0	0	3	5	176	0	0	184	0	0	0	4	0	4	353
Total	2	0	681	14	0	697	0	0	0	0	1	1	8	18	787	0	0	813	0	4	0	17	2	23	1534
06:00 PM	1	0	135	0	0	136	0	0	0	0	0	0	1	4	143	0	0	148	0	1	0	4	5	10	294
Grand Total	6	0	2320	28	0	2354	0	0	0	0	3	3	13	47	1994	0	0	2054	2	18	0	54	14	88	4499
Apprch %	0.3	0	98.6	1.2	0		0	0	0	0	100		0.6	2.3	97.1	0	0		2.3	20.5	0	61.4	15.9		
Total %	0.1	0	51.6	0.6	0	52.3	0	0	0	0	0.1	0.1	0.3	1	44.3	0	0	45.7	0	0.4	0	1.2	0.3	2	
Cars +	6	0	2299	24	0	2329	0	0	0	0	0	0	13	47	1961	0	0	2021	0	17	0	53	5	75	4425
% Cars +	100	0	99.1	85.7	0	98.9	0	0	0	0	0	0	100	100	98.3	0	0	98.4	0	94.4	0	98.1	35.7	85.2	98.4
Trucks	0	0	21	4	0	25	0	0	0	0	3	3	0	0	33	0	0	33	2	1	0	1	9	13	74
% Trucks	0	0	0.9	14.3	0	1.1	0	0	0	0	100	100	0	0	1.7	0	0	1.6	100	5.6	0	1.9	64.3	14.8	1.6

PO Box 16296
St. Louis Park, MN 55416

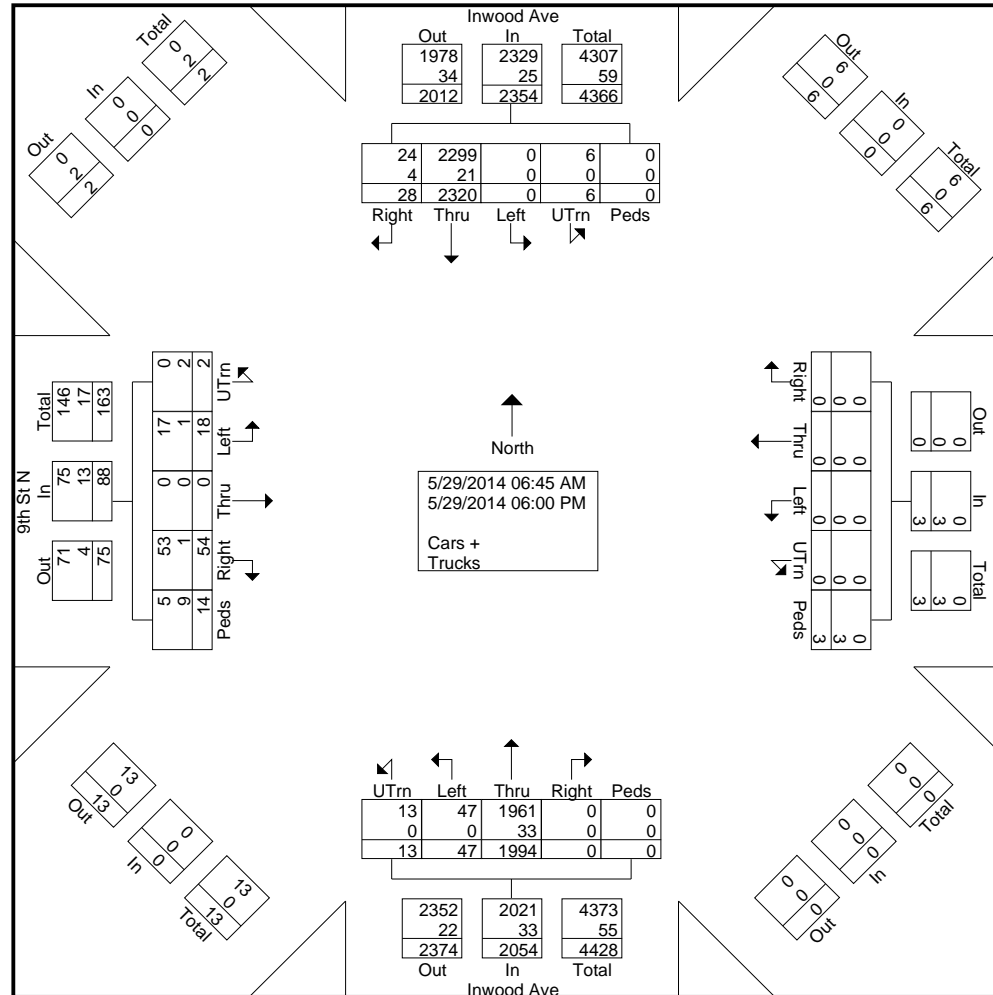
File Name : 5 - Inwood Ave & 9th St, 5-29-14, 645-845am, 415-615pm

Site Code : 5

Start Date : 5/29/2014

Page No : 2

Inwood Ave & 9th St
Lake Elmo, MN





Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 5 - Inwood Ave & 9th St, 5-29-14, 645-845am, 415-615pm
Site Code : 5
Start Date : 5/29/2014
Page No : 3

Inwood Ave & 9th St
Lake Elmo, MN

	Inwood Ave Southbound						Westbound						Inwood Ave Northbound						9th St N Eastbound							
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total	
Peak Hour Analysis From 06:45 AM to 12:30 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:15 AM																										
07:15 AM	0	0	125	2	0	127	0	0	0	0	0	0	0	0	69	0	0	69	0	3	0	3	1	7	203	
07:30 AM	0	0	137	0	0	137	0	0	0	0	0	0	0	1	68	0	0	69	0	2	0	2	0	4	210	
07:45 AM	0	0	168	1	0	169	0	0	0	0	0	0	0	1	78	0	0	79	1	0	0	4	1	6	254	
08:00 AM	0	0	135	1	0	136	0	0	0	0	0	0	1	2	63	0	0	66	0	0	0	6	2	8	210	
Total Volume	0	0	565	4	0	569	0	0	0	0	0	0	1	4	278	0	0	283	1	5	0	15	4	25	877	
% App. Total	0	0	99.3	0.7	0		0	0	0	0	0		0.4	1.4	98.2	0	0		4	20	0	60	16			
PHF	.000	.000	.841	.500	.000	.842	.000	.000	.000	.000	.000	.000	.250	.500	.891	.000	.000	.896	.250	.417	.000	.625	.500	.781	.863	

Peak Hour Analysis From 12:45 PM to 06:00 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:30 PM

04:30 PM	1	0	191	3	0	195	0	0	0	0	0	0	0	6	219	0	0	225	0	0	0	1	0	1	421
04:45 PM	1	0	195	2	0	198	0	0	0	0	0	0	0	5	175	0	0	180	0	3	0	3	1	7	385
05:00 PM	1	0	170	3	0	174	0	0	0	0	0	0	2	6	210	0	0	218	0	2	0	4	0	6	398
05:15 PM	0	0	171	4	0	175	0	0	0	0	0	0	2	2	228	0	0	232	0	1	0	5	1	7	414
Total Volume	3	0	727	12	0	742	0	0	0	0	0	0	4	19	832	0	0	855	0	6	0	13	2	21	1618
% App. Total	0.4	0	98	1.6	0		0	0	0	0	0		0.5	2.2	97.3	0	0		0	28.6	0	61.9	9.5		
PHF	.750	.000	.932	.750	.000	.937	.000	.000	.000	.000	.000	.000	.500	.792	.912	.000	.000	.921	.000	.500	.000	.650	.500	.750	.961



Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 6 - Inwood Ave & 10th St, 5-29-14, 6am-7pm

Site Code : 6

Start Date : 5/29/2014

Page No : 1

Inwood Ave & 10th St
Lake Elmo, MN

Groups Printed- Cars + - Trucks

	Inwood Ave Southbound						10th St N Westbound						Inwood Ave Northbound						10th St N Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	2	22	9	0	33	0	0	14	5	0	19	0	6	17	3	0	26	0	1	8	5	0	14	92
06:15 AM	0	2	19	8	0	29	0	1	24	7	0	32	0	10	20	2	0	32	0	1	11	12	0	24	117
06:30 AM	0	7	41	9	0	57	0	3	45	13	0	61	0	5	16	0	0	21	0	3	8	15	0	26	165
06:45 AM	0	11	58	13	1	83	0	7	33	15	0	55	0	15	20	5	0	40	0	4	12	25	0	41	219
Total	0	22	140	39	1	202	0	11	116	40	0	167	0	36	73	10	0	119	0	9	39	57	0	105	593
07:00 AM	0	9	61	17	0	87	0	12	78	28	1	119	0	13	15	5	0	33	0	5	20	23	2	50	289
07:15 AM	0	12	64	20	0	96	0	21	74	29	0	124	0	22	38	9	0	69	0	3	31	44	0	78	367
07:30 AM	0	18	79	23	0	120	0	17	103	26	0	146	1	26	39	10	0	76	0	6	25	40	0	71	413
07:45 AM	0	11	83	21	0	115	0	27	124	32	0	183	3	29	47	8	0	87	0	9	42	57	1	109	494
Total	0	50	287	81	0	418	0	77	379	115	1	572	4	90	139	32	0	265	0	23	118	164	3	308	1563
08:00 AM	0	8	95	18	0	121	0	22	118	34	2	176	3	23	28	7	2	63	0	9	19	33	0	61	421
08:15 AM	0	8	39	8	0	55	0	19	109	26	0	154	1	24	20	2	0	47	0	11	27	29	0	67	323
08:30 AM	0	13	81	18	0	112	0	13	84	37	0	134	0	21	51	5	0	77	0	10	20	46	1	77	400
08:45 AM	0	22	73	9	0	104	0	14	54	14	0	82	0	27	33	3	2	65	0	2	35	52	1	90	341
Total	0	51	288	53	0	392	0	68	365	111	2	546	4	95	132	17	4	252	0	32	101	160	2	295	1485
09:00 AM	0	16	53	11	0	80	0	6	38	7	0	51	3	24	36	10	0	73	0	9	24	26	2	61	265
09:15 AM	0	11	34	10	0	55	0	8	25	15	0	48	0	18	31	5	0	54	0	2	27	40	2	71	228
09:30 AM	0	11	42	8	3	64	0	11	11	8	2	32	0	19	35	7	0	61	0	6	22	32	2	62	219
09:45 AM	0	7	48	5	0	60	0	11	27	13	0	51	0	27	38	6	1	72	0	5	26	28	2	61	244
Total	0	45	177	34	3	259	0	36	101	43	2	182	3	88	140	28	1	260	0	22	99	126	8	255	956
10:00 AM	0	15	30	4	5	54	0	4	36	4	0	44	0	32	30	5	0	67	1	2	25	21	0	49	214
10:15 AM	0	6	40	2	1	49	0	12	31	14	0	57	1	22	41	4	0	68	0	5	29	35	0	69	243
10:30 AM	0	9	40	13	0	62	0	9	41	8	0	58	0	23	37	7	0	67	0	4	20	52	0	76	263
10:45 AM	0	14	37	2	0	53	0	13	21	16	0	50	1	28	47	17	0	93	0	4	28	42	0	74	270
Total	0	44	147	21	6	218	0	38	129	42	0	209	2	105	155	33	0	295	1	15	102	150	0	268	990
11:00 AM	0	7	34	7	2	50	0	10	31	9	0	50	0	28	36	14	0	78	0	2	35	43	1	81	259
11:15 AM	1	15	44	4	0	64	1	8	27	8	0	44	1	36	52	11	6	106	0	4	40	33	2	79	293
11:30 AM	0	13	42	2	0	57	0	4	28	8	3	43	1	40	48	6	0	95	0	4	28	43	1	76	271
11:45 AM	0	16	45	7	0	68	0	10	21	8	0	39	1	28	39	11	0	79	0	12	26	36	0	74	260
Total	1	51	165	20	2	239	1	32	107	33	3	176	3	132	175	42	6	358	0	22	129	155	4	310	1083
12:00 PM	0	8	58	6	0	72	0	16	19	10	0	45	1	34	48	8	0	91	0	11	35	38	2	86	294
12:15 PM	0	5	28	10	0	43	0	14	16	15	0	45	0	43	57	27	0	127	0	4	31	48	0	83	298
12:30 PM	0	10	42	6	1	59	0	11	29	10	1	51	0	34	47	14	0	95	0	6	40	27	1	74	279
12:45 PM	0	9	38	6	0	53	0	16	39	15	0	70	3	60	47	16	0	126	0	11	31	35	0	77	326
Total	0	32	166	28	1	227	0	57	103	50	1	211	4	171	199	65	0	439	0	32	137	148	3	320	1197
01:00 PM	0	13	44	7	1	65	0	5	21	19	0	45	2	43	46	13	0	104	0	8	20	37	0	65	279
01:15 PM	0	6	45	7	0	58	0	8	21	10	0	39	1	31	47	8	0	87	0	5	39	30	0	74	258
01:30 PM	0	5	47	2	0	54	0	8	28	14	0	50	1	36	44	15	0	96	0	4	35	29	0	68	268
01:45 PM	0	17	47	11	0	75	0	15	37	10	0	62	1	29	55	8	0	93	0	5	26	33	0	64	294
Total	0	41	183	27	1	252	0	36	107	53	0	196	5	139	192	44	0	380	0	22	120	129	0	271	1099



Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 6 - Inwood Ave & 10th St, 5-29-14, 6am-7pm

Site Code : 6

Start Date : 5/29/2014

Page No : 2

Inwood Ave & 10th St
Lake Elmo, MN

Groups Printed- Cars + - Trucks

	Inwood Ave Southbound						10th St N Westbound						Inwood Ave Northbound						10th St N Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	12	35	5	0	52	0	10	39	15	0	64	2	38	42	8	0	90	0	6	37	29	0	72	278
02:15 PM	0	13	40	8	0	61	0	11	34	16	0	61	1	46	42	17	0	106	0	10	39	36	0	85	313
02:30 PM	0	14	37	10	0	61	0	17	24	13	0	54	0	40	55	13	0	108	1	12	29	50	0	92	315
02:45 PM	0	12	47	6	0	65	0	8	33	19	0	60	0	28	59	11	1	99	0	13	45	51	0	109	333
Total	0	51	159	29	0	239	0	46	130	63	0	239	3	152	198	49	1	403	1	41	150	166	0	358	1239
03:00 PM	0	23	42	5	0	70	0	8	24	17	0	49	1	43	69	11	0	124	0	20	58	38	0	116	359
03:15 PM	0	23	47	11	0	81	0	12	26	18	0	56	0	50	59	22	0	131	0	18	55	42	0	115	383
03:30 PM	1	32	73	10	0	116	0	8	42	12	0	62	0	48	74	15	0	137	0	9	62	58	1	130	445
03:45 PM	0	20	66	12	0	98	0	14	38	22	0	74	1	42	73	18	0	134	1	13	97	73	0	184	490
Total	1	98	228	38	0	365	0	42	130	69	0	241	2	183	275	66	0	526	1	60	272	211	1	545	1677
04:00 PM	0	26	66	13	1	106	0	13	31	22	0	66	2	60	78	16	1	157	0	17	85	61	0	163	492
04:15 PM	0	33	57	5	2	97	0	20	35	35	0	90	0	66	93	19	0	178	0	25	94	57	0	176	541
04:30 PM	0	53	81	8	1	143	0	12	33	14	0	59	2	70	110	27	2	211	0	38	121	98	2	259	672
04:45 PM	0	41	80	6	0	127	0	14	36	36	1	87	0	47	91	21	0	159	1	35	162	78	0	276	649
Total	0	153	284	32	4	473	0	59	135	107	1	302	4	243	372	83	3	705	1	115	462	294	2	874	2354
05:00 PM	0	39	83	9	0	131	0	11	30	22	0	63	1	64	125	44	0	234	0	35	132	70	0	237	665
05:15 PM	0	51	70	8	1	130	0	5	50	19	0	74	1	69	100	28	0	198	0	33	176	107	0	316	718
05:30 PM	0	50	92	9	0	151	0	15	40	35	0	90	1	50	118	22	0	191	0	28	183	76	3	290	722
05:45 PM	0	25	75	16	0	116	0	23	37	28	0	88	0	68	101	23	0	192	0	22	150	66	0	238	634
Total	0	165	320	42	1	528	0	54	157	104	0	315	3	251	444	117	0	815	0	118	641	319	3	1081	2739
06:00 PM	0	34	57	15	0	106	0	10	44	22	0	76	0	45	81	23	0	149	0	12	76	60	3	151	482
06:15 PM	0	28	57	8	1	94	0	10	37	25	0	72	0	33	61	17	0	111	0	19	66	45	0	130	407
06:30 PM	0	17	42	8	0	67	0	11	30	19	0	60	0	27	68	16	0	111	0	12	55	38	1	106	344
06:45 PM	0	13	52	4	0	69	0	8	28	16	0	52	0	31	47	12	0	90	0	14	53	36	4	107	318
Total	0	92	208	35	1	336	0	39	139	82	0	260	0	136	257	68	0	461	0	57	250	179	8	494	1551
Grand Total	2	895	2752	479	20	4148	1	595	2098	912	10	3616	37	1821	2751	654	15	5278	4	568	2620	2258	34	5484	18526
Apprch %	0	21.6	66.3	11.5	0.5		0	16.5	58	25.2	0.3		0.7	34.5	52.1	12.4	0.3		0.1	10.4	47.8	41.2	0.6		
Total %	0	4.8	14.9	2.6	0.1	22.4	0	3.2	11.3	4.9	0.1	19.5	0.2	9.8	14.8	3.5	0.1	28.5	0	3.1	14.1	12.2	0.2	29.6	
Cars +	2	872	2714	473	1	4062	1	581	2043	887	5	3517	36	1788	2704	639	3	5170	4	557	2611	2224	15	5411	18160
% Cars +	100	97.4	98.6	98.7	5	97.9	100	97.6	97.4	97.3	50	97.3	97.3	98.2	98.3	97.7	20	98	100	98.1	99.7	98.5	44.1	98.7	98
Trucks	0	23	38	6	19	86	0	14	55	25	5	99	1	33	47	15	12	108	0	11	9	34	19	73	366
% Trucks	0	2.6	1.4	1.3	95	2.1	0	2.4	2.6	2.7	50	2.7	2.7	1.8	1.7	2.3	80	2	0	1.9	0.3	1.5	55.9	1.3	2



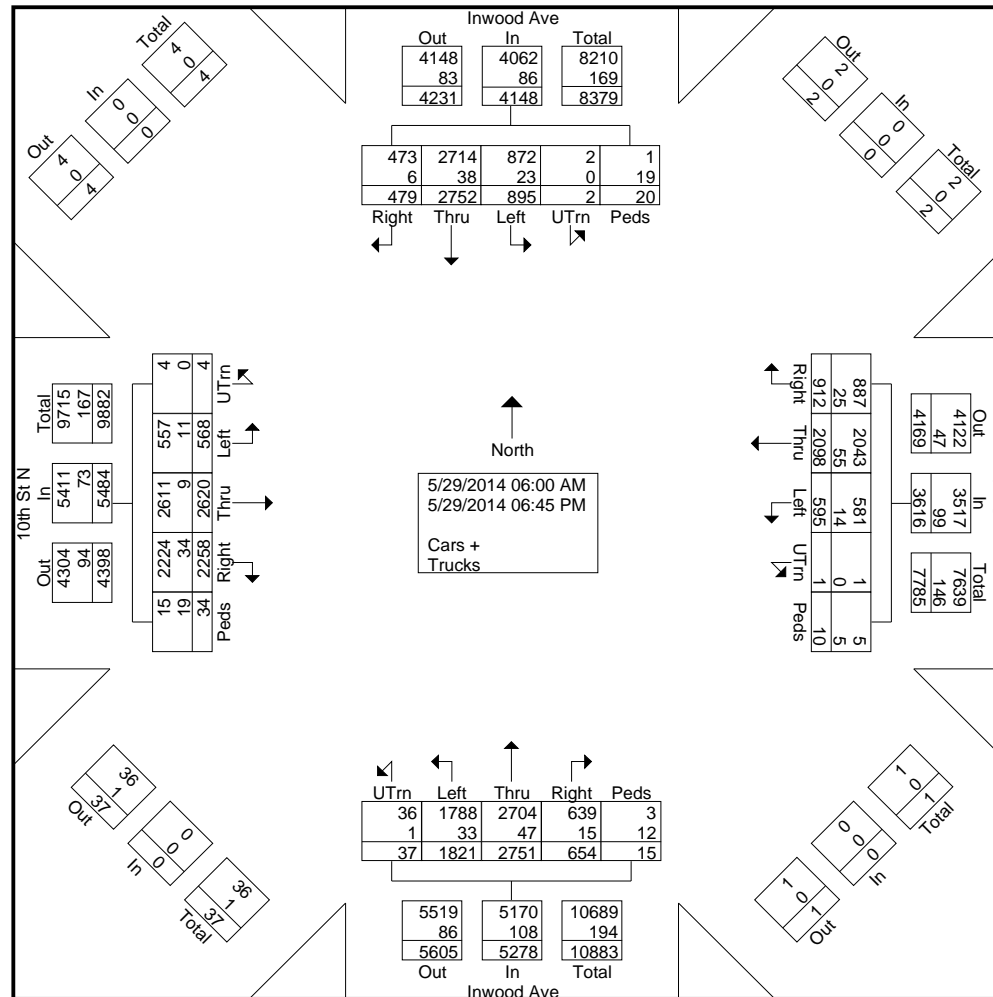
Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 6 - Inwood Ave & 10th St, 5-29-14, 6am-7pm
Site Code : 6
Start Date : 5/29/2014
Page No : 3

Inwood Ave & 10th St
Lake Elmo, MN





Traffic Data Inc

Appendix C - Traffic Counts

PO Box 16296
St. Louis Park, MN 55416

File Name : 6 - Inwood Ave & 10th St, 5-29-14, 6am-7pm

Site Code : 6

Start Date : 5/29/2014

Page No : 4

Inwood Ave & 10th St
Lake Elmo, MN

	Inwood Ave Southbound						10th St N Westbound						Inwood Ave Northbound						10th St N Eastbound							
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total	
Peak Hour Analysis From 06:00 AM to 09:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:15 AM																										
07:15 AM	0	12	64	20	0	96	0	21	74	29	0	124	0	22	38	9	0	69	0	3	31	44	0	78	367	
07:30 AM	0	18	79	23	0	120	0	17	103	26	0	146	1	26	39	10	0	76	0	6	25	40	0	71	413	
07:45 AM	0	11	83	21	0	115	0	27	124	32	0	183	3	29	47	8	0	87	0	9	42	57	1	109	494	
08:00 AM	0	8	95	18	0	121	0	22	118	34	2	176	3	23	28	7	2	63	0	9	19	33	0	61	421	
Total Volume	0	49	321	82	0	452	0	87	419	121	2	629	7	100	152	34	2	295	0	27	117	174	1	319	1695	
% App. Total	0	10.8	71	18.1	0		0	13.8	66.6	19.2	0.3		2.4	33.9	51.5	11.5	0.7		0	8.5	36.7	54.5	0.3			
PHF	.000	.681	.845	.891	.000	.934	.000	.806	.845	.890	.250	.859	.583	.862	.809	.850	.250	.848	.000	.750	.696	.763	.250	.732	.858	

Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 12:00 PM

12:00 PM	0	8	58	6	0	72	0	16	19	10	0	45	1	34	48	8	0	91	0	11	35	38	2	86	294
12:15 PM	0	5	28	10	0	43	0	14	16	15	0	45	0	43	57	27	0	127	0	4	31	48	0	83	298
12:30 PM	0	10	42	6	1	59	0	11	29	10	1	51	0	34	47	14	0	95	0	6	40	27	1	74	279
12:45 PM	0	9	38	6	0	53	0	16	39	15	0	70	3	60	47	16	0	126	0	11	31	35	0	77	326
Total Volume	0	32	166	28	1	227	0	57	103	50	1	211	4	171	199	65	0	439	0	32	137	148	3	320	1197
% App. Total	0	14.1	73.1	12.3	0.4		0	27	48.8	23.7	0.5		0.9	39	45.3	14.8	0		0	10	42.8	46.2	0.9		
PHF	.000	.800	.716	.700	.250	.788	.000	.891	.660	.833	.250	.754	.333	.713	.873	.602	.000	.864	.000	.727	.856	.771	.375	.930	.918

Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:45 PM

04:45 PM	0	41	80	6	0	127	0	14	36	36	1	87	0	47	91	21	0	159	1	35	162	78	0	276	649
05:00 PM	0	39	83	9	0	131	0	11	30	22	0	63	1	64	125	44	0	234	0	35	132	70	0	237	665
05:15 PM	0	51	70	8	1	130	0	5	50	19	0	74	1	69	100	28	0	198	0	33	176	107	0	316	718
05:30 PM	0	50	92	9	0	151	0	15	40	35	0	90	1	50	118	22	0	191	0	28	183	76	3	290	722
Total Volume	0	181	325	32	1	539	0	45	156	112	1	314	3	230	434	115	0	782	1	131	653	331	3	1119	2754
% App. Total	0	33.6	60.3	5.9	0.2		0	14.3	49.7	35.7	0.3		0.4	29.4	55.5	14.7	0		0.1	11.7	58.4	29.6	0.3		
PHF	.000	.887	.883	.889	.250	.892	.000	.750	.780	.778	.250	.872	.750	.833	.868	.653	.000	.835	.250	.936	.892	.773	.250	.885	.954

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 1: AM Existing

Report File: C:\...\AM Existing.pdf

7/2/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	CSAH 13 & I-94 Southern Ramp	Signalized	HCM2010	SBL	0.364	15.8	B
2	CSAH 13 & I-94 Northern Ramp	Signalized	HCM2010	SBL	0.383	21.4	C
3	Inwood Ave & Hudson Blvd	Signalized	HCM2010	EBL	0.292	29.8	C
4	CSAH 13 & Eagle Point Blvd	Two-way stop	HCM2010	EBT	0.000	29.6	D
6	CSAH 13 & 9th St	Two-way stop	HCM2010	EBL	0.021	16.3	C
7	CSAH 13 & CSAH 10	Signalized	HCM2010	WBL	0.348	18.5	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #1: CSAH 13 & I-94 Southern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 15.8
Level Of Service: B
Volume to Capacity (v/c): 0.364

Intersection Setup

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	2	0	1	1	0	2	0	0	0
Pocket Length [ft]	100.00	100.00	400.00	175.00	100.00	150.00	500.00	100.00	500.00	100.00	100.00	100.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Base Volume Input [veh/h]	0	1172	76	12	613	55	286	20	410	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	38	0	0	28	0	0	205	0	0	0
Total Hourly Volume [veh/h]	0	1172	38	12	613	27	286	20	205	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	318	10	3	167	7	78	5	56	0	0	0
Total Analysis Volume [veh/h]	0	1274	41	13	666	29	311	22	223	0	0	0
Presence of On-Street Parking			no	no		no	no		no			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Version 2.00-06



Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Protecte	Permiss
Signal Group	0	2	0	1	6	0	0	4	5	0	0	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	20	0	7	20	0	0	10	10	0	0	0
Maximum Green [s]	0	57	0	10	58	0	0	25	13	0	0	0
Amber [s]	0.0	4.5	0.0	3.0	4.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	2.0	1.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
Split [s]	0	63	0	15	61	0	0	32	17	0	0	0
Vehicle Extension [s]	0.0	4.6	0.0	2.0	4.6	0.0	0.0	3.0	2.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	3.5	0.0	3.0	4.0	0.0	0.0	5.0	5.0	0.0	0.0	0.0
Minimum Recall		no		no	no			no	no			
Maximum Recall		yes		no	yes			no	no			
Pedestrian Recall		no		no	no			no	no			
Detector Location [ft]	0.0	400.0	0.0	20.0	400.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	C	R	L	C	R	L	C	R	
L, Total Lost Time per Cycle [s]	5.50	5.50	5.00	6.00	6.00	7.00	7.00	7.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	3.50	3.50	3.00	4.00	4.00	5.00	5.00	0.00	
g_i, Effective Green Time [s]	77	77	2	67	67	13	13	30	
g / C, Green / Cycle	0.70	0.70	0.02	0.61	0.61	0.12	0.12	0.27	
(v / s)_i Volume / Saturation Flow Rate	0.25	0.03	0.00	0.19	0.02	0.09	0.09	0.08	
s, saturation flow rate [veh/h]	5025	1568	3412	3512	1568	1757	1757	2775	
c, Capacity [veh/h]	3528	1101	75	2144	957	205	205	753	
d1, Uniform Delay [s]	6.54	5.01	52.84	10.31	8.51	47.08	47.08	31.75	
k, delay calibration	0.50	0.50	0.04	0.50	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.29	0.06	0.41	0.38	0.06	5.61	5.61	0.22	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.36	0.04	0.17	0.31	0.03	0.76	0.76	0.30	
d, Delay for Lane Group [s/veh]	6.83	5.08	53.25	10.69	8.57	52.69	52.69	31.97	
Lane Group LOS	A	A	D	B	A	D	D	C	
Critical Lane Group	no	no	no	yes	no	yes	no	yes	
50th-Percentile Queue Length [veh]	3.23	0.25	0.18	3.54	0.26	4.43	4.43	2.37	
50th-Percentile Queue Length [ft]	80.77	6.29	4.40	88.42	6.55	110.85	110.85	59.34	
95th-Percentile Queue Length [veh]	5.82	0.45	0.32	6.37	0.47	7.89	7.89	4.27	
95th-Percentile Queue Length [ft]	145.39	11.32	7.92	159.15	11.78	197.19	197.19	106.82	

Appendix D - Capacity Analysis Backup

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	6.83	5.08	53.25	10.69	8.57	52.69	52.69	31.97	0.00	0.00	0.00
Movement LOS		A	A	D	B	A	D	D	C			
d_A, Approach Delay [s/veh]	6.77			11.38			44.04			0.00		
Approach LOS	A			B			D			A		
d_I, Intersection Delay [s/veh]	15.83											
Intersection LOS	B											
Intersection V/C	0.364											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #2: CSAH 13 & I-94 Northern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 21.4
Level Of Service: C
Volume to Capacity (v/c): 0.383

Intersection Setup

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	325.00	100.00	100.00	250.00	100.00	275.00	175.00	100.00	100.00	400.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Base Volume Input [veh/h]	80	636	710	91	462	9	8	21	25	160	53	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	355	0	0	5	0	0	13	0	0	29
Total Hourly Volume [veh/h]	80	636	355	91	462	4	8	21	12	160	53	28
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	173	96	25	126	1	2	6	3	43	14	8
Total Analysis Volume [veh/h]	87	691	386	99	502	4	9	23	13	174	58	30
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	89.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	10	44	0	15	49	0	10	11	0	18	30	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	3.5	0.0	3.0	3.5	0.0
All red [s]	2.0	1.5	0.0	2.0	2.0	0.0	2.0	3.5	0.0	2.0	3.0	0.0
Split [s]	15	50	0	20	55	0	15	18	0	22	25	0
Vehicle Extension [s]	2.0	4.6	0.0	2.0	4.6	0.0	2.0	3.0	0.0	2.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.5	0.0	3.0	5.0	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	39.0	300.0	0.0	39.0	300.0	0.0	39.0	120.0	0.0	120.0	120.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.50	6.50	5.00	7.00	7.00	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.50	4.50	3.00	5.00	5.00	3.00	4.50	4.50
g_i, Effective Green Time [s]	7	65	65	8	66	66	6	7	7	8	9	9
g / C, Green / Cycle	0.06	0.59	0.59	0.07	0.60	0.60	0.05	0.06	0.06	0.07	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.03	0.20	0.25	0.06	0.14	0.00	0.01	0.01	0.01	0.05	0.03	0.02
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	203	2064	922	125	2089	933	89	113	96	243	159	135
d1, Uniform Delay [s]	49.97	11.64	12.41	50.34	10.54	9.06	49.88	49.14	48.93	50.04	47.46	46.86
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.11	0.11	0.04	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.53	0.44	1.40	4.23	0.27	0.01	0.18	0.88	0.64	1.49	1.40	0.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.33	0.42	0.79	0.24	0.00	0.10	0.20	0.14	0.72	0.36	0.22
d, Delay for Lane Group [s/veh]	50.51	12.08	13.81	54.57	10.81	9.07	50.06	50.02	49.57	51.53	48.85	47.68
Lane Group LOS	D	B	B	D	B	A	D	D	D	D	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	1.14	4.00	4.97	2.75	2.65	0.04	0.24	0.63	0.36	2.39	1.56	0.80
50th-Percentile Queue Length [ft]	28.49	99.97	124.24	68.82	66.35	0.94	6.03	15.73	8.89	59.76	39.08	19.94
95th-Percentile Queue Length [veh]	2.05	7.20	8.63	4.95	4.78	0.07	0.43	1.13	0.64	4.30	2.81	1.44
95th-Percentile Queue Length [ft]	51.28	179.95	215.63	123.87	119.43	1.68	10.85	28.31	16.00	107.57	70.34	35.89

Appendix D - Capacity Analysis Backup

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	50.51	12.08	13.81	54.57	10.81	9.07	50.06	50.02	49.57	51.53	48.85	47.68
Movement LOS	D	B	B	D	B	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	15.53			17.96			49.90			50.50		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	21.40											
Intersection LOS	C											
Intersection V/C	0.383											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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Intersection Level Of Service Report #3: Inwood Ave & Hudson Blvd

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 29.8
Level Of Service: C
Volume to Capacity (v/c): 0.292

Intersection Setup

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	175.00	100.00	250.00	100.00	100.00	100.00	175.00	100.00	100.00	250.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Base Volume Input [veh/h]	176	314	139	33	373	52	14	22	149	137	167	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	70	0	0	26	0	0	75	0	0	24
Total Hourly Volume [veh/h]	176	314	69	33	373	26	14	22	74	137	167	24
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	85	19	9	101	7	4	6	20	37	45	7
Total Analysis Volume [veh/h]	191	341	75	36	405	28	15	24	80	149	182	26
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			11			0			3		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	94.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	16	39	0	12	35	0	12	24	0	12	25	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	2.0	1.5	0.0	2.0	1.5	0.0	2.0	2.5	0.0	2.0	2.5	0.0
Split [s]	21	45	0	17	41	0	17	31	0	17	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.0	0.0	3.0	4.5	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	55.0	300.0	0.0	55.0	475.0	0.0	50.0	250.0	0.0	50.0	250.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.00	6.00	5.00	6.50	6.50	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.00	4.00	3.00	4.50	4.50	3.00	4.50	4.50
g_i, Effective Green Time [s]	8	66	66	5	63	63	3	10	10	7	14	14
g / C, Green / Cycle	0.08	0.60	0.60	0.04	0.57	0.57	0.02	0.09	0.09	0.06	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.06	0.10	0.05	0.02	0.12	0.02	0.01	0.01	0.05	0.04	0.10	0.02
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	258	2112	943	75	1996	891	42	162	137	218	236	200
d1, Uniform Delay [s]	49.77	9.68	9.18	51.46	11.59	10.44	52.87	46.39	48.25	50.41	46.43	42.55
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.12	0.16	0.16	4.68	0.23	0.07	5.15	0.42	3.87	3.77	5.33	0.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.16	0.08	0.48	0.20	0.03	0.36	0.15	0.58	0.68	0.77	0.13
d, Delay for Lane Group [s/veh]	53.89	9.85	9.35	56.14	11.82	10.50	58.02	46.81	52.11	54.18	51.76	42.84
Lane Group LOS	D	A	A	E	B	B	E	D	D	D	D	D
Critical Lane Group	yes	no	no	no	yes	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	2.64	1.67	0.72	1.04	2.26	0.29	0.47	0.63	2.26	2.12	5.15	0.64
50th-Percentile Queue Length [ft]	66.11	41.82	18.02	26.05	56.61	7.26	11.68	15.67	56.38	52.95	128.73	16.12
95th-Percentile Queue Length [veh]	4.76	3.01	1.30	1.88	4.08	0.52	0.84	1.13	4.06	3.81	8.87	1.16
95th-Percentile Queue Length [ft]	119.00	75.28	32.44	46.88	101.89	13.06	21.03	28.20	101.48	95.31	221.77	29.01

Appendix D - Capacity Analysis Backup

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.89	9.85	9.35	56.14	11.82	10.50	58.02	46.81	52.11	54.18	51.76	42.84
Movement LOS	D	A	A	E	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	23.64			15.14			51.79			52.12		
Approach LOS	C			B			D			D		
d_I, Intersection Delay [s/veh]	29.78											
Intersection LOS	C											
Intersection V/C	0.292											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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Intersection Level Of Service Report #4: CSAH 13 & Eagle Point Blvd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 29.6
Level Of Service: D
Volume to Capacity (v/c): 0.000

Intersection Setup

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	250.00	250.00	100.00	250.00	50.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	45.00			55.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Base Volume Input [veh/h]	61	276	84	92	474	32	8	0	9	3	0	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	276	84	92	474	32	8	0	9	3	0	4
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	75	23	25	129	9	2	0	2	1	0	1
Total Analysis Volume [veh/h]	66	300	91	100	515	35	9	0	10	3	0	4
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.09	0.01	0.00	0.05	0.00	0.01	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	8.84	0.00	0.00	8.41	0.00	0.00	27.00	29.62	9.98	22.68	27.74	9.17
Movement LOS	A	A	A	A	A	A	D	D	A	C	D	A
95th-Percentile Queue Length [veh]	0.21	0.00	0.00	0.28	0.00	0.00	0.16	0.04	0.04	0.04	0.01	0.01
95th-Percentile Queue Length [ft]	5.27	0.00	0.00	7.08	0.00	0.00	4.09	1.04	1.04	1.10	0.35	0.35
d_A, Approach Delay [s/veh]	1.28			1.29			18.04			14.96		
Approach LOS	A			A			C			B		
d_I, Intersection Delay [s/veh]	1.65											
Intersection LOS	D											

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #6: CSAH 13 & 9th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 16.3
Level Of Service: C
Volume to Capacity (v/c): 0.021

Intersection Setup

Name	CSAH 13		CSAH 13		9th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [ft]	300.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	CSAH 13		CSAH 13		9th St	
Base Volume Input [veh/h]	5	278	565	4	6	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	278	565	4	6	15
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	76	154	1	2	4
Total Analysis Volume [veh/h]	5	302	614	4	7	16
Pedestrian Volume [ped/h]	0		0		4	
Bicycle Volume [bicycles/h]	0		0		0	

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.02	0.02
d_M, Delay for Movement [s/veh]	8.83	0.00	0.00	0.00	16.32	10.63
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.02	0.00	0.00	0.00	0.14	0.14
95th-Percentile Queue Length [ft]	0.40	0.00	0.00	0.00	3.52	3.52
d_A, Approach Delay [s/veh]	0.14		0.00		12.36	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.35					
Intersection LOS	C					

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #7: CSAH 13 & CSAH 10

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 18.5
Level Of Service: B
Volume to Capacity (v/c): 0.348

Intersection Setup

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	250.00	100.00	250.00	250.00	100.00	250.00	275.00	100.00	275.00	250.00	100.00	250.00
Speed [mph]	55.00			55.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Base Volume Input [veh/h]	107	152	34	49	321	82	27	117	174	87	419	121
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	17	0	0	41	0	0	87	0	0	61
Total Hourly Volume [veh/h]	107	152	17	49	321	41	27	117	87	87	419	60
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	41	5	13	87	11	7	32	24	24	114	16
Total Analysis Volume [veh/h]	116	165	18	53	349	45	29	127	95	95	455	65
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	2			0			1			2		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	40	0	30	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	24	34	0	24	34	0	10	27	0	25	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	no	no		no	no		no	yes		no	yes	
Maximum Recall	no	no		no	no		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	4	9	9	5	10	10	3	9	9	4	10	10
g / C, Green / Cycle	0.09	0.19	0.19	0.11	0.21	0.21	0.07	0.20	0.20	0.08	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.07	0.05	0.01	0.03	0.10	0.03	0.02	0.04	0.06	0.05	0.13	0.04
s, saturation flow rate [veh/h]	1757	3512	1568	1757	3512	1568	1757	3512	1568	1757	3512	1568
c, Capacity [veh/h]	158	680	303	187	739	330	117	706	315	136	744	332
d1, Uniform Delay [s]	21.03	16.18	15.60	19.51	16.42	15.22	21.02	15.71	16.11	21.35	16.92	15.37
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.51	0.18	0.08	0.82	0.47	0.19	1.10	0.12	0.53	6.41	0.82	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.24	0.06	0.28	0.47	0.14	0.25	0.18	0.30	0.70	0.61	0.20
d, Delay for Lane Group [s/veh]	27.54	16.37	15.68	20.33	16.89	15.41	22.12	15.83	16.65	27.76	17.74	15.65
Lane Group LOS	C	B	B	C	B	B	C	B	B	C	B	B
Critical Lane Group	yes	no	no	no	yes	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.27	0.59	0.13	0.46	1.28	0.31	0.28	0.44	0.70	1.06	1.74	0.46
50th-Percentile Queue Length [ft]	31.79	14.65	3.16	11.60	31.92	7.77	6.97	10.95	17.52	26.38	43.45	11.38
95th-Percentile Queue Length [veh]	2.29	1.05	0.23	0.84	2.30	0.56	0.50	0.79	1.26	1.90	3.13	0.82
95th-Percentile Queue Length [ft]	57.22	26.37	5.69	20.89	57.46	13.99	12.55	19.71	31.54	47.49	78.20	20.48

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.54	16.37	15.68	20.33	16.89	15.41	22.12	15.83	16.65	27.76	17.74	15.65
Movement LOS	C	B	B	C	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	20.66			17.15			16.86			19.07		
Approach LOS	C			B			B			B		
d_I, Intersection Delay [s/veh]	18.49											
Intersection LOS	B											
Intersection V/C	0.348											

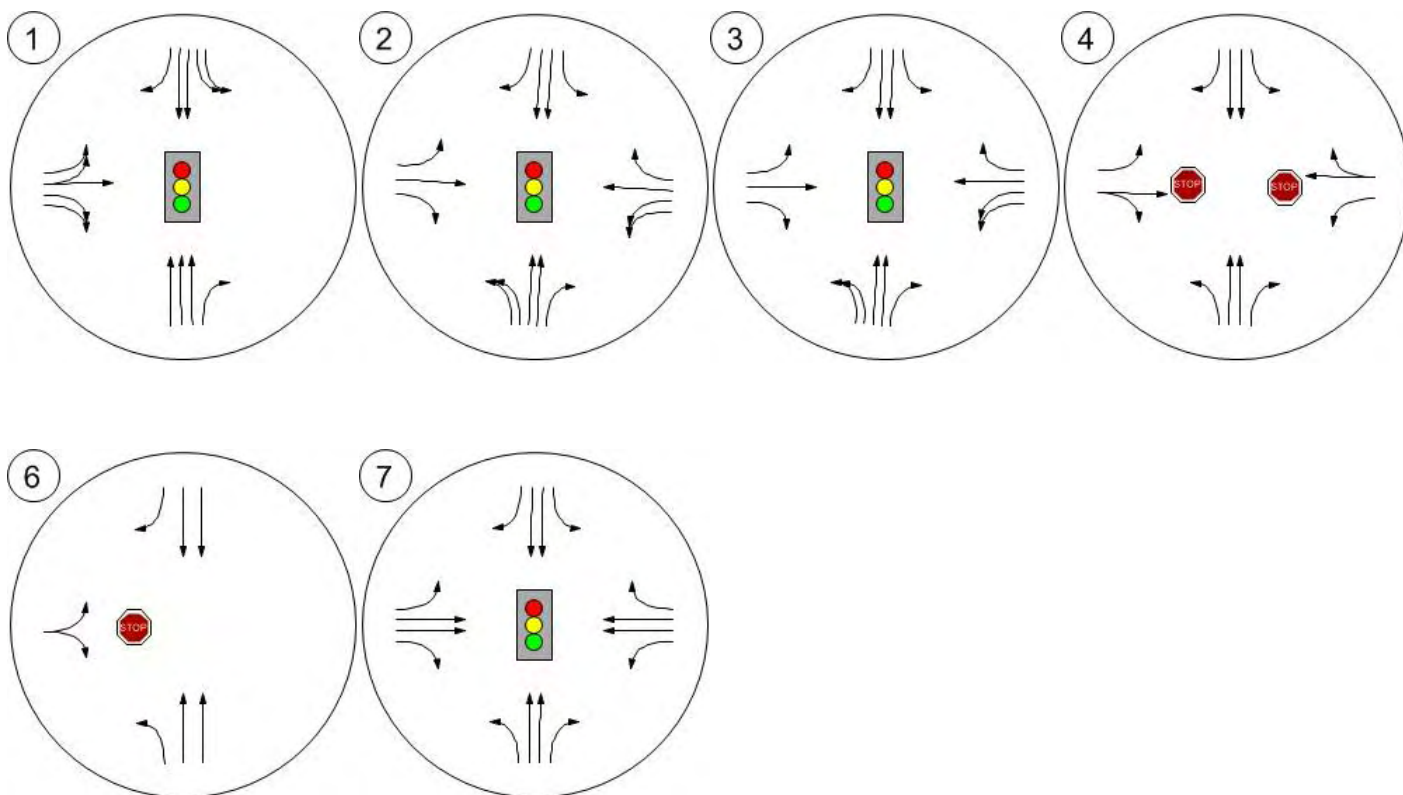
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Lane Configuration and Traffic Control



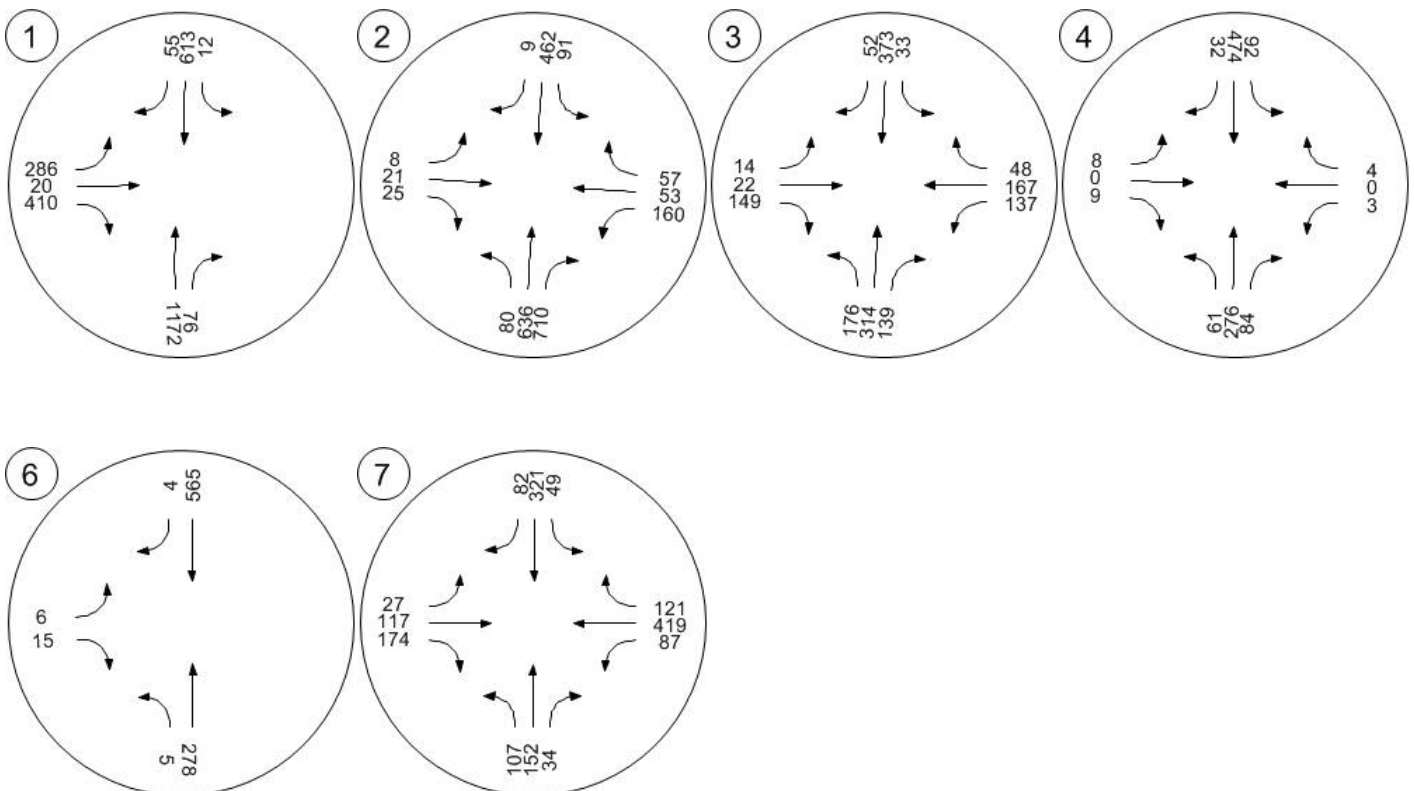
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Traffic Volume - Base Volume



Lake Elmo Development

Scenario 1: 1: AM Existing
Traffic Impact Study

D23

Lake Elmo Development

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Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 2: PM Existing

Report File: C:\...\PM Existing.pdf

7/2/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	CSAH 13 & I-94 Southern Ramp	Signalized	HCM2010	EBL	0.659	23.1	C
2	CSAH 13 & I-94 Northern Ramp	Signalized	HCM2010	EBR	0.592	35.7	D
3	Inwood Ave & Hudson Blvd	Signalized	HCM2010	SBL	0.497	34.9	C
4	CSAH 13 & Eagle Point Blvd	Two-way stop	HCM2010	WBL	1.195	253.7	F
6	CSAH 13 & 9th St	Two-way stop	HCM2010	EBL	0.047	30.3	D
7	CSAH 13 & CSAH 10	Signalized	HCM2010	WBL	0.521	23.4	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report #1: CSAH 13 & I-94 Southern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 23.1
Level Of Service: C
Volume to Capacity (v/c): 0.659

Intersection Setup

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	2	0	1	1	0	2	0	0	0
Pocket Length [ft]	100.00	100.00	400.00	175.00	100.00	150.00	500.00	100.00	500.00	100.00	100.00	100.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Base Volume Input [veh/h]	0	1367	466	90	1220	254	233	119	916	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	233	0	0	127	0	0	458	0	0	0
Total Hourly Volume [veh/h]	0	1367	233	90	1220	127	233	119	458	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	371	63	24	332	35	63	32	124	0	0	0
Total Analysis Volume [veh/h]	0	1486	253	98	1326	138	253	129	498	0	0	0
Presence of On-Street Parking			no	no		no	no		no			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			1			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Protecte	Permiss
Signal Group	0	2	0	1	6	0	0	4	5	0	0	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	20	0	7	20	0	0	10	10	0	0	0
Maximum Green [s]	0	57	0	10	58	0	0	25	13	0	0	0
Amber [s]	0.0	4.5	0.0	3.0	4.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	2.0	1.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
Split [s]	0	94	0	15	72	0	0	31	37	0	0	0
Vehicle Extension [s]	0.0	4.6	0.0	2.0	4.6	0.0	0.0	3.0	2.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	3.5	0.0	3.0	4.0	0.0	0.0	5.0	5.0	0.0	0.0	0.0
Minimum Recall		no		no	no			no	no			
Maximum Recall		yes		no	yes			no	no			
Pedestrian Recall		no		no	no			no	no			
Detector Location [ft]	0.0	400.0	0.0	20.0	400.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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Lane Group Calculations

Lane Group	C	R	L	C	R	L	C	R	
L, Total Lost Time per Cycle [s]	5.50	5.50	5.00	6.00	6.00	7.00	7.00	7.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	3.50	3.50	3.00	4.00	4.00	5.00	5.00	0.00	
g_i, Effective Green Time [s]	94	94	7	88	88	22	22	39	
g / C, Green / Cycle	0.67	0.67	0.05	0.63	0.63	0.16	0.16	0.28	
(v / s)_i Volume / Saturation Flow Rate	0.30	0.16	0.03	0.38	0.09	0.13	0.08	0.18	
s, saturation flow rate [veh/h]	5025	1568	3412	3512	1568	1757	1835	2775	
c, Capacity [veh/h]	3358	1048	169	2201	982	276	288	778	
d1, Uniform Delay [s]	10.93	9.18	65.03	15.66	10.69	57.40	53.92	44.11	
k, delay calibration	0.50	0.50	0.04	0.50	0.50	0.18	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.42	0.55	1.18	1.23	0.30	11.78	1.36	0.88	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.44	0.24	0.58	0.60	0.14	0.86	0.50	0.64	
d, Delay for Lane Group [s/veh]	11.35	9.72	66.21	16.89	10.99	69.19	55.27	44.99	
Lane Group LOS	B	A	E	B	B	E	E	D	
Critical Lane Group	no	no	no	yes	no	yes	no	yes	
50th-Percentile Queue Length [veh]	6.69	2.97	1.71	12.04	1.74	9.09	4.81	7.70	
50th-Percentile Queue Length [ft]	167.21	74.28	42.80	301.04	43.47	227.17	120.22	192.59	
95th-Percentile Queue Length [veh]	10.93	5.35	3.08	17.73	3.13	14.03	8.41	12.26	
95th-Percentile Queue Length [ft]	273.24	133.70	77.04	443.32	78.25	350.77	210.14	306.39	

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	11.35	9.72	66.21	16.89	10.99	66.88	55.27	44.99	0.00	0.00	0.00
Movement LOS		B	A	E	B	B	E	E	D			
d_A, Approach Delay [s/veh]	11.12			19.47			53.20			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	23.09											
Intersection LOS	C											
Intersection V/C	0.659											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #2: CSAH 13 & I-94 Northern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 35.7
Level Of Service: D
Volume to Capacity (v/c): 0.592

Intersection Setup

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	325.00	100.00	100.00	250.00	100.00	275.00	175.00	100.00	100.00	400.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Base Volume Input [veh/h]	221	933	577	192	1009	38	39	73	258	231	51	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	289	0	0	19	0	0	129	0	0	31
Total Hourly Volume [veh/h]	221	933	288	192	1009	19	39	73	129	231	51	30
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	254	78	52	274	5	11	20	35	63	14	8
Total Analysis Volume [veh/h]	240	1014	313	209	1097	21	42	79	140	251	55	33
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	89.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	10	44	0	15	49	0	10	11	0	18	30	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	3.5	0.0	3.0	3.5	0.0
All red [s]	2.0	1.5	0.0	2.0	2.0	0.0	2.0	3.5	0.0	2.0	3.0	0.0
Split [s]	24	63	0	35	74	0	15	24	0	18	27	0
Vehicle Extension [s]	2.0	4.6	0.0	2.0	4.6	0.0	2.0	3.0	0.0	2.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.5	0.0	3.0	5.0	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	39.0	300.0	0.0	39.0	300.0	0.0	39.0	120.0	0.0	120.0	120.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.50	6.50	5.00	7.00	7.00	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.50	4.50	3.00	5.00	5.00	3.00	4.50	4.50
g_i, Effective Green Time [s]	12	71	71	19	77	77	18	15	15	12	10	10
g / C, Green / Cycle	0.08	0.51	0.51	0.13	0.55	0.55	0.13	0.11	0.11	0.09	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.07	0.29	0.20	0.12	0.31	0.01	0.02	0.04	0.09	0.07	0.03	0.02
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	289	1789	799	232	1943	868	224	193	164	304	130	110
d1, Uniform Delay [s]	63.03	23.65	21.02	59.80	20.29	14.15	54.55	58.54	61.53	62.61	62.31	61.75
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.11	0.11	0.04	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.39	1.31	1.44	5.54	1.19	0.05	0.15	1.38	11.58	2.17	2.19	1.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.57	0.39	0.90	0.56	0.02	0.19	0.41	0.85	0.82	0.42	0.30
d, Delay for Lane Group [s/veh]	65.41	24.96	22.47	65.34	21.49	14.20	54.70	59.92	73.10	64.79	64.50	63.25
Lane Group LOS	E	C	C	E	C	B	D	E	E	E	E	E
Critical Lane Group	no	yes	no	yes	no	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	4.23	11.38	6.39	7.51	11.33	0.31	1.34	2.71	5.43	4.50	1.97	1.17
50th-Percentile Queue Length [ft]	105.68	284.48	159.63	187.80	283.30	7.66	33.59	67.68	135.82	112.44	49.14	29.19
95th-Percentile Queue Length [veh]	7.60	16.91	10.53	12.01	16.85	0.55	2.42	4.87	9.26	7.98	3.54	2.10
95th-Percentile Queue Length [ft]	189.98	422.78	263.24	300.18	421.32	13.78	60.46	121.83	231.38	199.39	88.45	52.55

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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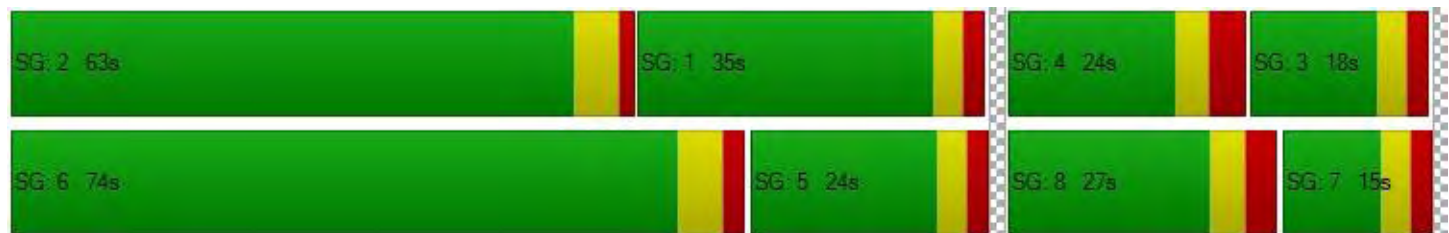


Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.41	24.96	22.47	65.34	21.49	14.20	54.70	59.92	73.10	64.79	64.50	63.25
Movement LOS	E	C	C	E	C	B	D	E	E	E	E	E
d_A, Approach Delay [s/veh]	30.66			28.28			66.15			64.59		
Approach LOS	C			C			E			E		
d_I, Intersection Delay [s/veh]	35.70											
Intersection LOS	D											
Intersection V/C	0.592											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #3: Inwood Ave & Hudson Blvd

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 34.9
Level Of Service: C
Volume to Capacity (v/c): 0.497

Intersection Setup

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	175.00	100.00	250.00	100.00	100.00	100.00	175.00	100.00	100.00	250.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Base Volume Input [veh/h]	207	646	96	29	745	37	59	128	384	156	33	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	48	0	0	19	0	0	192	0	0	15
Total Hourly Volume [veh/h]	207	646	48	29	745	18	59	128	192	156	33	15
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	176	13	8	202	5	16	35	52	42	9	4
Total Analysis Volume [veh/h]	225	702	52	32	810	20	64	139	209	170	36	16
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			4			4			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	94.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	16	39	0	12	35	0	12	24	0	12	25	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	2.0	1.5	0.0	2.0	1.5	0.0	2.0	2.5	0.0	2.0	2.5	0.0
Split [s]	16	56	0	15	55	0	20	48	0	21	49	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.0	0.0	3.0	4.5	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	55.0	300.0	0.0	55.0	475.0	0.0	50.0	250.0	0.0	50.0	250.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.00	6.00	5.00	6.50	6.50	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.00	4.00	3.00	4.50	4.50	3.00	4.50	4.50
g_i, Effective Green Time [s]	11	82	82	5	76	76	22	21	21	9	9	9
g / C, Green / Cycle	0.08	0.59	0.59	0.04	0.54	0.54	0.16	0.15	0.15	0.07	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.07	0.20	0.03	0.02	0.23	0.01	0.04	0.08	0.13	0.05	0.02	0.01
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	268	2058	919	63	1907	851	273	278	237	227	115	98
d1, Uniform Delay [s]	63.57	14.99	12.40	66.24	18.98	14.79	51.81	54.53	58.18	64.14	62.71	62.12
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.89	0.45	0.12	6.27	0.69	0.05	0.44	1.38	10.37	4.89	1.53	0.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.34	0.06	0.51	0.42	0.02	0.23	0.50	0.88	0.75	0.31	0.16
d, Delay for Lane Group [s/veh]	70.46	15.44	12.52	72.52	19.68	14.84	52.25	55.92	68.55	69.03	64.25	62.90
Lane Group LOS	E	B	B	E	B	B	D	E	E	E	E	E
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	4.14	5.63	0.70	1.21	7.66	0.30	2.02	4.63	7.94	3.14	1.28	0.56
50th-Percentile Queue Length [ft]	103.53	140.70	17.60	30.37	191.53	7.49	50.54	115.85	198.59	78.55	32.04	14.09
95th-Percentile Queue Length [veh]	7.45	9.52	1.27	2.19	12.20	0.54	3.64	8.16	12.57	5.66	2.31	1.01
95th-Percentile Queue Length [ft]	186.36	237.97	31.69	54.67	305.02	13.49	90.98	204.11	314.14	141.39	57.67	25.37

Appendix D - Capacity Analysis Backup

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	70.46	15.44	12.52	72.52	19.68	14.84	52.25	55.92	68.55	69.03	64.25	62.90
Movement LOS	E	B	B	E	B	B	D	E	E	E	E	E
d_A, Approach Delay [s/veh]	27.93			21.53			61.76			67.81		
Approach LOS	C			C			E			E		
d_I, Intersection Delay [s/veh]	34.91											
Intersection LOS	C											
Intersection V/C	0.497											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #4: CSAH 13 & Eagle Point Blvd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 253.7
Level Of Service: F
Volume to Capacity (v/c): 1.195

Intersection Setup

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	250.00	250.00	100.00	250.00	50.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	45.00			55.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Base Volume Input [veh/h]	95	734	3	15	631	69	38	0	68	89	0	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	734	3	15	631	69	38	0	68	89	0	78
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	199	1	4	171	19	10	0	18	24	0	21
Total Analysis Volume [veh/h]	103	798	3	16	686	75	41	0	74	97	0	85
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.01	0.00	0.02	0.01	0.00	0.48	0.00	0.11	1.19	0.00	0.14
d_M, Delay for Movement [s/veh]	9.91	0.00	0.00	9.53	0.00	0.00	80.42	54.19	11.30	253.72	59.75	12.02
Movement LOS	A	A	A	A	A	A	F	F	B	F	F	B
95th-Percentile Queue Length [veh]	0.42	0.00	0.00	0.06	0.00	0.00	2.02	0.39	0.39	7.10	0.49	0.49
95th-Percentile Queue Length [ft]	10.49	0.00	0.00	1.51	0.00	0.00	50.39	9.66	9.66	177.51	12.34	12.34
d_A, Approach Delay [s/veh]	1.13			0.20			35.94			140.84		
Approach LOS	A			A			E			F		
d_I, Intersection Delay [s/veh]	15.64											
Intersection LOS	F											

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #6: CSAH 13 & 9th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 30.3
Level Of Service: D
Volume to Capacity (v/c): 0.047

Intersection Setup

Name	CSAH 13		CSAH 13		9th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [ft]	300.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	CSAH 13		CSAH 13		9th St	
Base Volume Input [veh/h]	23	832	727	12	6	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	832	727	12	6	13
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	226	198	3	2	4
Total Analysis Volume [veh/h]	25	904	790	13	7	14
Pedestrian Volume [ped/h]	0		0		2	
Bicycle Volume [bicycles/h]	0		0		0	

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.01	0.00	0.05	0.02
d_M, Delay for Movement [s/veh]	9.60	0.00	0.00	0.00	30.26	11.94
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	0.10	0.00	0.00	0.00	0.23	0.23
95th-Percentile Queue Length [ft]	2.39	0.00	0.00	0.00	5.67	5.67
d_A, Approach Delay [s/veh]	0.26		0.00		18.05	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.35					
Intersection LOS	D					

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #7: CSAH 13 & CSAH 10

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 23.4
Level Of Service: C
Volume to Capacity (v/c): 0.521

Intersection Setup

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	250.00	100.00	250.00	250.00	100.00	250.00	275.00	100.00	275.00	250.00	100.00	250.00
Speed [mph]	55.00			55.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Base Volume Input [veh/h]	233	434	115	181	325	32	132	653	331	45	156	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	58	0	0	16	0	0	166	0	0	56
Total Hourly Volume [veh/h]	233	434	57	181	325	16	132	653	165	45	156	56
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	118	15	49	88	4	36	177	45	12	42	15
Total Analysis Volume [veh/h]	253	472	62	197	353	17	143	710	179	49	170	61
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			1			3			1		
Bicycle Volume [bicycles/h]	0			0			0			0		

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	40	0	30	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	41	39	0	33	31	0	41	56	0	12	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	no	no		no	no		no	yes		no	yes	
Maximum Recall	no	no		no	no		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	10	11	11	10	10	10	8	15	15	3	10	10
g / C, Green / Cycle	0.18	0.18	0.18	0.17	0.17	0.17	0.14	0.26	0.26	0.05	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.14	0.13	0.04	0.11	0.10	0.01	0.08	0.20	0.11	0.03	0.05	0.04
s, saturation flow rate [veh/h]	1757	3512	1568	1757	3512	1568	1757	3512	1568	1757	3512	1568
c, Capacity [veh/h]	316	638	285	296	598	267	249	917	409	83	586	262
d1, Uniform Delay [s]	23.02	22.66	20.42	22.81	22.41	20.38	23.50	20.05	18.06	27.35	21.36	21.15
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.71	1.71	0.38	2.57	0.93	0.10	2.10	1.44	0.74	6.46	0.27	0.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.74	0.22	0.67	0.59	0.06	0.58	0.77	0.44	0.59	0.29	0.23
d, Delay for Lane Group [s/veh]	27.73	24.37	20.80	25.38	23.34	20.48	25.60	21.49	18.79	33.80	21.63	21.60
Lane Group LOS	C	C	C	C	C	C	C	C	B	C	C	C
Critical Lane Group	no	yes	no	yes	no	no	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	3.16	2.68	0.63	2.31	1.93	0.17	1.69	3.74	1.70	0.73	0.87	0.64
50th-Percentile Queue Length [ft]	79.08	66.98	15.71	57.85	48.26	4.24	42.28	93.40	42.43	18.16	21.77	15.90
95th-Percentile Queue Length [veh]	5.69	4.82	1.13	4.17	3.47	0.31	3.04	6.72	3.06	1.31	1.57	1.14
95th-Percentile Queue Length [ft]	142.34	120.57	28.29	104.13	86.87	7.63	76.10	168.12	76.38	32.69	39.18	28.61

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.73	24.37	20.80	25.38	23.34	20.48	25.60	21.49	18.79	33.80	21.63	21.60
Movement LOS	C	C	C	C	C	C	C	C	B	C	C	C
d_A, Approach Delay [s/veh]	25.17			23.97			21.59			23.76		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	23.38											
Intersection LOS	C											
Intersection V/C	0.521											

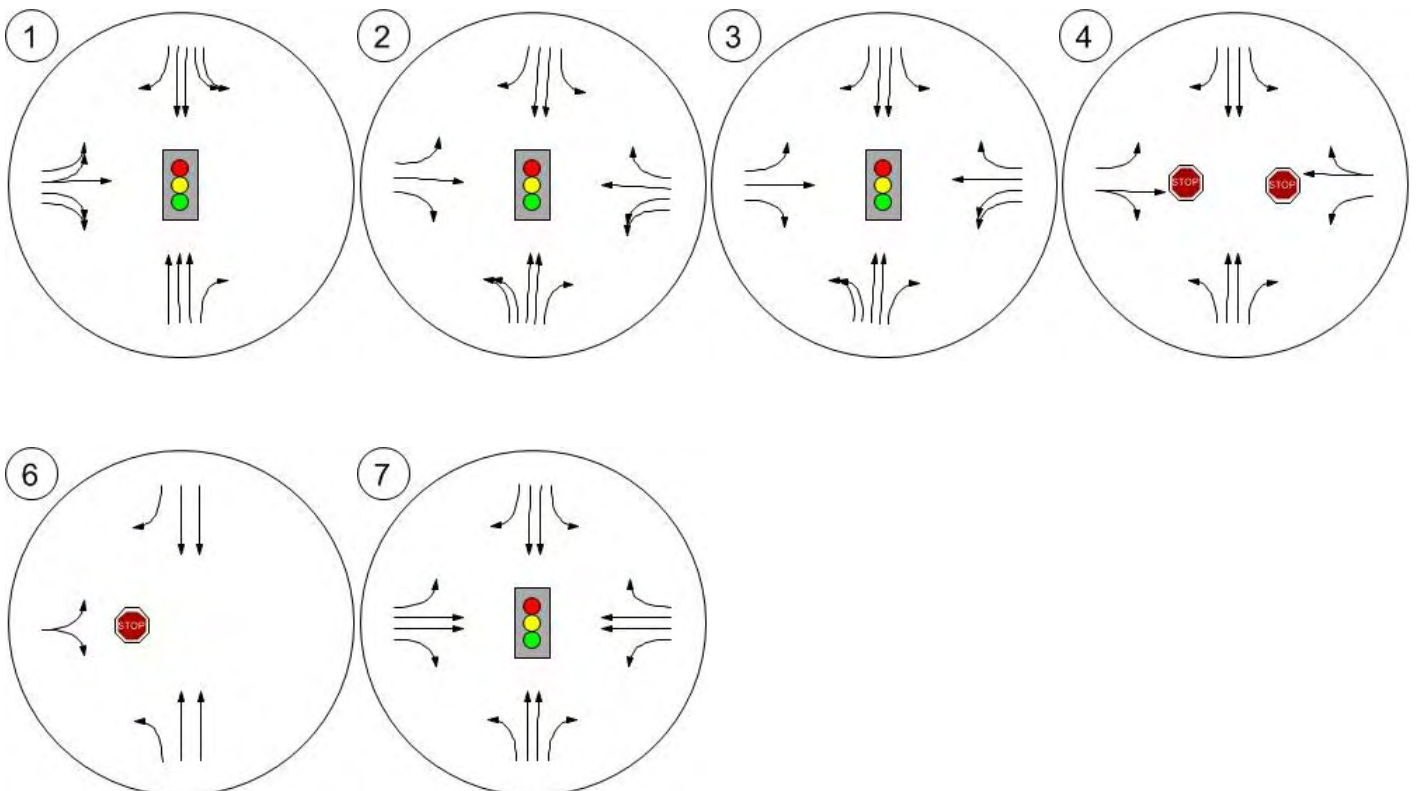
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Lane Configuration and Traffic Control



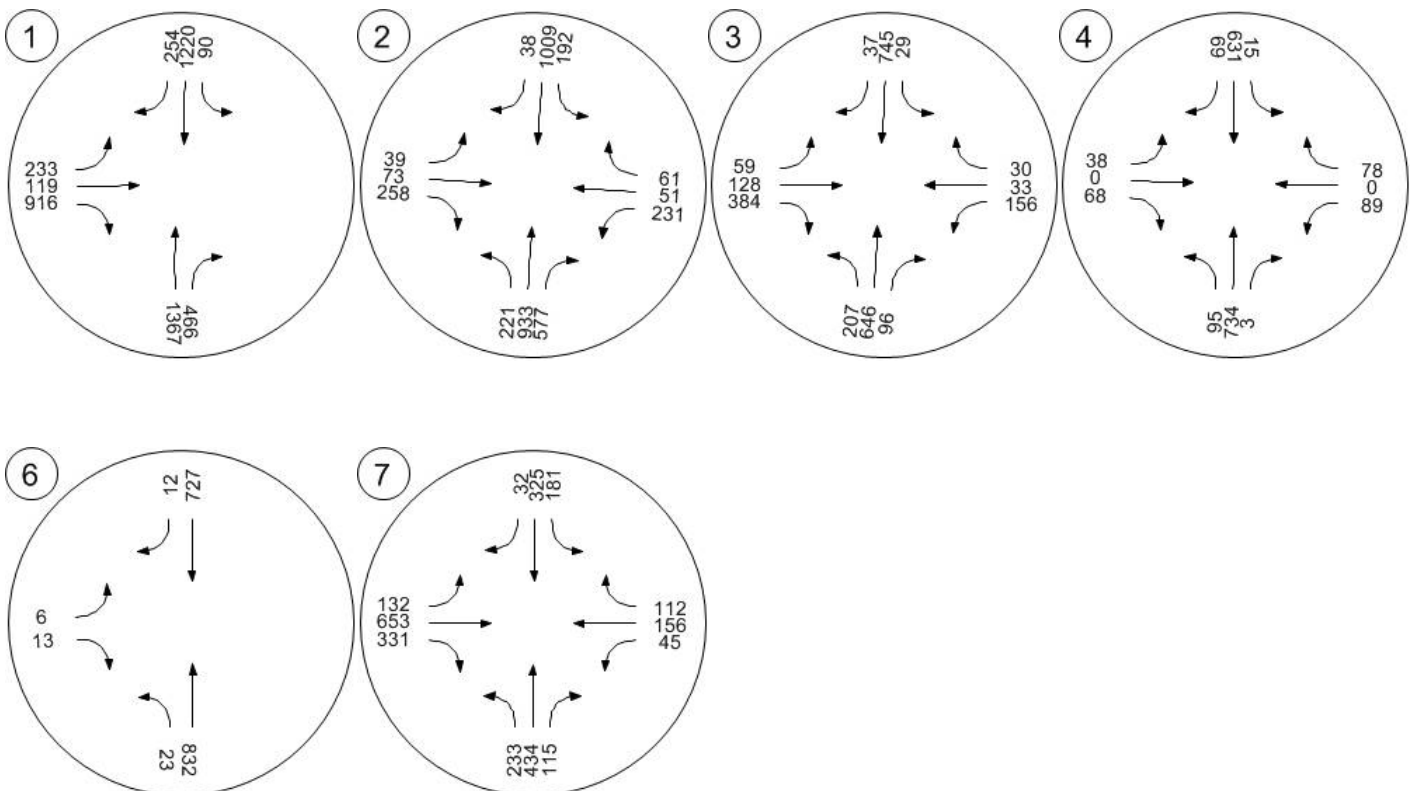
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Traffic Volume - Base Volume



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Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 3: AM 2019 No-Build

Report File: C:\...\AM 2019 No-Build.pdf

7/2/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	CSAH 13 & I-94 Southern Ramp	Signalized	HCM2010	SBL	0.396	16.3	B
2	CSAH 13 & I-94 Northern Ramp	Signalized	HCM2010	SBL	0.418	22.1	C
3	Inwood Ave & Hudson Blvd	Signalized	HCM2010	EBL	0.318	30.2	C
4	CSAH 13 & Eagle Point Blvd	Two-way stop	HCM2010	EBT	0.000	34.5	D
6	CSAH 13 & 9th St	Two-way stop	HCM2010	EBL	0.027	17.6	C
7	CSAH 13 & CSAH 10	Signalized	HCM2010	WBL	0.380	19.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report #1: CSAH 13 & I-94 Southern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 16.3
Level Of Service: B
Volume to Capacity (v/c): 0.396

Intersection Setup

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	2	0	1	1	0	2	0	0	0
Pocket Length [ft]	100.00	100.00	400.00	175.00	100.00	150.00	500.00	100.00	500.00	100.00	100.00	100.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Base Volume Input [veh/h]	0	1172	76	12	613	55	286	20	410	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	42	0	0	30	0	0	224	0	0	0
Total Hourly Volume [veh/h]	0	1277	41	13	668	30	312	22	223	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	347	11	4	182	8	85	6	61	0	0	0
Total Analysis Volume [veh/h]	0	1388	45	14	726	33	339	24	242	0	0	0
Presence of On-Street Parking			no	no		no	no		no			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Protecte	Permiss
Signal Group	0	2	0	1	6	0	0	4	5	0	0	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	20	0	7	20	0	0	10	10	0	0	0
Maximum Green [s]	0	57	0	10	58	0	0	25	13	0	0	0
Amber [s]	0.0	4.5	0.0	3.0	4.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	2.0	1.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
Split [s]	0	67	0	12	62	0	0	31	17	0	0	0
Vehicle Extension [s]	0.0	4.6	0.0	2.0	4.6	0.0	0.0	3.0	2.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	3.5	0.0	3.0	4.0	0.0	0.0	5.0	5.0	0.0	0.0	0.0
Minimum Recall		no		no	no			no	no			
Maximum Recall		yes		no	yes			no	no			
Pedestrian Recall		no		no	no			no	no			
Detector Location [ft]	0.0	400.0	0.0	20.0	400.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Lane Group Calculations

Lane Group	C	R	L	C	R	L	C	R	
L, Total Lost Time per Cycle [s]	5.50	5.50	5.00	6.00	6.00	7.00	7.00	7.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	3.50	3.50	3.00	4.00	4.00	5.00	5.00	0.00	
g_i, Effective Green Time [s]	76	76	2	66	66	14	14	31	
g / C, Green / Cycle	0.69	0.69	0.02	0.60	0.60	0.12	0.12	0.28	
(v / s)_i Volume / Saturation Flow Rate	0.28	0.03	0.00	0.21	0.02	0.10	0.10	0.09	
s, saturation flow rate [veh/h]	5025	1568	3412	3512	1568	1757	1757	2775	
c, Capacity [veh/h]	3481	1086	79	2115	944	220	220	776	
d1, Uniform Delay [s]	7.18	5.35	52.72	10.98	8.90	46.62	46.62	31.27	
k, delay calibration	0.50	0.50	0.04	0.50	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.34	0.07	0.39	0.44	0.07	5.66	5.66	0.23	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.40	0.04	0.18	0.34	0.03	0.77	0.77	0.31	
d, Delay for Lane Group [s/veh]	7.52	5.42	53.11	11.42	8.97	52.27	52.27	31.50	
Lane Group LOS	A	A	D	B	A	D	D	C	
Critical Lane Group	no	no	no	yes	no	yes	no	yes	
50th-Percentile Queue Length [veh]	3.82	0.29	0.19	4.06	0.31	4.82	4.82	2.56	
50th-Percentile Queue Length [ft]	95.52	7.26	4.73	101.48	7.69	120.55	120.55	64.04	
95th-Percentile Queue Length [veh]	6.88	0.52	0.34	7.31	0.55	8.42	8.42	4.61	
95th-Percentile Queue Length [ft]	171.94	13.07	8.51	182.66	13.84	210.58	210.58	115.26	

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	7.52	5.42	53.11	11.42	8.97	52.27	52.27	31.50	0.00	0.00	0.00
Movement LOS		A	A	D	B	A	D	D	C			
d_A, Approach Delay [s/veh]	7.46			12.07			43.62			0.00		
Approach LOS	A			B			D			A		
d_I, Intersection Delay [s/veh]	16.28											
Intersection LOS	B											
Intersection V/C	0.396											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #2: CSAH 13 & I-94 Northern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 22.1
Level Of Service: C
Volume to Capacity (v/c): 0.418

Intersection Setup

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	325.00	100.00	100.00	250.00	100.00	275.00	175.00	100.00	100.00	400.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Base Volume Input [veh/h]	80	636	710	91	462	9	8	21	25	160	53	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	387	0	0	5	0	0	14	0	0	31
Total Hourly Volume [veh/h]	87	693	387	99	504	5	9	23	13	174	58	31
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	188	105	27	137	1	2	6	4	47	16	8
Total Analysis Volume [veh/h]	95	753	421	108	548	5	10	25	14	189	63	34
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	89.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	10	44	0	15	49	0	10	11	0	18	30	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	3.5	0.0	3.0	3.5	0.0
All red [s]	2.0	1.5	0.0	2.0	2.0	0.0	2.0	3.5	0.0	2.0	3.0	0.0
Split [s]	15	60	0	17	62	0	12	17	0	16	21	0
Vehicle Extension [s]	2.0	4.6	0.0	2.0	4.6	0.0	2.0	3.0	0.0	2.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.5	0.0	3.0	5.0	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	39.0	300.0	0.0	39.0	300.0	0.0	39.0	120.0	0.0	120.0	120.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.50	6.50	5.00	7.00	7.00	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.50	4.50	3.00	5.00	5.00	3.00	4.50	4.50
g_i, Effective Green Time [s]	7	63	63	8	65	65	6	7	7	8	10	10
g / C, Green / Cycle	0.06	0.58	0.58	0.08	0.59	0.59	0.06	0.06	0.06	0.07	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.03	0.21	0.27	0.06	0.16	0.00	0.01	0.01	0.01	0.06	0.03	0.02
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	206	2022	903	135	2063	921	98	118	100	256	162	137
d1, Uniform Delay [s]	49.99	12.62	13.55	50.01	11.10	9.40	49.37	48.92	48.69	49.85	47.44	46.83
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.11	0.11	0.04	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	0.53	1.73	4.16	0.32	0.01	0.17	0.89	0.63	1.57	1.53	0.93
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.46	0.37	0.47	0.80	0.27	0.01	0.10	0.21	0.14	0.74	0.39	0.25
d, Delay for Lane Group [s/veh]	50.59	13.14	15.28	54.17	11.42	9.41	49.54	49.81	49.33	51.42	48.96	47.76
Lane Group LOS	D	B	B	D	B	A	D	D	D	D	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	1.25	4.64	5.83	2.99	3.02	0.05	0.27	0.68	0.38	2.60	1.70	0.91
50th-Percentile Queue Length [ft]	31.16	116.05	145.76	74.86	75.50	1.20	6.65	17.04	9.53	64.94	42.52	22.63
95th-Percentile Queue Length [veh]	2.24	8.18	9.79	5.39	5.44	0.09	0.48	1.23	0.69	4.68	3.06	1.63
95th-Percentile Queue Length [ft]	56.09	204.38	244.76	134.75	135.91	2.16	11.97	30.67	17.16	116.89	76.54	40.73

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	50.59	13.14	15.28	54.17	11.42	9.41	49.54	49.81	49.33	51.42	48.96	47.76
Movement LOS	D	B	B	D	B	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	16.65			18.39			49.62			50.44		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	22.14											
Intersection LOS	C											
Intersection V/C	0.418											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #3: Inwood Ave & Hudson Blvd

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 30.2
Level Of Service: C
Volume to Capacity (v/c): 0.318

Intersection Setup

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	175.00	100.00	250.00	100.00	100.00	100.00	175.00	100.00	100.00	250.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Base Volume Input [veh/h]	176	314	139	33	373	52	14	22	149	137	167	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	76	0	0	29	0	0	81	0	0	26
Total Hourly Volume [veh/h]	192	342	76	36	407	28	15	24	81	149	182	26
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	52	93	21	10	111	8	4	7	22	40	49	7
Total Analysis Volume [veh/h]	209	372	83	39	442	30	16	26	88	162	198	28
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			11			0			3		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	94.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	16	39	0	12	35	0	12	24	0	12	25	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	2.0	1.5	0.0	2.0	1.5	0.0	2.0	2.5	0.0	2.0	2.5	0.0
Split [s]	22	48	0	14	40	0	12	26	0	22	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.0	0.0	3.0	4.5	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	55.0	300.0	0.0	55.0	475.0	0.0	50.0	250.0	0.0	50.0	250.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.00	6.00	5.00	6.50	6.50	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.00	4.00	3.00	4.50	4.50	3.00	4.50	4.50
g_i, Effective Green Time [s]	9	65	65	5	61	61	3	10	10	7	14	14
g / C, Green / Cycle	0.08	0.59	0.59	0.04	0.56	0.56	0.02	0.09	0.09	0.07	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.06	0.11	0.05	0.02	0.13	0.02	0.01	0.01	0.06	0.05	0.11	0.02
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	278	2084	930	79	1955	873	44	164	140	232	243	207
d1, Uniform Delay [s]	49.42	10.17	9.60	51.32	12.37	11.02	52.74	46.29	48.35	50.14	46.42	42.19
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.06	0.19	0.19	4.75	0.27	0.07	4.85	0.44	4.60	3.74	6.46	0.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.18	0.09	0.50	0.23	0.03	0.36	0.16	0.63	0.70	0.81	0.14
d, Delay for Lane Group [s/veh]	53.49	10.36	9.79	56.07	12.64	11.10	57.59	46.73	52.95	53.89	52.88	42.49
Lane Group LOS	D	B	A	E	B	B	E	D	D	D	D	D
Critical Lane Group	yes	no	no	no	yes	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	2.88	1.89	0.82	1.13	2.59	0.32	0.49	0.68	2.51	2.30	5.68	0.69
50th-Percentile Queue Length [ft]	72.12	47.30	20.58	28.15	64.77	8.06	12.36	16.97	62.65	57.43	142.05	17.28
95th-Percentile Queue Length [veh]	5.19	3.41	1.48	2.03	4.66	0.58	0.89	1.22	4.51	4.14	9.59	1.24
95th-Percentile Queue Length [ft]	129.82	85.13	37.04	50.67	116.58	14.51	22.25	30.54	112.78	103.38	239.78	31.10

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.49	10.36	9.79	56.07	12.64	11.10	57.59	46.73	52.95	53.89	52.88	42.49
Movement LOS	D	B	A	E	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	23.86			15.86			52.28			52.55		
Approach LOS	C			B			D			D		
d_I, Intersection Delay [s/veh]	30.20											
Intersection LOS	C											
Intersection V/C	0.318											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #4: CSAH 13 & Eagle Point Blvd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 34.5
Level Of Service: D
Volume to Capacity (v/c): 0.000

Intersection Setup

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	250.00	250.00	100.00	250.00	50.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	45.00			55.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Base Volume Input [veh/h]	61	276	84	92	474	32	8	0	9	3	0	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	301	92	100	517	35	9	0	10	3	0	4
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	82	25	27	140	10	2	0	3	1	0	1
Total Analysis Volume [veh/h]	72	327	100	109	562	38	10	0	11	3	0	4
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.10	0.01	0.00	0.07	0.00	0.02	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	9.05	0.00	0.00	8.55	0.00	0.00	31.51	34.45	10.17	25.66	31.96	9.26
Movement LOS	A	A	A	A	A	A	D	D	B	D	D	A
95th-Percentile Queue Length [veh]	0.24	0.00	0.00	0.32	0.00	0.00	0.22	0.05	0.05	0.05	0.01	0.01
95th-Percentile Queue Length [ft]	6.06	0.00	0.00	8.05	0.00	0.00	5.45	1.18	1.18	1.29	0.35	0.35
d_A, Approach Delay [s/veh]	1.31			1.32			20.33			16.29		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	1.72											
Intersection LOS	D											

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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Intersection Level Of Service Report #6: CSAH 13 & 9th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 17.6
Level Of Service: C
Volume to Capacity (v/c): 0.027

Intersection Setup

Name	CSAH 13		CSAH 13		9th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [ft]	300.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	CSAH 13		CSAH 13		9th St	
Base Volume Input [veh/h]	5	278	565	4	6	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	303	616	4	7	16
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	82	167	1	2	4
Total Analysis Volume [veh/h]	5	329	670	4	8	17
Pedestrian Volume [ped/h]	0		0		4	
Bicycle Volume [bicycles/h]	0		0		0	

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.03	0.03
d_M, Delay for Movement [s/veh]	9.02	0.00	0.00	0.00	17.61	10.96
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.02	0.00	0.00	0.00	0.17	0.17
95th-Percentile Queue Length [ft]	0.42	0.00	0.00	0.00	4.20	4.20
d_A, Approach Delay [s/veh]	0.14		0.00		13.09	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.36					
Intersection LOS	C					

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Intersection Level Of Service Report #7: CSAH 13 & CSAH 10

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 19.1
Level Of Service: B
Volume to Capacity (v/c): 0.380

Intersection Setup

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	250.00	100.00	250.00	250.00	100.00	250.00	275.00	100.00	275.00	250.00	100.00	250.00
Speed [mph]	55.00			55.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Base Volume Input [veh/h]	107	152	34	49	321	82	27	117	174	87	419	121
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	19	0	0	45	0	0	95	0	0	66
Total Hourly Volume [veh/h]	117	166	18	53	350	44	29	128	95	95	457	66
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	45	5	14	95	12	8	35	26	26	124	18
Total Analysis Volume [veh/h]	127	180	20	58	380	48	32	139	103	103	497	72
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	2			0			1			2		
Bicycle Volume [bicycles/h]	0			0			0			0		

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	40	0	30	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	24	34	0	24	34	0	10	27	0	25	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	no	no		no	no		no	yes		no	yes	
Maximum Recall	no	no		no	no		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	5	9	9	5	10	10	3	10	10	4	10	10
g / C, Green / Cycle	0.10	0.19	0.19	0.11	0.21	0.21	0.07	0.20	0.20	0.08	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.07	0.05	0.01	0.03	0.11	0.03	0.02	0.04	0.07	0.06	0.14	0.05
s, saturation flow rate [veh/h]	1757	3512	1568	1757	3512	1568	1757	3512	1568	1757	3512	1568
c, Capacity [veh/h]	173	683	305	196	727	325	126	703	314	141	733	327
d1, Uniform Delay [s]	21.15	16.52	15.88	19.72	17.02	15.66	21.21	16.08	16.53	21.71	17.61	15.85
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.90	0.20	0.09	0.84	0.58	0.21	1.05	0.14	0.60	7.17	1.11	0.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.26	0.07	0.30	0.52	0.15	0.25	0.20	0.33	0.73	0.68	0.22
d, Delay for Lane Group [s/veh]	27.05	16.73	15.97	20.56	17.61	15.87	22.26	16.22	17.13	28.88	18.72	16.18
Lane Group LOS	C	B	B	C	B	B	C	B	B	C	B	B
Critical Lane Group	yes	no	no	no	yes	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.38	0.66	0.14	0.52	1.46	0.34	0.31	0.50	0.79	1.19	2.01	0.53
50th-Percentile Queue Length [ft]	34.62	16.48	3.61	12.93	36.47	8.60	7.76	12.39	19.69	29.66	50.26	13.13
95th-Percentile Queue Length [veh]	2.49	1.19	0.26	0.93	2.63	0.62	0.56	0.89	1.42	2.14	3.62	0.95
95th-Percentile Queue Length [ft]	62.31	29.67	6.49	23.28	65.65	15.48	13.97	22.31	35.44	53.40	90.47	23.63

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.05	16.73	15.97	20.56	17.61	15.87	22.26	16.22	17.13	28.88	18.72	16.18
Movement LOS	C	B	B	C	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	20.69			17.79			17.27			20.00		
Approach LOS	C			B			B			C		
d_I, Intersection Delay [s/veh]	19.09											
Intersection LOS	B											
Intersection V/C	0.380											

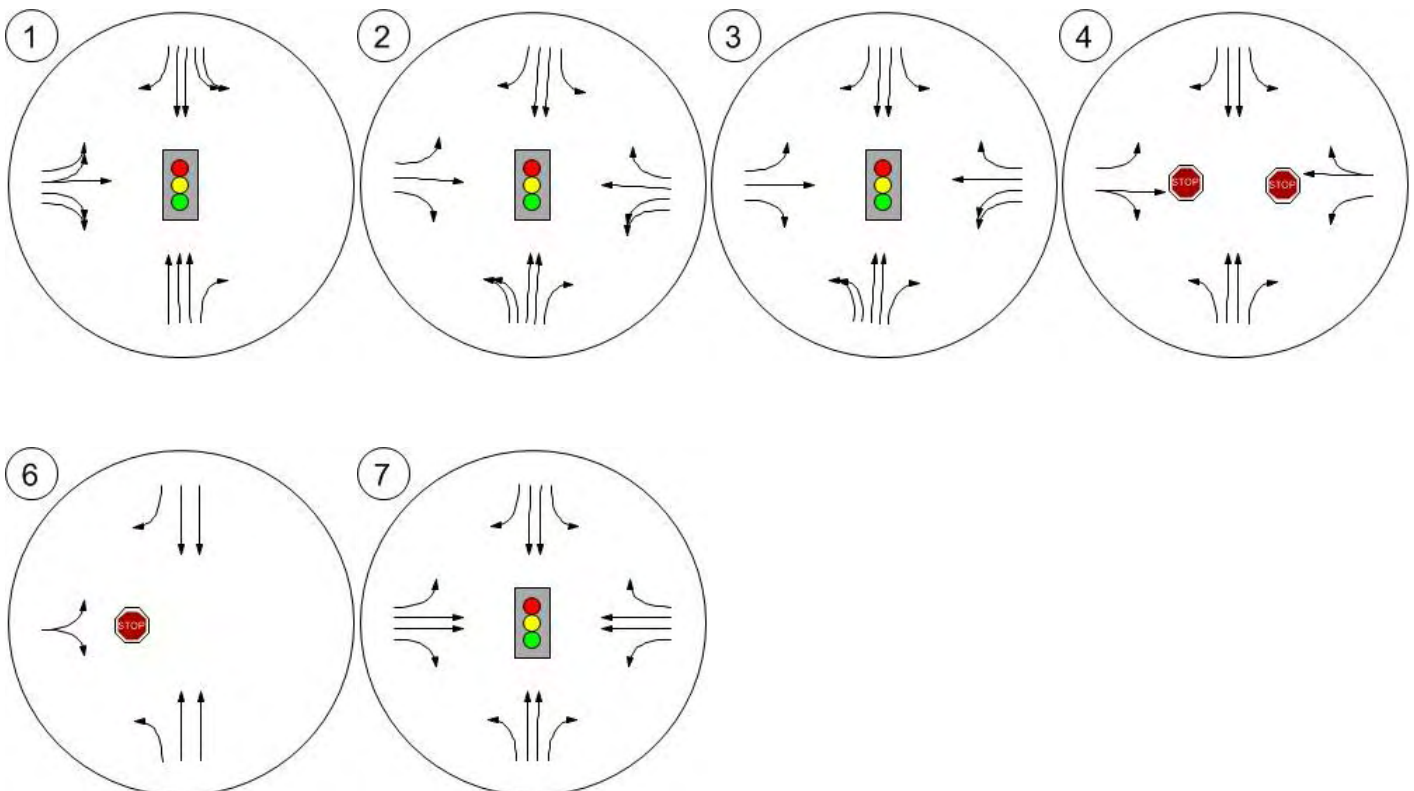
Appendix D - Capacity Analysis Backup

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Lane Configuration and Traffic Control



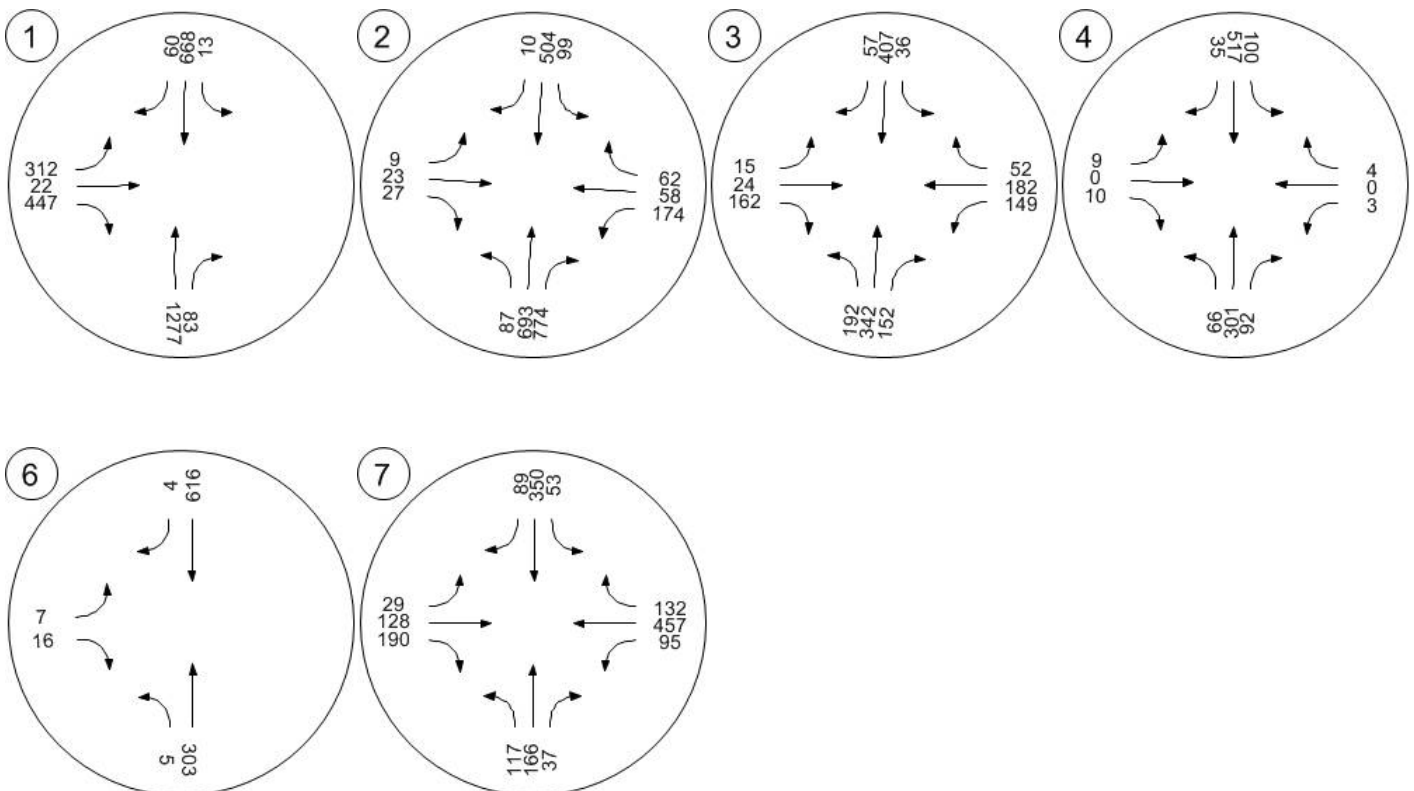
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Traffic Volume - Future Total Volume



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Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 4: PM 2019 No-Build

Report File: C:\...\PM 2019 No-Build.pdf

7/2/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	CSAH 13 & I-94 Southern Ramp	Signalized	HCM2010	EBL	0.704	24.3	C
2	CSAH 13 & I-94 Northern Ramp	Signalized	HCM2010	SBL	0.644	38.8	D
3	Inwood Ave & Hudson Blvd	Signalized	HCM2010	SBL	0.542	36.2	D
4	CSAH 13 & Eagle Point Blvd	Two-way stop	HCM2010	WBL	1.664	466.5	F
6	CSAH 13 & 9th St	Two-way stop	HCM2010	EBL	0.065	35.6	E
7	CSAH 13 & CSAH 10	Signalized	HCM2010	WBL	0.564	24.9	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report #1: CSAH 13 & I-94 Southern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 24.3
Level Of Service: C
Volume to Capacity (v/c): 0.704

Intersection Setup

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	2	0	1	1	0	2	0	0	0
Pocket Length [ft]	100.00	100.00	400.00	175.00	100.00	150.00	500.00	100.00	500.00	100.00	100.00	100.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Base Volume Input [veh/h]	0	1367	466	90	1220	254	233	119	916	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	254	0	0	139	0	0	499	0	0	0
Total Hourly Volume [veh/h]	0	1490	254	98	1330	138	254	130	499	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	405	69	27	361	38	69	35	136	0	0	0
Total Analysis Volume [veh/h]	0	1620	276	107	1446	150	276	141	542	0	0	0
Presence of On-Street Parking			no	no		no	no		no			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			1			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Protecte	Permiss
Signal Group	0	2	0	1	6	0	0	4	5	0	0	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	20	0	7	20	0	0	10	10	0	0	0
Maximum Green [s]	0	57	0	10	58	0	0	25	13	0	0	0
Amber [s]	0.0	4.5	0.0	3.0	4.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	2.0	1.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
Split [s]	0	94	0	14	91	0	0	32	17	0	0	0
Vehicle Extension [s]	0.0	4.6	0.0	2.0	4.6	0.0	0.0	3.0	2.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	3.5	0.0	3.0	4.0	0.0	0.0	5.0	5.0	0.0	0.0	0.0
Minimum Recall		no		no	no			no	no			
Maximum Recall		yes		no	yes			no	no			
Pedestrian Recall		no		no	no			no	no			
Detector Location [ft]	0.0	400.0	0.0	20.0	400.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	C	R	L	C	R	L	C	R	
L, Total Lost Time per Cycle [s]	5.50	5.50	5.00	6.00	6.00	7.00	7.00	7.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	3.50	3.50	3.00	4.00	4.00	5.00	5.00	0.00	
g_i, Effective Green Time [s]	92	92	7	87	87	23	23	40	
g / C, Green / Cycle	0.66	0.66	0.05	0.62	0.62	0.17	0.17	0.29	
(v / s)_i Volume / Saturation Flow Rate	0.32	0.18	0.03	0.41	0.10	0.15	0.09	0.20	
s, saturation flow rate [veh/h]	5025	1568	3412	3512	1568	1757	1833	2775	
c, Capacity [veh/h]	3309	1033	170	2173	970	292	305	800	
d1, Uniform Delay [s]	12.03	9.89	65.16	17.27	11.23	56.82	53.28	44.01	
k, delay calibration	0.50	0.50	0.04	0.50	0.50	0.21	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.52	0.63	1.43	1.63	0.34	14.29	1.43	1.01	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.49	0.27	0.63	0.67	0.15	0.87	0.53	0.68	
d, Delay for Lane Group [s/veh]	12.55	10.52	66.60	18.90	11.57	71.10	54.71	45.03	
Lane Group LOS	B	B	E	B	B	E	D	D	
Critical Lane Group	no	no	no	yes	no	yes	no	yes	
50th-Percentile Queue Length [veh]	7.89	3.43	1.88	14.32	1.96	9.96	5.36	8.46	
50th-Percentile Queue Length [ft]	197.24	85.78	46.93	357.98	48.94	249.06	134.04	211.39	
95th-Percentile Queue Length [veh]	12.50	6.18	3.38	20.53	3.52	15.14	9.16	13.22	
95th-Percentile Queue Length [ft]	312.40	154.40	84.47	513.13	88.09	378.47	228.97	330.61	

Appendix D - Capacity Analysis Backup

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	12.55	10.52	66.60	18.90	11.57	68.31	54.71	45.03	0.00	0.00	0.00
Movement LOS		B	B	E	B	B	E	D	D			
d_A, Approach Delay [s/veh]	12.25			21.25			53.60			0.00		
Approach LOS	B			C			D			A		
d_I, Intersection Delay [s/veh]	24.31											
Intersection LOS	C											
Intersection V/C	0.704											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #2: CSAH 13 & I-94 Northern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 38.8
Level Of Service: D
Volume to Capacity (v/c): 0.644

Intersection Setup

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	325.00	100.00	100.00	250.00	100.00	275.00	175.00	100.00	100.00	400.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Base Volume Input [veh/h]	221	933	577	192	1009	38	39	73	258	231	51	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	315	0	0	21	0	0	141	0	0	33
Total Hourly Volume [veh/h]	241	1017	314	209	1100	20	43	80	140	252	56	33
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	276	85	57	299	5	12	22	38	68	15	9
Total Analysis Volume [veh/h]	262	1105	341	227	1196	22	47	87	152	274	61	36
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	89.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	10	44	0	15	49	0	10	11	0	18	30	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	3.5	0.0	3.0	3.5	0.0
All red [s]	2.0	1.5	0.0	2.0	2.0	0.0	2.0	3.5	0.0	2.0	3.0	0.0
Split [s]	20	65	0	30	75	0	20	25	0	20	25	0
Vehicle Extension [s]	2.0	4.6	0.0	2.0	4.6	0.0	2.0	3.0	0.0	2.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.5	0.0	3.0	5.0	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	39.0	300.0	0.0	39.0	300.0	0.0	39.0	120.0	0.0	120.0	120.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.50	6.50	5.00	7.00	7.00	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.50	4.50	3.00	5.00	5.00	3.00	4.50	4.50
g_i, Effective Green Time [s]	13	68	68	20	75	75	20	16	16	13	10	10
g / C, Green / Cycle	0.09	0.49	0.49	0.14	0.53	0.53	0.14	0.11	0.11	0.10	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.08	0.31	0.22	0.13	0.34	0.01	0.03	0.05	0.10	0.08	0.03	0.02
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	308	1708	763	249	1876	838	246	206	175	326	131	111
d1, Uniform Delay [s]	62.69	26.92	23.58	59.15	23.00	15.39	53.13	57.90	61.09	62.19	62.42	61.78
k, delay calibration	0.04	0.50	0.50	0.17	0.50	0.50	0.04	0.11	0.11	0.04	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.57	1.91	1.90	17.85	1.67	0.06	0.14	1.37	12.04	2.25	2.57	1.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.85	0.65	0.45	0.91	0.64	0.03	0.19	0.42	0.87	0.84	0.47	0.32
d, Delay for Lane Group [s/veh]	65.26	28.83	25.48	76.99	24.67	15.44	53.27	59.27	73.13	64.43	64.99	63.44
Lane Group LOS	E	C	C	E	C	B	D	E	E	E	E	E
Critical Lane Group	no	yes	no	yes	no	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	4.62	13.68	7.55	9.00	13.62	0.34	1.48	2.97	5.91	4.91	2.19	1.28
50th-Percentile Queue Length [ft]	115.52	342.05	188.83	224.96	340.59	8.45	37.08	74.16	147.77	122.73	54.77	31.91
95th-Percentile Queue Length [veh]	8.15	19.75	12.06	13.92	19.68	0.61	2.67	5.34	9.90	8.54	3.94	2.30
95th-Percentile Queue Length [ft]	203.65	493.71	301.50	347.95	491.92	15.21	66.74	133.49	247.44	213.58	98.59	57.44

Appendix D - Capacity Analysis Backup

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.26	28.83	25.48	76.99	24.67	15.44	53.27	59.27	73.13	64.43	64.99	63.44
Movement LOS	E	C	C	E	C	B	D	E	E	E	E	E
d_A, Approach Delay [s/veh]	33.75			32.75			65.65			64.43		
Approach LOS	C			C			E			E		
d_I, Intersection Delay [s/veh]	38.75											
Intersection LOS	D											
Intersection V/C	0.644											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #3: Inwood Ave & Hudson Blvd

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 36.2
Level Of Service: D
Volume to Capacity (v/c): 0.542

Intersection Setup

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	175.00	100.00	250.00	100.00	100.00	100.00	175.00	100.00	100.00	250.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Base Volume Input [veh/h]	207	646	96	29	745	37	59	128	384	156	33	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	53	0	0	20	0	0	210	0	0	17
Total Hourly Volume [veh/h]	226	704	52	32	812	20	64	140	209	170	36	16
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	191	14	9	221	5	17	38	57	46	10	4
Total Analysis Volume [veh/h]	246	765	57	35	883	22	70	152	227	185	39	17
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			4			4			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	94.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	16	39	0	12	35	0	12	24	0	12	25	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	2.0	1.5	0.0	2.0	1.5	0.0	2.0	2.5	0.0	2.0	2.5	0.0
Split [s]	21	72	0	12	63	0	34	39	0	17	22	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.0	0.0	3.0	4.5	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	55.0	300.0	0.0	55.0	475.0	0.0	50.0	250.0	0.0	50.0	250.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.00	6.00	5.00	6.50	6.50	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.00	4.00	3.00	4.50	4.50	3.00	4.50	4.50
g_i, Effective Green Time [s]	12	80	80	5	73	73	24	23	23	10	9	9
g / C, Green / Cycle	0.09	0.57	0.57	0.04	0.52	0.52	0.17	0.16	0.16	0.07	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.07	0.22	0.04	0.02	0.25	0.01	0.04	0.08	0.14	0.05	0.02	0.01
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	296	2001	893	66	1827	816	296	298	254	240	118	100
d1, Uniform Delay [s]	62.85	16.55	13.43	66.14	21.51	16.33	50.38	53.57	57.47	63.91	62.64	61.98
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.13	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.93	0.56	0.14	6.60	0.92	0.06	0.41	1.35	12.14	5.17	1.63	0.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.38	0.06	0.53	0.48	0.03	0.24	0.51	0.90	0.77	0.33	0.17
d, Delay for Lane Group [s/veh]	68.78	17.11	13.57	72.74	22.43	16.39	50.79	54.91	69.61	69.08	64.27	62.78
Lane Group LOS	E	B	B	E	C	B	D	D	E	E	E	E
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	4.48	6.59	0.81	1.33	9.14	0.35	2.18	5.03	8.74	3.42	1.39	0.60
50th-Percentile Queue Length [ft]	111.91	164.80	20.32	33.23	228.45	8.77	54.47	125.76	218.42	85.61	34.72	14.95
95th-Percentile Queue Length [veh]	7.95	10.80	1.46	2.39	14.10	0.63	3.92	8.71	13.58	6.16	2.50	1.08
95th-Percentile Queue Length [ft]	198.65	270.07	36.57	59.82	352.38	15.78	98.04	217.72	339.61	154.10	62.50	26.92

Appendix D - Capacity Analysis Backup

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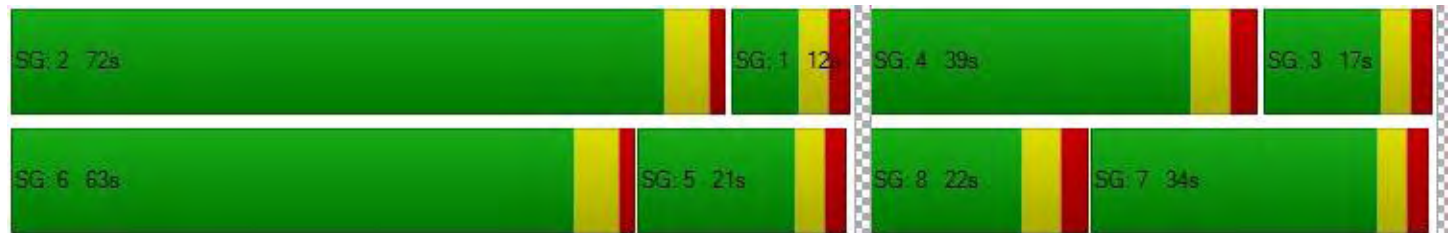


Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	68.78	17.11	13.57	72.74	22.43	16.39	50.79	54.91	69.61	69.08	64.27	62.78
Movement LOS	E	B	B	E	C	B	D	D	E	E	E	E
d_A, Approach Delay [s/veh]	28.82			24.16			61.70			67.86		
Approach LOS	C			C			E			E		
d_I, Intersection Delay [s/veh]	36.16											
Intersection LOS	D											
Intersection V/C	0.542											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #4: CSAH 13 & Eagle Point Blvd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 466.5
Level Of Service: F
Volume to Capacity (v/c): 1.664

Intersection Setup

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	250.00	250.00	100.00	250.00	50.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	45.00			55.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Base Volume Input [veh/h]	95	734	3	15	631	69	38	0	68	89	0	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	104	800	3	16	688	75	41	0	74	97	0	85
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	217	1	4	187	20	11	0	20	26	0	23
Total Analysis Volume [veh/h]	113	870	3	17	748	82	45	0	80	105	0	92
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.01	0.00	0.02	0.01	0.00	0.67	0.00	0.13	1.66	0.00	0.16
d_M, Delay for Movement [s/veh]	10.34	0.00	0.00	9.83	0.00	0.00	132.39	68.15	11.71	466.46	76.07	12.59
Movement LOS	B	A	A	A	A	A	F	F	B	F	F	B
95th-Percentile Queue Length [veh]	0.50	0.00	0.00	0.07	0.00	0.00	2.96	0.44	0.44	9.42	0.58	0.58
95th-Percentile Queue Length [ft]	12.50	0.00	0.00	1.71	0.00	0.00	73.99	11.12	11.12	235.45	14.41	14.41
d_A, Approach Delay [s/veh]	1.19			0.20			55.16			254.50		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	27.08											
Intersection LOS	F											

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #6: CSAH 13 & 9th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 35.6
Level Of Service: E
Volume to Capacity (v/c): 0.065

Intersection Setup

Name	CSAH 13		CSAH 13		9th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [ft]	300.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	CSAH 13		CSAH 13		9th St	
Base Volume Input [veh/h]	23	832	727	12	6	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	907	792	13	7	14
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	246	215	4	2	4
Total Analysis Volume [veh/h]	27	986	861	14	8	15
Pedestrian Volume [ped/h]	0		0		2	
Bicycle Volume [bicycles/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.01	0.01	0.00	0.06	0.03
d_M, Delay for Movement [s/veh]	9.92	0.00	0.00	0.00	35.61	12.78
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh]	0.11	0.00	0.00	0.00	0.30	0.30
95th-Percentile Queue Length [ft]	2.77	0.00	0.00	0.00	7.46	7.46
d_A, Approach Delay [s/veh]	0.26		0.00		20.72	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.39					
Intersection LOS	E					

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #7: CSAH 13 & CSAH 10

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 24.9
Level Of Service: C
Volume to Capacity (v/c): 0.564

Intersection Setup

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	250.00	100.00	250.00	250.00	100.00	250.00	275.00	100.00	275.00	250.00	100.00	250.00
Speed [mph]	55.00			55.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Base Volume Input [veh/h]	233	434	115	181	325	32	132	653	331	45	156	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	63	0	0	18	0	0	181	0	0	61
Total Hourly Volume [veh/h]	254	473	62	197	354	17	144	712	180	49	170	61
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	129	17	54	96	5	39	193	49	13	46	17
Total Analysis Volume [veh/h]	276	514	67	214	385	18	157	774	196	53	185	66
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			1			3			1		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	40	0	30	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	41	39	0	33	31	0	41	56	0	12	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	no	no		no	no		no	yes		no	yes	
Maximum Recall	no	no		no	no		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	12	12	12	10	10	10	10	17	17	3	10	10
g / C, Green / Cycle	0.19	0.19	0.19	0.16	0.16	0.16	0.17	0.28	0.28	0.05	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.16	0.15	0.04	0.12	0.11	0.01	0.09	0.22	0.13	0.03	0.05	0.04
s, saturation flow rate [veh/h]	1757	3512	1568	1757	3512	1568	1757	3512	1568	1757	3512	1568
c, Capacity [veh/h]	337	674	301	282	564	252	295	977	436	85	557	249
d1, Uniform Delay [s]	24.14	23.84	21.26	25.00	24.66	22.22	23.68	20.83	18.56	29.08	23.29	23.03
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.91	1.83	0.37	4.18	1.47	0.12	1.48	1.50	0.73	7.16	0.35	0.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.76	0.22	0.76	0.68	0.07	0.53	0.79	0.45	0.62	0.33	0.27
d, Delay for Lane Group [s/veh]	29.05	25.66	21.63	29.18	26.14	22.34	25.16	22.32	19.28	36.25	23.64	23.60
Lane Group LOS	C	C	C	C	C	C	C	C	B	D	C	C
Critical Lane Group	no	yes	no	yes	no	no	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	3.72	3.16	0.73	2.88	2.38	0.20	1.91	4.40	1.98	0.85	1.05	0.76
50th-Percentile Queue Length [ft]	92.91	79.12	18.17	72.00	59.50	4.98	47.70	110.00	49.55	21.21	26.32	19.08
95th-Percentile Queue Length [veh]	6.69	5.70	1.31	5.18	4.28	0.36	3.43	7.84	3.57	1.53	1.90	1.37
95th-Percentile Queue Length [ft]	167.24	142.41	32.71	129.61	107.10	8.96	85.86	196.01	89.19	38.17	47.38	34.34

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.05	25.66	21.63	29.18	26.14	22.34	25.16	22.32	19.28	36.25	23.64	23.60
Movement LOS	C	C	C	C	C	C	C	C	B	D	C	C
d_A, Approach Delay [s/veh]	26.44			27.08			22.19			25.83		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.86											
Intersection LOS	C											
Intersection V/C	0.564											

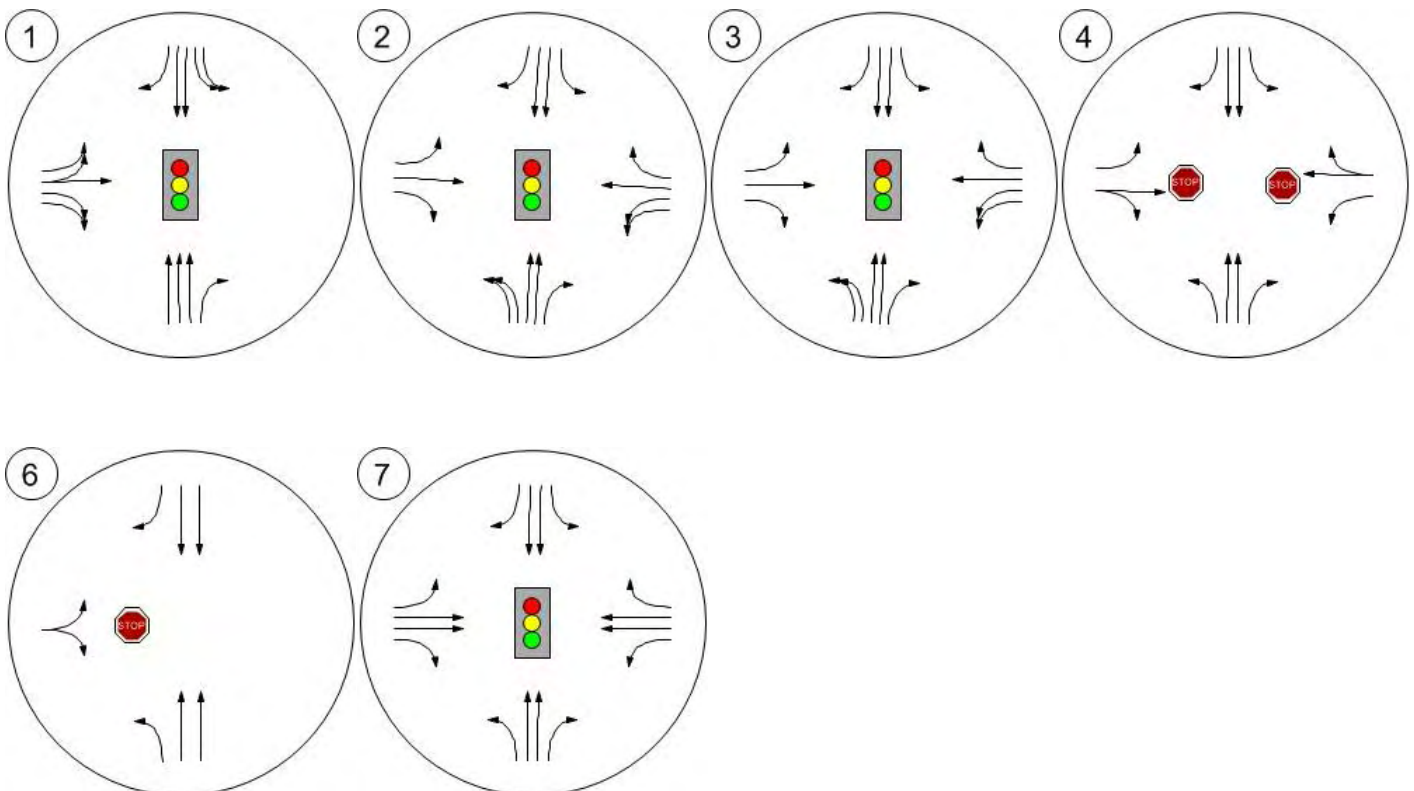
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Lane Configuration and Traffic Control



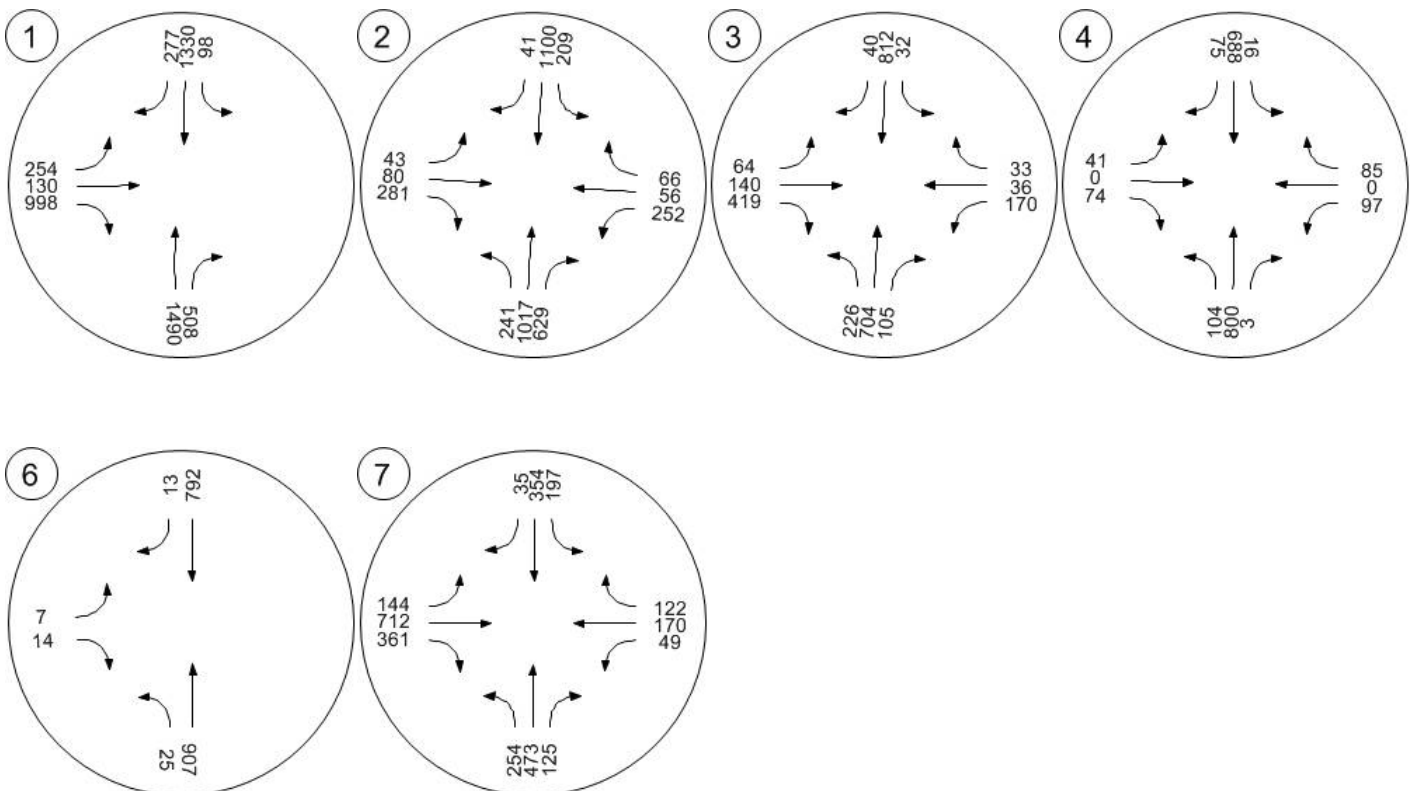
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Traffic Volume - Future Total Volume



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Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 5: AM 2019 Build

Report File: C:\...\AM 2019 Build.pdf

7/2/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	CSAH 13 & I-94 Southern Ramp	Signalized	HCM2010	SBL	0.446	17.9	B
2	CSAH 13 & I-94 Northern Ramp	Signalized	HCM2010	SBL	0.506	26.8	C
3	Inwood Ave & Hudson Blvd	Signalized	HCM2010	EBL	0.417	27.0	C
4	CSAH 13 & Eagle Point Blvd	Two-way stop	HCM2010	WBL	0.475	69.4	F
5	CSAH 13 & 5th St	Two-way stop	HCM2010	WBL	1.716	431.3	F
6	CSAH 13 & 9th St	Two-way stop	HCM2010	EBT	0.000	25.8	D
7	CSAH 13 & CSAH 10	Signalized	HCM2010	WBL	0.417	20.9	C
8	CSAH 10 & Western Site Access	Two-way stop	HCM2010	SBT	0.000	21.0	C
9	CSAH 10 & Eastern Site Access	Two-way stop	HCM2010	NBL	0.146	20.7	C
10	Eagle Point Blvd & Site Access	Two-way stop	HCM2010	SBL	0.000	10.4	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #1: CSAH 13 & I-94 Southern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 17.9
Level Of Service: B
Volume to Capacity (v/c): 0.446

Intersection Setup

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	2	0	1	1	0	2	0	0	0
Pocket Length [ft]	100.00	100.00	400.00	175.00	100.00	150.00	500.00	100.00	500.00	100.00	100.00	100.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Base Volume Input [veh/h]	0	1172	76	12	613	55	286	20	410	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	47	0	0	79	79	83	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	42	0	0	70	0	0	224	0	0	0
Total Hourly Volume [veh/h]	0	1324	41	13	747	69	395	22	223	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	360	11	4	203	19	107	6	61	0	0	0
Total Analysis Volume [veh/h]	0	1439	45	14	812	75	429	24	242	0	0	0
Presence of On-Street Parking			no	no		no	no		no			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Protecte	Permiss
Signal Group	0	2	0	1	6	0	0	4	5	0	0	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	20	0	7	20	0	0	10	10	0	0	0
Maximum Green [s]	0	57	0	10	58	0	0	25	13	0	0	0
Amber [s]	0.0	4.5	0.0	3.0	4.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	2.0	1.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
Split [s]	0	64	0	12	59	0	0	34	17	0	0	0
Vehicle Extension [s]	0.0	4.6	0.0	2.0	4.6	0.0	0.0	3.0	2.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	3.5	0.0	3.0	4.0	0.0	0.0	5.0	5.0	0.0	0.0	0.0
Minimum Recall		no		no	no			no	no			
Maximum Recall		yes		no	yes			no	no			
Pedestrian Recall		no		no	no			no	no			
Detector Location [ft]	0.0	400.0	0.0	20.0	400.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	C	R	L	C	R	L	C	R	
L, Total Lost Time per Cycle [s]	5.50	5.50	5.00	6.00	6.00	7.00	7.00	7.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	3.50	3.50	3.00	4.00	4.00	5.00	5.00	0.00	
g_i, Effective Green Time [s]	73	73	2	63	63	17	17	34	
g / C, Green / Cycle	0.67	0.67	0.02	0.58	0.58	0.15	0.15	0.31	
(v / s)_i Volume / Saturation Flow Rate	0.29	0.03	0.00	0.23	0.05	0.12	0.12	0.09	
s, saturation flow rate [veh/h]	5025	1568	3412	3512	1568	1757	1757	2775	
c, Capacity [veh/h]	3347	1044	79	2021	902	267	267	850	
d1, Uniform Delay [s]	8.60	6.32	52.72	12.90	10.41	45.10	45.10	29.00	
k, delay calibration	0.50	0.50	0.04	0.50	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.41	0.08	0.39	0.60	0.18	5.64	5.64	0.18	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.43	0.04	0.18	0.40	0.08	0.80	0.80	0.28	
d, Delay for Lane Group [s/veh]	9.00	6.40	53.11	13.50	10.60	50.74	50.74	29.18	
Lane Group LOS	A	A	D	B	B	D	D	C	
Critical Lane Group	no	no	no	yes	no	yes	no	yes	
50th-Percentile Queue Length [veh]	4.58	0.33	0.19	5.13	0.79	6.05	6.05	2.45	
50th-Percentile Queue Length [ft]	114.41	8.23	4.73	128.33	19.65	151.21	151.21	61.25	
95th-Percentile Queue Length [veh]	8.08	0.59	0.34	8.85	1.41	10.08	10.08	4.41	
95th-Percentile Queue Length [ft]	202.12	14.82	8.51	221.22	35.37	252.04	252.04	110.25	

Appendix D - Capacity Analysis Backup

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	9.00	6.40	53.11	13.50	10.60	50.74	50.74	29.18	0.00	0.00	0.00
Movement LOS		A	A	D	B	B	D	D	C			
d_A, Approach Delay [s/veh]	8.93			13.87			42.96			0.00		
Approach LOS	A			B			D			A		
d_I, Intersection Delay [s/veh]	17.86											
Intersection LOS	B											
Intersection V/C	0.446											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #2: CSAH 13 & I-94 Northern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 26.8
Level Of Service: C
Volume to Capacity (v/c): 0.506

Intersection Setup

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	325.00	100.00	100.00	250.00	100.00	275.00	175.00	100.00	100.00	400.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Base Volume Input [veh/h]	80	636	710	91	462	9	8	21	25	160	53	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	130	0	136	158	0	0	0	0	0	0	47
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	387	0	0	5	0	0	14	0	0	55
Total Hourly Volume [veh/h]	87	823	387	235	662	5	9	23	13	174	58	54
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	224	105	64	180	1	2	6	4	47	16	15
Total Analysis Volume [veh/h]	95	895	421	255	720	5	10	25	14	189	63	59
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	89.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	10	44	0	15	49	0	10	11	0	18	30	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	3.5	0.0	3.0	3.5	0.0
All red [s]	2.0	1.5	0.0	2.0	2.0	0.0	2.0	3.5	0.0	2.0	3.0	0.0
Split [s]	13	50	0	29	66	0	12	17	0	14	19	0
Vehicle Extension [s]	2.0	4.6	0.0	2.0	4.6	0.0	2.0	3.0	0.0	2.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.5	0.0	3.0	5.0	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	39.0	300.0	0.0	39.0	300.0	0.0	39.0	120.0	0.0	120.0	120.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.50	6.50	5.00	7.00	7.00	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.50	4.50	3.00	5.00	5.00	3.00	4.50	4.50
g_i, Effective Green Time [s]	7	54	54	18	65	65	6	7	7	8	10	10
g / C, Green / Cycle	0.06	0.49	0.49	0.16	0.59	0.59	0.05	0.06	0.06	0.07	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.03	0.25	0.27	0.15	0.20	0.00	0.01	0.01	0.01	0.06	0.03	0.04
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	206	1721	768	285	2063	921	94	118	100	257	166	141
d1, Uniform Delay [s]	49.99	19.21	19.57	45.20	11.80	9.41	49.61	48.92	48.69	49.84	47.18	47.35
k, delay calibration	0.04	0.50	0.50	0.12	0.50	0.50	0.04	0.11	0.11	0.04	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	1.13	2.80	10.91	0.47	0.01	0.18	0.89	0.63	1.55	1.42	1.96
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.46	0.52	0.55	0.90	0.35	0.01	0.11	0.21	0.14	0.74	0.38	0.42
d, Delay for Lane Group [s/veh]	50.59	20.34	22.37	56.11	12.26	9.42	49.80	49.81	49.33	51.39	48.60	49.31
Lane Group LOS	D	C	C	E	B	A	D	D	D	D	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	1.25	7.48	7.50	7.44	4.22	0.05	0.27	0.68	0.38	2.60	1.69	1.61
50th-Percentile Queue Length [ft]	31.16	186.89	187.60	186.01	105.54	1.20	6.67	17.04	9.53	64.92	42.33	40.16
95th-Percentile Queue Length [veh]	2.24	11.96	12.00	11.91	7.59	0.09	0.48	1.23	0.69	4.67	3.05	2.89
95th-Percentile Queue Length [ft]	56.09	298.99	299.91	297.85	189.78	2.16	12.01	30.67	17.16	116.86	76.19	72.29

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	50.59	20.34	22.37	56.11	12.26	9.42	49.80	49.81	49.33	51.39	48.60	49.31
Movement LOS	D	C	C	E	B	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	22.98			23.66			49.67			50.43		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	26.80											
Intersection LOS	C											
Intersection V/C	0.506											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #3: Inwood Ave & Hudson Blvd

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 27.0
Level Of Service: C
Volume to Capacity (v/c): 0.417

Intersection Setup

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	175.00	100.00	250.00	100.00	100.00	100.00	175.00	100.00	100.00	250.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Base Volume Input [veh/h]	176	314	139	33	373	52	14	22	149	137	167	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	177	0	0	294	8	5	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	76	0	0	33	0	0	81	0	0	26
Total Hourly Volume [veh/h]	192	519	76	36	701	32	20	24	81	149	182	26
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	52	141	21	10	190	9	5	7	22	40	49	7
Total Analysis Volume [veh/h]	209	564	83	39	762	35	22	26	88	162	198	28
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			11			0			3		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	94.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	16	39	0	12	35	0	12	24	0	12	25	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	2.0	1.5	0.0	2.0	1.5	0.0	2.0	2.5	0.0	2.0	2.5	0.0
Split [s]	18	57	0	12	51	0	12	22	0	19	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.0	0.0	3.0	4.5	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	55.0	300.0	0.0	55.0	475.0	0.0	50.0	250.0	0.0	50.0	250.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.00	6.00	5.00	6.50	6.50	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.00	4.00	3.00	4.50	4.50	3.00	4.50	4.50
g_i, Effective Green Time [s]	9	65	65	5	61	61	3	10	10	8	14	14
g / C, Green / Cycle	0.08	0.59	0.59	0.04	0.56	0.56	0.03	0.09	0.09	0.07	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.06	0.16	0.05	0.02	0.22	0.02	0.01	0.01	0.06	0.05	0.11	0.02
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	275	2077	927	79	1952	871	56	164	140	239	235	200
d1, Uniform Delay [s]	49.54	10.94	9.70	51.32	13.86	11.10	52.22	46.29	48.35	49.93	46.90	42.63
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.34	0.32	0.19	4.75	0.59	0.09	4.46	0.44	4.60	3.33	7.91	0.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.27	0.09	0.50	0.39	0.04	0.39	0.16	0.63	0.68	0.84	0.14
d, Delay for Lane Group [s/veh]	53.89	11.26	9.89	56.07	14.45	11.19	56.68	46.73	52.95	53.26	54.82	42.95
Lane Group LOS	D	B	A	E	B	B	E	D	D	D	D	D
Critical Lane Group	yes	no	no	no	yes	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	2.90	3.08	0.83	1.13	5.02	0.38	0.66	0.68	2.51	2.28	5.79	0.70
50th-Percentile Queue Length [ft]	72.43	77.07	20.73	28.15	125.52	9.46	16.61	16.97	62.65	57.04	144.80	17.39
95th-Percentile Queue Length [veh]	5.21	5.55	1.49	2.03	8.70	0.68	1.20	1.22	4.51	4.11	9.74	1.25
95th-Percentile Queue Length [ft]	130.37	138.72	37.31	50.67	217.39	17.04	29.89	30.54	112.78	102.67	243.47	31.30

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.89	11.26	9.89	56.07	14.45	11.19	56.68	46.73	52.95	53.26	54.82	42.95
Movement LOS	D	B	A	E	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	21.54			16.26			52.37			53.31		
Approach LOS	C			B			D			D		
d_I, Intersection Delay [s/veh]	27.00											
Intersection LOS	C											
Intersection V/C	0.417											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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Intersection Level Of Service Report #4: CSAH 13 & Eagle Point Blvd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 69.4
Level Of Service: F
Volume to Capacity (v/c): 0.475

Intersection Setup

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	250.00	250.00	100.00	250.00	50.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	45.00			55.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Base Volume Input [veh/h]	61	276	84	92	474	32	8	0	9	3	0	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	154	28	0	261	0	0	0	0	41	0	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	455	120	100	778	35	9	0	10	44	0	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	124	33	27	211	10	2	0	3	12	0	3
Total Analysis Volume [veh/h]	72	495	130	109	846	38	10	0	11	48	0	11
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.00	0.00	0.12	0.01	0.00	0.13	0.00	0.02	0.48	0.00	0.01
d_M, Delay for Movement [s/veh]	10.30	0.00	0.00	9.30	0.00	0.00	60.67	65.95	11.41	69.37	58.36	9.87
Movement LOS	B	A	A	A	A	A	F	F	B	F	F	A
95th-Percentile Queue Length [veh]	0.32	0.00	0.00	0.39	0.00	0.00	0.44	0.06	0.06	2.07	0.04	0.04
95th-Percentile Queue Length [ft]	7.93	0.00	0.00	9.74	0.00	0.00	11.02	1.47	1.47	51.73	1.12	1.12
d_A, Approach Delay [s/veh]	1.06			1.02			34.87			58.28		
Approach LOS	A			A			D			F		
d_I, Intersection Delay [s/veh]	3.35											
Intersection LOS	F											

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #5: CSAH 13 & 5th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 431.3
Level Of Service: F
Volume to Capacity (v/c): 1.716

Intersection Setup

Name	CSAH 13		CSAH 13		5th St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	CSAH 13		CSAH 13		5th St	
Base Volume Input [veh/h]	288	0	0	598	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	108	34	22	239	47
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	-36	36	71	-74	74	36
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	330	144	105	600	313	83
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	39	29	163	85	23
Total Analysis Volume [veh/h]	359	157	114	652	340	90
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.11	0.01	1.72	0.12
d_M, Delay for Movement [s/veh]	0.00	0.00	8.89	0.00	431.33	418.04
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh]	0.00	0.00	1.72	0.86	29.90	29.90
95th-Percentile Queue Length [ft]	0.00	0.00	42.89	21.45	747.40	747.40
d_A, Approach Delay [s/veh]	0.00		1.32		428.55	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	108.23					
Intersection LOS	F					

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #6: CSAH 13 & 9th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 25.8
Level Of Service: D
Volume to Capacity (v/c): 0.000

Intersection Setup

Name	CSAH 13			CSAH 13			9th St					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	300.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	55.00			55.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			9th St					
Base Volume Input [veh/h]	5	278	0	0	565	4	6	0	15	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	40	6	55	0	0	0	0	0	0	17
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	3	-3	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	362	40	9	668	4	7	0	16	0	0	17
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	98	11	2	182	1	2	0	4	0	0	5
Total Analysis Volume [veh/h]	5	393	43	10	726	4	8	0	17	0	0	18
Pedestrian Volume [ped/h]	0			0			4			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.01	0.00	0.04	0.00	0.03	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	9.23	0.00	0.00	8.26	0.00	0.00	23.52	25.83	11.45	0.00	0.00	9.70
Movement LOS	A	A	A	A	A	A	C	D	B			A
95th-Percentile Queue Length [veh]	0.02	0.00	0.00	1.46	0.73	0.00	0.21	0.21	0.21	0.00	0.00	0.07
95th-Percentile Queue Length [ft]	0.44	0.00	0.00	36.47	18.24	0.00	5.35	5.35	5.35	0.00	0.00	1.76
d_A, Approach Delay [s/veh]	0.10			0.11			15.31			9.70		
Approach LOS	A			A			C			A		
d_I, Intersection Delay [s/veh]	0.56											
Intersection LOS	D											

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Intersection Level Of Service Report #7: CSAH 13 & CSAH 10

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 20.9
Level Of Service: C
Volume to Capacity (v/c): 0.417

Intersection Setup

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	250.00	100.00	250.00	250.00	100.00	250.00	275.00	100.00	275.00	250.00	100.00	250.00
Speed [mph]	55.00			55.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Base Volume Input [veh/h]	107	152	34	49	321	82	27	117	174	87	419	121
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	49	17	11	3	9	0	0	8	27	24	11	4
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	24	0	0	45	0	0	109	0	0	68
Total Hourly Volume [veh/h]	166	183	24	56	359	44	29	136	108	119	468	68
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	45	50	7	15	98	12	8	37	29	32	127	18
Total Analysis Volume [veh/h]	180	199	26	61	390	48	32	148	117	129	509	74
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	2			0			1			2		
Bicycle Volume [bicycles/h]	0			0			0			0		

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	40	0	30	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	29	37	0	24	32	0	10	25	0	24	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	no	no		no	no		no	yes		no	yes	
Maximum Recall	no	no		no	no		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	7	10	10	7	10	10	5	10	10	5	10	10
g / C, Green / Cycle	0.13	0.19	0.19	0.14	0.19	0.19	0.09	0.19	0.19	0.10	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.10	0.06	0.02	0.03	0.11	0.03	0.02	0.04	0.07	0.07	0.14	0.05
s, saturation flow rate [veh/h]	1757	3512	1568	1757	3512	1568	1757	3512	1568	1757	3512	1568
c, Capacity [veh/h]	238	652	291	250	676	302	152	663	296	173	705	315
d1, Uniform Delay [s]	21.64	18.28	17.54	19.81	19.07	17.49	22.09	17.86	18.49	22.79	19.42	17.43
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.85	0.26	0.13	0.50	0.78	0.24	0.68	0.17	0.86	6.19	1.42	0.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.31	0.09	0.24	0.58	0.16	0.21	0.22	0.40	0.74	0.72	0.24
d, Delay for Lane Group [s/veh]	26.50	18.54	17.67	20.31	19.85	17.73	22.77	18.03	19.34	28.98	20.83	17.81
Lane Group LOS	C	B	B	C	B	B	C	B	B	C	C	B
Critical Lane Group	yes	no	no	no	yes	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	2.01	0.84	0.21	0.56	1.74	0.40	0.33	0.61	1.04	1.55	2.37	0.62
50th-Percentile Queue Length [ft]	50.35	20.92	5.36	14.05	43.56	9.93	8.16	15.19	25.98	38.69	59.29	15.39
95th-Percentile Queue Length [veh]	3.63	1.51	0.39	1.01	3.14	0.71	0.59	1.09	1.87	2.79	4.27	1.11
95th-Percentile Queue Length [ft]	90.63	37.66	9.65	25.29	78.41	17.87	14.69	27.34	46.77	69.63	106.71	27.71

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.50	18.54	17.67	20.31	19.85	17.73	22.77	18.03	19.34	28.98	20.83	17.81
Movement LOS	C	B	B	C	B	B	C	B	B	C	C	B
d_A, Approach Delay [s/veh]	22.02			19.70			19.06			22.00		
Approach LOS	C			B			B			C		
d_I, Intersection Delay [s/veh]	20.95											
Intersection LOS	C											
Intersection V/C	0.417											

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Intersection Level Of Service Report #8: CSAH 10 & Western Site Access

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 21.0
Level Of Service: C
Volume to Capacity (v/c): 0.000

Intersection Setup

Name	Western Site Access						CSAH 10			CSAH 10		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			⬆			↱↱↱			↱↱↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	125.00	100.00	100.00	275.00	100.00	100.00
Speed [mph]	30.00			30.00			55.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			no			no		

Volumes

Name	Western Site Access						CSAH 10			CSAH 10		
Base Volume Input [veh/h]	0	0	0	0	0	0	0	200	0	0	627	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	3	0	0	0	0	15	6	1	38	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	3	0	0	0	0	233	6	1	721	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	0	0	0	0	63	2	0	196	0
Total Analysis Volume [veh/h]	0	0	3	0	0	0	0	253	7	1	784	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	9.05	20.92	20.98	10.96	9.37	0.00	0.00	7.78	0.00	0.00
Movement LOS			A	C	C	B	A	A	A	A	A	
95th-Percentile Queue Length [veh]	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
d_A, Approach Delay [s/veh]	9.05			17.62			0.00			0.01		
Approach LOS	A			C			A			A		
d_I, Intersection Delay [s/veh]	0.03											
Intersection LOS	C											

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Intersection Level Of Service Report #9: CSAH 10 & Eastern Site Access

Control Type:	Two-way stop	Delay (sec / veh):	20.7
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.146

Intersection Setup

Name	Eastern Site Access		CSAH 10		CSAH 10	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		55.00		55.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	Eastern Site Access		CSAH 10		CSAH 10	
Base Volume Input [veh/h]	0	0	200	0	0	627
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	36	5	7	10	2	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	5	225	10	2	687
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	1	61	3	1	187
Total Analysis Volume [veh/h]	39	5	245	11	2	747
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.01	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	20.71	11.81	0.00	0.00	7.77	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.53	0.53	0.00	0.00	3.84	3.84
95th-Percentile Queue Length [ft]	13.25	13.25	0.00	0.00	96.06	96.06
d_A, Approach Delay [s/veh]	19.70		0.00		0.02	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.84					
Intersection LOS	C					

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Intersection Level Of Service Report #10: Eagle Point Blvd & Site Access

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Site Access		Eagle Point Blvd		Eagle Point Blvd	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	Site Access		Eagle Point Blvd		Eagle Point Blvd	
Base Volume Input [veh/h]	0	0	0	176	7	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	48	28	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	48	28	192	8	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	13	8	52	2	0
Total Analysis Volume [veh/h]	0	52	30	209	9	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.05	0.02	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.36	8.54	7.29	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.15	0.15	0.52	0.52	0.00	0.00
95th-Percentile Queue Length [ft]	3.83	3.83	13.09	13.09	0.00	0.00
d_A, Approach Delay [s/veh]	8.54		0.91		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.21					
Intersection LOS	B					

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Signal Warrants Report For Intersection #4: CSAH 13 & Eagle Point Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	913	641	54	19
2	876	615	52	18
3	858	603	51	18
4	730	513	43	15
5	694	487	41	14
6	621	436	37	13
7	575	404	34	12
8	548	385	32	11
9	438	308	26	9
10	411	288	24	9
11	411	288	24	9
12	393	276	23	8
13	356	250	21	7
14	329	231	19	7
15	329	231	19	7
16	320	224	19	7
17	183	128	11	4
18	100	71	6	2
19	91	64	5	2
20	37	26	2	1
21	27	19	2	1
22	27	19	2	1
23	18	13	1	0
24	18	13	1	0

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	8	1554	4	73	No	No	No	No	No	No	No	No	No	No
2	8	1491	4	70	No	No	No	No	No	No	No	No	No	No
3	8	1461	4	69	No	No	No	No	No	No	No	No	No	No
4	8	1243	4	58	No	No	No	No	No	No	No	No	No	No
5	8	1181	4	55	No	No	No	No	No	No	No	No	No	No
6	8	1057	4	50	No	No	No	No	No	No	No	No	No	No
7	8	979	4	46	No	No	No	No	No	No	No	No	No	No
8	8	933	4	43	No	No	No	No	No	No	No	No	No	No
9	8	746	4	35	No	No	No	No	No	No	No	No	No	No
10	8	699	4	33	No	No	No	No	No	No	No	No	No	No
11	8	699	4	33	No	No	No	No	No	No	No	No	No	No
12	8	669	4	31	No	No	No	No	No	No	No	No	No	No
13	8	606	4	28	No	No	No	No	No	No	No	No	No	No
14	8	560	4	26	No	No	No	No	No	No	No	No	No	No
15	8	560	4	26	No	No	No	No	No	No	No	No	No	No
16	8	544	4	26	No	No	No	No	No	No	No	No	No	No
17	8	311	4	15	No	No	No	No	No	No	No	No	No	No
18	8	171	4	8	No	No	No	No	No	No	No	No	No	No
19	8	155	4	7	No	No	No	No	No	No	No	No	No	No
20	8	63	4	3	No	No	No	No	No	No	No	No	No	No
21	8	46	4	3	No	No	No	No	No	No	No	No	No	No
22	8	46	4	3	No	No	No	No	No	No	No	No	No	No
23	8	31	4	1	No	No	No	No	No	No	No	No	No	No
24	8	31	4	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	58.3	34.9
Number of Lanes on Minor Street Approach	2	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:52	0:11
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	54	19
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	1627	1627
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

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Signal Warrants Report For Intersection #5: CSAH 13 & 5th St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	474	705	396
2	455	677	380
3	446	663	372
4	379	564	317
5	360	536	301
6	322	479	269
7	299	444	249
8	284	423	238
9	228	338	190
10	213	317	178
11	213	317	178
12	204	303	170
13	185	275	154
14	171	254	143
15	171	254	143
16	166	247	139
17	95	141	79
18	52	78	44
19	47	71	40
20	19	28	16
21	14	21	12
22	14	21	12
23	9	14	8
24	9	14	8

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	1179	1	396	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	4	1132	1	380	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	4	1109	1	372	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	4	943	1	317	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	4	896	1	301	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
6	4	801	1	269	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
7	4	743	1	249	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
8	4	707	1	238	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
9	4	566	1	190	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
10	4	530	1	178	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
11	4	530	1	178	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
12	4	507	1	170	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
13	4	460	1	154	No	No	Yes	Yes	No	No	No	No	Yes	No
14	4	425	1	143	No	No	Yes	Yes	No	No	No	No	Yes	No
15	4	425	1	143	No	No	Yes	Yes	No	No	No	No	Yes	No
16	4	413	1	139	No	No	No	Yes	No	No	No	No	Yes	No
17	4	236	1	79	No	No	No	No	No	No	No	No	No	No
18	4	130	1	44	No	No	No	No	No	No	No	No	No	No
19	4	118	1	40	No	No	No	No	No	No	No	No	No	No
20	4	47	1	16	No	No	No	No	No	No	No	No	No	No
21	4	35	1	12	No	No	No	No	No	No	No	No	No	No
22	4	35	1	12	No	No	No	No	No	No	No	No	No	No
23	4	23	1	8	No	No	No	No	No	No	No	No	No	No
24	4	23	1	8	No	No	No	No	No	No	No	No	No	No
Hours Met					8	12	15	16	4	7	8	12	16	9

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	428.6
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	47:08
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	396
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1575
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	Yes

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Signal Warrants Report For Intersection #6: CSAH 13 & 9th St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	407	681	17	23
2	391	654	16	22
3	383	640	16	22
4	326	545	14	18
5	309	518	13	17
6	277	463	12	16
7	256	429	11	14
8	244	409	10	14
9	195	327	8	11
10	183	306	8	10
11	183	306	8	10
12	175	293	7	10
13	159	266	7	9
14	147	245	6	8
15	147	245	6	8
16	142	238	6	8
17	81	136	3	5
18	45	75	2	3
19	41	68	2	2
20	16	27	1	1
21	12	20	1	1
22	12	20	1	1
23	8	14	0	0
24	8	14	0	0

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	6	1088	2	40	No	No	No	No	No	No	No	No	No	No
2	6	1045	2	38	No	No	No	No	No	No	No	No	No	No
3	6	1023	2	38	No	No	No	No	No	No	No	No	No	No
4	6	871	2	32	No	No	No	No	No	No	No	No	No	No
5	6	827	2	30	No	No	No	No	No	No	No	No	No	No
6	6	740	2	28	No	No	No	No	No	No	No	No	No	No
7	6	685	2	25	No	No	No	No	No	No	No	No	No	No
8	6	653	2	24	No	No	No	No	No	No	No	No	No	No
9	6	522	2	19	No	No	No	No	No	No	No	No	No	No
10	6	489	2	18	No	No	No	No	No	No	No	No	No	No
11	6	489	2	18	No	No	No	No	No	No	No	No	No	No
12	6	468	2	17	No	No	No	No	No	No	No	No	No	No
13	6	425	2	16	No	No	No	No	No	No	No	No	No	No
14	6	392	2	14	No	No	No	No	No	No	No	No	No	No
15	6	392	2	14	No	No	No	No	No	No	No	No	No	No
16	6	380	2	14	No	No	No	No	No	No	No	No	No	No
17	6	217	2	8	No	No	No	No	No	No	No	No	No	No
18	6	120	2	5	No	No	No	No	No	No	No	No	No	No
19	6	109	2	4	No	No	No	No	No	No	No	No	No	No
20	6	43	2	2	No	No	No	No	No	No	No	No	No	No
21	6	32	2	2	No	No	No	No	No	No	No	No	No	No
22	6	32	2	2	No	No	No	No	No	No	No	No	No	No
23	6	22	2	0	No	No	No	No	No	No	No	No	No	No
24	6	22	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.7	15.3
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:02	0:05
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	17	23
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	1128	1128
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

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Signal Warrants Report For Intersection #8: CSAH 10 & Western Site Access

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	722	239	3	0
2	693	229	3	0
3	679	225	3	0
4	578	191	2	0
5	549	182	2	0
6	491	163	2	0
7	455	151	2	0
8	433	143	2	0
9	347	115	1	0
10	325	108	1	0
11	325	108	1	0
12	310	103	1	0
13	282	93	1	0
14	260	86	1	0
15	260	86	1	0
16	253	84	1	0
17	144	48	1	0
18	79	26	0	0
19	72	24	0	0
20	29	10	0	0
21	22	7	0	0
22	22	7	0	0
23	14	5	0	0
24	14	5	0	0

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	6	961	2	3	No	No	No	No	No	No	No	No	No	No
2	6	922	2	3	No	No	No	No	No	No	No	No	No	No
3	6	904	2	3	No	No	No	No	No	No	No	No	No	No
4	6	769	2	2	No	No	No	No	No	No	No	No	No	No
5	6	731	2	2	No	No	No	No	No	No	No	No	No	No
6	6	654	2	2	No	No	No	No	No	No	No	No	No	No
7	6	606	2	2	No	No	No	No	No	No	No	No	No	No
8	6	576	2	2	No	No	No	No	No	No	No	No	No	No
9	6	462	2	1	No	No	No	No	No	No	No	No	No	No
10	6	433	2	1	No	No	No	No	No	No	No	No	No	No
11	6	433	2	1	No	No	No	No	No	No	No	No	No	No
12	6	413	2	1	No	No	No	No	No	No	No	No	No	No
13	6	375	2	1	No	No	No	No	No	No	No	No	No	No
14	6	346	2	1	No	No	No	No	No	No	No	No	No	No
15	6	346	2	1	No	No	No	No	No	No	No	No	No	No
16	6	337	2	1	No	No	No	No	No	No	No	No	No	No
17	6	192	2	1	No	No	No	No	No	No	No	No	No	No
18	6	105	2	0	No	No	No	No	No	No	No	No	No	No
19	6	96	2	0	No	No	No	No	No	No	No	No	No	No
20	6	39	2	0	No	No	No	No	No	No	No	No	No	No
21	6	29	2	0	No	No	No	No	No	No	No	No	No	No
22	6	29	2	0	No	No	No	No	No	No	No	No	No	No
23	6	19	2	0	No	No	No	No	No	No	No	No	No	No
24	6	19	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	9	17.6
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	3	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	964	964
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

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Signal Warrants Report For Intersection #9: CSAH 10 & Eastern Site Access

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	689	235	41
2	661	226	39
3	648	221	39
4	551	188	33
5	524	179	31
6	469	160	28
7	434	148	26
8	413	141	25
9	331	113	20
10	310	106	18
11	310	106	18
12	296	101	18
13	269	92	16
14	248	85	15
15	248	85	15
16	241	82	14
17	138	47	8
18	76	26	5
19	69	24	4
20	28	9	2
21	21	7	1
22	21	7	1
23	14	5	1
24	14	5	1

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	924	1	41	No	No	No	No	No	No	No	No	No	No
2	2	887	1	39	No	No	No	No	No	No	No	No	No	No
3	2	869	1	39	No	No	No	No	No	No	No	No	No	No
4	2	739	1	33	No	No	No	No	No	No	No	No	No	No
5	2	703	1	31	No	No	No	No	No	No	No	No	No	No
6	2	629	1	28	No	No	No	No	No	No	No	No	No	No
7	2	582	1	26	No	No	No	No	No	No	No	No	No	No
8	2	554	1	25	No	No	No	No	No	No	No	No	No	No
9	2	444	1	20	No	No	No	No	No	No	No	No	No	No
10	2	416	1	18	No	No	No	No	No	No	No	No	No	No
11	2	416	1	18	No	No	No	No	No	No	No	No	No	No
12	2	397	1	18	No	No	No	No	No	No	No	No	No	No
13	2	361	1	16	No	No	No	No	No	No	No	No	No	No
14	2	333	1	15	No	No	No	No	No	No	No	No	No	No
15	2	333	1	15	No	No	No	No	No	No	No	No	No	No
16	2	323	1	14	No	No	No	No	No	No	No	No	No	No
17	2	185	1	8	No	No	No	No	No	No	No	No	No	No
18	2	102	1	5	No	No	No	No	No	No	No	No	No	No
19	2	93	1	4	No	No	No	No	No	No	No	No	No	No
20	2	37	1	2	No	No	No	No	No	No	No	No	No	No
21	2	28	1	1	No	No	No	No	No	No	No	No	No	No
22	2	28	1	1	No	No	No	No	No	No	No	No	No	No
23	2	19	1	1	No	No	No	No	No	No	No	No	No	No
24	2	19	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	19.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:13
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	41
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	965
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No

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Signal Warrants Report For Intersection #10: Eagle Point Blvd & Site Access

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	8	220	48
2	8	211	46
3	8	207	45
4	6	176	38
5	6	167	36
6	5	150	33
7	5	139	30
8	5	132	29
9	4	106	23
10	4	99	22
11	4	99	22
12	3	95	21
13	3	86	19
14	3	79	17
15	3	79	17
16	3	77	17
17	2	44	10
18	1	24	5
19	1	22	5
20	0	9	2
21	0	7	1
22	0	7	1
23	0	4	1
24	0	4	1

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	228	1	48	No	No	No	No	No	No	No	No	No	No
2	2	219	1	46	No	No	No	No	No	No	No	No	No	No
3	2	215	1	45	No	No	No	No	No	No	No	No	No	No
4	2	182	1	38	No	No	No	No	No	No	No	No	No	No
5	2	173	1	36	No	No	No	No	No	No	No	No	No	No
6	2	155	1	33	No	No	No	No	No	No	No	No	No	No
7	2	144	1	30	No	No	No	No	No	No	No	No	No	No
8	2	137	1	29	No	No	No	No	No	No	No	No	No	No
9	2	110	1	23	No	No	No	No	No	No	No	No	No	No
10	2	103	1	22	No	No	No	No	No	No	No	No	No	No
11	2	103	1	22	No	No	No	No	No	No	No	No	No	No
12	2	98	1	21	No	No	No	No	No	No	No	No	No	No
13	2	89	1	19	No	No	No	No	No	No	No	No	No	No
14	2	82	1	17	No	No	No	No	No	No	No	No	No	No
15	2	82	1	17	No	No	No	No	No	No	No	No	No	No
16	2	80	1	17	No	No	No	No	No	No	No	No	No	No
17	2	46	1	10	No	No	No	No	No	No	No	No	No	No
18	2	25	1	5	No	No	No	No	No	No	No	No	No	No
19	2	23	1	5	No	No	No	No	No	No	No	No	No	No
20	2	9	1	2	No	No	No	No	No	No	No	No	No	No
21	2	7	1	1	No	No	No	No	No	No	No	No	No	No
22	2	7	1	1	No	No	No	No	No	No	No	No	No	No
23	2	4	1	1	No	No	No	No	No	No	No	No	No	No
24	2	4	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.5
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:06
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	48
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	276
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

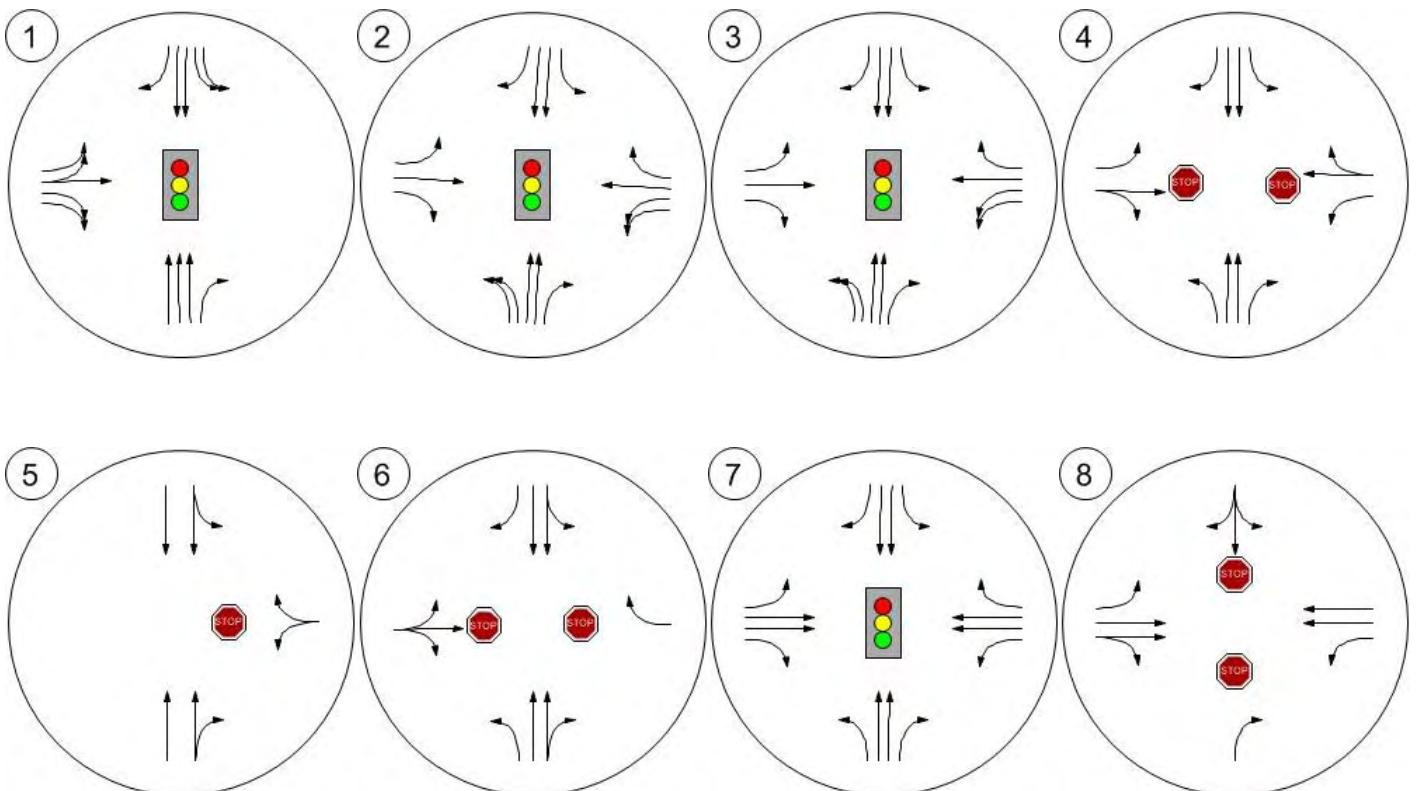
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Lane Configuration and Traffic Control



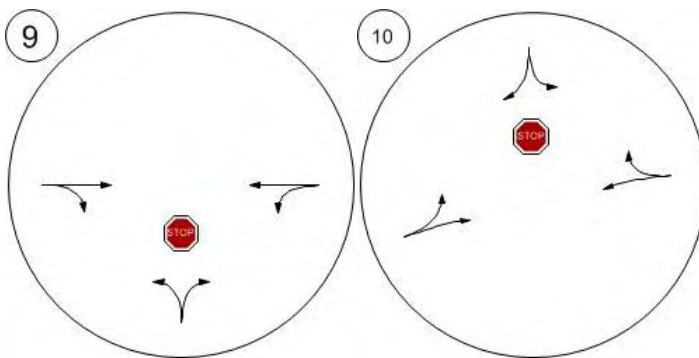
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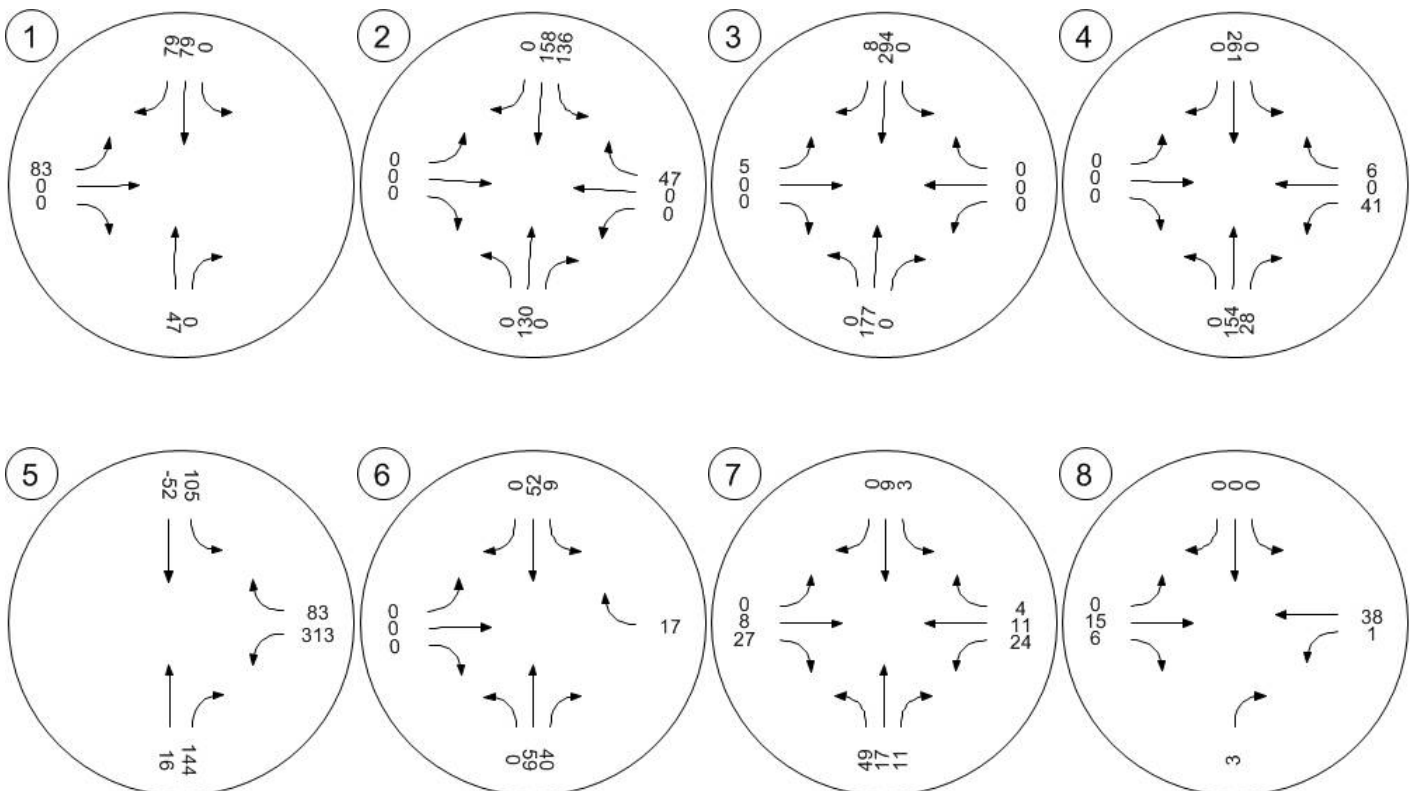
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Traffic Volume - Net New Site Trips



Lake Elmo Development

Scenario 5: 5: AM 2019 Build
Traffic Impact Study

D136

Lake Elmo Development

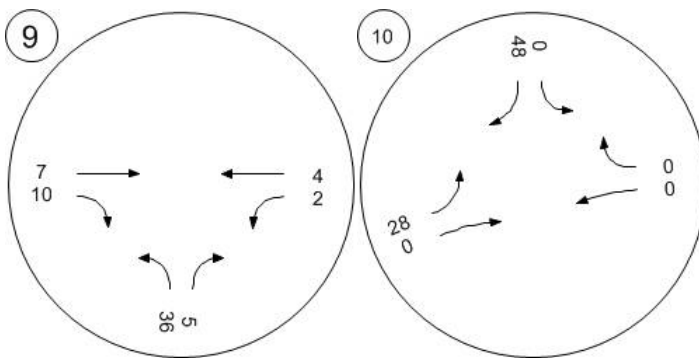
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Traffic Volume - Net New Site Trips



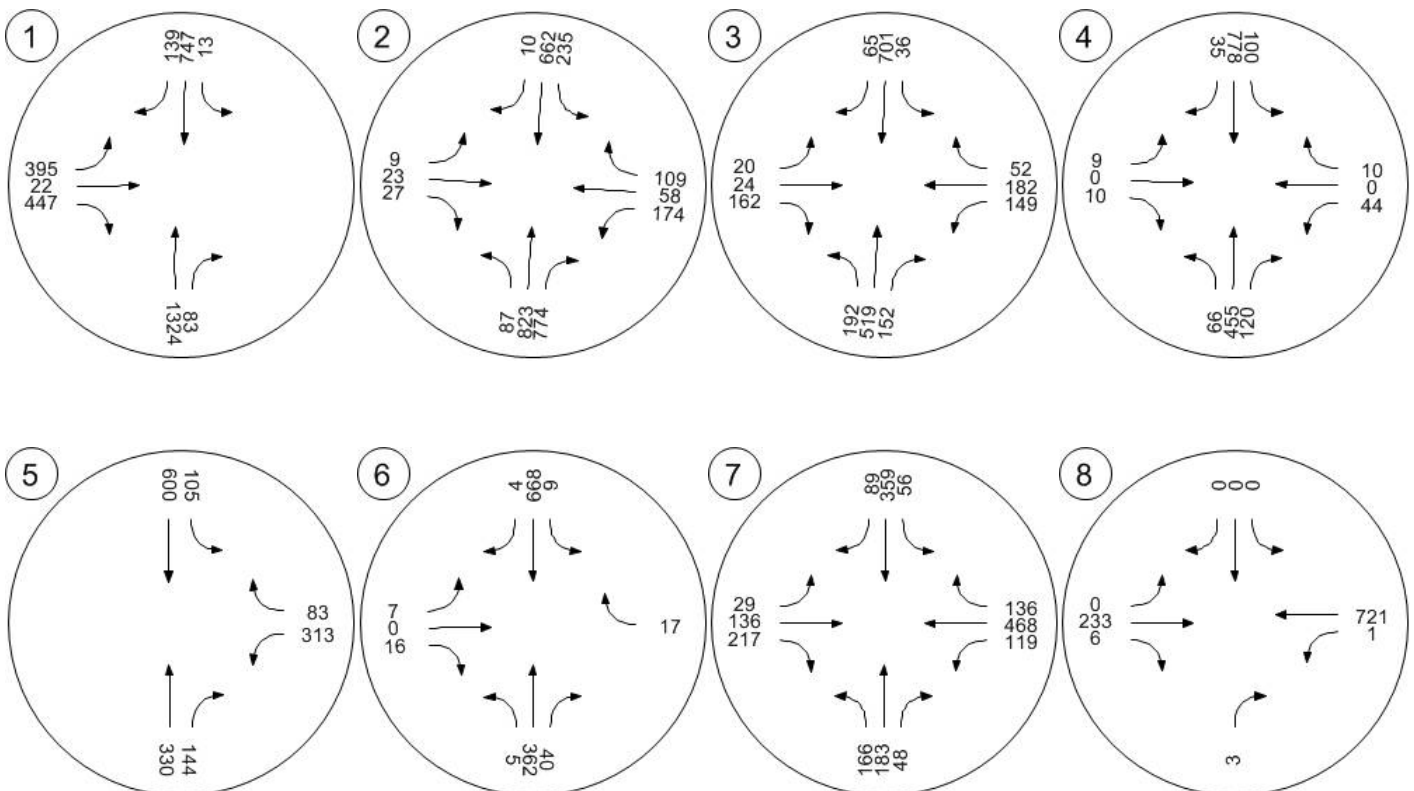
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Traffic Volume - Future Total Volume



Lake Elmo Development

Scenario 5: 5: AM 2019 Build
Traffic Impact Study

D138

Lake Elmo Development

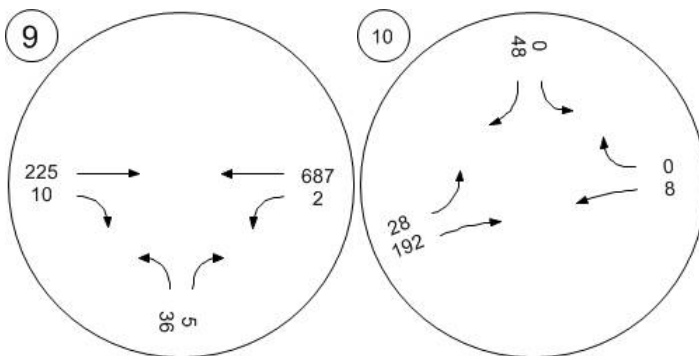
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Traffic Volume - Future Total Volume



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Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 6: PM 2019 Build

Report File: C:\...\PM 2019 Build.pdf

7/2/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	CSAH 13 & I-94 Southern Ramp	Signalized	HCM2010	SBL	0.750	27.0	C
2	CSAH 13 & I-94 Northern Ramp	Signalized	HCM2010	EBR	0.791	47.2	D
3	Inwood Ave & Hudson Blvd	Signalized	HCM2010	EBR	0.623	35.4	D
4	CSAH 13 & Eagle Point Blvd	Two-way stop	HCM2010	WBL	4.886	2,021.6	F
5	CSAH 13 & 5th St	Two-way stop	HCM2010	WBL	7.815	3,367.1	F
6	CSAH 13 & 9th St	Two-way stop	HCM2010	EBT	0.000	92.4	F
7	CSAH 13 & CSAH 10	Signalized	HCM2010	WBL	0.612	27.2	C
8	CSAH 10 & Western Site Access	Two-way stop	HCM2010	SBT	0.000	39.2	E
9	CSAH 10 & Eastern Site Access	Two-way stop	HCM2010	NBL	0.194	41.3	E
10	Eagle Point Blvd & Site Access	Two-way stop	HCM2010	SBL	0.000	10.8	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report #1: CSAH 13 & I-94 Southern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 27.0
Level Of Service: C
Volume to Capacity (v/c): 0.750

Intersection Setup

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	2	0	1	1	0	2	0	0	0
Pocket Length [ft]	100.00	100.00	400.00	175.00	100.00	150.00	500.00	100.00	500.00	100.00	100.00	100.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			I-94 Ramp			I-94		
Base Volume Input [veh/h]	0	1367	466	90	1220	254	233	119	916	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	81	0	0	68	68	143	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	254	0	0	173	0	0	499	0	0	0
Total Hourly Volume [veh/h]	0	1571	254	98	1398	172	397	130	499	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	427	69	27	380	47	108	35	136	0	0	0
Total Analysis Volume [veh/h]	0	1708	276	107	1520	187	432	141	542	0	0	0
Presence of On-Street Parking			no	no		no	no		no			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			1			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Protecte	Permiss
Signal Group	0	2	0	1	6	0	0	4	5	0	0	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	20	0	7	20	0	0	10	10	0	0	0
Maximum Green [s]	0	57	0	10	58	0	0	25	13	0	0	0
Amber [s]	0.0	4.5	0.0	3.0	4.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	2.0	1.5	0.0	0.0	3.5	3.5	0.0	0.0	0.0
Split [s]	0	90	0	13	86	0	0	37	17	0	0	0
Vehicle Extension [s]	0.0	4.6	0.0	2.0	4.6	0.0	0.0	3.0	2.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	3.5	0.0	3.0	4.0	0.0	0.0	5.0	5.0	0.0	0.0	0.0
Minimum Recall		no		no	no			no	no			
Maximum Recall		yes		no	yes			no	no			
Pedestrian Recall		no		no	no			no	no			
Detector Location [ft]	0.0	400.0	0.0	20.0	400.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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Lane Group Calculations

Lane Group	C	R	L	C	R	L	C	R	
L, Total Lost Time per Cycle [s]	5.50	5.50	5.00	6.00	6.00	7.00	7.00	7.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	3.50	3.50	3.00	4.00	4.00	5.00	5.00	0.00	
g_i, Effective Green Time [s]	89	89	7	83	83	27	27	44	
g / C, Green / Cycle	0.63	0.63	0.05	0.59	0.59	0.19	0.19	0.31	
(v / s)_i Volume / Saturation Flow Rate	0.34	0.18	0.03	0.43	0.12	0.17	0.15	0.20	
s, saturation flow rate [veh/h]	5025	1568	3412	3512	1568	1757	1800	2775	
c, Capacity [veh/h]	3183	993	170	2085	931	337	345	870	
d1, Uniform Delay [s]	14.23	11.40	65.16	20.34	13.10	54.94	54.01	40.96	
k, delay calibration	0.50	0.50	0.04	0.50	0.50	0.23	0.18	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.65	0.70	1.43	2.28	0.49	14.05	7.28	0.74	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.54	0.28	0.63	0.73	0.20	0.88	0.80	0.62	
d, Delay for Lane Group [s/veh]	14.88	12.09	66.60	22.62	13.59	68.99	61.28	41.70	
Lane Group LOS	B	B	E	C	B	E	E	D	
Critical Lane Group	no	no	no	yes	no	yes	no	yes	
50th-Percentile Queue Length [veh]	9.40	3.77	1.88	17.05	2.72	11.46	10.04	8.10	
50th-Percentile Queue Length [ft]	235.06	94.22	46.93	426.15	68.05	286.40	251.08	202.56	
95th-Percentile Queue Length [veh]	14.43	6.78	3.38	23.82	4.90	17.01	15.24	12.77	
95th-Percentile Queue Length [ft]	360.78	169.59	84.47	595.43	122.50	425.17	381.02	319.27	

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06

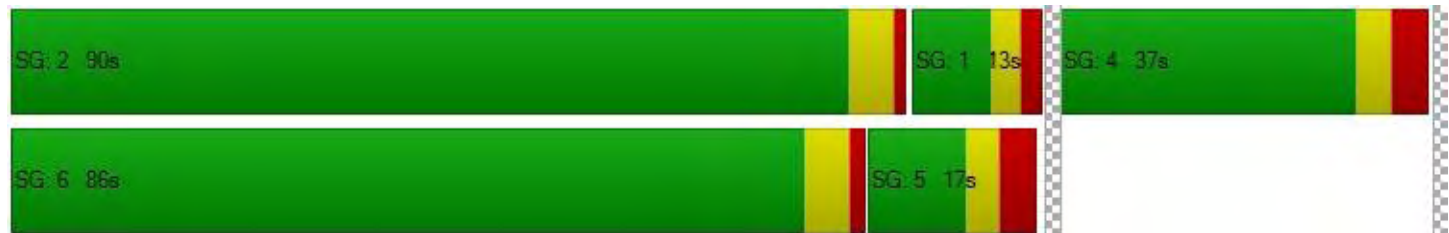


Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	14.88	12.09	66.60	22.62	13.59	66.50	61.28	41.70	0.00	0.00	0.00
Movement LOS		B	B	E	C	B	E	E	D			
d_A, Approach Delay [s/veh]	14.49			24.28			53.81			0.00		
Approach LOS	B			C			D			A		
d_I, Intersection Delay [s/veh]	27.03											
Intersection LOS	C											
Intersection V/C	0.750											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #2: CSAH 13 & I-94 Northern Ramp

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 47.2
Level Of Service: D
Volume to Capacity (v/c): 0.791

Intersection Setup

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	325.00	100.00	100.00	250.00	100.00	275.00	175.00	100.00	100.00	400.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			3rd St N			I-94 Ramp		
Base Volume Input [veh/h]	221	933	577	192	1009	38	39	73	258	231	51	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	224	0	117	136	0	0	0	0	0	0	81
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	315	0	0	21	0	0	141	0	0	74
Total Hourly Volume [veh/h]	241	1241	314	326	1236	20	43	80	140	252	56	73
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	337	85	89	336	5	12	22	38	68	15	20
Total Analysis Volume [veh/h]	262	1349	341	354	1343	22	47	87	152	274	61	79
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	89.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	10	44	0	15	49	0	10	11	0	18	30	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	3.5	0.0	3.0	3.5	0.0
All red [s]	2.0	1.5	0.0	2.0	2.0	0.0	2.0	3.5	0.0	2.0	3.0	0.0
Split [s]	20	65	0	36	81	0	15	22	0	17	24	0
Vehicle Extension [s]	2.0	4.6	0.0	2.0	4.6	0.0	2.0	3.0	0.0	2.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.5	0.0	3.0	5.0	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	39.0	300.0	0.0	39.0	300.0	0.0	39.0	120.0	0.0	120.0	120.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.50	6.50	5.00	7.00	7.00	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.50	4.50	3.00	5.00	5.00	3.00	4.50	4.50
g_i, Effective Green Time [s]	13	59	59	30	76	76	19	15	15	13	10	10
g / C, Green / Cycle	0.09	0.42	0.42	0.21	0.54	0.54	0.13	0.11	0.11	0.09	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.08	0.38	0.22	0.20	0.38	0.01	0.03	0.05	0.10	0.08	0.03	0.05
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	309	1477	659	374	1895	846	236	203	173	313	131	112
d1, Uniform Delay [s]	62.70	38.16	30.04	54.27	24.04	15.06	53.89	58.16	61.36	62.78	62.45	63.59
k, delay calibration	0.04	0.50	0.50	0.34	0.50	0.50	0.04	0.11	0.22	0.04	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.50	10.19	2.89	27.14	2.27	0.06	0.15	1.42	23.20	3.06	2.54	7.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.85	0.91	0.52	0.95	0.71	0.03	0.20	0.43	0.88	0.87	0.46	0.71
d, Delay for Lane Group [s/veh]	65.20	48.35	32.92	81.41	26.31	15.11	54.04	59.58	84.57	65.84	64.99	71.54
Lane Group LOS	E	D	C	F	C	B	D	E	F	E	E	E
Critical Lane Group	no	yes	no	yes	no	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	4.62	22.85	8.79	14.81	16.17	0.33	1.50	2.98	6.45	4.97	2.19	3.01
50th-Percentile Queue Length [ft]	115.48	571.18	219.71	370.15	404.35	8.33	37.43	74.41	161.32	124.18	54.74	75.29
95th-Percentile Queue Length [veh]	8.14	30.69	13.65	21.12	22.77	0.60	2.69	5.36	10.62	8.62	3.94	5.42
95th-Percentile Queue Length [ft]	203.60	767.15	341.25	527.91	569.24	14.99	67.37	133.94	265.47	215.55	98.53	135.52

Appendix D - Capacity Analysis Backup

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Version 2.00-06



Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.20	48.35	32.92	81.41	26.31	15.11	54.04	59.58	84.57	65.84	64.99	71.54
Movement LOS	E	D	C	F	C	B	D	E	F	E	E	E
d_A, Approach Delay [s/veh]	47.91			37.51			71.95			66.80		
Approach LOS	D			D			E			E		
d_I, Intersection Delay [s/veh]	47.19											
Intersection LOS	D											
Intersection V/C	0.791											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #3: Inwood Ave & Hudson Blvd

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 35.4
Level Of Service: D
Volume to Capacity (v/c): 0.623

Intersection Setup

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	175.00	100.00	250.00	100.00	100.00	100.00	175.00	100.00	100.00	250.00	100.00	250.00
Speed [mph]	45.00			45.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			4th St N			Hudson Blvd		
Base Volume Input [veh/h]	207	646	96	29	745	37	59	128	384	156	33	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	305	0	0	253	7	8	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	53	0	0	24	0	0	210	0	0	17
Total Hourly Volume [veh/h]	226	1009	52	32	1065	23	72	140	209	170	36	16
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	274	14	9	289	6	20	38	57	46	10	4
Total Analysis Volume [veh/h]	246	1097	57	35	1158	25	78	152	227	185	39	17
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			4			4			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	94.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	7	20	0	7	20	0	7	10	0	7	10	0
Maximum Green [s]	16	39	0	12	35	0	12	24	0	12	25	0
Amber [s]	3.0	4.5	0.0	3.0	4.5	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	2.0	1.5	0.0	2.0	1.5	0.0	2.0	2.5	0.0	2.0	2.5	0.0
Split [s]	19	77	0	12	70	0	32	35	0	16	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.0	0.0	3.0	4.0	0.0	3.0	4.5	0.0	3.0	4.5	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	55.0	300.0	0.0	55.0	475.0	0.0	50.0	250.0	0.0	50.0	250.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	6.00	6.00	5.00	6.00	6.00	5.00	6.50	6.50	5.00	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	4.00	4.00	3.00	4.00	4.00	3.00	4.50	4.50	3.00	4.50	4.50
g_i, Effective Green Time [s]	12	80	80	5	73	73	23	23	23	10	9	9
g / C, Green / Cycle	0.09	0.57	0.57	0.04	0.52	0.52	0.17	0.16	0.16	0.07	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.07	0.31	0.04	0.02	0.33	0.02	0.04	0.08	0.14	0.05	0.02	0.01
s, saturation flow rate [veh/h]	3412	3512	1568	1757	3512	1568	1757	1845	1568	3412	1845	1568
c, Capacity [veh/h]	294	2006	896	66	1835	819	293	297	252	238	118	100
d1, Uniform Delay [s]	62.95	18.70	13.34	66.14	23.80	16.21	50.80	53.68	57.59	63.99	62.64	61.98
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.17	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.26	1.08	0.14	6.60	1.66	0.07	0.48	1.37	16.32	5.39	1.63	0.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.55	0.06	0.53	0.63	0.03	0.27	0.51	0.90	0.78	0.33	0.17
d, Delay for Lane Group [s/veh]	69.21	19.78	13.48	72.74	25.47	16.28	51.28	55.05	73.91	69.38	64.27	62.78
Lane Group LOS	E	B	B	E	C	B	D	E	E	E	E	E
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	4.49	10.76	0.81	1.33	13.39	0.40	2.45	5.04	9.03	3.43	1.39	0.60
50th-Percentile Queue Length [ft]	112.29	268.89	20.23	33.23	334.79	9.93	61.14	125.93	225.84	85.81	34.72	14.95
95th-Percentile Queue Length [veh]	7.97	16.13	1.46	2.39	19.39	0.71	4.40	8.72	13.96	6.18	2.50	1.08
95th-Percentile Queue Length [ft]	199.19	403.35	36.42	59.82	484.82	17.87	110.05	217.95	349.07	154.46	62.50	26.92

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06

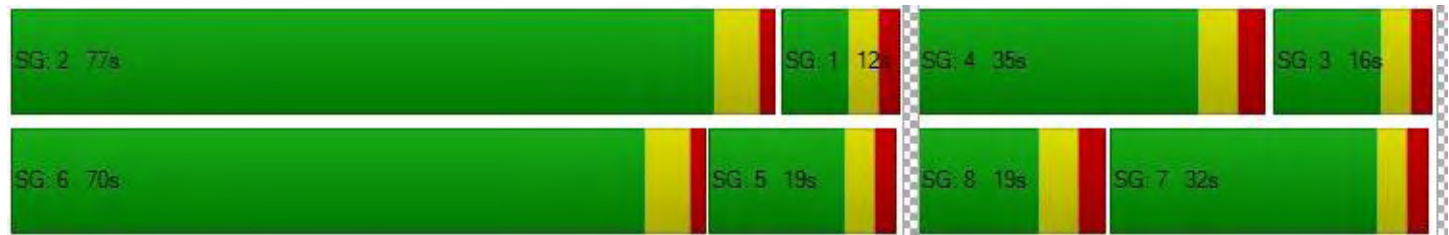


Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	69.21	19.78	13.48	72.74	25.47	16.28	51.28	55.05	73.91	69.38	64.27	62.78
Movement LOS	E	B	B	E	C	B	D	E	E	E	E	E
d_A, Approach Delay [s/veh]	28.21			26.63			63.77			68.09		
Approach LOS	C			C			E			E		
d_I, Intersection Delay [s/veh]	35.43											
Intersection LOS	D											
Intersection V/C	0.623											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

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Intersection Level Of Service Report #4: CSAH 13 & Eagle Point Blvd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 2,021.6
Level Of Service: F
Volume to Capacity (v/c): 4.886

Intersection Setup

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	250.00	250.00	100.00	250.00	50.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	45.00			55.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Base Volume Input [veh/h]	95	734	3	15	631	69	38	0	68	89	0	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	261	52	0	227	0	0	0	0	34	0	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	104	1061	55	16	915	75	41	0	74	131	0	91
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	288	15	4	249	20	11	0	20	36	0	25
Total Analysis Volume [veh/h]	113	1153	60	17	995	82	45	0	80	142	0	99
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.18	0.01	0.00	0.03	0.01	0.00	1.46	0.00	0.16	4.89	0.00	0.22
d_M, Delay for Movement [s/veh]	11.91	0.00	0.00	11.57	0.00	0.00	522.94	161.49	13.33	2021.60	167.53	15.03
Movement LOS	B	A	A	B	A	A	F	F	B	F	F	C
95th-Percentile Queue Length [veh]	0.64	0.00	0.00	0.09	0.00	0.00	5.09	0.55	0.55	17.21	0.81	0.81
95th-Percentile Queue Length [ft]	16.11	0.00	0.00	2.32	0.00	0.00	127.35	13.76	13.76	430.28	20.34	20.34
d_A, Approach Delay [s/veh]	1.01			0.18			196.79			1197.32		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	112.96											
Intersection LOS	F											

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06



Intersection Level Of Service Report #5: CSAH 13 & 5th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 3,367.1
Level Of Service: F
Volume to Capacity (v/c): 7.815

Intersection Setup

Name	CSAH 13		CSAH 13		5th St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	CSAH 13		CSAH 13		5th St	
Base Volume Input [veh/h]	855	0	0	740	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	82	185	54	13	214	39
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	-64	64	55	-63	63	64
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	950	249	109	757	277	103
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	258	68	30	206	75	28
Total Analysis Volume [veh/h]	1033	271	118	823	301	112
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.23	0.01	7.81	0.27
d_M, Delay for Movement [s/veh]	0.00	0.00	13.91	0.00	3367.12	3282.48
Movement LOS	A	A	B	A	F	F
95th-Percentile Queue Length [veh]	0.00	0.00	10.47	5.24	48.44	48.44
95th-Percentile Queue Length [ft]	0.00	0.00	261.83	130.92	1211.01	1211.01
d_A, Approach Delay [s/veh]	0.00		1.74		3344.17	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	520.23					
Intersection LOS	F					

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #6: CSAH 13 & 9th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 92.4
Level Of Service: F
Volume to Capacity (v/c): 0.000

Intersection Setup

Name	CSAH 13			CSAH 13			9th St					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	300.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	55.00			55.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			9th St					
Base Volume Input [veh/h]	23	832	0	0	727	12	6	0	13	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	69	53	9	67	0	0	0	0	0	0	19
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	8	-8	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	976	53	17	851	13	7	0	14	0	0	19
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	265	14	5	231	4	2	0	4	0	0	5
Total Analysis Volume [veh/h]	27	1061	58	18	925	14	8	0	15	0	0	21
Pedestrian Volume [ped/h]	0			0			2			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.01	0.00	0.03	0.01	0.00	0.12	0.00	0.03	0.00	0.00	0.04
d_M, Delay for Movement [s/veh]	10.22	0.00	0.00	11.04	0.00	0.00	62.03	92.38	15.52	0.00	0.00	13.03
Movement LOS	B	A	A	B	A	A	F	F	C			B
95th-Percentile Queue Length [veh]	0.12	0.00	0.00	7.09	3.55	0.00	0.50	0.50	0.50	0.00	0.00	0.14
95th-Percentile Queue Length [ft]	2.93	0.00	0.00	177.34	88.67	0.00	12.44	12.44	12.44	0.00	0.00	3.50
d_A, Approach Delay [s/veh]	0.24			0.21			31.70			13.03		
Approach LOS	A			A			D			B		
d_I, Intersection Delay [s/veh]	0.69											
Intersection LOS	F											

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #7: CSAH 13 & CSAH 10

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 27.2
Level Of Service: C
Volume to Capacity (v/c): 0.612

Intersection Setup

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	250.00	100.00	250.00	250.00	100.00	250.00	275.00	100.00	275.00	250.00	100.00	250.00
Speed [mph]	55.00			55.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	CSAH 13			CSAH 13			CSAH 10			CSAH 10		
Base Volume Input [veh/h]	233	434	115	181	325	32	132	653	331	45	156	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	45	15	28	6	15	0	0	19	43	17	7	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	77	0	0	18	0	0	202	0	0	61
Total Hourly Volume [veh/h]	299	488	76	203	369	17	144	731	202	66	177	63
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	81	133	21	55	100	5	39	199	55	18	48	17
Total Analysis Volume [veh/h]	325	530	83	221	401	18	157	795	220	72	192	68
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			1			3			1		
Bicycle Volume [bicycles/h]	0			0			0			0		

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	2	0	1	6	0	7	4	0	3	8	0
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	40	0	30	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	44	39	0	34	29	0	40	53	0	14	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	no	no		no	no		no	yes		no	yes	
Maximum Recall	no	no		no	no		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	15	13	13	12	10	10	13	19	19	4	10	10
g / C, Green / Cycle	0.22	0.19	0.19	0.18	0.15	0.15	0.19	0.28	0.28	0.05	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.05	0.13	0.11	0.01	0.09	0.23	0.14	0.04	0.05	0.04
s, saturation flow rate [veh/h]	1757	3512	1568	1757	3512	1568	1757	3512	1568	1757	3512	1568
c, Capacity [veh/h]	383	679	303	310	533	238	333	986	440	97	514	229
d1, Uniform Delay [s]	25.48	26.01	23.32	26.33	27.56	24.70	24.50	22.71	20.43	31.61	26.17	25.86
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.30	2.00	0.48	3.04	2.16	0.13	1.04	1.62	0.88	10.75	0.45	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.85	0.78	0.27	0.71	0.75	0.08	0.47	0.81	0.50	0.75	0.37	0.30
d, Delay for Lane Group [s/veh]	30.78	28.01	23.81	29.38	29.73	24.83	25.54	24.32	21.31	42.36	26.62	26.58
Lane Group LOS	C	C	C	C	C	C	C	C	C	D	C	C
Critical Lane Group	yes	no	no	no	yes	no	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	4.83	3.67	1.02	3.16	2.86	0.23	2.03	5.11	2.54	1.32	1.25	0.90
50th-Percentile Queue Length [ft]	120.74	91.77	25.46	79.08	71.55	5.65	50.85	127.78	63.58	33.04	31.35	22.52
95th-Percentile Queue Length [veh]	8.43	6.61	1.83	5.69	5.15	0.41	3.66	8.82	4.58	2.38	2.26	1.62
95th-Percentile Queue Length [ft]	210.84	165.19	45.84	142.34	128.80	10.18	91.53	220.47	114.44	59.47	56.44	40.54

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.78	28.01	23.81	29.38	29.73	24.83	25.54	24.32	21.31	42.36	26.62	26.58
Movement LOS	C	C	C	C	C	C	C	C	C	D	C	C
d_A, Approach Delay [s/veh]	28.60			29.47			23.92			30.03		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.15											
Intersection LOS	C											
Intersection V/C	0.612											

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Intersection Level Of Service Report #8: CSAH 10 & Western Site Access

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 39.2
Level Of Service: E
Volume to Capacity (v/c): 0.000

Intersection Setup

Name	Western Site Access						CSAH 10			CSAH 10		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↱			⬆			↱↱↱			↱↱↱		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	125.00	100.00	100.00	275.00	100.00	100.00
Speed [mph]	30.00			30.00			55.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			no			no		

Volumes

Name	Western Site Access						CSAH 10			CSAH 10		
Base Volume Input [veh/h]	0	0	0	0	0	0	0	949	0	0	313	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	3	0	0	0	0	44	10	3	26	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	3	0	0	0	0	1078	10	3	367	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	0	0	0	0	293	3	1	100	0
Total Analysis Volume [veh/h]	0	0	3	0	0	0	0	1172	11	3	399	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.10	23.29	39.20	9.47	8.13	0.00	0.00	11.23	0.00	0.00
Movement LOS			B	C	E	A	A	A	A	B	A	
95th-Percentile Queue Length [veh]	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00
d_A, Approach Delay [s/veh]	13.10			23.99			0.00			0.08		
Approach LOS	B			C			A			A		
d_I, Intersection Delay [s/veh]	0.05											
Intersection LOS	E											

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Intersection Level Of Service Report #9: CSAH 10 & Eastern Site Access

Control Type:	Two-way stop	Delay (sec / veh):	41.3
Analysis Method:	HCM2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.194

Intersection Setup

Name	Eastern Site Access		CSAH 10		CSAH 10	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		55.00		55.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	Eastern Site Access		CSAH 10		CSAH 10	
Base Volume Input [veh/h]	0	0	949	0	0	313
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	4	7	39	6	7
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	4	1041	39	6	348
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	1	283	11	2	95
Total Analysis Volume [veh/h]	24	4	1132	42	7	378
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.19	0.02	0.01	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	41.26	27.16	0.00	0.00	11.16	0.00
Movement LOS	E	D	A	A	B	A
95th-Percentile Queue Length [veh]	0.76	0.76	0.00	0.00	4.73	4.73
95th-Percentile Queue Length [ft]	18.96	18.96	0.00	0.00	118.24	118.24
d_A, Approach Delay [s/veh]	39.24		0.00		0.20	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	0.74					
Intersection LOS	E					

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Intersection Level Of Service Report #10: Eagle Point Blvd & Site Access

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Site Access		Eagle Point Blvd		Eagle Point Blvd	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	Site Access		Eagle Point Blvd		Eagle Point Blvd	
Base Volume Input [veh/h]	0	0	0	176	7	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	39	52	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	39	52	192	8	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	11	14	52	2	0
Total Analysis Volume [veh/h]	0	42	57	209	9	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.04	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.82	8.50	7.33	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.12	0.12	0.59	0.59	0.00	0.00
95th-Percentile Queue Length [ft]	3.06	3.06	14.85	14.85	0.00	0.00
d_A, Approach Delay [s/veh]	8.50		1.57		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.44					
Intersection LOS	B					

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Signal Warrants Report For Intersection #4: CSAH 13 & Eagle Point Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	1006	1220	222	115
2	966	1171	213	110
3	946	1147	209	108
4	805	976	178	92
5	765	927	169	87
6	684	830	151	78
7	634	769	140	72
8	604	732	133	69
9	483	586	107	55
10	453	549	100	52
11	453	549	100	52
12	433	525	95	49
13	392	476	87	45
14	362	439	80	41
15	362	439	80	41
16	352	427	78	40
17	201	244	44	23
18	111	134	24	13
19	101	122	22	12
20	40	49	9	5
21	30	37	7	3
22	30	37	7	3
23	20	24	4	2
24	20	24	4	2

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	8	2226	4	337	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	8	2137	4	323	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	8	2093	4	317	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	8	1781	4	270	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	8	1692	4	256	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	8	1514	4	229	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	8	1403	4	212	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	8	1336	4	202	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	8	1069	4	162	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
10	8	1002	4	152	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No
11	8	1002	4	152	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No
12	8	958	4	144	No	No	No	No	No	Yes	Yes	Yes	Yes	No
13	8	868	4	132	No	No	No	No	No	Yes	Yes	Yes	Yes	No
14	8	801	4	121	No	No	No	No	No	Yes	Yes	Yes	No	No
15	8	801	4	121	No	No	No	No	No	Yes	Yes	Yes	No	No
16	8	779	4	118	No	No	No	No	No	No	Yes	Yes	No	No
17	8	445	4	67	No	No	No	No	No	No	No	No	No	No
18	8	245	4	37	No	No	No	No	No	No	No	No	No	No
19	8	223	4	34	No	No	No	No	No	No	No	No	No	No
20	8	89	4	14	No	No	No	No	No	No	No	No	No	No
21	8	67	4	10	No	No	No	No	No	No	No	No	No	No
22	8	67	4	10	No	No	No	No	No	No	No	No	No	No
23	8	44	4	6	No	No	No	No	No	No	No	No	No	No
24	8	44	4	6	No	No	No	No	No	No	No	No	No	No
Hours Met					3	5	7	8	11	15	16	16	13	9

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	1197.3	196.8
Number of Lanes on Minor Street Approach	2	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	73:50	6:17
Delay Condition Met	Yes	Yes
Volume on Minor Street Approach During Same Hour	222	115
High Minor Volume Condition Met	Yes	No
Total Entering Volume on All Approaches During Same Hour	2563	2563
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	Yes	No
Warrant Met for Intersection	Yes	

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Signal Warrants Report For Intersection #5: CSAH 13 & 5th St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	1199	866	380
2	1151	831	365
3	1127	814	357
4	959	693	304
5	911	658	289
6	815	589	258
7	755	546	239
8	719	520	228
9	576	416	182
10	540	390	171
11	540	390	171
12	516	372	163
13	468	338	148
14	432	312	137
15	432	312	137
16	420	303	133
17	240	173	76
18	132	95	42
19	120	87	38
20	48	35	15
21	36	26	11
22	36	26	11
23	24	17	8
24	24	17	8

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	2065	1	380	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	4	1982	1	365	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	4	1941	1	357	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	4	1652	1	304	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	4	1569	1	289	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	4	1404	1	258	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	4	1301	1	239	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	4	1239	1	228	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	4	992	1	182	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	4	930	1	171	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	4	930	1	171	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	4	888	1	163	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
13	4	806	1	148	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
14	4	744	1	137	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
15	4	744	1	137	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
16	4	723	1	133	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
17	4	413	1	76	No	No	No	No	No	No	No	No	No	No
18	4	227	1	42	No	No	No	No	No	No	No	No	No	No
19	4	207	1	38	No	No	No	No	No	No	No	No	No	No
20	4	83	1	15	No	No	No	No	No	No	No	No	No	No
21	4	62	1	11	No	No	No	No	No	No	No	No	No	No
22	4	62	1	11	No	No	No	No	No	No	No	No	No	No
23	4	41	1	8	No	No	No	No	No	No	No	No	No	No
24	4	41	1	8	No	No	No	No	No	No	No	No	No	No
Hours Met					12	16	16	16	11	16	16	16	16	16

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	3344.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	352:59
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	380
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	2445
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	Yes

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Signal Warrants Report For Intersection #6: CSAH 13 & 9th St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	1054	881	19	21
2	1012	846	18	20
3	991	828	18	20
4	843	705	15	17
5	801	670	14	16
6	717	599	13	14
7	664	555	12	13
8	632	529	11	13
9	506	423	9	10
10	474	396	9	9
11	474	396	9	9
12	453	379	8	9
13	411	344	7	8
14	379	317	7	8
15	379	317	7	8
16	369	308	7	7
17	211	176	4	4
18	116	97	2	2
19	105	88	2	2
20	42	35	1	1
21	32	26	1	1
22	32	26	1	1
23	21	18	0	0
24	21	18	0	0

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	6	1935	2	40	No	No	No	No	No	No	No	No	No	No
2	6	1858	2	38	No	No	No	No	No	No	No	No	No	No
3	6	1819	2	38	No	No	No	No	No	No	No	No	No	No
4	6	1548	2	32	No	No	No	No	No	No	No	No	No	No
5	6	1471	2	30	No	No	No	No	No	No	No	No	No	No
6	6	1316	2	27	No	No	No	No	No	No	No	No	No	No
7	6	1219	2	25	No	No	No	No	No	No	No	No	No	No
8	6	1161	2	24	No	No	No	No	No	No	No	No	No	No
9	6	929	2	19	No	No	No	No	No	No	No	No	No	No
10	6	870	2	18	No	No	No	No	No	No	No	No	No	No
11	6	870	2	18	No	No	No	No	No	No	No	No	No	No
12	6	832	2	17	No	No	No	No	No	No	No	No	No	No
13	6	755	2	15	No	No	No	No	No	No	No	No	No	No
14	6	696	2	15	No	No	No	No	No	No	No	No	No	No
15	6	696	2	15	No	No	No	No	No	No	No	No	No	No
16	6	677	2	14	No	No	No	No	No	No	No	No	No	No
17	6	387	2	8	No	No	No	No	No	No	No	No	No	No
18	6	213	2	4	No	No	No	No	No	No	No	No	No	No
19	6	193	2	4	No	No	No	No	No	No	No	No	No	No
20	6	77	2	2	No	No	No	No	No	No	No	No	No	No
21	6	58	2	2	No	No	No	No	No	No	No	No	No	No
22	6	58	2	2	No	No	No	No	No	No	No	No	No	No
23	6	39	2	0	No	No	No	No	No	No	No	No	No	No
24	6	39	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	13	31.7
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:04	0:11
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	19	21
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	1975	1975
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

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Signal Warrants Report For Intersection #8: CSAH 10 & Western Site Access

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	370	1088	3	0
2	355	1044	3	0
3	348	1023	3	0
4	296	870	2	0
5	281	827	2	0
6	252	740	2	0
7	233	685	2	0
8	222	653	2	0
9	178	522	1	0
10	167	490	1	0
11	167	490	1	0
12	159	468	1	0
13	144	424	1	0
14	133	392	1	0
15	133	392	1	0
16	130	381	1	0
17	74	218	1	0
18	41	120	0	0
19	37	109	0	0
20	15	44	0	0
21	11	33	0	0
22	11	33	0	0
23	7	22	0	0
24	7	22	0	0

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	6	1458	2	3	No	No	No	No	No	No	No	No	No	No
2	6	1399	2	3	No	No	No	No	No	No	No	No	No	No
3	6	1371	2	3	No	No	No	No	No	No	No	No	No	No
4	6	1166	2	2	No	No	No	No	No	No	No	No	No	No
5	6	1108	2	2	No	No	No	No	No	No	No	No	No	No
6	6	992	2	2	No	No	No	No	No	No	No	No	No	No
7	6	918	2	2	No	No	No	No	No	No	No	No	No	No
8	6	875	2	2	No	No	No	No	No	No	No	No	No	No
9	6	700	2	1	No	No	No	No	No	No	No	No	No	No
10	6	657	2	1	No	No	No	No	No	No	No	No	No	No
11	6	657	2	1	No	No	No	No	No	No	No	No	No	No
12	6	627	2	1	No	No	No	No	No	No	No	No	No	No
13	6	568	2	1	No	No	No	No	No	No	No	No	No	No
14	6	525	2	1	No	No	No	No	No	No	No	No	No	No
15	6	525	2	1	No	No	No	No	No	No	No	No	No	No
16	6	511	2	1	No	No	No	No	No	No	No	No	No	No
17	6	292	2	1	No	No	No	No	No	No	No	No	No	No
18	6	161	2	0	No	No	No	No	No	No	No	No	No	No
19	6	146	2	0	No	No	No	No	No	No	No	No	No	No
20	6	59	2	0	No	No	No	No	No	No	No	No	No	No
21	6	44	2	0	No	No	No	No	No	No	No	No	No	No
22	6	44	2	0	No	No	No	No	No	No	No	No	No	No
23	6	29	2	0	No	No	No	No	No	No	No	No	No	No
24	6	29	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	13.1	24
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	3	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	1461	1461
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

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Signal Warrants Report For Intersection #9: CSAH 10 & Eastern Site Access

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	354	1080	26
2	340	1037	25
3	333	1015	24
4	283	864	21
5	269	821	20
6	241	734	18
7	223	680	16
8	212	648	16
9	170	518	12
10	159	486	12
11	159	486	12
12	152	464	11
13	138	421	10
14	127	389	9
15	127	389	9
16	124	378	9
17	71	216	5
18	39	119	3
19	35	108	3
20	14	43	1
21	11	32	1
22	11	32	1
23	7	22	1
24	7	22	1

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1434	1	26	No	No	No	No	No	No	No	No	No	No
2	2	1377	1	25	No	No	No	No	No	No	No	No	No	No
3	2	1348	1	24	No	No	No	No	No	No	No	No	No	No
4	2	1147	1	21	No	No	No	No	No	No	No	No	No	No
5	2	1090	1	20	No	No	No	No	No	No	No	No	No	No
6	2	975	1	18	No	No	No	No	No	No	No	No	No	No
7	2	903	1	16	No	No	No	No	No	No	No	No	No	No
8	2	860	1	16	No	No	No	No	No	No	No	No	No	No
9	2	688	1	12	No	No	No	No	No	No	No	No	No	No
10	2	645	1	12	No	No	No	No	No	No	No	No	No	No
11	2	645	1	12	No	No	No	No	No	No	No	No	No	No
12	2	616	1	11	No	No	No	No	No	No	No	No	No	No
13	2	559	1	10	No	No	No	No	No	No	No	No	No	No
14	2	516	1	9	No	No	No	No	No	No	No	No	No	No
15	2	516	1	9	No	No	No	No	No	No	No	No	No	No
16	2	502	1	9	No	No	No	No	No	No	No	No	No	No
17	2	287	1	5	No	No	No	No	No	No	No	No	No	No
18	2	158	1	3	No	No	No	No	No	No	No	No	No	No
19	2	143	1	3	No	No	No	No	No	No	No	No	No	No
20	2	57	1	1	No	No	No	No	No	No	No	No	No	No
21	2	43	1	1	No	No	No	No	No	No	No	No	No	No
22	2	43	1	1	No	No	No	No	No	No	No	No	No	No
23	2	29	1	1	No	No	No	No	No	No	No	No	No	No
24	2	29	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	39.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:17
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	26
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1460
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No

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Signal Warrants Report For Intersection #10: Eagle Point Blvd & Site Access

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	8	244	39
2	8	234	37
3	8	229	37
4	6	195	31
5	6	185	30
6	5	166	27
7	5	154	25
8	5	146	23
9	4	117	19
10	4	110	18
11	4	110	18
12	3	105	17
13	3	95	15
14	3	88	14
15	3	88	14
16	3	85	14
17	2	49	8
18	1	27	4
19	1	24	4
20	0	10	2
21	0	7	1
22	0	7	1
23	0	5	1
24	0	5	1

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	252	1	39	No	No	No	No	No	No	No	No	No	No
2	2	242	1	37	No	No	No	No	No	No	No	No	No	No
3	2	237	1	37	No	No	No	No	No	No	No	No	No	No
4	2	201	1	31	No	No	No	No	No	No	No	No	No	No
5	2	191	1	30	No	No	No	No	No	No	No	No	No	No
6	2	171	1	27	No	No	No	No	No	No	No	No	No	No
7	2	159	1	25	No	No	No	No	No	No	No	No	No	No
8	2	151	1	23	No	No	No	No	No	No	No	No	No	No
9	2	121	1	19	No	No	No	No	No	No	No	No	No	No
10	2	114	1	18	No	No	No	No	No	No	No	No	No	No
11	2	114	1	18	No	No	No	No	No	No	No	No	No	No
12	2	108	1	17	No	No	No	No	No	No	No	No	No	No
13	2	98	1	15	No	No	No	No	No	No	No	No	No	No
14	2	91	1	14	No	No	No	No	No	No	No	No	No	No
15	2	91	1	14	No	No	No	No	No	No	No	No	No	No
16	2	88	1	14	No	No	No	No	No	No	No	No	No	No
17	2	51	1	8	No	No	No	No	No	No	No	No	No	No
18	2	28	1	4	No	No	No	No	No	No	No	No	No	No
19	2	25	1	4	No	No	No	No	No	No	No	No	No	No
20	2	10	1	2	No	No	No	No	No	No	No	No	No	No
21	2	7	1	1	No	No	No	No	No	No	No	No	No	No
22	2	7	1	1	No	No	No	No	No	No	No	No	No	No
23	2	5	1	1	No	No	No	No	No	No	No	No	No	No
24	2	5	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.5
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:05
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	39
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	291
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No

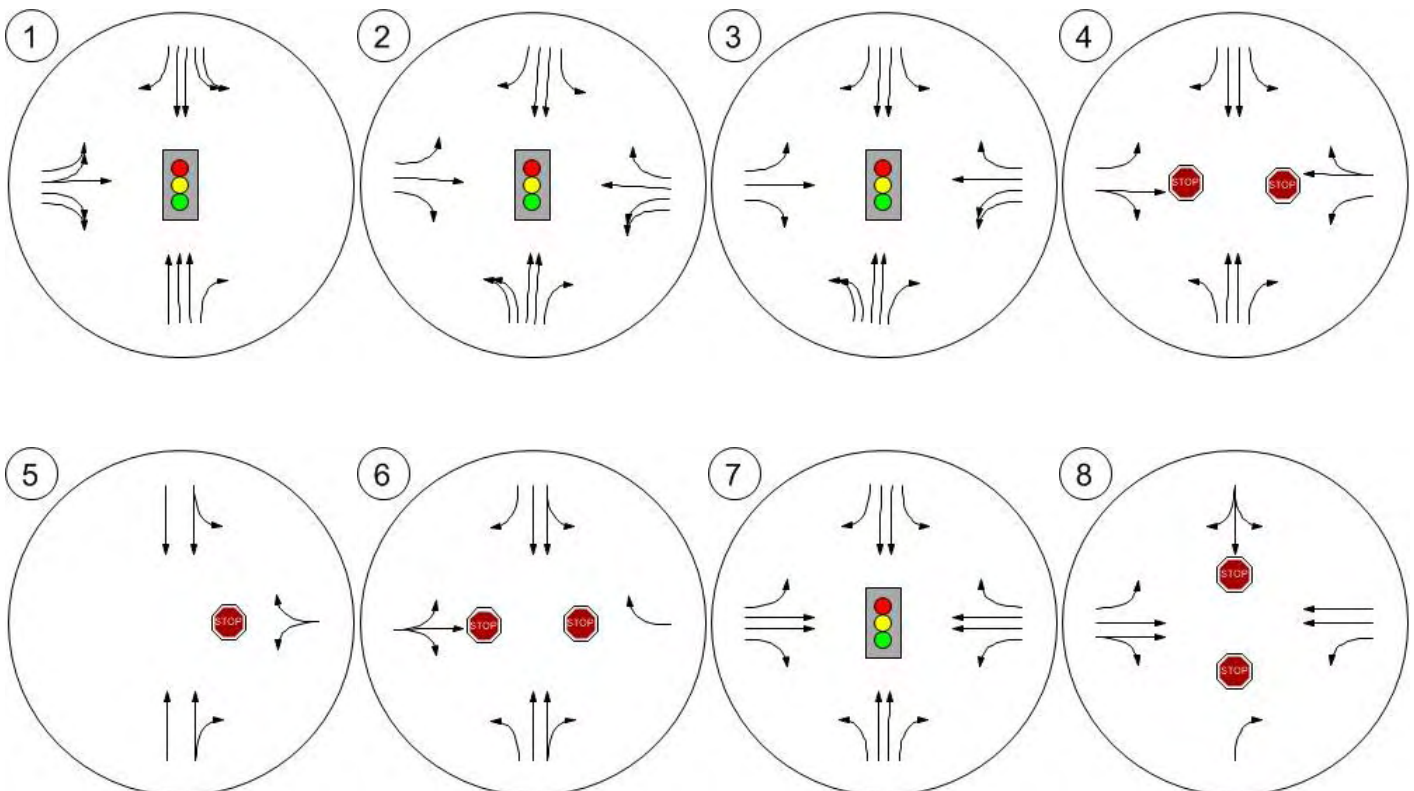
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Lane Configuration and Traffic Control



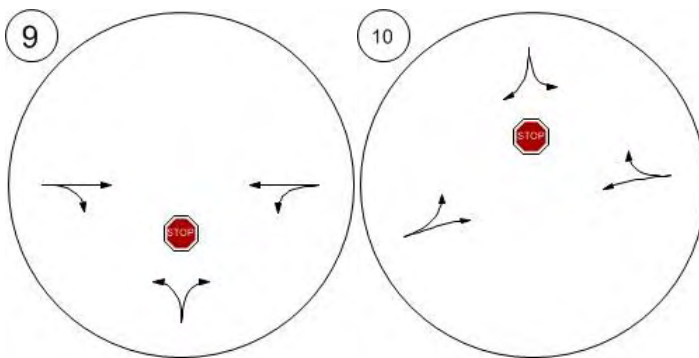
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Lane Configuration and Traffic Control



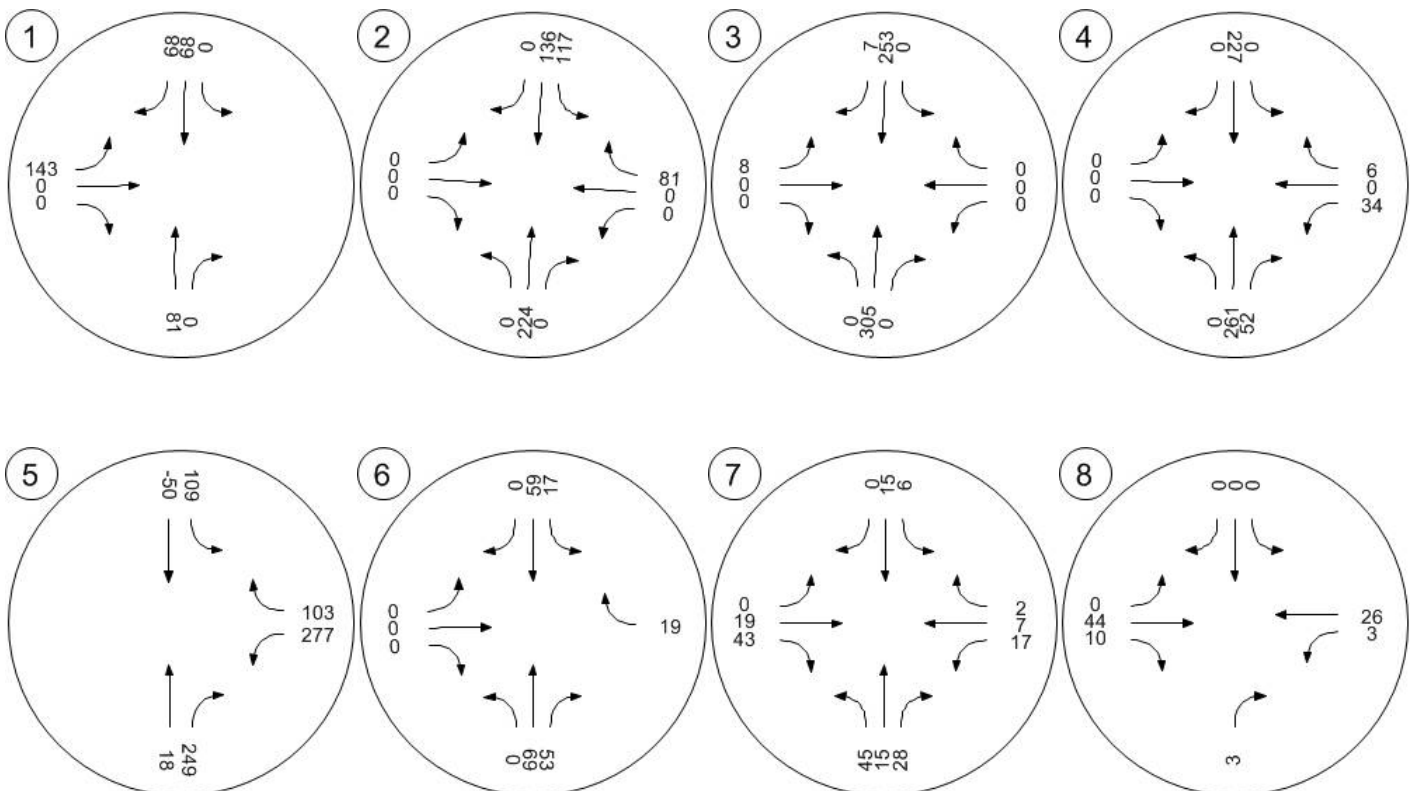
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Traffic Volume - Net New Site Trips



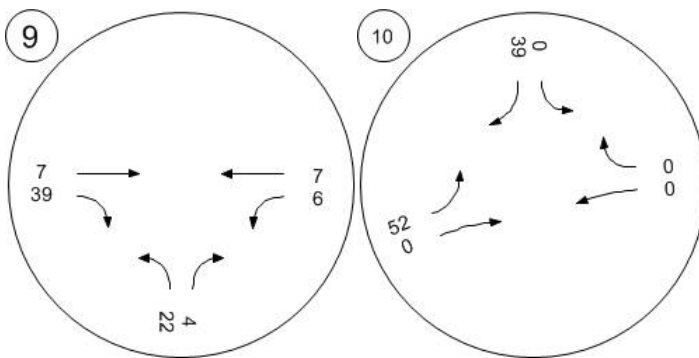
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Traffic Volume - Net New Site Trips



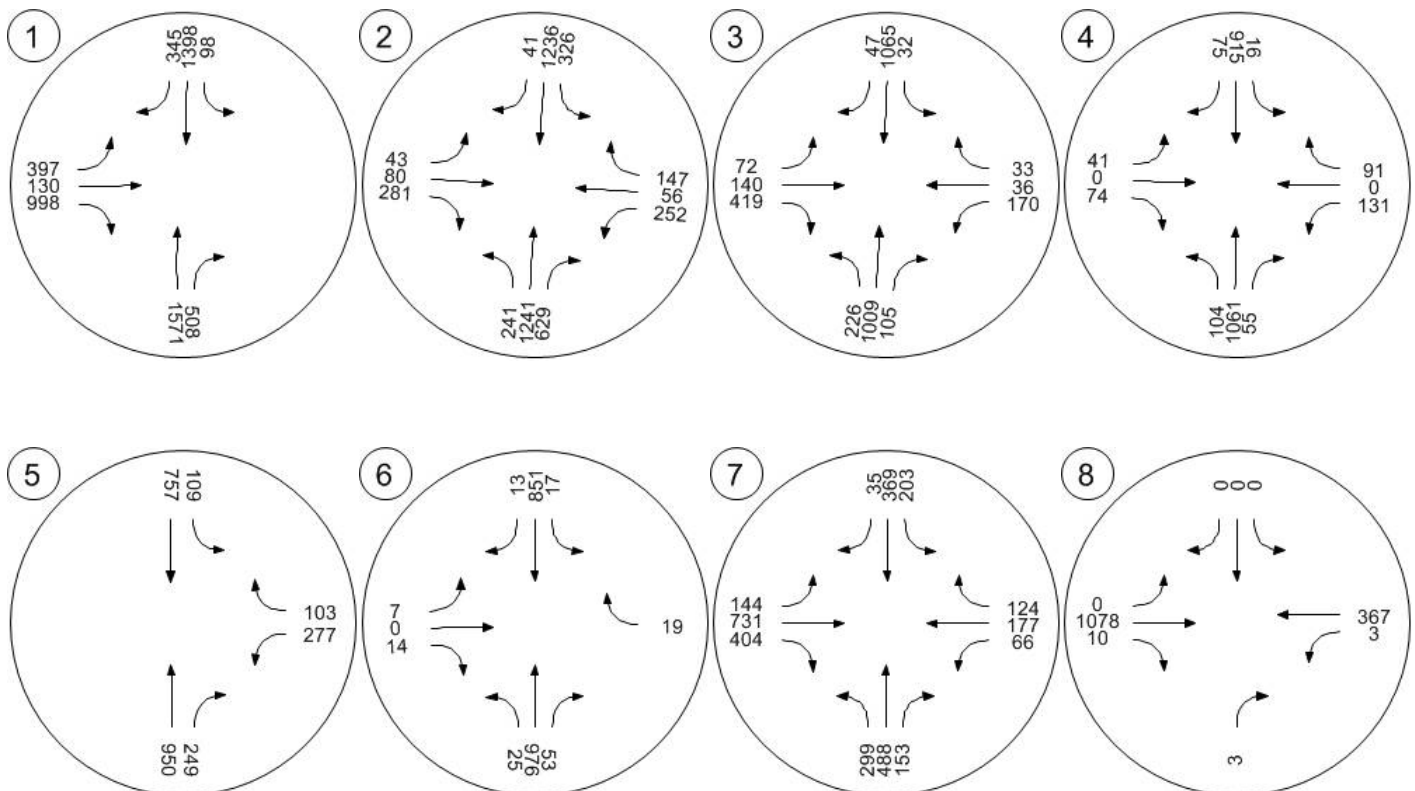
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Traffic Volume - Future Total Volume



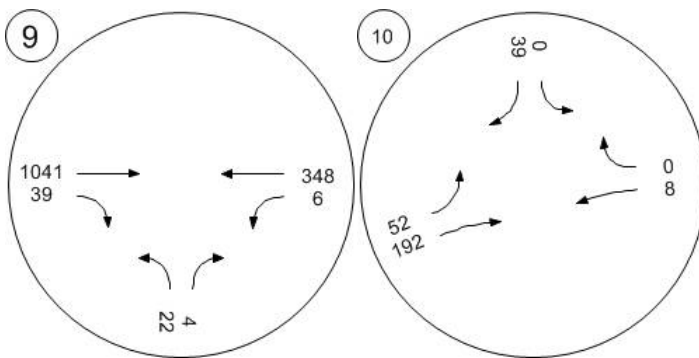
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Traffic Volume - Future Total Volume



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Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 7: PM 2019 Build - Improvements

Report File: C:\...\PM 2019 Build - Turn Lanes at 5th St.pdf

7/7/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
5	CSAH 13 & 5th St	Two-way stop	HCM2010	WBL	4.597	1,745.9	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report #5: CSAH 13 & 5th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 1,745.9
Level Of Service: F
Volume to Capacity (v/c): 4.597

Intersection Setup

Name	CSAH 13		CSAH 13		5th St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	0	1
Pocket Length [ft]	100.00	250.00	250.00	100.00	100.00	250.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	CSAH 13		CSAH 13		5th St	
Base Volume Input [veh/h]	855	0	0	740	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	82	185	54	13	214	39
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	-64	64	55	-63	63	64
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	950	249	109	757	277	103
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	258	68	30	206	75	28
Total Analysis Volume [veh/h]	1033	271	118	823	301	112
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

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Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.23	0.01	4.60	0.22
d_M, Delay for Movement [s/veh]	0.00	0.00	13.91	0.00	1745.91	14.24
Movement LOS	A	A	B	A	F	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.86	0.00	32.87	0.85
95th-Percentile Queue Length [ft]	0.00	0.00	21.57	0.00	821.83	21.23
d_A, Approach Delay [s/veh]	0.00		1.74		1276.30	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	198.93					
Intersection LOS	F					

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Signal Warrants Report For Intersection #5: CSAH 13 & 5th St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	1199	866	380
2	1151	831	365
3	1127	814	357
4	959	693	304
5	911	658	289
6	815	589	258
7	755	546	239
8	719	520	228
9	576	416	182
10	540	390	171
11	540	390	171
12	516	372	163
13	468	338	148
14	432	312	137
15	432	312	137
16	420	303	133
17	240	173	76
18	132	95	42
19	120	87	38
20	48	35	15
21	36	26	11
22	36	26	11
23	24	17	8
24	24	17	8

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	6	2065	2	380	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	6	1982	2	365	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	6	1941	2	357	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	6	1652	2	304	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	6	1569	2	289	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	6	1404	2	258	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	6	1301	2	239	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	6	1239	2	228	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	6	992	2	182	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	6	930	2	171	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	6	930	2	171	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	6	888	2	163	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
13	6	806	2	148	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
14	6	744	2	137	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes
15	6	744	2	137	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes
16	6	723	2	133	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes
17	6	413	2	76	No	No	No	No	No	No	No	No	No	No
18	6	227	2	42	No	No	No	No	No	No	No	No	No	No
19	6	207	2	38	No	No	No	No	No	No	No	No	No	No
20	6	83	2	15	No	No	No	No	No	No	No	No	No	No
21	6	62	2	11	No	No	No	No	No	No	No	No	No	No
22	6	62	2	11	No	No	No	No	No	No	No	No	No	No
23	6	41	2	8	No	No	No	No	No	No	No	No	No	No
24	6	41	2	8	No	No	No	No	No	No	No	No	No	No
Hours Met					8	12	13	16	11	16	16	16	16	16

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	1276.3
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	134:43
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	380
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	2445
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	Yes

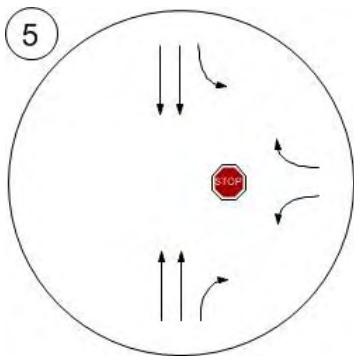
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Lane Configuration and Traffic Control



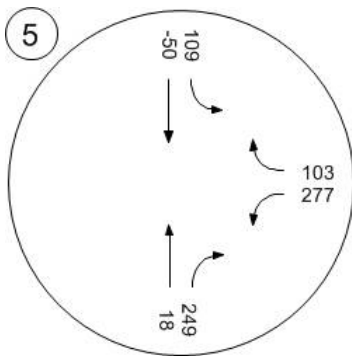
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Traffic Volume - Net New Site Trips



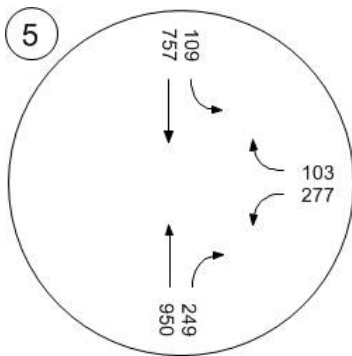
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Traffic Volume - Future Total Volume



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Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 7: PM 2019 Build - Improvements

Report File: C:\...\2019 PM Build - Signal at 5th St.pdf

7/7/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
5	CSAH 13 & 5th St	Signalized	HCM2010	WBL	0.534	12.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report #5: CSAH 13 & 5th St

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 12.9
Level Of Service: B
Volume to Capacity (v/c): 0.534

Intersection Setup

Name	CSAH 13		CSAH 13		5th St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	0	1
Pocket Length [ft]	100.00	250.00	250.00	100.00	100.00	250.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	CSAH 13		CSAH 13		5th St	
Base Volume Input [veh/h]	855	0	0	740	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	82	185	54	13	214	39
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	-64	64	55	-63	63	64
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	125	0	0	0	52
Total Hourly Volume [veh/h]	950	124	109	757	277	51
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	258	34	30	206	75	14
Total Analysis Volume [veh/h]	1033	135	118	823	301	55
Presence of On-Street Parking	no	no	no	no	no	no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Permissive	Permissive	ProtectedPermissi	Permissive	Permissive	Permissive
Signal Group	2	0	1	6	8	0
Lead / Lag	-	-	Lead	-	Lag	-
Minimum Green [s]	15	0	5	15	10	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	2.0	0.0	2.0	2.0	2.0	0.0
Split [s]	36	0	10	46	24	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	0.0	3.0	3.0	3.0	0.0
Minimum Recall	no		no	no	no	
Maximum Recall	yes		no	yes	no	
Pedestrian Recall	no		no	no	no	
Detector Location [ft]	0.0	0.0	6.0	0.0	6.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	C	R	L	C	L	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	36	36	46	46	14	14
g / C, Green / Cycle	0.52	0.52	0.66	0.66	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.29	0.09	0.16	0.23	0.17	0.04
s, saturation flow rate [veh/h]	3512	1568	739	3512	1757	1568
c, Capacity [veh/h]	1821	813	520	2299	356	317
d1, Uniform Delay [s]	11.49	8.88	6.57	5.45	26.86	23.07
k, delay calibration	0.50	0.50	0.50	0.50	0.14	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.29	0.44	1.01	0.44	7.23	0.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.57	0.17	0.23	0.36	0.85	0.17
d, Delay for Lane Group [s/veh]	12.78	9.32	7.58	5.89	34.10	23.33
Lane Group LOS	B	A	A	A	C	C
Critical Lane Group	yes	no	yes	no	yes	no
50th-Percentile Queue Length [veh]	4.21	0.88	0.48	1.58	5.31	0.74
50th-Percentile Queue Length [ft]	105.35	22.11	12.11	39.38	132.69	18.58
95th-Percentile Queue Length [veh]	7.58	1.59	0.87	2.84	9.09	1.34
95th-Percentile Queue Length [ft]	189.52	39.80	21.79	70.89	227.14	33.45

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	12.78	9.32	7.58	5.89	34.10	23.33
Movement LOS	B	A	A	A	C	C
d_A, Approach Delay [s/veh]	12.38		6.10		32.43	
Approach LOS	B		A		C	
d_I, Intersection Delay [s/veh]	12.88					
Intersection LOS	B					
Intersection V/C	0.534					

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



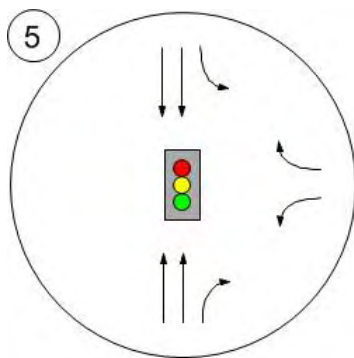
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Lane Configuration and Traffic Control



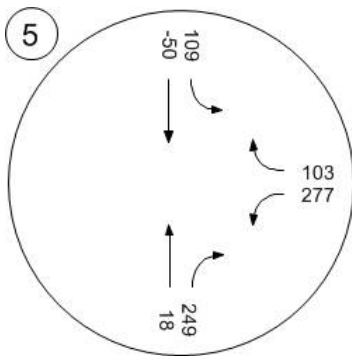
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Traffic Volume - Net New Site Trips



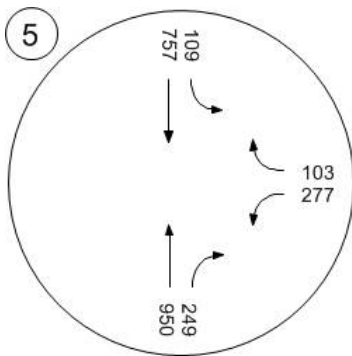
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Traffic Volume - Future Total Volume



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Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 8: PM 2019 Build - Improvements 2

Report File: C:\...\PM 2019 Build - Signal at 5th St no Eagle
Point Connection.pdf

7/7/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	CSAH 13 & Eagle Point Blvd	Two-way stop	HCM2010	WBL	4.162	1,738.4	F
5	CSAH 13 & 5th St	Signalized	HCM2010	WBL	0.556	14.0	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #4: CSAH 13 & Eagle Point Blvd

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 1,738.4
Level Of Service: F
Volume to Capacity (v/c): 4.162

Intersection Setup

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	250.00	250.00	100.00	250.00	50.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	45.00			55.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			no		

Volumes

Name	CSAH 13			CSAH 13			Oak Marsh Rd			Eagle Point Blvd		
Base Volume Input [veh/h]	95	734	3	15	631	69	38	0	68	89	0	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	313	0	0	260	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	104	1113	3	16	948	75	41	0	74	97	0	85
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	302	1	4	258	20	11	0	20	26	0	23
Total Analysis Volume [veh/h]	113	1210	3	17	1030	82	45	0	80	105	0	92
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	no	no	no	no
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	no	no	no	no
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.18	0.01	0.00	0.03	0.01	0.00	1.63	0.00	0.16	4.16	0.00	0.21
d_M, Delay for Movement [s/veh]	12.17	0.00	0.00	11.57	0.00	0.00	618.02	171.12	13.60	1738.39	192.61	15.38
Movement LOS	B	A	A	B	A	A	F	F	B	F	F	C
95th-Percentile Queue Length [veh]	0.67	0.00	0.00	0.09	0.00	0.00	5.34	0.57	0.57	13.00	0.78	0.78
95th-Percentile Queue Length [ft]	16.72	0.00	0.00	2.32	0.00	0.00	133.45	14.19	14.19	325.00	19.57	19.57
d_A, Approach Delay [s/veh]	1.04			0.17			231.19			933.74		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	77.21											
Intersection LOS	F											

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #5: CSAH 13 & 5th St

Control Type: Signalized
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 14.0
Level Of Service: B
Volume to Capacity (v/c): 0.556

Intersection Setup

Name	CSAH 13		CSAH 13		5th St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	0	1
Pocket Length [ft]	100.00	250.00	250.00	100.00	100.00	250.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	CSAH 13		CSAH 13		5th St	
Base Volume Input [veh/h]	855	0	0	740	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.09	1.09	1.09	1.09	1.09	1.09
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	77	236	54	13	247	45
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	-64	64	55	-63	63	64
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	150	0	0	0	55
Total Hourly Volume [veh/h]	945	150	109	757	310	54
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	257	41	30	206	84	15
Total Analysis Volume [veh/h]	1027	163	118	823	337	59
Presence of On-Street Parking	no	no	no	no	no	no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Appendix D - Capacity Analysis Backup

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Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	5.00

Phasing & Timing

Control Type	Permissive	Permissive	ProtectedPermissi	Permissive	Permissive	Permissive
Signal Group	2	0	1	6	8	0
Lead / Lag	-	-	Lead	-	Lag	-
Minimum Green [s]	15	0	5	15	10	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	2.0	0.0	2.0	2.0	2.0	0.0
Split [s]	35	0	10	45	25	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	0.0	3.0	3.0	3.0	0.0
Minimum Recall	no		no	no	no	
Maximum Recall	yes		no	yes	no	
Pedestrian Recall	no		no	no	no	
Detector Location [ft]	0.0	0.0	6.0	0.0	6.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D - Capacity Analysis Backup

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Lane Group Calculations

Lane Group	C	R	L	C	L	R
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	35	35	44	44	16	16
g / C, Green / Cycle	0.50	0.50	0.64	0.64	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.29	0.10	0.16	0.23	0.19	0.04
s, saturation flow rate [veh/h]	3512	1568	748	3512	1757	1568
c, Capacity [veh/h]	1751	782	508	2229	391	349
d1, Uniform Delay [s]	12.44	9.82	7.20	6.10	26.18	21.99
k, delay calibration	0.50	0.50	0.50	0.50	0.17	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.45	0.61	1.07	0.47	8.77	0.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.59	0.21	0.23	0.37	0.86	0.17
d, Delay for Lane Group [s/veh]	13.88	10.43	8.27	6.57	34.95	22.21
Lane Group LOS	B	B	A	A	C	C
Critical Lane Group	yes	no	yes	no	yes	no
50th-Percentile Queue Length [veh]	4.49	1.17	0.54	1.79	6.06	0.77
50th-Percentile Queue Length [ft]	112.35	29.24	13.47	44.84	151.52	19.33
95th-Percentile Queue Length [veh]	7.97	2.11	0.97	3.23	10.10	1.39
95th-Percentile Queue Length [ft]	199.26	52.64	24.24	80.71	252.46	34.79

Appendix D - Capacity Analysis Backup

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	13.88	10.43	8.27	6.57	34.95	22.21
Movement LOS	B	B	A	A	C	C
d_A, Approach Delay [s/veh]	13.41		6.79		33.05	
Approach LOS	B		A		C	
d_I, Intersection Delay [s/veh]	14.02					
Intersection LOS	B					
Intersection V/C	0.556					

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Capacity Analysis Backup

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Signal Warrants Report For Intersection #4: CSAH 13 & Eagle Point Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	21	24	4	2
2	21	24	4	2
3	31	37	5	3
4	31	37	5	3
5	42	49	7	5
6	104	122	18	12
7	114	134	20	13
8	208	244	36	23
9	364	427	64	40
10	374	439	66	41
11	374	439	66	41
12	405	476	71	45
13	447	525	78	49
14	468	549	82	52
15	468	549	82	52
16	499	586	87	55
17	623	732	109	69
18	655	769	115	72
19	707	830	124	78
20	790	927	138	87
21	831	976	146	92
22	977	1147	171	108
23	997	1171	175	110
24	1039	1220	182	115

Appendix D - Capacity Analysis Backup

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	8	45	4	6	No	No	No	No	No	No	No	No	No	No
2	8	45	4	6	No	No	No	No	No	No	No	No	No	No
3	8	68	4	8	No	No	No	No	No	No	No	No	No	No
4	8	68	4	8	No	No	No	No	No	No	No	No	No	No
5	8	91	4	12	No	No	No	No	No	No	No	No	No	No
6	8	226	4	30	No	No	No	No	No	No	No	No	No	No
7	8	248	4	33	No	No	No	No	No	No	No	No	No	No
8	8	452	4	59	No	No	No	No	No	No	No	No	No	No
9	8	791	4	104	No	No	No	No	No	No	No	Yes	No	No
10	8	813	4	107	No	No	No	No	No	No	No	Yes	No	No
11	8	813	4	107	No	No	No	No	No	No	No	Yes	No	No
12	8	881	4	116	No	No	No	No	No	No	Yes	Yes	No	No
13	8	972	4	127	No	No	No	No	No	No	Yes	Yes	No	No
14	8	1017	4	134	No	No	No	No	No	Yes	Yes	Yes	Yes	No
15	8	1017	4	134	No	No	No	No	No	Yes	Yes	Yes	Yes	No
16	8	1085	4	142	No	No	No	No	No	Yes	Yes	Yes	Yes	No
17	8	1355	4	178	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
18	8	1424	4	187	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	8	1537	4	202	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	8	1717	4	225	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	8	1807	4	238	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	8	2124	4	279	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	8	2168	4	285	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	8	2259	4	297	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hours Met					0	3	4	7	8	11	13	16	11	8

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	933.7	231.2
Number of Lanes on Minor Street Approach	2	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	47:12	7:23
Delay Condition Met	Yes	Yes
Volume on Minor Street Approach During Same Hour	182	115
High Minor Volume Condition Met	Yes	No
Total Entering Volume on All Approaches During Same Hour	2556	2556
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	Yes	No
Warrant Met for Intersection	Yes	

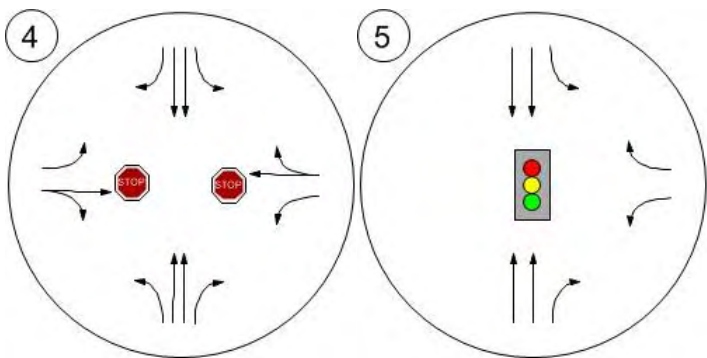
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Lane Configuration and Traffic Control



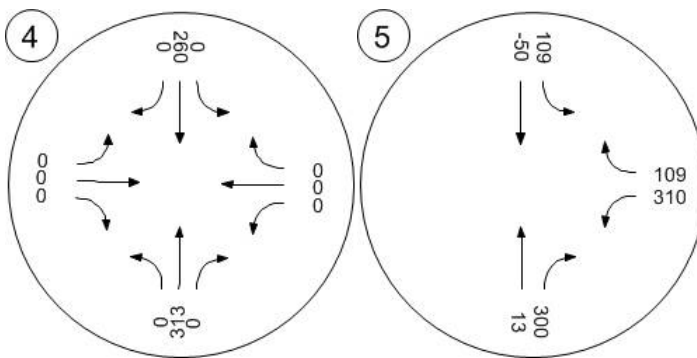
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Traffic Volume - Net New Site Trips



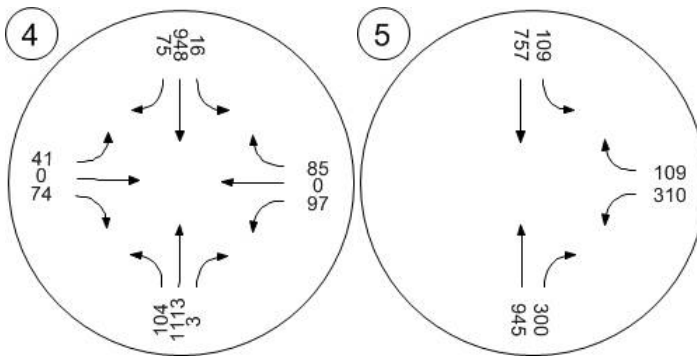
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Traffic Volume - Future Total Volume



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Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 9: PM 2019 Build - Signal Warrant

Report File: C:\...\Signal Warrant - 25%.pdf

7/8/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
5	CSAH 13 & 5th St	Two-way stop	HCM2010	WBL	0.616	73.3	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #5: CSAH 13 & 5th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 73.3
Level Of Service: F
Volume to Capacity (v/c): 0.616

Intersection Setup

Name	CSAH 13		CSAH 13		5th St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	0	1
Pocket Length [ft]	100.00	250.00	250.00	100.00	100.00	200.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	CSAH 13		CSAH 13		5th St	
Base Volume Input [veh/h]	855	0	0	740	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	21	48	13	3	53	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	-16	16	14	-16	16	16
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	877	64	27	742	69	26
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	238	17	7	202	19	7
Total Analysis Volume [veh/h]	953	70	29	807	75	28
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Appendix D - Capacity Analysis Backup

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Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Appendix D - Capacity Analysis Backup

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Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.04	0.01	0.62	0.05
d_M, Delay for Movement [s/veh]	0.00	0.00	10.63	0.00	73.28	12.14
Movement LOS	A	A	B	A	F	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.14	0.00	3.13	0.17
95th-Percentile Queue Length [ft]	0.00	0.00	3.40	0.00	78.30	4.16
d_A, Approach Delay [s/veh]	0.00		0.37		56.66	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	3.13					
Intersection LOS	F					

Appendix D - Capacity Analysis Backup

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Signal Warrants Report For Intersection #5: CSAH 13 & 5th St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	941	769	95
2	903	738	91
3	885	723	89
4	753	615	76
5	715	584	72
6	640	523	65
7	593	484	60
8	565	461	57
9	452	369	46
10	423	346	43
11	423	346	43
12	405	331	41
13	367	300	37
14	339	277	34
15	339	277	34
16	329	269	33
17	188	154	19
18	104	85	10
19	94	77	10
20	38	31	4
21	28	23	3
22	28	23	3
23	19	15	2
24	19	15	2

Appendix D - Capacity Analysis Backup

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	6	1710	2	95	No	No	No	No	No	Yes	Yes	Yes	Yes	No
2	6	1641	2	91	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	6	1608	2	89	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	6	1368	2	76	No	No	No	No	No	No	Yes	Yes	No	No
5	6	1299	2	72	No	No	No	No	No	No	Yes	Yes	No	No
6	6	1163	2	65	No	No	No	No	No	No	No	Yes	No	No
7	6	1077	2	60	No	No	No	No	No	No	No	Yes	No	No
8	6	1026	2	57	No	No	No	No	No	No	No	Yes	No	No
9	6	821	2	46	No	No	No	No	No	No	No	No	No	No
10	6	769	2	43	No	No	No	No	No	No	No	No	No	No
11	6	769	2	43	No	No	No	No	No	No	No	No	No	No
12	6	736	2	41	No	No	No	No	No	No	No	No	No	No
13	6	667	2	37	No	No	No	No	No	No	No	No	No	No
14	6	616	2	34	No	No	No	No	No	No	No	No	No	No
15	6	616	2	34	No	No	No	No	No	No	No	No	No	No
16	6	598	2	33	No	No	No	No	No	No	No	No	No	No
17	6	342	2	19	No	No	No	No	No	No	No	No	No	No
18	6	189	2	10	No	No	No	No	No	No	No	No	No	No
19	6	171	2	10	No	No	No	No	No	No	No	No	No	No
20	6	69	2	4	No	No	No	No	No	No	No	No	No	No
21	6	51	2	3	No	No	No	No	No	No	No	No	No	No
22	6	51	2	3	No	No	No	No	No	No	No	No	No	No
23	6	34	2	2	No	No	No	No	No	No	No	No	No	No
24	6	34	2	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	3	5	8	3	0

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	56.7
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	1:29
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	95
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1805
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No

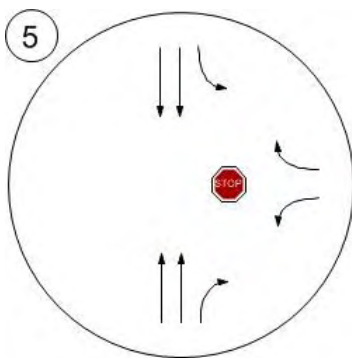
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Lane Configuration and Traffic Control



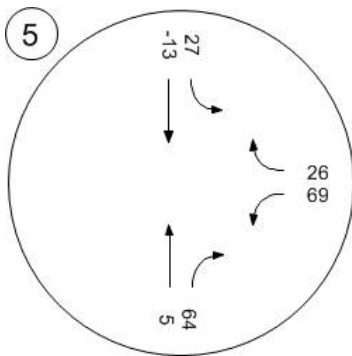
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Traffic Volume - Net New Site Trips



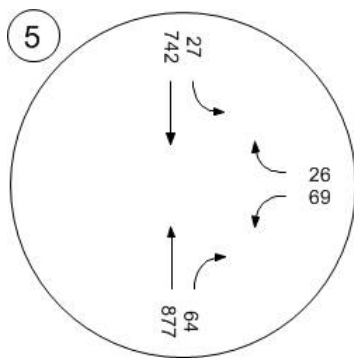
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Traffic Volume - Future Total Volume



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Lake Elmo Development

Vistro File: C:\...\Lake Elmo.vistropdb

Scenario 9: PM 2019 Build - Signal Warrant

Report File: C:\...\Signal Warrant - 30%.pdf

7/8/2014

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
5	CSAH 13 & 5th St	Two-way stop	HCM2010	WBL	0.762	98.9	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

Appendix D - Capacity Analysis Backup

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Intersection Level Of Service Report #5: CSAH 13 & 5th St

Control Type: Two-way stop
Analysis Method: HCM2010
Analysis Period: 15 minutes

Delay (sec / veh): 98.9
Level Of Service: F
Volume to Capacity (v/c): 0.762

Intersection Setup

Name	CSAH 13		CSAH 13		5th St	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	0	1
Pocket Length [ft]	100.00	250.00	250.00	100.00	100.00	200.00
Speed [mph]	55.00		55.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		no	

Volumes

Name	CSAH 13		CSAH 13		5th St	
Base Volume Input [veh/h]	855	0	0	740	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	3.00	3.00	3.00	3.00
Growth Rate	1.03	1.03	1.03	1.03	1.03	1.03
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	24	56	16	4	62	12
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	-19	19	17	-19	19	19
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	886	75	33	747	81	31
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	241	20	9	203	22	8
Total Analysis Volume [veh/h]	963	82	36	812	88	34
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	no	no	no
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	no	no	no
Number of Storage Spaces in Median	0	0	0

Appendix D - Capacity Analysis Backup

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Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.05	0.01	0.76	0.06
d_M, Delay for Movement [s/veh]	0.00	0.00	10.81	0.00	98.95	12.29
Movement LOS	A	A	B	A	F	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.17	0.00	4.28	0.21
95th-Percentile Queue Length [ft]	0.00	0.00	4.35	0.00	106.89	5.14
d_A, Approach Delay [s/veh]	0.00		0.46		74.80	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	4.72					
Intersection LOS	F					

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Signal Warrants Report For Intersection #5: CSAH 13 & 5th St

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	Yes
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	961	780	112
2	923	749	108
3	903	733	105
4	769	624	90
5	730	593	85
6	653	530	76
7	605	491	71
8	577	468	67
9	461	374	54
10	432	351	50
11	432	351	50
12	413	335	48
13	375	304	44
14	346	281	40
15	346	281	40
16	336	273	39
17	192	156	22
18	106	86	12
19	96	78	11
20	38	31	4
21	29	23	3
22	29	23	3
23	19	16	2
24	19	16	2

Appendix D - Capacity Analysis Backup

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Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	6	1741	2	112	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	6	1672	2	108	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3	6	1636	2	105	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
4	6	1393	2	90	No	No	No	No	No	Yes	Yes	Yes	Yes	No
5	6	1323	2	85	No	No	No	No	No	Yes	Yes	Yes	Yes	No
6	6	1183	2	76	No	No	No	No	No	No	Yes	Yes	No	No
7	6	1096	2	71	No	No	No	No	No	No	Yes	Yes	No	No
8	6	1045	2	67	No	No	No	No	No	No	No	Yes	No	No
9	6	835	2	54	No	No	No	No	No	No	No	No	No	No
10	6	783	2	50	No	No	No	No	No	No	No	No	No	No
11	6	783	2	50	No	No	No	No	No	No	No	No	No	No
12	6	748	2	48	No	No	No	No	No	No	No	No	No	No
13	6	679	2	44	No	No	No	No	No	No	No	No	No	No
14	6	627	2	40	No	No	No	No	No	No	No	No	No	No
15	6	627	2	40	No	No	No	No	No	No	No	No	No	No
16	6	609	2	39	No	No	No	No	No	No	No	No	No	No
17	6	348	2	22	No	No	No	No	No	No	No	No	No	No
18	6	192	2	12	No	No	No	No	No	No	No	No	No	No
19	6	174	2	11	No	No	No	No	No	No	No	No	No	No
20	6	69	2	4	No	No	No	No	No	No	No	No	No	No
21	6	52	2	3	No	No	No	No	No	No	No	No	No	No
22	6	52	2	3	No	No	No	No	No	No	No	No	No	No
23	6	35	2	2	No	No	No	No	No	No	No	No	No	No
24	6	35	2	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	1	3	5	7	8	5	3

Warrant 3 Condition A

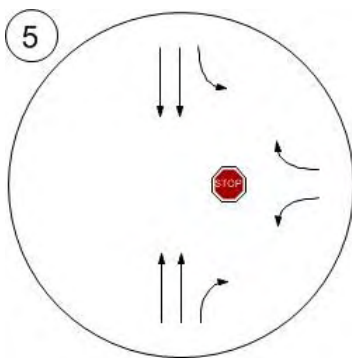
Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	74.8
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	2:19
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	112
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1853
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No

Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06

Lane Configuration and Traffic Control

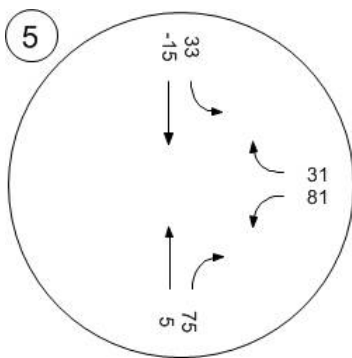


Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06

Traffic Volume - Net New Site Trips

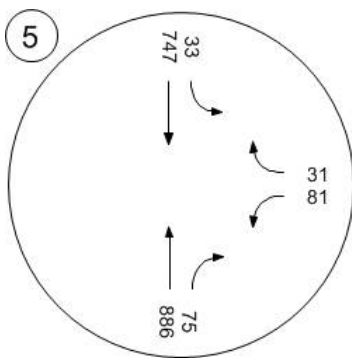


Appendix D - Capacity Analysis Backup

Generated with **PTV VISTRO**

Version 2.00-06

Traffic Volume - Future Total Volume





MAYOR & COUNCIL COMMUNICATION

DATE: August 19, 2014
REGULAR \$\$
ITEM #: 13
MOTION

AGENDA ITEM: Enter into a Lease with Lake Elmo Associates LLP for the purpose of leasing 2,461 sq. ft. of office space at 3880 Laverne Ave. North for the purpose of operating the City of Lake Elmo.

SUBMITTED BY: Dean Zuleger, City Administrator

THROUGH: Mayor Mike Pearson

REVIEWED BY: Mayor Pearson,
Council member Nelson,
EDA Member John Thompson, and
Finance Committee

SUGGESTED ORDER OF BUSINESS:

- Introduction of Item City Administrator
- Report/Presentation.....City Administrator
- Questions from Council to Staff..... Mayor Facilitates
- Public Input, if Appropriate Mayor Facilitates
- Call for Motion Mayor & City Council
- Discussion Mayor & City Council
- Action on Motion..... Mayor Facilitates

POLICY RECCOMENDER: City Administrator

FISCAL IMPACT: \$2,461 per month / \$29,532 annually in 2015-16
\$2,666 per month / \$31,993 annually in 2017-18
\$2,769 per month / \$33,223 annually in 2019
Reduction in utilities allocated toward the annex

SUMMARY AND ACTION REQUESTED: Approval of a five year lease of 2,461 sq. ft. of office space (\$12 square foot triple net) AS IS with fixtures with the only utility costs to the City that of telephone and information technology. The City would also be offered a first right of refusal to purchase the building in the future. The recommended motion for this action is as follows:

“Approve the five year lease with Lake Elmo Associates LLP for certain rental space of 2,461 square feet in a building located at 3880 Laverne Avenue North for the purposes of improving office efficiency for the general administration for the City of Lake Elmo.”

LEGISLATIVE HISTORY: None

BACKGROUND INFORMATION: The City of Lake Elmo has outgrown its space in the current City Hall from a staffing, records management, and meeting utility usefulness. The Annex is a double wide trailer that does not meet code, is inefficient in HVAC function, and cannot maintain a level. The City is requesting leasing 2,461 square feet of space in the Brookview Building directly across from the current City Hall to house its Administrative function. The current City Hall would be used for the Community Development and Building Department. The annex would be razed. (see attached lease)

BACKGROUND INFORMATION (SWOT):

Strengths: Provides an affordable way to handle City growth and administrative services adding privacy, storage, and meeting efficiency. News offices are next to City’s contract engineers.

Weakness: City Departments are still separated by 500 feet causing an inordinate amount of travel to and from facilities.

Opportunities: Functionally handle the growth of the City without increasing the debt in infrastructure.

Threats: Building could be sold to another less civically minded entity and new space would have to be acquired / built after the five lease expires.

RECOMMENDATION: City Administrator, in concert with the Mayor / Council member Nelson recommends the following:

“Approve the five year lease with Lake Elmo Associates LLP for certain rental space of 2,461 square feet in a building located at 3880 Laverne Avenue North for the purposes of improving office efficiency for the general administration for the City of Lake Elmo.”

LEASE AGREEMENT

THIS LEASE AGREEMENT, made this ____ day of August, 2014, by and between Lake Elmo Associates, L.L.P. (hereafter called "Landlord") and the City of Lake Elmo (hereinafter called "Tenant"),

WITNESSES, that the Landlord, in consideration of the rents and covenants hereinafter mentioned, does hereby lease to the said Tenant, and the said Tenant does hereby hire and take from the Landlord the following-described real estate (hereinafter called "Premises") situated in the City of Lake Elmo, County of Washington and State of Minnesota, to-wit:

That certain rental space in a building owned by Landlord and located on the southwest corner of the first floor of Lot One (1), Block Two (2), BROOKMAN ADDITION, which rental space totals 2461 square feet; the post office address of said building is 3880 Laverne Avenue North, Lake Elmo, Minnesota 55042.

TO HAVE AND TO HOLD the Premises for a term of five (5) years, beginning October 1, 2014 and continuing to and including the 30th day of September, 2019, on the following terms and conditions:

1. Rent. Tenant shall pay to Landlord, during the term of this Lease, rent for the first and second year in the sum of \$29,532.00 per year; said rent shall be paid in equal monthly installments of \$2,461.00 each, to be paid on the first day of each month.

Tenant shall pay to Landlord, rent for the third and fourth year in the sum of \$31,993.00 per year; said rent shall be paid in equal monthly installments of \$2,666.00 each, to be paid on the first day of each month.

Tenant shall pay to Landlord, rent for the fifth year in the sum of \$33,223.00 per year; said rent shall be paid in equal monthly installments of \$2,769.00 each, to be paid on the first day of each month.

Tenant shall, also, pay as additional rent, in the year 2015 and thereafter, during the term or any extension thereof, Tenant's pro rata share of any increase in:

- a) real estate taxes on said building over and above taxes payable in the year 2015;
- b) utility costs over and above the total utility costs for the entire building payable in the year 2015. "Utility costs" as used herein shall mean the costs of heating, air-conditioning, water service, sewer service, electric power service and trash-removal.

The additional rent to be paid by Tenant shall be based on the ratio of the total floor area of the Tenant's Premises to the total rentable floor area of the building.

The tenant shall pay any such additional rent to Landlord, monthly in advance by paying an amount equal to one-twelfth (1/12) of Tenant's share of any such increase in real estate taxes and utility costs, as estimated by Landlord. Adjustments shall be made, if necessary, at the end of each calendar year based on actual costs.

2. Use of Premises. Unless otherwise agreed by the Landlord, in writing (which consent the Landlord shall not unreasonably withhold) the Tenant shall use the Premises only for purposes incidental to Tenant's business which is a City Office but, in any case, not for any purpose which may be hazardous on account of fire or other risk. The premises shall be used in accordance with all ordinances, rules, regulations or orders of any public authority having jurisdiction over the Premises.

3. Indemnification. The Tenant will indemnify and hold Landlord harmless as against any and all liability or claims by or in behalf of any person, firm, association, corporation or governmental authority arising from or incidental to the Tenant's use of said premises. The Tenant at its expense shall maintain in full force and effect, with Landlord named as additional insured, public liability insurance coverage with respect to the Premises in a minimum aggregate amount satisfactory to Landlord and shall deposit with Landlord evidence of such insurance.

4. Utilities. Landlord without additional charge, shall provide and maintain adequate mechanical apparatus to furnish satisfactory heating, air-conditioning, water service, sewer service, and electrical power service to the Premises and Landlord shall pay for all heating, air-conditioning, water service or sewer service, electric power service and trash-removal costs attributable to Tenant's occupancy of the Premises (except as provided in this paragraph 4 at no cost to Tenant except the rent and additional rent provided above in paragraph 1. Provided, however, that if any Tenant shall conduct any activity or use any equipment in Tenant's Premises which would require utilities such as gas, water, or electric power in an amount significantly greater than might reasonably be expected for general office use, then such Tenant shall be required to pay an amount equal to any increase in utility costs to Landlord over and above normal costs. If Landlord determines that the volume of Tenant's refuse is substantially greater than the average volume of other tenants, Tenant shall pay as additional rent a reasonable charge for the additional cost of refuse removal attributable to Tenant's greater volume.

5. Operation and Maintenance of Common Area. For the purpose of this Lease, the term "Common Area" shall be defined as all that portion of the real estate in which the Premises are located including hallways, stairs, atria, landscaped areas, parking facilities and other improvements excepting that area which is presently leased to tenants or is proposed to be leased to tenants.

Landlord agrees to manage, operate and maintain during the term of this lease and any renewal thereof all sidewalks, parking lots and driveways, landscaping, and lighting facilities with the Common Area, to a normal and reasonable standard for a professional office building. The manner in which such Common Area and facilities shall be maintained and the expenditures therefore shall be at the sole discretion of Landlord, who shall have the right to adopt and promulgate reasonable rules and regulations, from time-to-time, including the right to restrict tenant and tenant's employees from parking areas reserved for customers of the various tenants.

Landlord has made no representation as to identity, type, size or number of other tenancies in the building, and Landlord reserves the unrestricted right to change the building perimeters, driveways, office sizes, identity and type of other tenancies provided, however, there shall always be reasonable access to tenant's Premises.

Landlord hereby grants to Tenant, its employees, agents, customers and invitees, the non-exclusive right for and during the term of this Lease and any renewal thereof to use Common Area from time-to-time constituted, such use to be in common with Landlord and all tenants of Landlord from time-to-time, its and their employees, agents, customers and invitees, except when the same are being repaired. Tenant shall not at any time interfere with the rights of Landlord and other tenants, its and their employees, agents, customers and invitees, to use any part of the Common Area.

6. Assignment or Sublease. The Tenant shall not assign or sublease the whole or any part of the Premises without prior written permission of the Landlord, which permission will not unreasonably be withheld.

7. Repairs and Improvements. The Tenant shall be responsible for all repair and improvements to the interior of the Premises. During the time of this Lease and any renewal thereof, Tenant agrees to keep the interior of the premise in as good a state of repair as the same now is, except for reasonable use and wearing thereof.

Tenant shall replace any glass broken by Tenant.

Tenant shall make such leasehold improvements and install such fixtures and equipment as may be necessary for the operation of Tenant's business, all of which shall be made to Premises at Tenant's own cost and expense.

At any time after the installation of Tenant's original leasehold improvements, Tenant may, after written approval of Landlord, make such alterations, additional improvements and repairs to the Premises, and install such additional fixtures and equipment as may be necessary for the operation of Tenant's business, all of which shall also be made at Tenant's own cost and expense.

On the expiration of this Lease, or sooner termination thereof, improvements or alterations made shall become a part of the premises and shall belong to the Landlord without compensation to the Tenant, except that Tenant shall before the termination date remove any improvements or alterations which had not been consented to by the Landlord, if so requested by the Landlord. The Tenant may remove all or any part of the furniture and business equipment placed in, on or about the Premises by Tenant and upon removal, the Tenant shall at Tenant's expense repair and restore the Premises in as good, clean, sanitary and safe condition as they are now, ordinary use and reasonable wear and tear excepted.

8. Signs and Displays. Tenant shall not place any signs or displays in windows, on the exterior or interior Common Area of the building or any other place which would be visible from outside the building or the Common Area without specific written consent of the Landlord. It is understood, however, that Landlord shall permit at least one identification sign to be placed outside of the building and at least one identification sign inside the building but such signs shall be designed according to reasonable standards established by the Landlord for the purpose of maintaining a harmonious and aesthetically pleasing exterior for the building.

9. Inspection. The Landlord reserves the right to enter the Premises at all reasonable times to view them, or to show them to a mortgagee or to a purchaser, or to make repairs, alterations or improvements, all with prior Tenant approval which shall not be unreasonably withheld.

10. Hold harmless. Tenant shall not be liable to Landlord, nor shall Landlord be liable to Tenant for any expense or damage resulting from a peril which can be insured against under the Minnesota standard form office insurance policy, with extended coverage endorsement added, anything contained in this lease to the contrary notwithstanding.

11. Condemnation. If the whole or any part of the Premises shall be condemned by any public authority or any corporation in condemnation proceedings then, at the option of the Tenant, to be exercised in writing within sixty (60) days of the date of condemnation, this Lease shall cease upon the date that title passes to the condemnor and, if the option is exercised, the Tenant shall not be liable for payment of rent beyond that date.

12. Destruction of Premises. In the event the Premises shall be destroyed or so injured by fire, the elements, or any other cause, so as to be partially or wholly untenable, then at the option of the Tenant, the term of this Lease shall cease and the liability of the Tenant for further rent shall cease as of the date of the damage. If the Tenant shall, however, elect to continue the Lease, the Landlord shall restore the Premises to a tenantable condition substantially as before the destruction if such restoration is reasonably practical, and rent shall abate on that portion of the Premises which is untenable until it is restored to a tenantable condition.

13. Default by Tenant. In case of default by the Tenant in the payment of any rent or in performance of any of the agreements and covenants herein contained, the Landlord may, at its option, and after ten (10) days written notice to Tenant during which time Tenant shall have the right to remove such default, terminate this Lease Agreement, re-enter and take possession of the Premises (without working a forfeiture of the rent to be paid by the Lessee for the remainder of the term of the Lease) and exercise any and all other rights and remedies provided Landlord by law. No waiver of a breach of any of the covenants or conditions of this Lease shall be construed as a waiver of any subsequent breach of the same covenants or conditions.

14. Peaceable Possession. The Landlord covenants that the Tenant on paying the rents required by Tenant and upon performing the agreements and covenants required of Tenants, shall and may peacefully and quietly have, hold and enjoy the Premises for the term aforesaid.

15. Parking. Landlord agrees to provide reserved parking spaces as may reasonably be required for Tenant's business use but not to exceed five (5) spaces. The location of such reserved spaces shall be determined by the Landlord.

16. Notices. Any notices, payment or demand, permitted or required to be given or made pursuant to this Lease shall be delivered personally or mailed by Registered or Certified United States mail to the addresses hereinafter set forth. Such notices, demand, or payment shall be deemed timely given or made when delivered personally or when deposited in the United States mail in accordance with the above. The addresses of the parties are as follows:

If to Landlords: Lake Elmo Associates, L.L.P.
 3880 Laverne Avenue North
 Lake Elmo, MN 55042

If to Tenant: City of Lake Elmo
 3880 Laverne Avenue North
 Lake Elmo, MN 55042

17. Binding Effect. The terms and conditions of this Lease shall extend, apply to and firmly bind the heirs, executors, administrators, successors and assigns of the respective parties.

18. Renewal. Tenant shall give Landlord, prior to the expiration of the term of this lease, ninety (90) days notice, in writing of its desire to renew the Lease terms.

19. Miscellaneous.

- a) The rented Premises are delivered "as is" with existing furniture and fixtures in the Premises as of September 1, 2014, and Tenant may use this furniture and fixtures at no additional rent.
- b) Tenant may use and occupy the Premises as of September 1, 2014 for no additional rent.
- c) Parties agree that for no additional consideration Tenant shall have during the period of this Lease a Right of First Refusal to purchase the building in the event owner places the building on the market for sale.

IN WITNESS WHEREOF, the parties have hereunto caused these presents to be executed the day and year first above written.

TENANT:

LANDLORD:

CITY OF LAKE ELMO

LAKE ELMO ASSOCIATES, L.L.P.

By: _____
Its: _____

By: _____
Its: _____