

Office of the Clerk/Treasurer

W240N3065 Pewaukee Road
Pewaukee, WI 53072
(262) 691-0770 Fax 691-1798

~ MEETING CANCELLED ~

**COMMON COUNCIL
MEETING NOTICE AND AGENDA**

Monday, March 16, 2020

7:00 PM

Common Council Chambers ~ Pewaukee City Hall
W240 N3065 Pewaukee Road ~ Pewaukee, Wisconsin

-
1. Call to Order and Pledge of Allegiance
 2. Public Comment - Please limit your comments to two (2) minutes, if further time for discussion is needed please contact your District Alderperson prior to the meeting.
 3. Consent Agenda
 - 3.1. Approval of the Common Council Meeting Minutes Dated December 2, 2019
 - 3.2. Approval of the Accounts Payable Listing for March 16, 2020
 4. A Proclamation Recognizing Division Chief Misiak. [Mayor Bierce]
 5. Discussion and Possible Action Regarding **Resolution 20-03-05** Revising the City's Investment Policy [Tami Olszewski - Ehlers]
 6. Discussion and Possible Action Regarding the Selection of the Busse Road Bridge Replacement Alternative [Wagner]
 7. Lindsay Road and Redford Boulevard (CTH F) intersection Study [Wagner]
 - 7.1 Discussion and Possible Action to Begin Discussions with Waukesha County Regarding Final Design of the Intersection Improvements and Establishing Funding or Other Partnership Agreements for the Intersection Improvements.
 - 7.2 Discussion and Possible Action to Authorize Traffic Analysis & Design, Inc. to Complete an amended Study in accordance with the Agreement in the amount of \$15,912.
 8. Discussion and Possible Action to Limit Public Meetings or Make Alternative Arrangements to Hold Meetings [Mayor Bierce]
 9. Public Comment - Please limit your comments to two (2) minutes, if further time for discussion is needed please contact your district Alderperson prior to the meeting.
 10. Adjournment

Kelly Tarczewski
Clerk/Treasurer

March 12, 2020

NOTICE

It is possible that members of other governmental bodies of the municipality may be in attendance to gather information that may form a quorum. At the above stated meeting, no action will be taken by any governmental body other than the governmental body specifically referred to above in this notice.

Any person who has a qualifying disability under the Americans with Disabilities Act that requires the meeting or materials at the meeting to be in an accessible format must contact the Clerk/Treasurer, Kelly Tarczewski, at (262) 691-0770 three business days prior to the meeting so that arrangements may be made to accommodate your request.

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 3.1.**

DATE: March 16, 2020

DEPARTMENT: Clerk/Treasurer

PROVIDED BY:

SUBJECT:

Approval of the Common Council Meeting Minutes Dated December 2, 2019

BACKGROUND:

FINANCIAL IMPACT:

RECOMMENDED MOTION:

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 3.2.**

DATE: March 16, 2020

DEPARTMENT: Clerk/Treasurer

PROVIDED BY:

SUBJECT:

Approval of the Accounts Payable Listing for March 16, 2020

BACKGROUND:

FINANCIAL IMPACT:

RECOMMENDED MOTION:

ATTACHMENTS:

Description

A/P Listing 3-16-2020

ACCOUNTS PAYABLE	3/16/2020	TOTAL:	\$ 343,332.71
Vendor Name	Document Date	Document Amount	Transaction Description
1ST AYD	1/17/2020	\$26.80	FD FREIGHT
AARONIN STEEL	2/21/2020	\$454.00	HWY WALL DOMX
ADVANCE NAME PLATE & BADGE	2/28/2020	\$12.93	CT NAME PLATE
APEX SOFTWARE	2/20/2020	\$300.00	IT LICENSE FOR ASST ASSESSOR
ARAMARK	2/20/2020	\$72.72	HWY UNIFORMS
ARO LOCK & DOOR	3/3/2020	\$150.00	IT LATCH ON DOOR
ARROW TERMINAL, LLC	2/20/2020	\$122.11	HWY WASHERS AND CAPS
ASSESSMENT TECHNOLOGIES LLC	2/17/2020	\$422.99	IT ANNUAL HOSTING FEE
BARTLETT, SCOTT	2/24/2020	\$125.00	HWY SAFETY SHOE REIMB
BATTERIES PLUS BULBS	2/26/2020	\$14.85	WS BATTERIES
BURKE TRUCK & EQUIPMENT	2/25/2020	\$349.10	HWY CURB SHOE
CINTAS CORP.	2/26/2020	\$42.35	P&R FIRST AID SUPPLIES
CINTAS CORP.	2/25/2020	\$134.29	HWY FIRST AID SUPPLIES
CINTAS CORP.	2/24/2020	\$118.41	FD MATS
CINTAS CORP.	2/17/2020	\$61.14	FD MAT
CIVICPLUS	2/20/2020	\$160.00	IT FB LINK TO MAIN WEBPAGE
COMMUNICATIONS ENGINEERING CO	2/18/2020	\$401.00	IT BLANK BADGES
COMPASS MINERAL	2/14/2020	\$11,089.02	HWY BULK COARSE
COMPASS MINERAL	2/17/2020	\$19,190.06	HWY BULK COARSE
COREY OIL	2/28/2020	\$6,277.97	HWY FUEL
COREY OIL	2/24/2020	\$268.50	HWY DEF
CUMMINS SALES & SERVICE	1/22/2020	\$557.50	HWY CHIPPER
DWYER, CHARLIE	3/1/2020	\$122.48	BLD MILEAGE REIMBURSEMENT
ECO, INC.-MARIGOLD DAIRIES DIV	2/24/2020	\$350.00	P&R MILK
FIRNROHR, MARY	3/1/2020	\$168.00	P&R TAI CHI SESSION 2
FURST, MARTHA	3/1/2020	\$60.00	P&R YOGA SUBSTITUTE
GRAINGER	2/18/2020	\$32.32	ENG SUPPLIES FOR BRIAN
HEARTLAND BUSINESS SYSTEMS	2/17/2020	\$184.00	IT NONSERVER MONITORING
HEIN ELECTRIC SUPPLY	2/11/2020	\$12.73	FD CORDSEOW
HILTUNEN, MARIANNE	3/2/2020	\$106.38	ENG MILEAGE REIMBURSEMENT
HUMPHREY SERVICE PARTS, INC	2/13/2020	\$73.28	ENG CRIMP HOSE
HUMPHREY SERVICE PARTS, INC	2/19/2020	\$9.51	HWY BULB
IMEG CORP	2/17/2020	\$7,014.00	ENG BRIDGE REPLACEMENT
JEFFERSON FIRE & SAFETY, INC.	1/1/2020	\$9,068.00	FD HONEYWELL COAT AND PANTS
JEFFERSON FIRE & SAFETY, INC.	2/6/2020	\$459.20	FD BATTERY HOUSING AND SEP
JEFFERSON FIRE & SAFETY, INC.	2/6/2020	\$459.20	FD BATTERY HOUSING
KAYSER AUTOMOTIVE GROUP	2/28/2020	\$550.00	HWY #25 PAINT SHIELD
KAYSER AUTOMOTIVE GROUP	2/24/2020	\$40,374.50	HWY #25 REPLACEMENT
KOEPP, TOM	6/4/2019	\$374.97	CT 2019 DEER HERD REDUCTION
LANGE ENTERPRISES, INC	2/18/2020	\$206.81	BLD TILES
LAWN BOYZ CUSTOM CARE	2/25/2020	\$2,410.63	CT LAWN CARE PILGRIMS REST
LEVEL UP CONSTRUCTION	3/5/2020	\$70,300.00	AD PEWAUKEE STORAGE
LIFE-ASSIST INC	2/10/2020	\$297.32	FD FIRST AID SUPPLIES
LIFE-ASSIST INC	2/17/2020	\$161.56	FD FIRST AID SUPPLIES
LIFE-ASSIST INC	2/18/2020	\$22.00	FD FLUIDSHIELD

LINE-X MILWAUKEE	2/26/2020	\$1,468.90	HWY #25 MATS AND BED
MENARDS	2/20/2020	\$6.52	HWY GREREN TREATED
MENARDS	2/25/2020	\$17.96	HWY COV LOCK SAFETY HASP
MENARDS	2/27/2020	\$33.79	HWY BLADES AND RAZOR
MENARDS	2/26/2020	\$79.24	HWY BATTERIES
MENARDS	2/24/2020	\$11.16	SW LOW SPLASH BLEACH
MENARDS	2/25/2020	\$4.69	SW PVC PIPE
MENARDS	2/26/2020	\$44.67	SW FLR MT
MENARDS	1/12/2020	\$49.80	FD GLACIERMIST
Municipal Law & Litigation Group S.C.	2/17/2020	\$11,047.50	CT LEGAL FEES
NATIONWIDE RETIREMENT SOLUTIONS	2/28/2020	\$1,235.09	CT RETIREMENT PD 2/28/2020
NORTH CENTRAL UTILITY	2/19/2020	\$278.00	HWY ROPE TIE-OFF
NORTH CENTRAL UTILITY	2/27/2020	\$86.88	HWY #17 FORWARD LIGHTING
OFFICE COPYING EQUIPMENT, LTD	2/27/2020	\$434.53	P&R SHARP MX3070N CONTRACT
OFFICE COPYING EQUIPMENT, LTD	2/27/2020	\$189.20	ENG SHARP MX4070N
OFFICE COPYING EQUIPMENT, LTD	2/27/2020	\$1,196.32	CT SHARP MX6240N CONTRACT
OFFICE DEPOT	3/4/2020	\$33.49	BLD OFFICE SUPPLIES
PEWAUKEE, VILLAGE OF	2/18/2020	\$41.65	P&R FIRE INSPECTION
PEWAUKEE, VILLAGE OF	3/4/2020	\$1,277.78	CT P&R FEB 2020
PEWAUKEE, VILLAGE OF	3/5/2020	\$69,501.00	CT 2020 JOINT LIBRARY MAR
PITNEY BOWES GLOBAL FINANCIAL SERVIC	2/13/2020	\$1,681.53	SW RELAY INSERTS
POMP'S TIRE SERVICE, INC.	2/6/2020	\$655.00	HWY #20 TIRES
POMP'S TIRE SERVICE, INC.	2/11/2020	\$622.40	SW TIRES
POWER EQUIPMENT LEASING CO	2/17/2020	\$3,800.00	HWY VERSALIFT RENTAL
PREMIUM WATERS, INC	2/21/2020	\$46.49	P&R SHOP WATER
PREMIUM WATERS, INC	2/21/2020	\$53.25	HWY WATER
PROHEALTH PHARMACY WAUKESHA	1/3/2020	\$624.73	FD FIRST AID SUPPLIES
PROHEALTH PHARMACY WAUKESHA	1/14/2020	\$471.38	FD FIRST AID SUPPLIES
REINDERS, INC.	2/25/2020	\$41,842.36	P&R #83 TORO GM4000
RUEKERT & MIELKE, INC.	2/19/2020	\$3,388.75	ENG EROSION CONTROL REVIEW
RUEKERT & MIELKE, INC.	2/19/2020	\$351.94	ENG EROSION CONTROL REVIEW
RUEKERT & MIELKE, INC.	2/19/2020	\$350.39	ENG EROSION CONTROL REVIEW
RUEKERT & MIELKE, INC.	2/19/2020	\$323.89	ENG EROSION CONTROL REVIEW
RUEKERT & MIELKE, INC.	2/19/2020	\$350.39	ENG EROSION CONTROL INSPECTION
RUEKERT & MIELKE, INC.	2/19/2020	\$323.89	ENG EROSION CONTROL
RUEKERT & MIELKE, INC.	2/19/2020	\$198.00	ENG CONSTRUCTION REVIEW
RUEKERT & MIELKE, INC.	2/19/2020	\$217.50	ENG CONSTRUCTION REVIEW
RUEKERT & MIELKE, INC.	2/19/2020	\$2,049.50	ENG DESIGN
RUEKERT & MIELKE, INC.	2/19/2020	\$212.50	SW PROFESSIONAL FEES
RUEKERT & MIELKE, INC.	2/19/2020	\$15,161.30	SW DESIGN AND BIDDING SERVICES
RUEKERT & MIELKE, INC.	2/19/2020	\$2,818.80	SW PRELIM DESIGN STUDY
RUEKERT & MIELKE, INC.	2/19/2020	\$119.50	SW INSPECTION
RUEKERT & MIELKE, INC.	2/19/2020	\$1,606.30	SW DESIGN 26-10106
STRYKER SALES CORPORATION	10/7/2019	\$2,169.00	FD ASSEMBLY GATEWAY
SUSAN SCHROEDER	2/24/2020	\$57.38	CT VOTING
TD AMERITRADE TRUST COMPANY	2/28/2020	\$50.00	CT LOAN REPAYMENT PD 2/28/20
TOM'S TRAILERS, INC	2/19/2020	\$34.00	HWY COUPLER
VERIZON	2/12/2020	\$276.23	FD TELEPHONE
VERIZON	2/12/2020	\$96.45	FD TELEPHONE

VISU-SEWER	2/18/2020	\$670.00	SW VACTOR
WE ENERGIES	2/21/2020	\$16.90	P&R FLAG LIGHT
WE ENERGIES	2/21/2020	\$20.72	P&R FIELD LIGHTING
WE ENERGIES	2/21/2020	\$15.71	P&R ELECTRIC
WI RURAL WATER ASSOCIATION	2/18/2020	\$250.00	SW ANNUAL TECH CONFERENCE
WI RURAL WATER ASSOCIATION	2/18/2020	\$250.00	SW ANNUAL TECH CONFERENCE
WISCONSIN KENWORTH	2/18/2020	\$7.71	FD KNOB WITH INSERT
WISCONSIN LEGAL BLANK	2/14/2020	\$449.55	CT ABSENTEE ENV
WISCONSIN LEGAL BLANK	2/14/2020	\$1,098.90	CT ABSENTEE ENV
WISCONSIN LEGAL BLANK	2/14/2020	\$339.85	CT BLUE, WHITE PADS
XEROX CORPORATION	2/17/2020	\$54.72	SW LATE FEE

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 4.**

DATE: March 16, 2020

DEPARTMENT: Fire Department

PROVIDED BY:

SUBJECT:

A Proclamation Recognizing Division Chief Misiak. [Mayor Bierce]

BACKGROUND:

FINANCIAL IMPACT:

RECOMMENDED MOTION:

ATTACHMENTS:

Description

Award Notification Letter

Misiak Proclamation



FEMA

February 3, 2020

Fire Chief Kevin I. Bierce
City of Pewaukee Fire Department
W239 N2242 Pewaukee Road
Waukesha, Wisconsin 53188

Dear Chief Bierce,

It is my pleasure to inform you that Trevor Misiak, Division Chief of Training has been selected to receive the 2019 Department of Homeland Security/Federal Emergency Management Agency/U.S. Fire Administration/National Fire Academy Executive Fire Officer Program Outstanding Applied Research Award for the *Executive Development* course. His paper which was entitled "Employee Assistance Program Awareness of the City of Pewaukee Fire Department" was selected from a field of 481 completed Applied Research Projects (ARPs). His ARP along with 50 other entries was evaluated at the 4.0 academic-level. Chief Misiak's work was selected as one of 4 outstanding applied research award winning projects and is deemed truly outstanding.

The selection committee chose his ARP as an example of excellent work for its contribution to the professionalism of the fire service and providing others inspiration to achieve new heights.

You and your city are to be commended for Chief Misiak's success and for the support provided to him. His research will now be available nationwide so others may benefit from this success. His work with your support truly contributes to the mission of the Department of Homeland Security/Federal Emergency Management's U.S. Fire Administration Agency in making a prepared and resilient fire and emergency medical services.

Once again, we extend our congratulations to Chief Misiak, you, and your organization and jurisdiction.

Sincerely,

A handwritten signature in blue ink, reading "Tonya L. Hoover".

Tonya L. Hoover
Superintendent
National Fire Academy
U.S. Fire Administration

A Proclamation
In Recognition of
DIVISION CHIEF TREVOR MISIAK

WHEREAS, Division Chief Trevor Misiak is participating in the 4 year long Executive Fire Officer Program; and

WHEREAS, Division Chief Misiak's first course was called Executive Development; and

WHEREAS, a requirement of this course is to perform an Applied Research Project; and

WHEREAS, Division Chief Misiak's project was entitled "Employee Assistance Program Awareness of the City of Pewaukee Fire Department". His project was selected from a field of 481 completed projects to be evaluated at the 4.0 academic-level. Division Chief Misiak's work was selected as one of 4 outstanding applied research award winning projects and he received the 2019 Department of Homeland Security/Federal Emergency Management Agency/U.S. Fire Administration/National Fire Academy Executive Fire Officer Program Outstanding Applied Research Award; and

WHEREAS, Division Chief Misiak's research will now be available nationwide so others may benefit from this success.

NOW, THEREFORE BE IT PROCLAIMED, that I, Steve Bierce, Mayor and I, Colleen Brown, Common Council President, of the City of Pewaukee, Wisconsin, on behalf of the City of Pewaukee, congratulate Division Chief Trevor Misiak on this accomplishment and thank him for being an exemplary representative of the Pewaukee Fire Department and City of Pewaukee.

Presented on this 16th day of March, 2020.

Steve Bierce,
Mayor

Colleen Brown,
Common Council President

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 5.**

DATE: March 16, 2020

DEPARTMENT: Clerk/Treasurer

PROVIDED BY:

SUBJECT:

Discussion and Possible Action Regarding **Resolution 20-03-05** Revising the City's Investment Policy [Tami Olszewski - Ehlers]

BACKGROUND:

FINANCIAL IMPACT:

RECOMMENDED MOTION:

ATTACHMENTS:

Description

Resolution 20-03-05

Portfolio Review

RESOLUTION NO. 20-03-05

RESOLUTION REVISING THE INVESTMENT POLICY FOR THE CITY OF PEWAUKEE

WHEREAS, the Finance Committee reviewed and made recommendation to the City of Pewaukee's Financial Policies and Procedures on June 8, 2010; and

WHEREAS, the Common Council adopted Resolution 10-07-18 entitled "Establishing Financial Policies and Procedures for the City of Pewaukee" on July 7, 2010

WHEREAS, the policy should be reviewed at least every three (3) years or sooner at the discretion of the Common Council.

BE IT HEREBY RESOLVED by the Common Council of the City of Pewaukee that it hereby revises the following investment policy in the public interest:

INVESTMENT POLICY

General: The purpose of these investment guidelines is to formalize the framework for the City's daily investment activities. The guidelines are intended to be broad enough to allow the investment officer to function properly within the parameters of responsibility and authority, yet specific enough to adequately safeguard the investment assets.

I. PUBLIC DEPOSITS

- A. **Depository.** The Common Council hereby designates J.P. Morgan Chase Bank as its public depository effective July 20, 2009, or as soon as practicable to facilitate the transition between depositories, in which the City Clerk/Treasurer shall deposit all public monies received by him/her on a daily basis in the name of the City of Pewaukee without any restriction as to the amount of deposit.
- B. **Limitations.** Not more than five hundred thousand dollars (\$500,000) shall be deposited in any one public depository unless properly collateralized or specifically authorized by the Common Council. The limit shall not include funds held for collection or in transit; accounts established for tax collections; escrow or other accounts requiring segregated funds as specified in City agreements (For example, Developer Escrow Agreements).
- C. **Deposit of Tax Payments.** In addition to the public depository denoted in Section I (A) above, the City Clerk/Treasurer, at his/her discretion, shall be authorized to establish and maintain accounts with local financial institutions for the purpose of accepting tax payments on behalf of the City of Pewaukee.
- D. **Withdrawals.** Withdrawals or disbursements by the City Clerk/Treasurer of monies deposited in a public depository shall be made as provided by sec. 66.0607, Wisconsin Statutes. The City Clerk/Treasurer is authorized at his/her discretion, to process periodic payments through the use of money transfer techniques as set forth in sec. 66.0607(3m), Wisconsin Statutes.

II. INVESTMENTS

- A. **Funds.** Subject to the provisions of this policy, the City Clerk/Treasurer or his/her designee shall have control of and discretion in the investment of all City funds that are not immediately needed and are available for investment. These funds are accounted for in the Financial Statements of the Annual Auditor's Report and include: General Fund; Special Revenue Funds; Debt Service Funds; Capital Project Funds; Enterprise Funds; Trust & Agency Funds; and any new fund created by the legislative body unless specifically exempt.
- B. **Intent.** It is the intent of the Common Council that the City Clerk/Treasurer utilize a wise and prudent cash management system within the level of his/her expertise in such a manner to ensure maximum investment earnings, while at the same time be able to respond promptly to authorized expenditures. The primary objectives, in priority order, of the City's investment activities shall be:
- I. *Safety:* Safety of principal is the foremost objective of the investment program. Investments of the City shall be undertaken in a manner that seeks to ensure the preservation of capital in the overall portfolio. Diversification and collateralization are two methods that may be used to attain this objective.
 2. *Liquidity:* The City's investment portfolio will remain sufficiently liquid to enable the City to meet all operating requirements that might be reasonably anticipated.
 3. *Return on Investment:* The City's investment portfolio shall be designed with the objective of attaining a market average rate of return throughout budgetary and economic cycles, taking into account the City's investment risk constraints and the cash flow characteristics of the portfolio.

Subject to requirements of the above objectives, it is the policy of the City of Pewaukee to offer financial institutions within the City of Pewaukee the opportunity to bid on investments; however, the City of Pewaukee will seek the best investment yields *and lowest costs*.

- C. **Scope.** The policy is limited in its application to funds that are not immediately needed and are available for investment. Other funds, the investment of which is subject to special federal and/or state laws and regulations, shall be invested in accordance with such laws and regulations to the extent they may be inconsistent with the provisions of this policy.
- D. **Responsibility.** In exercising his/her investment responsibilities, the City Clerk/Treasurer shall exercise the care, skill, prudence and diligence under the circumstances then prevailing that a prudent person acting in a similar capacity, with the same resources, and familiar activity, with a like purpose would use.
- E. **Diversification.** The City will attempt to diversify its investments according to type, maturity and institution. The portfolio, as much as possible, should contain both short-term and long-term investments. The City shall attempt to match its investments with anticipated cash flow requirements. Extended maturities may be utilized to take advantage of higher yields, however, the average weighted maturity of the portfolio should not be longer than 5 years. For the purpose of this section, the City's cash balance as of each June 30 shall be used to determine the percentage of funds available for investment. With the exception of

U.S. Treasury bonds and securities, and U.S. Government Agency bonds the City's total investment portfolio shall not be overly concentrated in a single security type or with a single financial institution.

- F. **Investments.** The investment of City funds shall be in accordance with Sections. 34.01 & 66.0603, Wisconsin Statutes, *see appendix A*.
- G. **Collateralization.** Collateralization will be required on two types of investments: certificates of deposit that exceed the State and FDIC insurance limits and repurchase agreements. In order to anticipate changes and provide a level of security for all funds, the collateralization level will be one hundred two percent (102%) of the market value of principal and accrued interest. Collateral shall be limited to securities of the U.S. Treasury and securities which are direct obligations of or guaranteed as to principal and interest by the federal government; and securities which are obligations of an agency, commission, board or other instrumentality of the federal government, where principal and interest are guaranteed by the federal government. Collateral shall always be held by an independent third party and evidenced by safekeeping receipts.
- H. **Safekeeping.** When investments purchased by the City are held in safekeeping by a broker/dealer they must provide asset protection of \$500,000 through the Securities Investor Protection Corporation (SIPC) and at least another \$49,500,000 supplemental insurance protection.

III. MISCELLANEOUS

- A. Any surplus funds of the City shall be invested by the City Clerk/Treasurer in compliance with this Investment Policy and Wisconsin Statutes in any public depository in such a manner that the highest yield can be obtained from these investments.
- B. In order to safeguard investments and deposits, the City's Finance Committee, City Administrator, or City Clerk/Treasurer shall periodically review all depositories utilized by the City.
- C. **Liability.** Notwithstanding any other provision of law, the City Clerk/Treasurer who deposits public monies in any public depository, in compliance with Section 34.05, Wisconsin Statutes, is under the provisions of Section 34.06, Wisconsin Statutes, relieved of any liability for any loss of public monies which results from the failure of any public depository to repay to the public depositor the full amount of its deposits, thus causing a loss as defined in Sec. 34.01(2), Wisconsin Statutes.
- D. **Definitions.** Words and phrases shall, insofar as applicable, have the meanings set forth in Section 34.01, Wisconsin Statutes, as amended.
- E. **Conflict.** This policy is enacted in accordance with the provisions of Chapter 34 and Sections 66.0603 and 66.0607, Wisconsin Statutes, or as amended. In case of conflict, state laws shall prevail.
- F. **Duration.** This policy shall continue in force until repealed or superseded by action of the Common Council.
- G. **Reporting.** The City Clerk/Treasurer shall provide the Finance Committee chairperson

with a quarterly investment report that provides a summary of the City's current investments. The quarterly report shall include a listing of the individual securities held at the end of the reporting period; final maturity of all investments listed; rate of return being earned on each individual security or investment; and total dollar amount held by each financial institution to ensure all funds are fully protected.

- H. **Considerations.** Any investment currently held that would not meet the guidelines of this policy shall be exempt from the requirements of the policy. At maturity or liquidation, such monies shall be reinvested only as provided under this policy.

Investment Policy Considerations:

The investment policy will be reviewed every three (3) years by the Finance Committee or sooner at the discretion of the Common Council.

SEVERABILITY

The several sections of this Resolution shall be declared to be severable. If any section shall be declared by a decision of a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the other provisions of the Resolution.

ADOPTED THIS 16th DAY OF MARCH, 2020.

CITY OF PEWAUKEE

Steve Bierce, Mayor

ATTEST:

Kelly Tarczewski, Clerk/Treasurer

66.0603 Investments.

(1g) DEFINITION. In this section, “governing board” has the meaning given under s. [34.01 \(1\)](#) but does not include a local exposition district board created under subch. [II of ch. 229](#) or a local cultural arts district board created under subch. [V of ch. 229](#).

(1m) INVESTMENTS.

(a) A county, Village, village, town, school district, drainage district, technical college district or other governing board, other than a local professional football stadium district board created under subch. [IV of ch. 229](#), may invest any of its funds not immediately needed in any of the following:

1. Time deposits in any credit union, bank, savings bank, trust company, or savings and loan association which is authorized to transact business in this state.
2. Bonds or securities issued or guaranteed as to principal and interest by the federal government, or by a commission, board or other instrumentality of the federal government.
3. Bonds or securities of any county, Village, drainage district, technical college district, village, town or school district of this state.

3m. Bonds issued by a local exposition district under subch. [II of ch. 229](#).

3p. Bonds issued by a local professional baseball park district created under subch. [III of ch. 229](#).

3q. Bonds issued by a local professional football stadium district created under subch. [IV of ch. 229](#).

3s. Bonds issued by the University of Wisconsin Hospitals and Clinics Authority.

3t. Bonds issued by a local cultural arts district under subch. [V of ch. 229](#).

3u. Bonds issued by the Wisconsin Aerospace Authority.

4. Any security which matures or which may be tendered for purchase at the option of the holder within not more than 7 years of the date on which it is acquired, if that security has a rating which is the highest or 2nd highest rating category assigned by Standard & Poor's corporation, Moody's investors service or other similar nationally recognized rating agency or if that security is senior to, or on a parity with, a security of the same issuer which has such a rating.

5. Securities of an open-end management investment company or investment trust, if the investment company or investment trust does not charge a sales load, if the investment company or investment trust is registered under the investment company act of 1940, [15 USC 80a-1](#) to [80a-64](#), and if the portfolio of the investment company or investment trust is limited to the following:

(a.) Bonds and securities issued by the federal government or a commission, board or other instrumentality of the federal government.

(b.) Bonds that are guaranteed as to principal and interest by the federal government or a commission, board or other instrumentality of the federal government.

(c.) Repurchase agreements that are fully collateralized by bonds or securities under subd. [5. a.](#) or [b.](#)

Portfolio Review

01/01/2019 - 12/31/2019

Pewaukee Investment Holdings (104051)

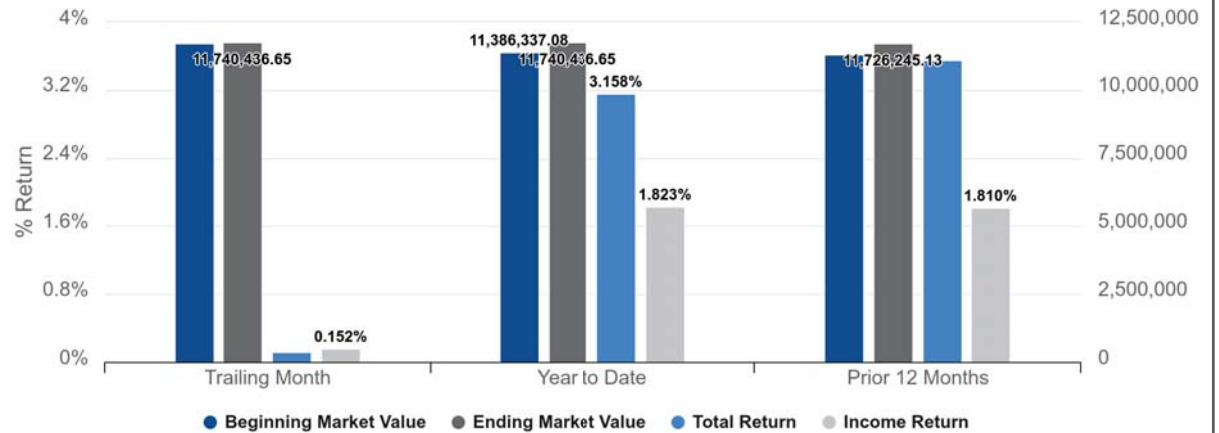
Dated: 03/11/2020

Investment Summary + Transactions

	Portfolio
Beginning Market Value	11,386,337.08
Beginning Accrued Balance	46,823.50
Net Realized Gain/Loss	2,778.46
Interest/Dividend Received	224,354.99
Net Amortization/Accretion Income	2,603.95
Change In Net Unrealized Gain/Loss	151,010.63
Transaction Total (Net Contribution)	-3,774.66
Expense (Fees deducted from account)	-20,456.47
Change In Accrued Balance	4,168.07
Ending Accrued Balance	50,991.57
Ending Market Value	11,740,436.65
Ending Market Value + Accrued	11,791,428.22

Footnote: 1

Performance Performance Summary



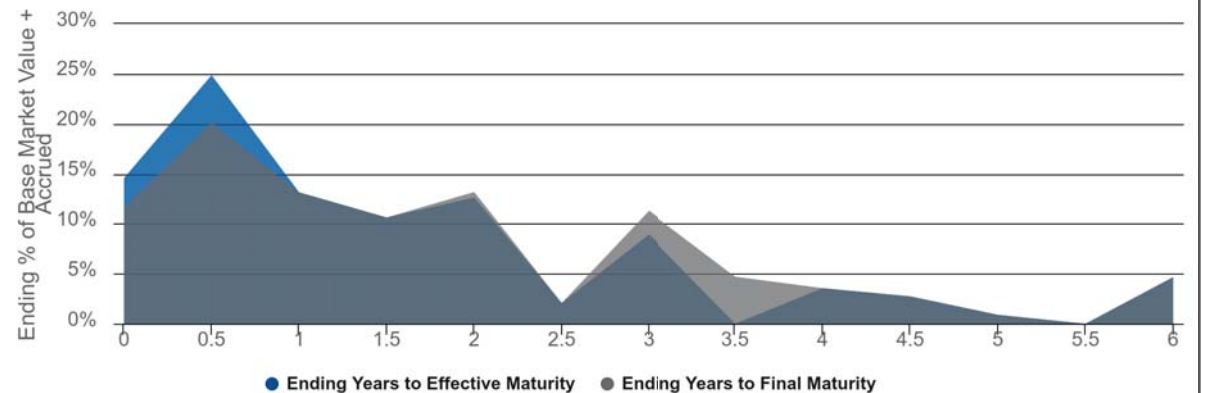
Investment Inventory

Description	Market Value	Purchase Yield	% of Market Value
Ally Bank	250,462.50	1.915	2.133%
Flagstar Bank, FSB	252,450.00	2.373	2.150%
Sallie Mae Bank	253,100.00	2.390	2.156%
Marlin Business Bank	253,262.50	2.370	2.157%
Goldman Sachs Bank USA	253,384.92	2.496	2.158%
Citibank, N.A.	256,165.20	3.070	2.182%
FEDERAL NATIONAL MORTGAGE ASSOCIATION	599,363.50	1.161	5.105%
FEDERAL HOME LOAN BANKS	793,961.60	1.907	6.763%
FEDERAL HOME LOAN MORTGAGE CORP	1,337,851.45	1.792	11.395%
FEDERAL FARM CREDIT BANKS FUNDING CORP	2,188,664.90	1.882	18.642%
Other	5,301,770.08	2.238	45.158%

Total 11,740,436.65 2.067 100.000%

Footnotes: 2,3,4

Time to Maturity



Portfolio Review

01/01/2019 - 12/31/2019

Pewaukee Investment Holdings (104051)

Dated: 03/11/2020

Cash and Fixed Income Summary

Risk Metric	Value
MMFund	145,146.63
Fixed Income	11,646,281.59
Duration	1.277
Convexity	-0.463
WAL	1.620
Years to Final Maturity	1.839
Years to Effective Maturity	1.618
Yield	1.792
Book Yield	2.044
Avg Credit Rating	A+/A1/A+

Exposure - Asset Class

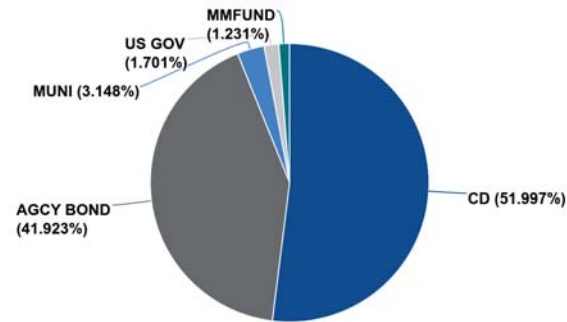


Chart calculated by: Market Value + Accrued

1: * Weighted by: Ending Market Value + Accrued. 2: * Grouped by: Description. 3: * Groups Sorted by: Market Value. 4: * Weighted by: Market Value.

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 6.**

DATE: March 16, 2020

DEPARTMENT: Public Works

PROVIDED BY: Magdelene Wagner

SUBJECT:

Discussion and Possible Action Regarding the Selection of the Busse Road Bridge Replacement Alternative [Wagner]

BACKGROUND:

The City is required to inspect all four bridge owned and maintained by the City bi-annually. Busse Road Bridge is located south of I-94 and north of Bluemound Road. During the 2016 inspection of Busse Road Bridge, it was determined the bridge is in failure due to the haunches of the culvert pipe rusting through. In early 2017, the City was ordered by the State of Wisconsin to weight restrict the bridge due to its condition. Preliminary discussion occurred in 2017 on options for rehabilitating the bridge due to the low volume of the roadway. However, it was determined any rehabilitation would increase the floodplain elevation which would not be allowed without purchasing, at a minimum, floodplain easements from upstream properties. Given this and the condition of the existing culverts and headwalls, the City decided to pursue a bridge replacement. The City authorized the design for the Busse Road Bridge Replacement in 2018, executing a design contract with the Consultant, IMEG.

Shortly after the design agreement was executed, Busse Road Bridge's headwall was partially washed out. A temporary fix was permitted and completed in May 2018 by City forces.

In 2018, the Consultant completed the survey, wetland delineations, stream modeling, and alternatives. This was presented to Staff in late 2018. Interestingly, during the design right of way research, it was determined that the existing bridge and a portion of Busse Road are not in the platted right of way, but rather on private property. In addition, Staff and Consultant met with the Wisconsin Department of Natural Resources on site to discuss possible locations of the bridge and get preliminary buy-in from the regulating bodies.

Alternative One is moving the bridge to be contained with the existing platted right of way to the west of the current bridge location. See attachment labeled Alternative One. The estimated cost of installing the bridge in this location is \$487,855. Permanent property acquisition is required for the road that is currently located outside of the right of way. This would require 0.09 acre right of way from Johnson/Rosseau and 0.05 acre right of way from Jones. During Staff discussion with the adjacent property owners, we will likely need to condemn this land as our preliminary discussions with them is they do not support this alternative. In addition, temporary construction easements (0.04 acre from Johnson/Rosseau and 0.05 acre from Jones) are required for this alternative. The acquisition costs are not included in the estimate above.

Alternative Two is replacing the bridge in its current location which requires a temporary crossing for access to the Jones parcel. See attachment labeled Alternative Two. The estimated cost of installing the bridge in its current location with a temporary crossing is \$621,080. Permanent property acquisition is required for the bridge and the road that is currently located outside of the right of way in the amount of 0.27 acre from Jones. In addition, a temporary construction easement is required for the temporary access in the amount of 0.18 acre which would be required from

Jones. The acquisition costs are not included in the above estimate. A temporary access is required for this alternative as Busse Road is the only access for the Jones property and the business that operates from this location. The access is required to be constructed to allow emergency operations to utilize the road if necessary. This alternative cannot be constructed without an access to this property. To further clarify, this access is a temporary crossing that passes the base flow of the stream without overtopping. Any rainfall events will likely overtop the crossing reducing or eliminating the access to this parcel until the water recedes and will likely require some additional maintenance before access can be granted again.

Staff also briefly reviewed 2 additional alternatives of bridges to the east and west of the existing bridge, but these were ruled out due to property acquisition, environmental considerations, and/or moving the bridge too close to the existing structures.

Staff had preliminary discussions with the adjacent property owners based on the two viable alternatives. A letter was received from Ms. Jones regarding the desire to replace the bridge in its current location to preserve the beauty of the area and preserve trees. She also offered to donate or receive a nominal fee the land if necessary to accommodate the current location. See attachment Jones Letter. It is also our understanding that Johnson/Rosseau are opposed to any acquisition of their property.

This is a difficult project to give a recommendation for. Alternate One appears to be the cheaper alternative by \$133,225. It is unlikely that the required land acquisition costs will exceed this value, but it is not known at this time. However, the neighbors impacted do not support this alternative so the acquisition will likely be a lengthy process. The WDNR has stated they would likely approve this alternative location.

Alternate Two is more expensive, largely due to the temporary crossing that is required for the Jones parcel. The permitting from the WDNR might be slightly more difficult for this reason as well, but still attainable. The land acquisition is more with this alternative, however, we have a property owner who is willing to work with the City with the acquisition (perhaps even donate the land) so the process will likely move quickly. In addition, the neighbors prefer this alternative. Alternate Two is riskier from an access and safety perspective. The temporary crossing is highly dependent on the weather/rainfall during the construction period. Any rainfall or snow melt may eliminate the access until the water levels recede and access is returned to the property which we will have no control on the timing of this. Access will be limited for police and fire service and their equipment to the Jones property. An alternate emergency only access from I-94 may be possible, however we have not pursued this discussion yet with the State and we have no guarantees we will be granted this access.

From a purely fiscal and safety viewpoint, we would recommend Alternative One.

Mr. Mueller on behalf of Ms. Jones has asked for several items and letters to be included in the agenda packet as well for your information and discussion. You will find these under Mueller Items.

FINANCIAL IMPACT:

The City currently has budgeted in 2020 \$350,000 from the Storm Water Utility and \$350,000 from the Road portion of the City budget for a total of \$700,000 allocated for the Busse Road Bridge Replacement. Grant funding sought for this project have not been awarded.

Alternative One has an estimated budget without property acquisition of \$487,855.

Alternative Two has an estimated budget without property acquisition of \$621,080.

It should be noted that these estimates are based on a cast in place structure. From the initial estimates, this would be the least expensive method for this bridge replacement. We will review a precast bridge (commonly referred to as a

Conspan) once a final location of the bridge is selected to ensure we are pursuing the least expensive method to replace this bridge.

Property acquisition costs were not included in the estimates due to the wide variance in acquisition costs and to not bias the process. A typical property appraisal cost is in the range of \$2,500 to \$4,000 per parcel which we are required to complete and must offer to pay for an additional one if the property owner would elect to have one of their own. In addition, we will incur Attorney fees in the final paperwork and filings. If the property owners do not accept the appraised value offered, we could potentially go to Condemnation Court.

RECOMMENDED MOTION:

Direct staff to pursue Alternate _____ as the recommended replacement of the Busse Road Bridge.

ATTACHMENTS:

Description

Busse Road Bridge Location

Busse Bridge Property owners

Alternate One

Alternate One Estimate

Alternate Two

Alternate Two Estimate

Jones Letter

Mueller Letter 3.2.2020

Mueller Letter 3.6.2020

Maps from Mueller





NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION	DRAWN EMK	PROJECT TITLE CLIENT NAME VILLAGE, TOWN, OR CITY COUNTY, WISCONSIN	ALTERNATIVE 1	DATE 04/2018	 Robert E. Lee & Associates, Inc. ENGINEERING, SURVEYING, ENVIRONMENTAL SERVICES 1250 CENTENNIAL CENTRE BOULEVARD HOBART, WI 54155 920-662-9541 www.raleecinc.com	SHEET NO. X
								CHECKED BBB			FILE 22ND BUSSE RD TOPO REL		
								DESIGNED MSB			JOB NO. 2800001		

Page 5 of 26

BUSSE RD

PEWAUKEE, WI

IMEG NO. 18002280.00

ALTERNATE 1 - WEST REALIGNMENT

	ITEM DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
1	PAVEMENT REMOVAL	SQ YD	9,000	\$12.00	\$108,000.00
2	GUARDRAIL REMOVAL	L.F.	360	\$10.00	\$3,600.00
3	EARTH EXCAVATION	CU YD	700	\$35.00	\$24,500.00
4	AGGREGATE BASE COURSE, TYPE B 10"	TON	560	\$30.00	\$16,800.00
5	HOT-MIX ASPHALT SURFACE COURSE, 1.5"	TON	85	\$95.00	\$8,075.00
6	HOT-MIX ASPHALT BINDER COURSE, 3.5"	TON	210	\$95.00	\$19,950.00
7	BITUMINOUS MATERIALS (TACK COAT)	LBS	230	\$1.00	\$230.00
8	GUARDRAIL	L.F.	200	\$23.00	\$4,600.00
9	RIPRAP HEAVY	CU YD	400	\$60.00	\$24,000.00
10	TREE REMOVAL (6 TO 15 IN DIAMETER)	UNIT DIAMETER	217	\$100.00	\$21,700.00
11	TREE REMOVAL (OVER 15 IN DIAMETER)	UNIT DIAMETER	294	\$100.00	\$29,400.00
12	CLEARING AND GRUBBING	SQ YD	1,750	\$4.00	\$7,000.00
13	RIGHT-OF-WAY ACQUISITION	AC	0.06		
14	TEMPORARY CONSTRUCTION EASEMENT	AC			
15	BRIDGE	L.S.	1	\$220,000.00	\$220,000.00
TOTAL					\$487,855.00

Wednesday, July 3, 2019 2:27:20 PM
G:\2018\18002280.DWG\CAD-BIM FOLDERS\CIVIL\3D DWG SURVEY\2280 BUSSE RD TOPO-1-30.DWG



REVISIONS		DATE	
No.	DESCRIPTION		



4850 GRAND AVENUE
CURVEE, IL 60031
PH: 847.335.7100
www.imegcorp.com
Illinois Design Firm Registration #164-000973

BUSSE ROAD PHII PEWAUKEE, WISCONSIN	PROP. TEMP CL ROAD AND BRIDGE
--	-------------------------------

IMEG Project No:
18000358.00
File Name:
2280 Busse Rd Topo-1-30.dwg
© COPYRIGHT 2019
ALL RIGHTS RESERVED
Field Book No: #####
Drawn By: TEM
Checked By: JT
Date: 07/03/2019

1
Sheet 1 of 1

BUSSE RD

PEWAUKEE, WI

IMEG NO. 18002280.00

ALTERNATE 3 - EXISTING ALIGNMENT WITH TEMPORARY BYPASS

	ITEM DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
1	PAVEMENT REMOVAL	SQ YD	900	\$12.00	\$10,800.00
2	GUARDRAIL REMOVAL	L.F.	560	\$10.00	\$5,600.00
3	EARTH EXCAVATION	CU YD	600	\$35.00	\$21,000.00
4	AGGREGATE BASE COURSE, TYPE B 10"	TON	500	\$30.00	\$15,000.00
5	HOT-MIX ASPHALT SURFACE COURSE, 1.5"	TON	75	\$95.00	\$7,125.00
6	HOT-MIX ASPHALT BINDER COURSE, 3.5"	TON	185	\$95.00	\$17,575.00
7	BITUMINOUS MATERIALS (TACK COAT)	LBS	200	\$1.00	\$200.00
8	GUARDRAIL	L.F.	560	\$23.00	\$12,880.00
9	PIPE CULVERTS, SPECIAL 72"	L.F.	100	\$200.00	\$20,000.00
10	RIPRAP HEAVY	CU YD	400	\$60.00	\$24,000.00
11	TREE REMOVAL (6 TO 15 IN DIAMETER)	UNIT DIAMETER	231	\$100.00	\$23,100.00
12	TREE REMOVAL (OVER 15 IN DIAMETER)	UNIT DIAMETER	176	\$100.00	\$17,600.00
13	CLEARING AND GRUBBING	SQ YD	1,550	\$4.00	\$6,200.00
14	TEMPORARY CONSTRUCTION EASEMENT	AC			
15	BRIDGE	L.S.	1	\$220,000.00	\$220,000.00
16	TEMPORARY BYPASS BRIDGE	L.S.	1	\$220,000.00	\$220,000.00
				TOTAL	\$621,080.00

Subject:

Busse Rd Bridge Replacement -5/10/19 letter

May 10th, 2019
Jeffery Weigel PE
Director of Public Works
City Of Pewaukee
W240 N3065 Pewaukee Rd
Pewaukee, Wi.
53072

Dear Mr. Weigel,

I wanted to share with the Pewaukee Community my love for the Pewaukee River and the land that I have lived on since 1978. Although the River has sometimes challenged us and our homestead, it is an extraordinary asset to everyone who lives near it or gets to enjoy it. The way the River twists and turns just before the Busse Road bridge is nothing short of spectacular. The beautiful natural "S" curve prior to meeting the existing bridge is immediately before a stand of raspberry bushes that I have picked for the past 40 years! (Pictures attached)

It is my understanding, based upon the attached civil engineer's proposed bridge replacement design, that the new all concrete bridge would be positioned to the west of the existing quaint culvert bridge. Not only will this proposed design remove the beauty of the "S" curve, the raspberry bushes, and mature walnut trees, but it will require that the foundation of the old bridge, and as I understand it, approximately 100 feet before and after the bridge be removed. The proposed plan will also require the filling of approximately 9,000+/- square feet of surrounding wetlands and the acquisition of a small bit of private property. In addition to these requirements, the utilities that currently run under the road and bridge, must be addressed, because according to the attached plan they actually run across part of my property with no current utility easement documents.

To prevent the destruction of this natural Pewaukee asset and reduce excess expenses, I would like to suggest that serious consideration be given to the following concepts:

1. Donation of some of my property that is currently surveyed as part of the road and bridge so that the existing bridge could be replaced with no cost or expense for-
 - a. Building new approaches to the proposed bridge, with the change in alignment, acquiring additional property to construct the proposed changes in the road alignment.
 - b. The cost for over excavating the existing wetlands, providing permanent select back fill for the wetlands (and associated destruction of the areas natural beauty).
 - c. The additional cost of moving the existing utilities and providing the proper easement documents for the existing utilities.
 - d. Removal of the multiple Maple and Walnut on either side of the road and destruction of the large berry path on the north of the culvert.
- 2A. In an effort to utilize the extensive existing bridge approach from the north and south, I would offer my land to the east of the existing bridge as a temporary access point to my property. This temporary access would be a lower cost alternative for the city vs. the associated expenses with 1a, 1b, 1c and 1d. I would grant this access for as long as it takes to replace the existing bridge. This concept would allow the City to maximize the utilization of the existing approaches and as much of the existing structure as possible.

2B. As an alternative to 2A above, a civil engineering friend has suggested that it maybe possible to replace the bridge with a "CONTECH Engineered Solution" alternative. This alternative could utilize the current approaches and offers the city the possibility to replace one direction of the bridge at a time without the need to disrupt the surrounding area at all or the expense of building and removing a temporary access around the existing bridge.

CONTECH Website - <https://www.conteches.com/bridges-and-structures>

These alternative offers would:

1. Reduce the overall replacement cost for bridge to the city.
2. Preserve the beauty of the River's natural path and wetlands as well as the Pewaukee River's only "S" curve.
3. Minimize the cost of the replacement bridge and the related north and south approaches
4. Preserve the natural beauty of the Pewaukee River where Pewaukee residents fish and walk with their children and grandchildren.

In my absence please speak directly to my son Steve Mueller as he is available almost anytime to discuss these alternative ideas with you. His phone number is 414 687 7300.

I look forward to hearing from you before any final decisions are made regarding the Busse Rd bridge replacement and my property so we can discuss the above alternatives and any others that friends of the Pewaukee River may have.

Sincerely,



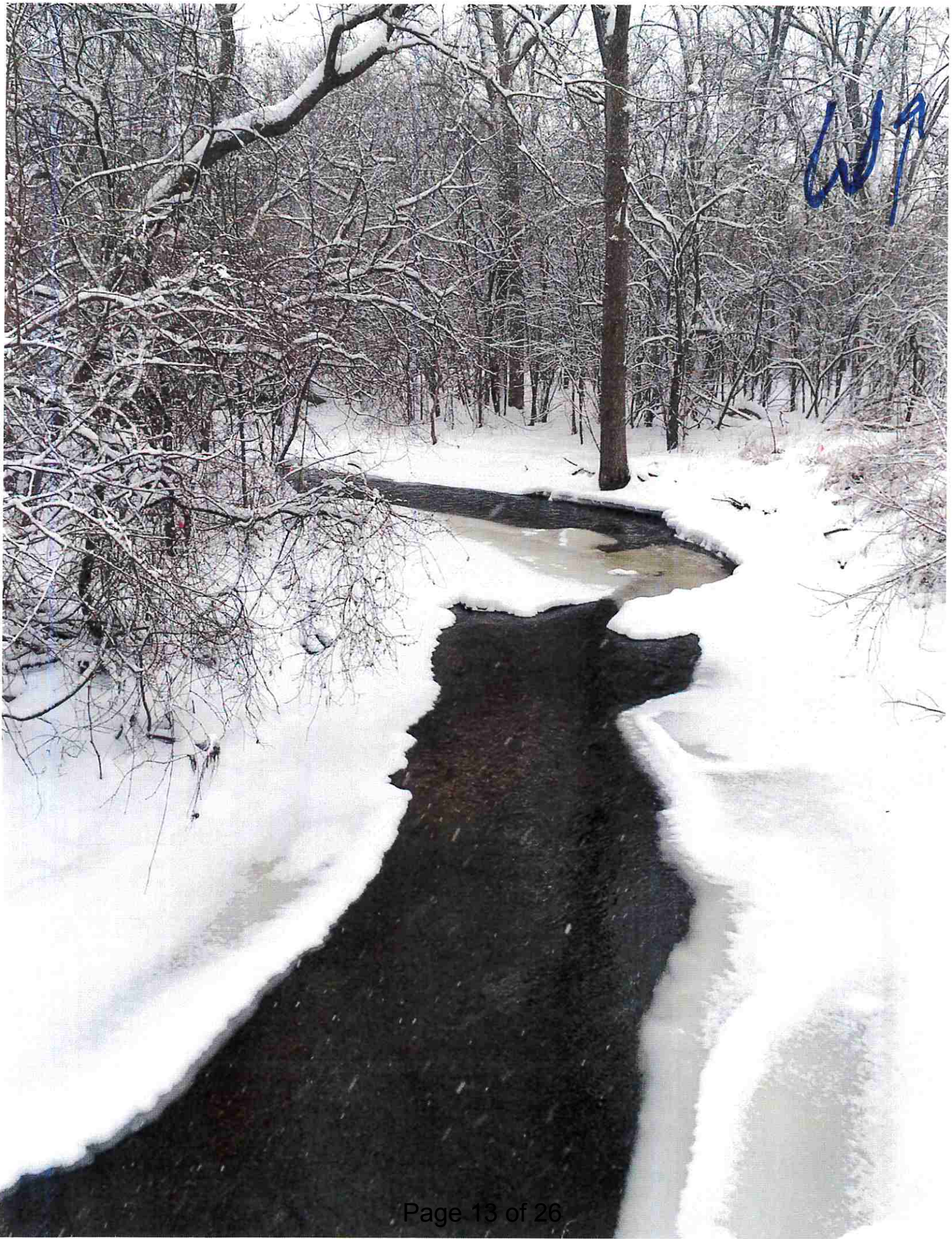
Regina C Jones
W235 N1264 Busse Rd
Waukesha, WI.
53188

Enclosures- Pictures of "S" curve at Busse Rd
LEE Bridge design alternatives
Contech CON/SPAN Series options

CC Steve Bierce
Brian Dziwulski
Jerry Wamser
Nick Fuchs
Nick Phalin -CPRP
Steve Mueller

Pewaukee River "S" Curve at Busse Rd





March 2nd, 2020

Dear members of the Pewaukee Common Council et al,

In late 2018 when my mother Jean Jones learned of the Busse Rd bridge replacement plan over the Pewaukee River and the related destruction of the surrounding trees, wetlands and S Curve in the River, she was upset to say the least. After a number of conversations, she decided to put her money where her heart was and donate her land "under" the road and bridge to the City to save the natural beauty around this very special river crossing.

This offer was made to save the city construction costs and land acquisition costs. In fact, she put this in writing on March 13th 2019 and sent it to the City Department of Public Works office. A copy of the letter is enclosed for your review. Furthermore, she remains committed to this land donation today and if more appropriate, to save the city appraisal costs, she will sell this nominal amount property to the City for whatever the lowest charge could be.

Suffices to say Jean Jones has totally enjoyed this river scene for the last 40 years. That said, she obviously wants to do everything in her power, at age 88 $\frac{3}{4}$ to preserve this scene for generations to come.

She thanks you for your consideration and asks that you please review the pictures and diagrams attached to experience "2nd hand" the City's spectacular asset of the Pewaukee River and its wetlands at the intersection of Busse Rd and the river.

Regards,



Steve Mueller

CC Steve Bierce
 Ray Grosch
 Brandon Bergman
 Jeff Kara
 Colleen Brown
 Jerry Wamser
 Brian Dziwulski
 Kelly Tarczewski
 Nick Fuchs

Enclosures: -3/13/19 Letter to Pewaukee DPW
 -Pictures of Pewaukee River "S" curve at Busse Rd.
 -Diagrams of Pewaukee River at Busse Rd.

Date: March 13th, 2019

Jeffery Weigel

Director of Public Works

City Of Pewaukee

W240 N3065 Pewaukee Rd

Pewaukee, Wi.

53072



Dear Mr. Weigel,

I wanted to share with the Pewaukee Community my love for the Pewaukee River and the land that I have lived on since 1978. Although the River has sometimes challenged us and our homestead, it is an extraordinary asset to everyone who lives near it or gets to enjoy it. The way the River twists and turns just before the Busse Road bridge is nothing short of spectacular. The beautiful natural "S" curve prior to meeting the existing bridge is immediately before a stand of raspberry bushes that I have picked for the past 40 years! (Picture attached)

It is my understanding, based upon the attached civil engineer's proposed bridge replacement design, that the new all bridge would be positioned to the west of the existing quaint culvert bridge. Not only will this proposed design remove the beauty of the "S" curve, the raspberry bushes, and mature walnut trees, but it will require that the foundation of the old bridge, and as I understand it, approximately 100 feet before and after the bridge be removed. The proposed plan will also require the back filling of approximately 9,000-13,000 square feet of surrounding wetlands and the acquisition of some private property. In addition to these requirements, the utilities that currently run under the road and bridge, must be addressed, because according to the attached plan they actually run across part of my property.

To prevent the destruction of this natural Pewaukee asset and reduce excess expenses, I would like to suggest that serious consideration be given to the following alternatives:

1. Donation of my property that is currently surveyed as part of the road and bridge so that the existing bridge could be replaced with no cost or expense-
 - a. for building new approaches to the proposed bridge.
 - b. for the permanent back filling of the wetlands (and associated destruction of the areas natural beauty).
 - c. for moving of existing utilities.
- 2A. In an effort to utilize the extensive existing bridge approach from the north and south, I would offer my land to the east of the existing bridge as a temporary access point to my property. This temporary access would be a lower cost alternative for the city vs. the associated expenses with 1a, 1b, and 1c. I would grant this access for as long as it takes to replace the existing bridge. This concept would allow the City to maximize the utilization of the existing approaches and as much of the existing structure as possible.
- 2B. As an alternative to 2A above, a civil engineering friend has suggested that it maybe possible to replace the bridge with a "Contech Bridge and Structures"* alternative. This alternative would also utilize the the current approaches and offers the city the possibility to replace one direction of the bridge at a time without the need to disrupt the surrounding area at all or the expense of building a temporary access around the existing bridge

* <https://www.conteches.com/bridges-and-structures>

These alternative offers would:

1. Preserve the beauty of the River's natural path and wetlands as well as the Pewaukee River's only "S" curve.
2. Minimize the cost of the replacement bridge and the related north and south approaches
3. Preserve the natural beauty of the Pewaukee River where Pewaukee residents fish and walk with their children and grandchildren.

In my absence please speak directly to my son Steve Mueller as he is available almost anytime to discuss these alternative ideas with you. His phone number is 414 687 7300.

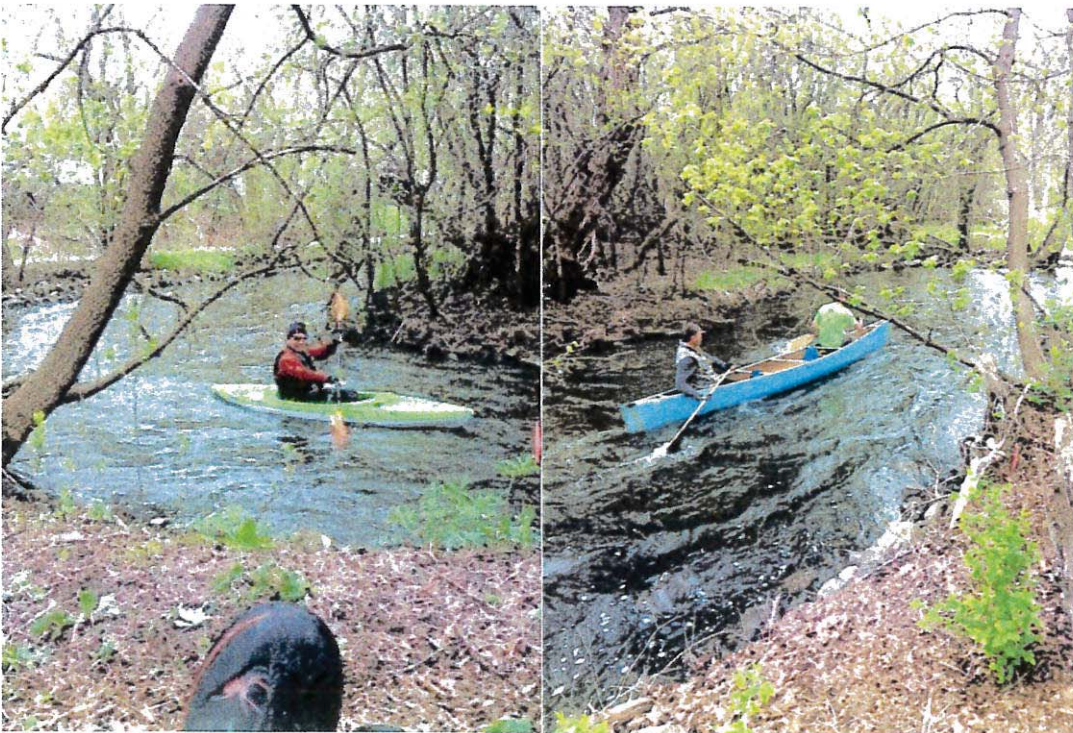
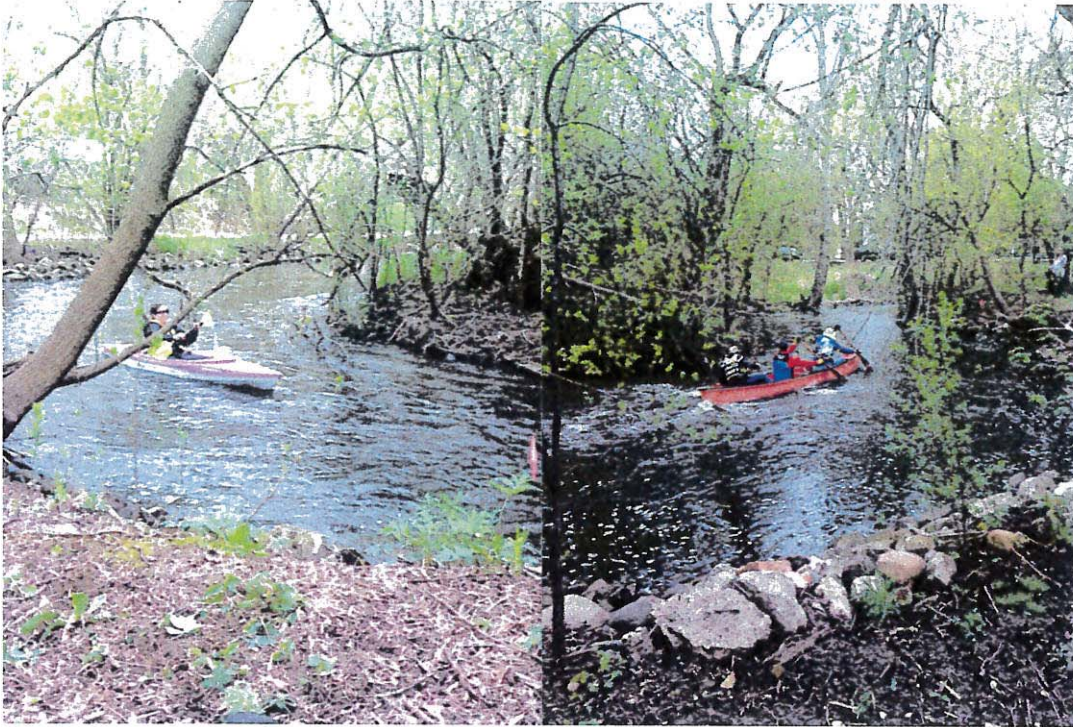
I look forward to hearing from you before any final decisions are made regarding the Busse Rd bridge replacement and my property so we can discuss the above alternatives and any others that friends of the Pewaukee river may have.

Sincerely,

Regina C Jones
W235 N1264 Busse Rd
Waukesha, Wi.
53188

cc Steve Bierce
Nick Fuchs
Kelly Woldanski
Steve Mueller
Sheri Enters

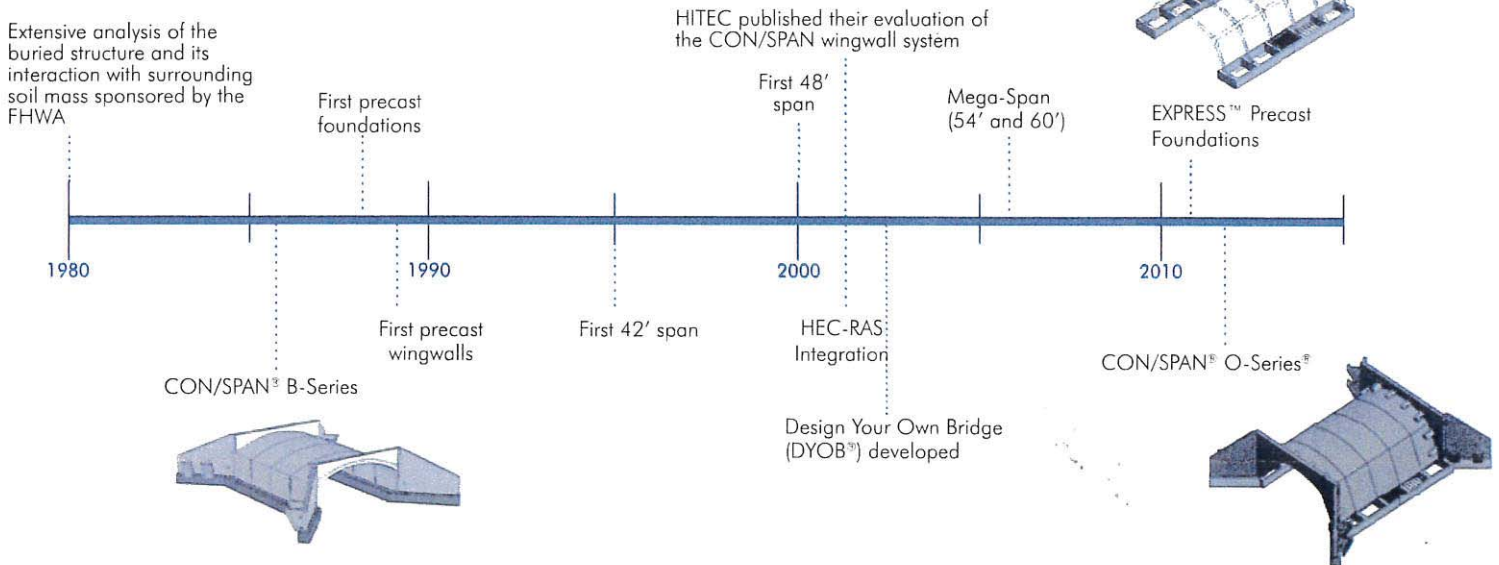
Pewaukee River "S" Curve at Busse Rd



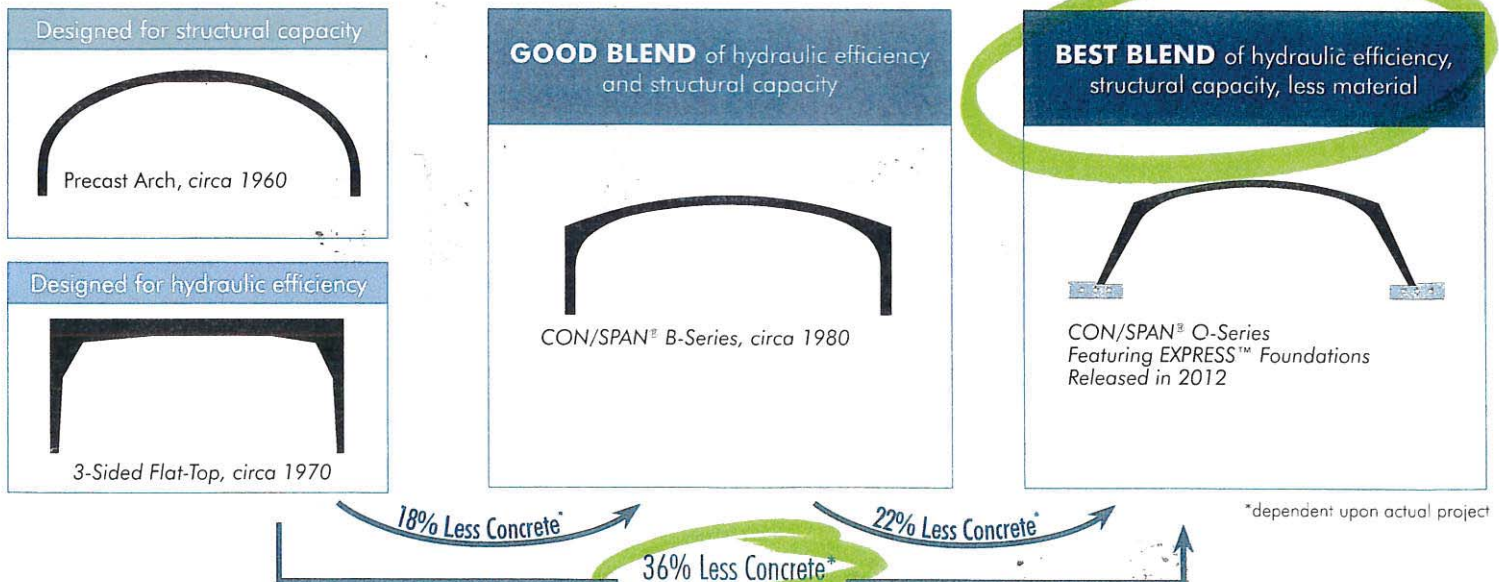


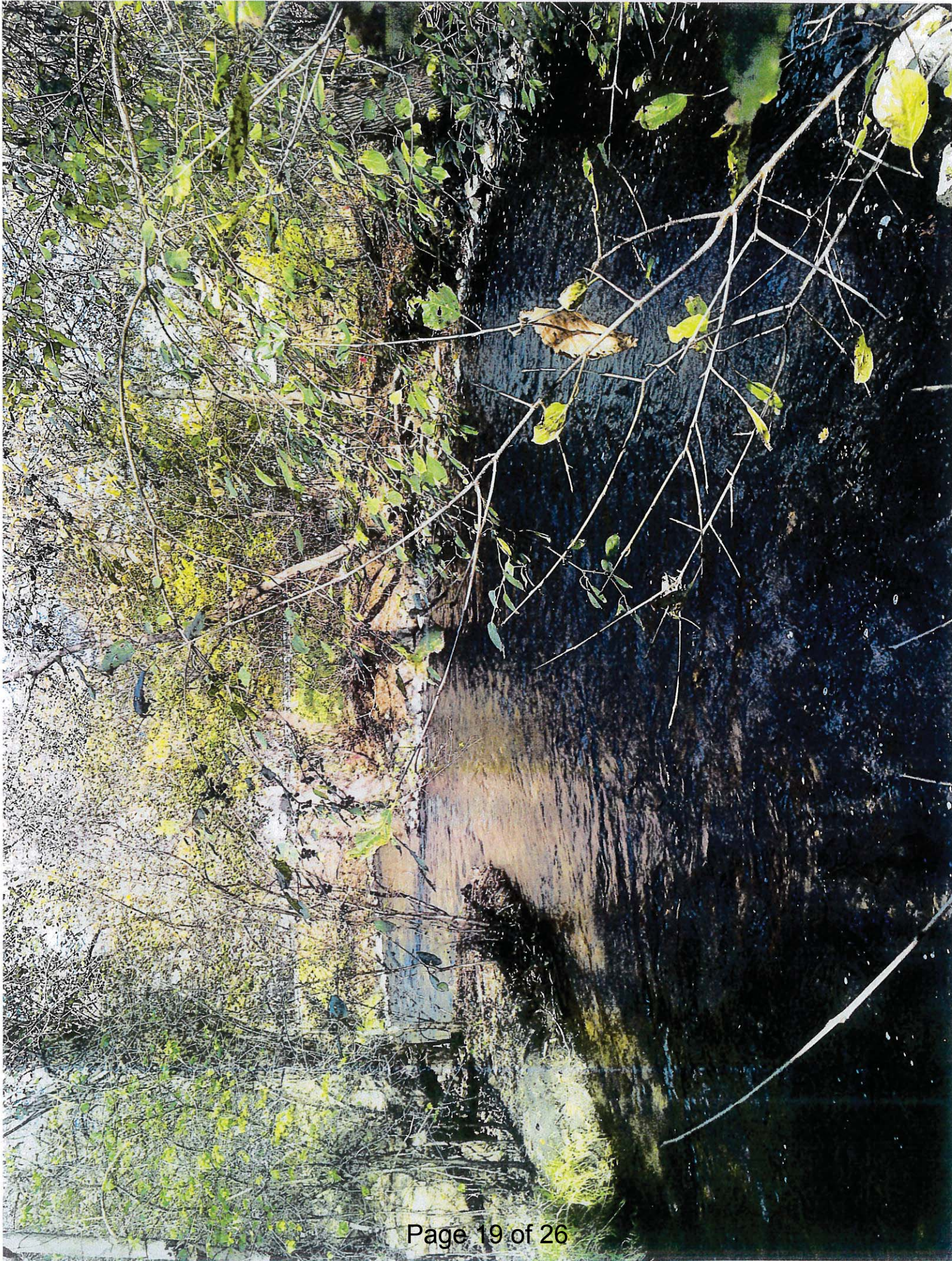
With a history of innovation and experience, Contech has taken precast buried bridge systems to the next level with the optimization of the **CON/SPAN® O-Series®**. Requiring less concrete per open area than any other precast buried bridge structure, the O-Series is the ideal blend of hydraulic efficiency and structural capacity.

A Legacy of Innovative Technologies...



Taken to the Next Level of Optimization...





Steve Mueller

Subject: Pewaukee River "S" Curve at Busse Rd. Bridge



March 6th, 2020

Dear members of the Pewaukee Common Council et al,

This letter is in regards to the replacement of the Busse Rd Bridge over the Pewaukee River.

For those of you who don't know me, I am Jean Jones' son Steve. Jean Jones owns the property at W 235 N 1264 Busse Rd, immediately North and East of the Busse Rd Bridge.

She has asked me to represent her at Mondays' 3/16/20 Common Council meeting since she is out of town. Simply stated my mother does not want to see the picturesque "S" curve at Busse Rd and the River, the nearby 100-year-old trees or the surrounding beauty dismantled by engineers whose task is to just replace a decaying old "bridge".

If you have NOT visited this beautiful river crossing on a spring morning, or on a summer noontime walk, during a sunset or after a fresh snowfall then you have missed seeing a spectacular City asset. To prove the point ask anyone who has canoed or kayaked this stretch of the river and they will immediately share that it is truly a very special place in the river. Please do not let this marvelous piece of nature be lost forever due to a short-sighted bridge replacement.

Bridge replacement facts:

- The City's engineers are really only considering "2" replacement bridge options (please see attachments #1 & #2),
- The two options drastically change the beauty of the area,
- Both options require the removal of the 100+ year old trees along Busse Rd.,
- The tree removal cost estimate is \$40,000-\$50,000,
- Both options require the unnecessary acquisition of property,
- Replacement options #1 & #2 are estimated to cost approximately \$500,000 – \$600,000,
- Option #1 moving the Bridge to the West will destroy the most beautiful "S" curve along the entire Pewaukee River.

-THERE ARE OTHER OPTIONS !

Jean Jones, the neighboring residents and property owners respectfully request that you ask the Engineers to give serious consideration to ideas #3 & #4 (attached). These are ideas that need to be seriously evaluated beyond options #1 & #2 that heretofore have been the only options given serious consideration by the engineers as evidenced by the design time invested in them.

That said it is fear of the residents that without your direct engagement the engineers will just replace an old limestone culvert bridge which will diminish the River's beauty and this magnificent city asset forever!

Please request the engineers evaluate all of the options before it is too late for cost effective evaluation!

Sincerely,



Steve Mueller
414 687 7300

CC Steve Bierce
Ray Grosch
Brandon Bergman
Jeff Kara
Colleen Brown
Jerry Wamser
Brian Dziwulski
Kelly Tarczewski
Nick Fuchs

Enclosures:

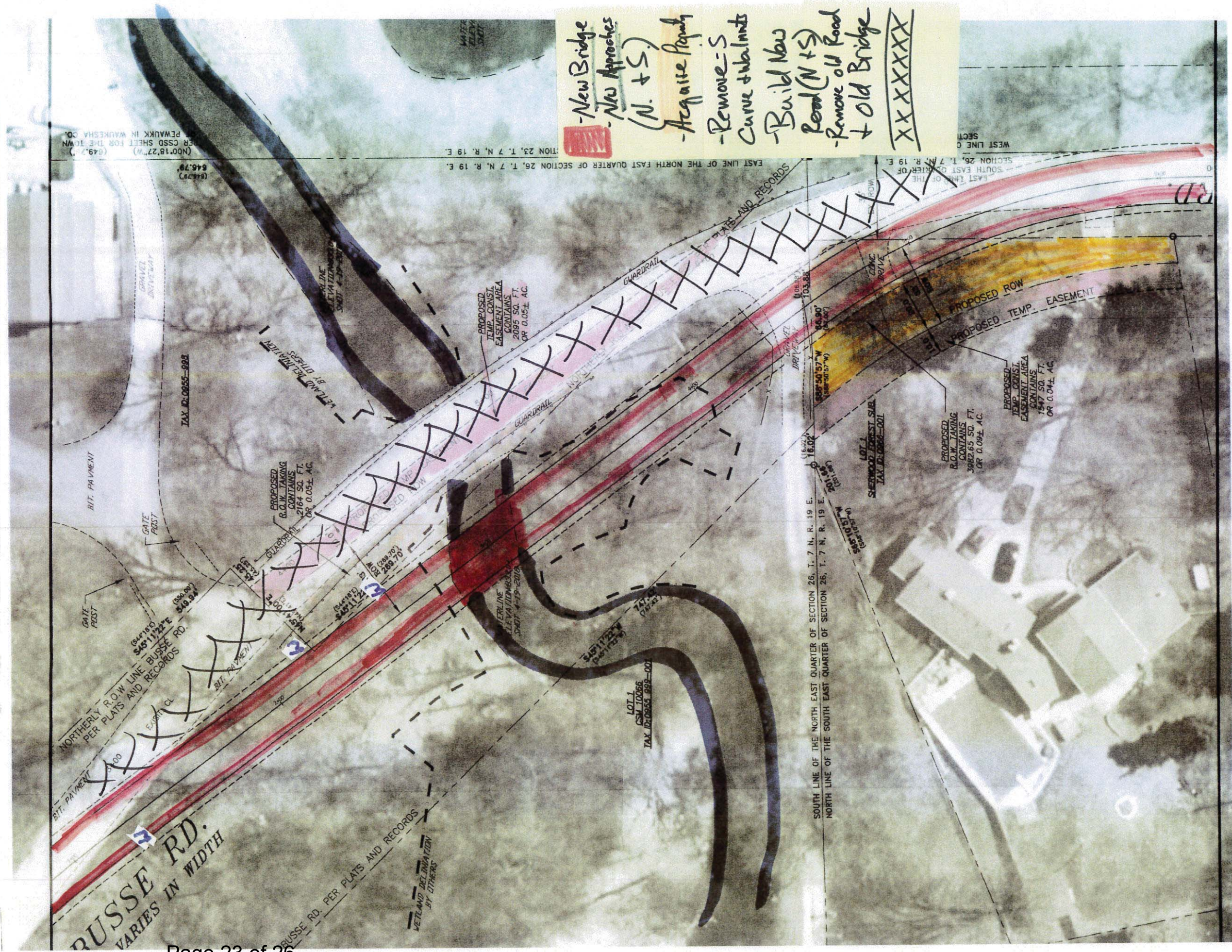
Engineer's Option #1- Replace Bridge to the West.

Engineer's Option #2- Replace bridge in place w/ Temp bypass at **HIGH Grade** next to Bridge

"IDEA" Option #3- Replace bridge in place w/ Temp bypass at a **LOW Grade** crossing where fewer if any mature trees must be removed.

"IDEA" Option #4- Replace bridge in place ONE direction at a time a "Contech" Solution

14



#3



Replace
in place
1 Direction
at a Time.

Page 26 of 26

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 7.**

DATE: March 16, 2020

DEPARTMENT: Public Works

PROVIDED BY: Magdelene Wagner

SUBJECT:

Lindsay Road and Redford Boulevard (CTH F) intersection Study [Wagner]

BACKGROUND:

Previously, the Common Council authorized the City to fund an intersection study of Lindsay Road and Redford Boulevard (CTH F) being completed on our behalf by Waukesha County. The study was completed and a draft report provided to the City in November of 2019. See the study attached. Also in November, the Consultant, along with Waukesha County Staff, presented the Study results to City Staff. At the March 2nd Common Council meeting, Traffic Analysis and Design Inc (TADI) presented the study to the Council Members.

On Monday, February 17, 2020, there was another severe accident at this intersection. Waukesha County, the Sheriff's Department, and the Engineering office received follow up phone calls regarding this accident and the status of the intersection study prompting Staff to bring the presentation to the City Common Council on March 2nd. Unfortunately the day after our presentation (Tuesday March 3rd), there was another severe accident at this intersection.

During the discussion regarding the Study, the Common Council requested a proposal for further analysis of the intersection that included traffic projections from future developable lands near the intersection. Staff also asked for a re-evaluation of alternatives for this intersection beyond the Restricted Crossing U-Turn (RCUT). See the attached Proposal and Agreement. The proposal would include all the information necessary to apply for the Highway Safety Improvement Program (HSIP) grant for funding the improvements at this intersection.

FINANCIAL IMPACT:

There is currently no funds budgeted in 2020 for design or construction improvements for this intersection in the City budget nor in the County budget.

In discussions with Waukesha County, their budget programming typically has a 3-5 year window. In addition, the project would likely include a substantial partnership with the City to assist in the funding of the project.

If the amended study by Traffic Analysis & Design, Inc. is authorized, \$15,912 will need to be re-allocated to allow for this study. It is recommended these funds be re-allocated from the Roundy's Industrial Park Road project previously authorized to be delayed to 2021 or from Contingency Funds.

RECOMMENDED MOTION:

Authorize the Director of Public Works and City Administrator, if desired, to begin discussions with Waukesha County regarding final design of the intersection improvements and establishing funding or other partnership agreements for the intersection improvements including applying for the HSIP grant.

Authorize Traffic Analysis & Design, Inc. to complete an amended study in accordance with the Agreement in the amount not to exceed \$15,912 with funds re-allocated from the account of your choice.

ATTACHMENTS:

Description

TADI Agreement

Intersection Study

AGREEMENT FOR ENGINEERING SERVICES

THIS AGREEMENT is entered into between the **City of Pewaukee** (Client) and **Traffic Analysis & Design, Inc.** (Engineer), based upon Client's intention to perform a traffic impact study and intersection control evaluation for the intersection of CTH F & Lindsay Road in The City of Pewaukee, Wisconsin (the Project) and Client's requirement for certain engineering services in connection with the Project (the Services) which Engineer is prepared to provide.

1. Engineer shall provide the Services described in Attachment A, "Scope of Services", according to Attachment A, "Schedule".
2. Client shall pay Engineer in accordance with Attachment A, "Compensation". Invoices shall be due and payable upon receipt. Invoice amounts not paid within 30 days after receipt shall accrue interest at the rate of 1.5% per month (or the maximum rate permitted by law, if less), with payments applied first to accrued interest and then to unpaid principal.
3. The same degree of care, skill, and diligence shall be exercised in the performance of the Services as is ordinarily possessed and exercised by a member of the same profession, currently practicing, under similar circumstances. No other warranty, express or implied, is included in this Agreement or in any drawing, specification, report, opinion, or other instrument of service, in any form or media, produced in connection with the Services.
4. Engineer shall not be liable to Client for any consequential damages resulting in any way from the performance of the Services. To the fullest extent permitted by law, Engineer's liability under this Agreement shall not exceed Engineer's total compensation actually received under this Agreement.
5. Engineer and Client waive all rights against each other for damages covered by property insurance during and after the completion of the Services.
6. Notwithstanding anything to the contrary in any Attachments hereto, Engineer has no responsibility for (a) construction means, methods, techniques, sequences, procedures, or safety precautions and programs in connection with the Project; or (b) the failure of any contractor, subcontractor, vendor, or other Project participant, not under contract to Engineer, to fulfill contractual responsibilities to Client or to comply with federal, state, or local laws, regulations, and codes.
7. Engineer does not guarantee that proposals, bids, or actual Project costs will not vary from Engineer's cost estimates or that actual schedules will not vary from Engineer's projected schedules.
8. This Agreement may be terminated upon written notice at Client's convenience or by either party in the event of substantial failure by the other party to perform in accordance with the terms of this Agreement. Engineer shall terminate performance of Services on a schedule acceptable to Client, and Client shall pay Engineer for all Services performed and reasonable termination expenses. Paragraphs 4 and 5 shall survive any termination or completion of this Agreement.
9. All documents prepared by Engineer pursuant to this Agreement are instruments of service in respect to the Project. Any use except for the specific purpose intended by this Agreement will be at the user's sole risk and without liability or legal exposure to Engineer. Engineer shall retain its ownership in its data bases, computer software, and other proprietary property. Intellectual property developed, utilized, or modified in the performance of the Services shall remain the property of Engineer.
10. The Services provided for in this Agreement are for the sole use and benefit of Client and Engineer. Nothing in this Agreement shall be construed to give any rights or benefits to anyone other than Client and Engineer.
11. Any notice required by this Agreement shall be made in writing to the address specified below:

Client: City of Pewaukee
W240 N3065 Pewaukee Road
Pewaukee, WI 53072
Attn: Magdelene Wagner, P.E.
Public Works Director

Engineer: Traffic Analysis & Design, Inc.
PO Box 128
Cedarburg, WI 53012
Attn: John A. Bieberitz, P.E., PTOE

IN WITNESS WHEREOF, Client and Engineer have executed this Agreement, effective as of March 6, 2020.

City of Pewaukee (Client)

By: _____

Title: _____

Date: _____

Traffic Analysis & Design, Inc. (Engineer)

By:  _____
John A. Bieberitz, P.E., PTOE

Date: 3/6/20

ATTACHMENT A

SCOPE OF SERVICES

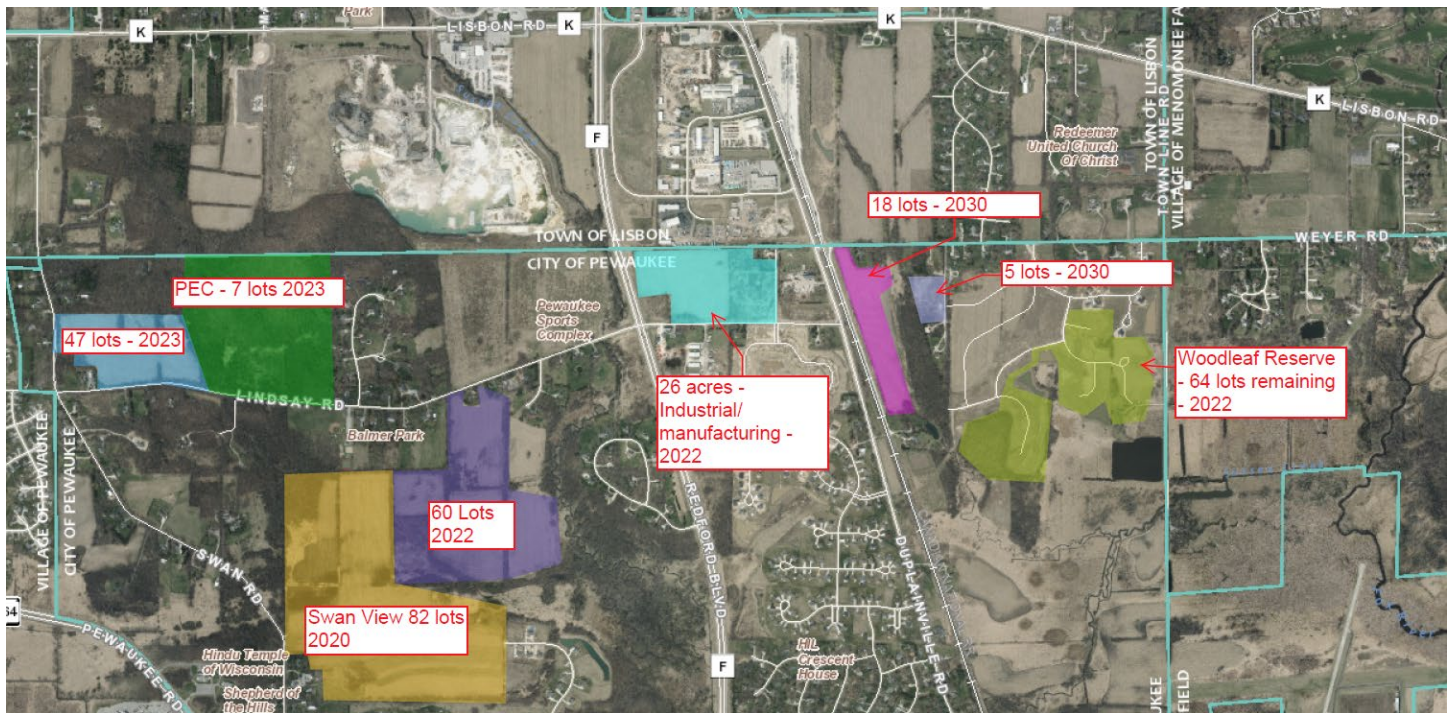
Engineer shall provide the Services described below. As indicated, Tasks 1-6 include activities involved with preparation of a Traffic Impact Analysis (TIA) and intersection control evaluation (ICE) for the intersection of CTH F and Lindsay Road. The TIA and ICE analysis will be completed to Waukesha County standards and that of the Highway Safety Improvement Program, but will not be completed to WisDOT standards as WisDOT will not review the TIA or ICE.

Engineer will prepare the traffic impact study analysis in accordance with the Institute of Transportation Engineers Traffic Impact Analysis (TIA) Guidelines and current Waukesha County TIA Guidelines. The study area will include the intersection of CTH F & Lindsay Road. Surrounding developments and potential developments, as provided by the CLIENT, will be included in the analysis.

The study will analyze the following scenarios:

1. Existing 2020 conditions, which will include:
 - a. Traffic from weekday turning movement count in October 2019
 - b. Traffic projected from the Pewaukee Sports Complex and the Swan View 82 Lot development
2. Future 2030 conditions, which will include:
 - a. Background traffic growth
 - b. Traffic projected from the Pewaukee Sports Complex, the Swan View 82 Lot development, and the other potential developments shown in [Figure 1](#) below

Figure 1 – Potential Future Developments Provided by Client



The TIA submittal will consist of a report with exhibits illustrating the traffic counts, traffic projections, level of service operations, trip generation, trip distribution, site plan, text, analysis procedures, recommendations, conclusions and appendix of all intersection capacity calculations.

Task 1 – Traffic Projections

Engineer will utilize TADI's historical traffic database of ADT's on arterials and collectors from WisDOT within the study area from 1976 to present to determine expected growth rates in future traffic. Engineer will use the growth rate to factor the existing traffic turning movement counts to the Year 2030 background traffic volumes. Engineer will then determine the weekday AM and PM peak hour traffic turning movements for the Year 2030 background conditions for the traffic analysis.

Task 2 – 2020 Traffic Analysis

Trip Generation and Distribution

Engineer will estimate the volume of traffic expected to be generated by Pewaukee Sports Complex and the Swan View 82 Lot development based on the known uses and utilizing the fitted curve equations in the *ITE Trip Generation Manual, 10th Edition*. Traffic will be generated for the weekday daily, weekday AM and PM peak hours. The traffic generated will be distributed to the study area intersections for the total build conditions based on the existing traffic patterns. The traffic assignment will be added to the existing traffic volumes (counted in October 2019) at the study area intersection.

Traffic Operational Analysis

Engineer will analyze the study area intersection as previously described for the typical weekday AM and PM peak hours for Year 2020 build conditions. The following configurations will be analyzed:

1. Two-way stop control
2. Restricted-Crossing-U-Turn (RCUT)
3. Traffic Signal
4. Roundabout

Based on this analysis, Engineer will make recommendations on traffic control, intersection geometrics, turn bay length extensions, channelization, by-pass lanes and other improvements required to provide LOS 'D' or better for all traffic movements at the study area intersections.

Task 3 – 2030 Traffic Analysis

Trip Generation and Distribution

In addition to generating traffic for the Pewaukee Sports Complex and the Swan View 82 Lot development, Engineer will generate traffic for the other potential developments shown previously in [Figure 1](#) based on the known uses and sizes by utilizing the fitted curve equations in the *ITE Trip Generation Manual, 10th Edition*. Traffic will be generated for the weekday daily, weekday AM and PM peak hours. The traffic generated will be distributed and assigned to the study area intersection and added to the projected Year 2030 background traffic volumes to determine the Year 2030 total build conditions traffic volumes.

Traffic Operational Analysis

Engineer will analyze the study area intersection as previously described for the Year 2030 total build conditions for the typical weekday AM and PM peak hours for Year 2030. The following configurations will be analyzed:

1. Two-way stop control

2. Restricted-Crossing-U-Turn (RCUT)
3. Traffic Signal
4. Roundabout

Based on the analysis, Engineer will make recommendations on traffic control, intersection geometrics, turn bay length extensions, channelization, by-pass lanes and other improvements required to provide LOS 'D' or better for all traffic movements at the study area intersections.

Task 4 – ICE Analysis

For each of the traffic control options analyzed in Task 3, Engineer will document the traffic queues, approach delays, and level of service for each of the traffic control scenarios. Intersection improvements will be made for each traffic control option. Engineer will provide recommendations for type of traffic control and intersection geometric recommendations based on this analysis.

Engineer will then prepare a traffic signal warrant/investigation study in accordance with the WisDOT TSDM as part of the intersection control evaluation report document. Traffic signal Warrants: Eight Hour Vehicular Volumes; Four Hour Volumes; Peak Hour Volumes; and Crash Warrant shall be evaluated for both the Year 2020 build and the 2030 total build conditions at the CTH F intersection with Lindsay Road. A left turn conflict check will also be performed, which will determine the need for left turn phasing/lanes.

Engineer will complete the WisDOT ICE analysis table for each scenario, which will be used by the County for review and approval.

Task 5 – Report

Engineer will prepare a traffic analysis ICE DRAFT report detailing the operational analysis and potential impacts utilizing two-way stop, RCUT, traffic signal and roundabout control scenarios. The report will contain text, tables, exhibit mark-ups and appendix documenting the traffic counts, data collection, field observations, traffic projections, traffic generation/assignment, traffic analysis, signal warrant analysis, ICE analysis, results and recommendations. Standards, specifications and reference materials used in the evaluation will be included in the report. The Client shall provide comments to Engineer so Engineer can finalize the report and submit a final electronic copy to the Client and Waukesha County.

Task 6 - Meetings

One meeting with the City is included in the base scope of this contract. If an additional meeting, or meetings, are required with attendance by the Engineer, it will be considered as additional services and will be billed at time and materials (meeting time, travel time, preparation time, mileage and handouts).

SCHEDULE

Engineer will submit a draft TIA report to the Client within three weeks of receiving authorization. The Engineer will finalize the report and submit a final electronic pdf copy to the Client within three days of receiving comments from the Client.

COMPENSATION

For the services described in Tasks 1, 2, 3, 4, 5, & 6: Client shall pay Engineer the lump sum fee of Fifteen Thousand Nine Hundred and Twelve Dollars (\$15,912.00).

All services not cited in the Scope of Services, will be conducted as additional services under an Amendment to this Agreement.



TRAFFIC AND SAFETY INTERSECTION ANALYSIS CTH F AT LINDSAY ROAD

YEARS 2014 - 2019

DATE SUBMITTED: NOVEMBER 7, 2019

PREPARED FOR:

Carolynn Gellings, P.E.

Engineering Services Manager, Waukesha County

Jeffrey Weigel, P.E.

Public Works Director, City of Pewaukee

PREPARED BY:

Traffic Analysis and Design, Inc. (TADI)

P.O. Box 128

Cedarburg, WI 53012

Authors: John Campbell, P.E., RSP₁

Christian R. Sternke, P.E., RSP₁

Phone: (800) 605-3091



Date: November 7, 2019

Technical Memorandum

To: Carolynn Gellings, P.E., Engineering Services Manager, Waukesha County
Jeffrey Weigel, P.E., Public Works Director, City of Pewaukee

From: John Campbell, P.E., RSP₁
Christian R. Sternke, P.E., RSP₁

CC: Bruce Barnes, P.E., Waukesha County
Magdelene Wagner, P.E., Assistant City Engineer, City of Pewaukee

Subject: Traffic and Safety Intersection Analysis
CTH F at Lindsay Road
City of Pewaukee, Waukesha County, Wisconsin

PART A – INTRODUCTION

At the request of the City of Pewaukee, Waukesha County arranged a safety and operational analysis of the County Trunk Highway (CTH) F intersection with Lindsay Road within the City of Pewaukee, Waukesha County, Wisconsin. The traffic study is being conducted to determine if modifications to the roadway geometry and/or traffic control would improve the safety and operations of the intersection. Currently, the intersection observes delays during peak hours on its side-street approaches and has experienced numerous severe right-angle crashes in recent years.

This technical memorandum has been prepared to analyze the intersection under Year 2019 existing traffic conditions.

PART B – EXISTING CONDITIONS

The CTH F intersection with Lindsay Road is located approximately 1.3 miles north of State Trunk Highway (STH) 190/Capitol Drive in the City of Pewaukee, Wisconsin. An aerial map showing the study area intersection is shown in [Figure B1](#) on the following page.

Figure B1
CTH F and Lindsay Road Aerial



CTH F, also designated as Redford Boulevard, is a four-lane north/south divided highway with a posted speed limit of 55 miles per hour (mph) in this area. The Wisconsin Department of Transportation (WisDOT) Year 2018 average annual daily traffic (AADT) volumes on CTH F were approximately 21,200 vehicles per day (vpd) south of Lindsay Road and 26,700-vpd north of Lindsay Road. WisDOT classifies CTH F as a principal arterial.

Figure B2
CTH F Looking North Approaching Lindsay Road



Lindsay Road is a two-lane east/west undivided roadway with a posted speed limit of 35-mph. The WisDOT Year 2018 AADT volumes on Lindsay Road were approximately 1,600-vpd west of CTH F. East of CTH F, WisDOT lists an AADT from Year 2015 of 960-vpd. WisDOT classifies Lindsay Road as a collector road.

Figure B3
Lindsay Road Looking East Approaching CTH F



Based on the 13-hour traffic turning movement count conducted for this study, the entering AADT of the CTH F intersection with Lindsay Road is estimated to be approximately 23,800-vpd.

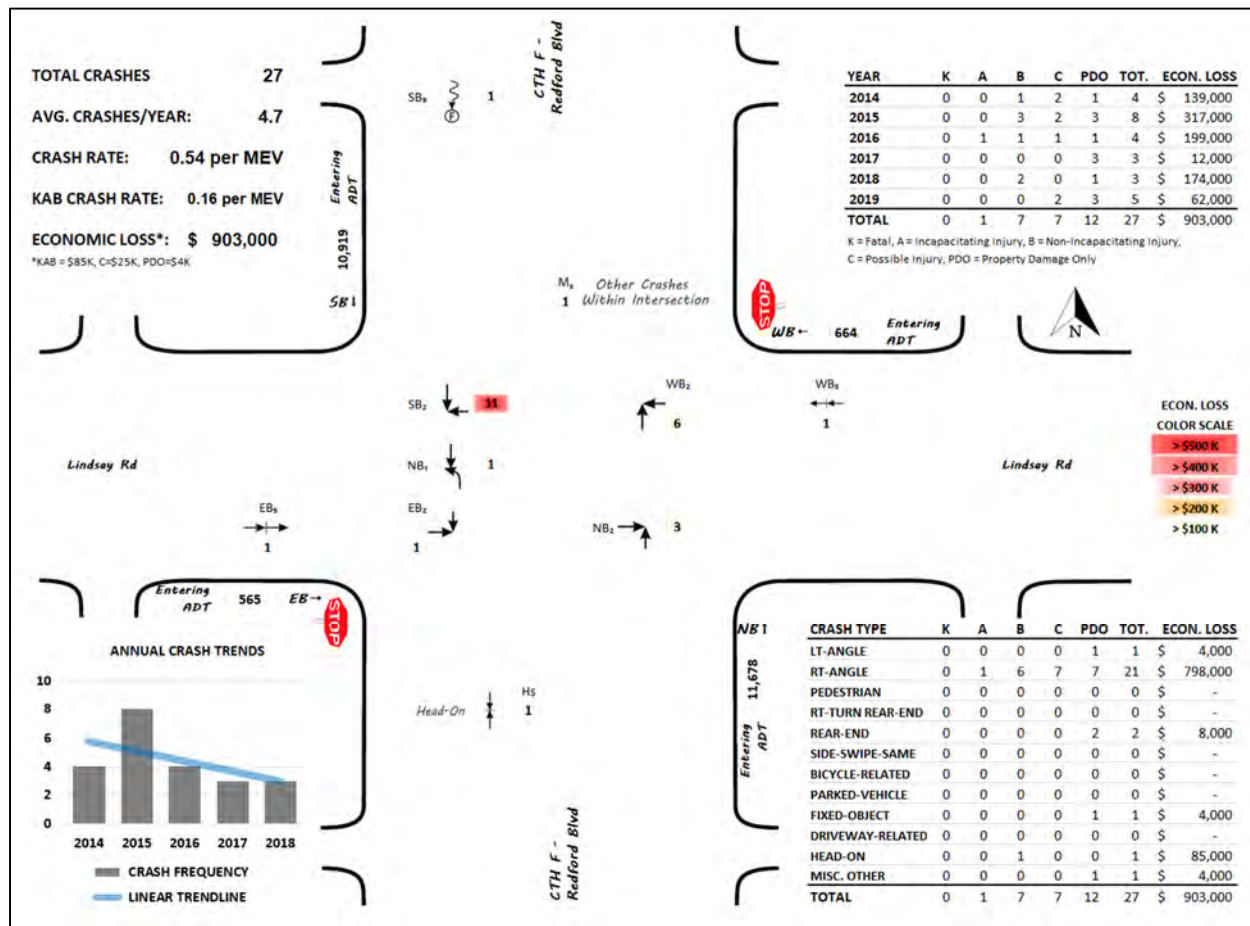
B1. Crash Analysis

A review of the crash records indicated that twenty-seven (27) non-deer crashes occurred at the intersection of CTH F with Lindsay Road between January 2014 and September 2019. The intersection crash rate was calculated to be 0.54 crashes per million entering vehicles (MEV) and the intersection averaged 4.7 crashes per year.

Most concerning at this location is the severity of the crashes observed. Seven (7) crashes resulted in Type C injury, another seven (7) resulted in Type B injury, and one (1) resulted in Type A injury. The remaining crashes (12) resulted in property damage only.

[Figure B4](#) shows the intersection crash plot, while full crash diagram and statistics have been included in the [appendix](#).

Figure B4
Crash Diagram



Seventy eight percent (78%) of the crashes were right-angle crashes. Drivers have difficulty crossing CTH F from Lindsay Road, particularly in the westbound direction where 17 right-angle crashes occurred (11 struck by southbound vehicles and 6 by northbound vehicles). Factors leading to these angle crashes include:

- Lindsay Road drivers misjudging available gaps
- Drivers not seeing oncoming northbound/southbound CTH F vehicles
- The higher speeds of CTH F (55-mph posted speed)

In reviewing the accident report forms, drivers often stated they stopped in the median and did not see the approaching southbound vehicle. Because sight distance is adequate, it is suspected that drivers are overloaded with information navigating this intersection. Furthermore, the high speeds on CTH F increase the likelihood and severity of collisions.

B2. Level of Service Definitions

The study area intersection was analyzed based on the procedures set forth in the *Highway Capacity Manual, 6th Edition* (HCM) using Synchro 10 traffic models. Intersection operation is defined by “level of service”. Level of Service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS ‘A’, to very poor, represented by LOS ‘F’. For the purpose of this study, LOS D has been identified as the acceptable LOS for peak hour operating conditions. It is noted that this threshold is the industry standard for urban areas used by WisDOT and many municipalities. Descriptions of the various levels of service are as follows:

LOS A is the highest level of service that can be achieved. Under this condition, intersection approaches appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation. At signalized and unsignalized intersections, average delays are less than 10 seconds.

LOS B represents stable operation. At signalized intersections, average vehicle delays are 10 to 20 seconds. At unsignalized intersections, average delays are 10 to 15 seconds.

LOS C still represents stable operation, but periodic backups of a few vehicles may develop behind turning vehicles. Most drivers begin to feel restricted, but not objectionably so. At signalized intersections, average vehicle delays are 20 to 35 seconds. At unsignalized intersections, average delays are 15 to 25 seconds.

LOS D represents increasing traffic restrictions as the intersection approaches instability. Delays to approaching vehicles may be substantial during short peaks within the peak period, but periodic clearance of long lines occurs, thus preventing excessive backups. At signalized intersections, average vehicle delays are 35 to 55 seconds. At unsignalized intersections, average delays are 25 to 35 seconds.

LOS E represents the capacity of the intersection. At signalized intersections, average vehicle delays are 55 to 80 seconds. At unsignalized intersections, average delays are 35 to 50 seconds.

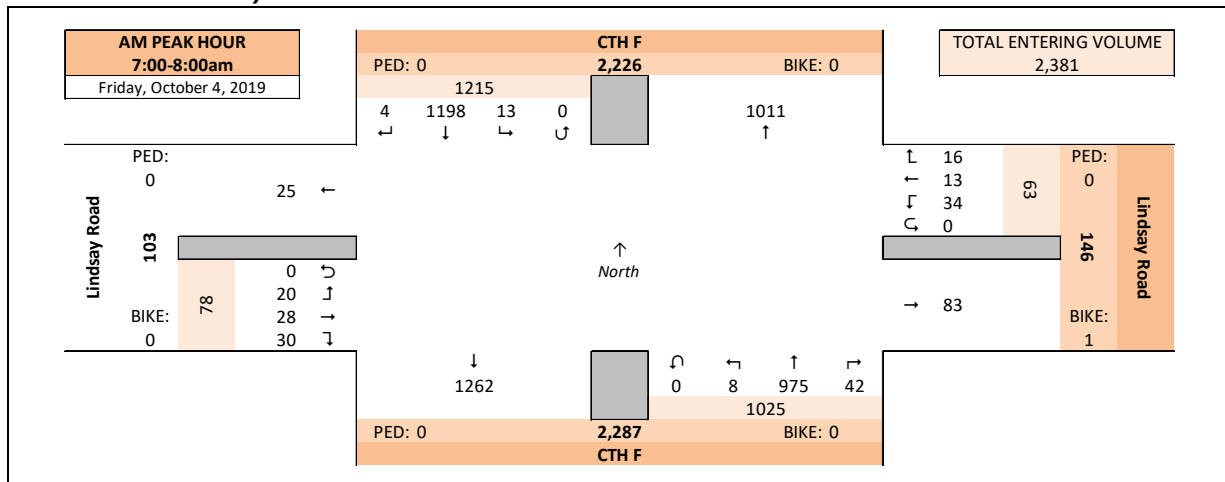
LOS F represents jammed conditions where the intersection is over capacity and acceptable gaps for unsignalized intersections in the mainline traffic flow are minimal. At signalized intersections, average vehicle delays exceed 80 seconds. At unsignalized intersections, average delays exceed 50 seconds.

B3. Year 2019 Existing Traffic Operations – Existing Geometry & Traffic Control

The weekday morning and weekday afternoon peak hours are expected to drive the improvements necessary to adequately accommodate the overall intersection volumes. A thirteen-hour (6:00 am to 7:00 pm) weekday turning movement count was conducted in late-September and early-October of 2019 at the study area intersection. Based on the turning movement counts, the weekday morning and weekday evening peak hours were identified as being 7:00 to 8:00 am and 4:30 to 5:30 pm, respectively. The existing traffic volumes at the study area intersection are shown below for the morning and evening peak hours. The traffic counts used to determine peak hour factors and truck percentages have been included in the [appendix](#) of this study.

Figure B5
Peak Hour Turning Movement Traffic Volumes

AM Peak Hour Summary



PM Peak Hour Summary

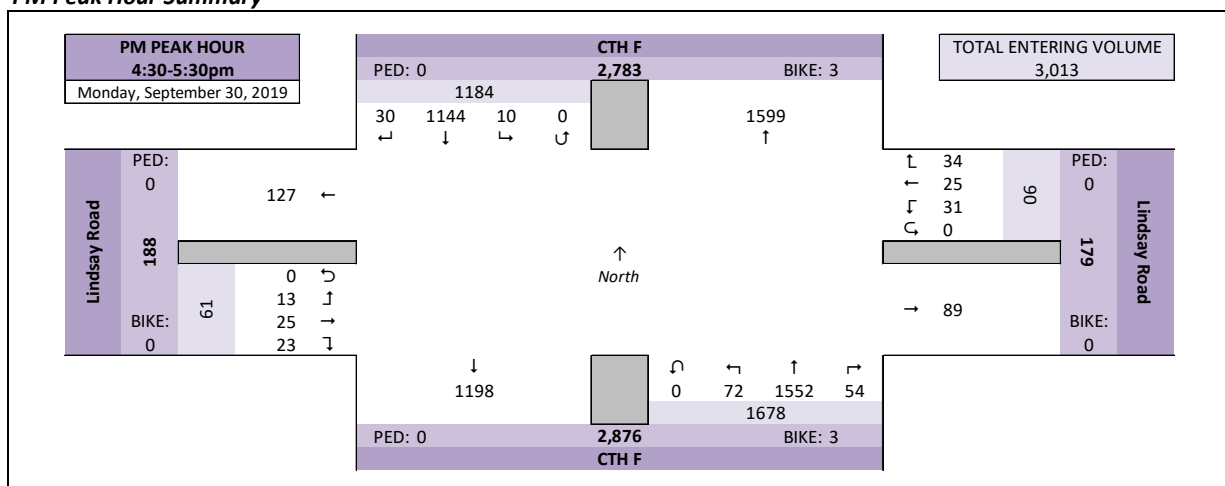


Table B3 shows the results of the Year 2019 existing weekday morning and weekday evening peak hour operational analysis at the study area intersection. The existing intersection geometry and traffic volumes were used for the analysis.

Table B3
Year 2019 Existing Traffic Peak Hour Operating Conditions
With Existing Geometrics and Traffic Control

Intersection	Peak Hour		Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
<i>Existing Geometrics with Two-Way Stop Control</i>	AM	LOS	E			D			B	*	*	B	*	*
		Queue	50			40			5	*	*	5	*	*
		Delay	36.4			34.0			12.5	*	*	11.3	*	*
	PM	LOS	F			F			B	*	*	C	*	*
		Queue	95			180			15	*	*	5	*	*
		Delay	96.3			239.0			13.5	*	*	16.7	*	*

(--) indicates a movement that is prohibited or does not exist; (*) indicates a freeflow movement.

Queue is maximum of the 50th & 95th percentile queue, measured in feet.

Delay is HCM control delay, measured in seconds.

As shown in [Table B3](#), the eastbound shared lane is currently operating at LOS E conditions in the morning peak hour and the eastbound and westbound shared lanes are both operating at LOS F conditions in the evening peak hour. All other movements are operating acceptably at LOS D or better conditions. The existing traffic control analysis outputs are included in the [appendix](#).

PART C – ALTERNATIVE ANALYSIS

Two alternatives were evaluated as part of this study: a traffic signal alternative and a restricted crossing U-turn (RCUT) alternative.

C1. Alternative One – Traffic Signal

Note that traffic signal warrants should be viewed as guidelines to help decide whether a traffic signal may be installed. Meeting traffic signal warrants does not translate to a legal requirement for their installation. Warrant descriptions and completed warrant analysis worksheets are included in the [appendix](#) of this study.

A traffic signal warrant analyses was performed at the CTH F intersection with Lindsay Road as part of this study. Chapter 4C of the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD) outlines the standards for determining the need for traffic signals at a particular location. For a traffic signal to be installed, at least one of the following warrants must be satisfied. The eight signal warrants are listed below:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Hour
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal Systems
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network

All warrants except Warrant 5 have been evaluated for this location. The posted speed limit along CTH F is 55-mph at the Lindsay Road intersection, so it was analyzed using the 70-percent minimum vehicular volumes per standard practice since the speed is greater than 40-mph.

The warrant analysis assumes the intersections to include two-lane approaches northbound and southbound on CTH F (major street) and a one-lane approaches eastbound and westbound along Lindsay Road (minor street). Right-turn movements on the Lindsay Road approaches were excluded from the approach volume per the MUTCD.

The traffic signal warrant study was conducted using the existing 13-hour turning movement counts collected at the intersection as part of this study.

Based on the warrant analysis, no warrants are expected to be met under Year 2019 existing traffic volumes. Therefore, traffic signals are not currently warranted at this intersection.

A sensitivity analysis was performed and for Warrant 7 to be met, Lindsay Road traffic would have to increase by at least fifteen percent (15%), and for Warrant 1 to be met, Lindsay Road traffic would have to increase by at least forty-five percent (45%).

Capacity analysis of the traffic signal alternative was performed using a Synchro 10 traffic model. [Table C1](#) shows the results of the Year 2019 weekday morning and weekday evening peak hour operational analysis at the study area intersection under traffic signal control.

Table C1
Year 2019 Existing Traffic Peak Hour Operating Conditions
Traffic Signal Control with Existing Geometrics

Intersection	Peak Hour		Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
<i>Existing Geometrics with Traffic Signal Control</i>	AM	LOS	B			B			B	A	A	B	A	A
		Queue	65			55			5	140	10	10	195	5
		Delay	15.9			15.7			13.0	7.1	4.8	10.3	8.2	4.7
	PM	LOS	C			C			B	B	A	B	A	A
		Queue	55			75			45	325	15	10	190	10
		Delay	20.8			21.3			13.4	10.0	4.2	17.2	6.8	4.1

(--) indicates a movement that is prohibited or does not exist; (*) indicates a freeflow movement.

Queue is maximum of the 50th & 95th percentile queue, measured in feet.

Delay is HCM control delay, measured in seconds.

As shown in [Table C1](#), under traffic signal control with existing geometrics, all movements are expected to operate at LOS C or better conditions under the Year 2019 existing traffic volumes. Traffic signal control analysis outputs are included in the [appendix](#).

C2. Alternative Two – Restricted Crossing U-Turn (RCUT)

A restricted crossing U-turn (RCUT) intersection design restricts through and left-turn movements from the minor street at the intersection and forces the vehicles desiring those movements to turn right and make a U-turn downstream. [Figure C1](#) shows an aerial of an RCUT intersection located in Plymouth, WI at the intersection of STH 23 and CTH M.

Figure C1

Example RCUT Intersection – STH 23/CTH M in Plymouth, WI



The goal of an RCUT is to reduce conflict points at the intersection to improve overall safety. Compared to a conventional 4-legged intersection, an RCUT intersection drastically decreases the number of angle crashes, due to removing the minor street through and left-turn movements.

The CTH F intersection with Lindsay Road is a candidate for an RCUT because there is a history of angle crashes from the Lindsay Road approaches and it does not meet any traffic signal warrants. An RCUT would not impede the CTH F through movements. STH 23/CTH M intersection in Plymouth, WI is an intersection that had a similar angle crash issue and has similar volumes. After the installation of the RCUT design, crashes drastically decreased at the intersection. In the 12 years prior to the RCUT installation, STH 23/CTH observed two fatal crashes, three A-level (incapacitating injury) crashes, and eight B-level (non-incapacitating injury) crashes, and 15 other crashes. In the five years after installation, only five property damage only crashes were observed.

In order to perform an accurate capacity analysis of the RCUT intersection design at CTH F and Lindsay Road, a microsimulation software, such as VISSIM, would need to be used, but it was outside the scope of this study to perform such analysis.

PART D – ALTERNATIVES COMPARISON

Two alternatives were looked at for the CTH F intersection with Lindsay Road: a traffic signal alternative and an RCUT alternative. Both have advantages and disadvantages, which are summarized in the table below. Both alternatives are expected to have a similar range of costs, between \$300,000 and \$600,000, but the estimates would need to be verified by a detailed cost estimate performed by roadway designers.

TRAFFIC SIGNAL	ADVANTAGES	DISADVANTAGES
Access	Full access maintained. Convenient access from side-street.	
Operations	Acceptable level-of-service traffic operations. Vastly improved level-of-service on side-street approaches.	Reduced level-of-service for northbound and southbound traffic. Previously free-flow through movements, which make approximately 90 percent of traffic at this intersection during the peak hours, would be subjected to delays averaging 8.2 sec/vehicle in peak hours.
Safety	Expected to reduce risk of right-angle crashes.	Expected to increase the likelihood of high-speed rear-end crashes. Right-angle crashes, although less likely than in existing conditions, would still be expected to occur as a result of red-light-running.
Federal Aid		Very unlikely to qualify for Federal Aid due to traffic signal warrants not being met.
RCUT	ADVANTAGES	DISADVANTAGES
Access		Through and left-turn movements from Lindsay Road restricted at intersection and forced to turn right and make U-turn downstream. These movements make up approximately 3.5 percent of the total traffic during the peak hours.
Operations	Expected to operate acceptably, however microsimulation model, such as VISSIM, should be used to verify.	Through and left-turn movements from Lindsay Road restricted at intersection and forced to turn right and make U-turn downstream, which increases travel distance and may increase delay.
Safety	Expected to reduce risk of right-angle crashes as through and left-turn movements from Lindsay Road would be restricted.	
Federal Aid	Good chance for Federal Aid through HSIP program due to the crash reduction benefits of RCUT intersections. Eligibility should be verified with SE Region Safety Engineer.	

PART E – SUMMARY

At the request of the City of Pewaukee, Waukesha County arranged a safety and operational analysis of the CTH F intersection with Lindsay Road. TADI performed capacity analysis of the existing conditions and looked at two alternatives to improve safety and operations at the intersection. Alternative One was to signalize the intersection, while Alternative Two was to install a Restricted Crossing U-Turn (RCUT) intersection design. Both improvements would be expected to reduce the risk of angle crashes, but with the traffic signal alternative, an increase in high-speed rear-end crashes would be expected and a risk for angle crashes caused by red-light-running would still exist. Traffic signal warrants are currently not met, and substantially more traffic Lindsay Road would be needed to meet the 8-hour volume warrant. Because warrants are not met, the traffic signal would not be a likely candidate for Federal Aid through the HSIP program. However, the RCUT intersection design appears to have a good chance of qualifying for Federal Aid (90 percent match through the HSIP program). It is suggested that HSIP eligibility be verified with the WisDOT SE Region safety engineer.

APPENDIX A

CRASH DIAGRAM AND STATISTICS

Intersection Collision Diagram



Location: CTH F & Lindsay Rd
Municipality: Pewaukee
County: Waukesha
Traffic Control: Minor Street Stop

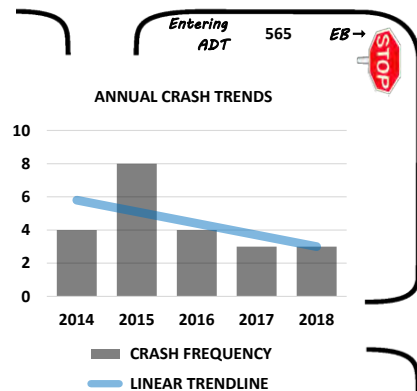
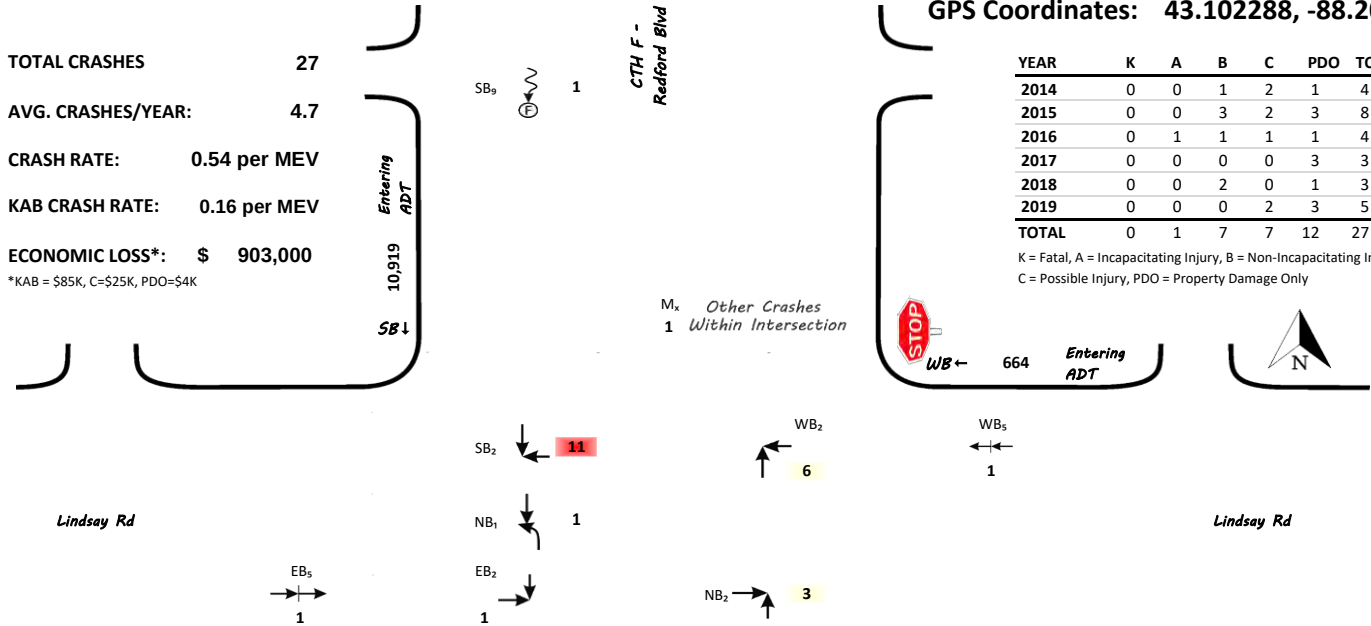
From: 1/1/2014 5 Years
To: 9/17/2019 8 Months
AADT: 23,826
Area Type: Urban
GPS Coordinates: 43.102288, -88.208759

TOTAL CRASHES 27
AVG. CRASHES/YEAR: 4.7
CRASH RATE: 0.54 per MEV
KAB CRASH RATE: 0.16 per MEV
ECONOMIC LOSS*: \$ 903,000

*KAB = \$85K, C=\$25K, PDO=\$4K

YEAR	K	A	B	C	PDO	TOT.	ECON. LOSS
2014	0	0	1	2	1	4	\$ 139,000
2015	0	0	3	2	3	8	\$ 317,000
2016	0	1	1	1	1	4	\$ 199,000
2017	0	0	0	0	3	3	\$ 12,000
2018	0	0	2	0	1	3	\$ 174,000
2019	0	0	0	2	3	5	\$ 62,000
TOTAL	0	1	7	7	12	27	\$ 903,000

K = Fatal, A = Incapacitating Injury, B = Non-Incapacitating Injury, C = Possible Injury, PDO = Property Damage Only



CRASH TYPE	K	A	B	C	PDO	TOT.	ECON. LOSS
LT-ANGLE	0	0	0	0	1	1	\$ 4,000
RT-ANGLE	0	1	6	7	7	21	\$ 798,000
PEDESTRIAN	0	0	0	0	0	0	\$ -
RT-TURN REAR-END	0	0	0	0	0	0	\$ -
REAR-END	0	0	0	0	2	2	\$ 8,000
SIDE-SWIPE-SAME	0	0	0	0	0	0	\$ -
BICYCLE-RELATED	0	0	0	0	0	0	\$ -
PARKED-VEHICLE	0	0	0	0	0	0	\$ -
FIXED-OBJECT	0	0	0	0	1	1	\$ 4,000
DRIVEWAY-RELATED	0	0	0	0	0	0	\$ -
HEAD-ON	0	0	1	0	0	1	\$ 85,000
MISC. OTHER	0	0	0	0	1	1	\$ 4,000
TOTAL	0	1	7	7	12	27	\$ 903,000

ROAD CONDITIONS		
DRY	22	81%
WET	2	7%
SNOW	2	7%
ICE	1	4%
OTH.	0	0%
TOT.	27	

LIGHT CONDITIONS		
DAY	24	89%
DARK	3	11%
TOT.	27	

DRIVER BEHAVIOR		
ALCOHOL	0	0%
DRUGS	0	0%
SPEED	2	7%

SEASON		
SPRING	8	30%
SUMMER	6	22%
FALL	7	26%
WINTER	6	22%
TOT.	27	

FAILURE TO YIELD		
NB	1	4%
SB	0	0%
EB	3	11%
WB	12	44%
TBD	0	0%
TOT.	16	

BLOWN CONTROL		
NB	0	0%
SB	0	0%
EB	0	0%
WB	0	0%
TBD	0	0%
TOT.	0	

VEHICLE DAMAGE		
OTHER/UNK.	0	0%
NONE	2	4%
VERY MINOR	0	0%
MINOR	5	11%
MODERATE	12	26%
SEVERE	26	55%
VERY SEVERE	2	4%
TOTAL VEHICLES	47	

TBD = verification from crash report needed for direction

DAY/TIME TRENDS

	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	UNK		TOT.
MON	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	MON	2
TUE	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	TUE	5
WED	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	WED	5
THU	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	THU	6
FRI	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	2	0	2	0	0	0	0	0	0	0	FRI	7
SAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	SAT	1
SUN	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SUN	1
	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	UNK		TOT.
TOT.	0	0	0	0	0	0	0	1	3	2	4	2	1	0	0	4	0	7	1	1	1	0	0	0	0	TOT.	27

Crash Data

Corresponds to Collision Diagram

Location: CTH F & Lindsay Rd
Municipality: Pewaukee
County: Waukesha
Traffic Control: Minor Street Stop

From: 1/1/2014
To: 9/17/2019
AADT: 23,826
Area Type: Urban



Duration
5 Years
8 Months

Ref #	Label	Doc. #	Date	Crash Type	Time	Severity	Road Cond.	Light Cond.	Alc. Flag	Drug Flag	Speed Flag	Notes
1	EB ₂	3WL0LCTJQQ	10/6/2017	RT-ANGLE	3 PM		WET					
2	EB ₂	3WL0LF2L6S	9/17/2019	REAR-END	7 AM							Pulled ahead and stopped
3	WB ₂	DJCLXF9	1/10/2014	RT-ANGLE	5 PM		ICE	DARK				
4	WB ₂	DHZ2MNHJ	4/10/2015	RT-ANGLE	5 PM	B						
5	WB ₂	DJOG3X2	6/16/2016	RT-ANGLE	7 PM	C						Medical issue, swerved i
6	WB ₂	3WL0LF2L0P	5/17/2018	RT-ANGLE	8 AM							
7	WB ₂	3WL0LCTJXS	6/18/2019	RT-ANGLE	12 PM			DAY				
8	WB ₂	3WL0MLVN1L	7/23/2019	RT-ANGLE	5 PM	C						
9	WB ₂	DHZ272TK	5/1/2015	REAR-END	8 AM							Pulled ahead and backet
10	NB ₂	DHZ272VH	8/5/2015	LT-ANGLE	9 AM							
11	NB ₂	DHZ28KSZ	11/6/2014	RT-ANGLE	10 AM	C						
12	NB ₂	DHZ28K7B	1/21/2015	RT-ANGLE	5 PM	C		DARK				
13	NB ₂	DJ00RSK	1/13/2016	RT-ANGLE	3 PM	B	SNOW			Y		
14	H ₂	3WL0NFKDHN	9/21/2018	HEAD-ON	10 AM	B						Swerved to avoid WB ve
15	SB ₂	DHZ272NG	5/29/2014	RT-ANGLE	8 AM	B						
16	SB ₂	DHZ272R2	12/12/2014	RT-ANGLE	3 PM	C		DAY				
17	SB ₂	DHZ28K72	1/10/2015	RT-ANGLE	3 PM	B	UNKN					
18	SB ₂	DHZ272T7	4/22/2015	RT-ANGLE	5 PM	C						
19	SB ₂	DHZ27236	8/12/2015	RT-ANGLE	5 PM							Missing Report
20	SB ₂	DHZ272L9M	9/29/2015	RT-ANGLE	9 AM	B	WET					
21	SB ₂	DJOG3WX	5/30/2016	RT-ANGLE	11 AM	A						
22	SB ₂	3WL0LCTJNZ	5/4/2017	RT-ANGLE	6 PM			DAY				
23	SB ₂	3WL0MOC3CM	10/27/2017	RT-ANGLE	11 AM							
24	SB ₂	3WL0NFKDGF	7/12/2018	RT-ANGLE	10 AM	B						
25	SB ₂	3WL0NFKDL9	3/3/2019	RT-ANGLE	10 AM	C						
26	SB ₂	DJOG3V4	2/9/2016	FIXED-OBJECT	8 PM		SNOW	DARK		Y		Gust of wind, icy road
27	M ₂	3WL0LVN066	9/9/2019	MISC. OTHER	5 PM			DAY				SSO in median
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												
47												
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
63												
64												
65												
66												
67												
68												
69												
70												
71												
72												
73												
74												
75												
76												
77												
78												
79												
80												
81												
82												
83												
84												
85												
86												
87												
88												
89												
90												
91												
92												
93												
94												
95												
96												
97												
98												
99												
100												

APPENDIX B

EXISTING TRAFFIC COUNTS

Intersection Traffic Volume Report

Count Basics		Version 2013.14.1	Page 1 of 13
Start Date:	Monday, September 30, 2019	Weekday	Schools in Session
Total Number of Hours Counted:	13	Non-Holiday	No Special Events

Base Information, Observed (13) Hour and Estimated (24) Hour Volume Summaries

Intersection of: CTH F and Lindsay Road

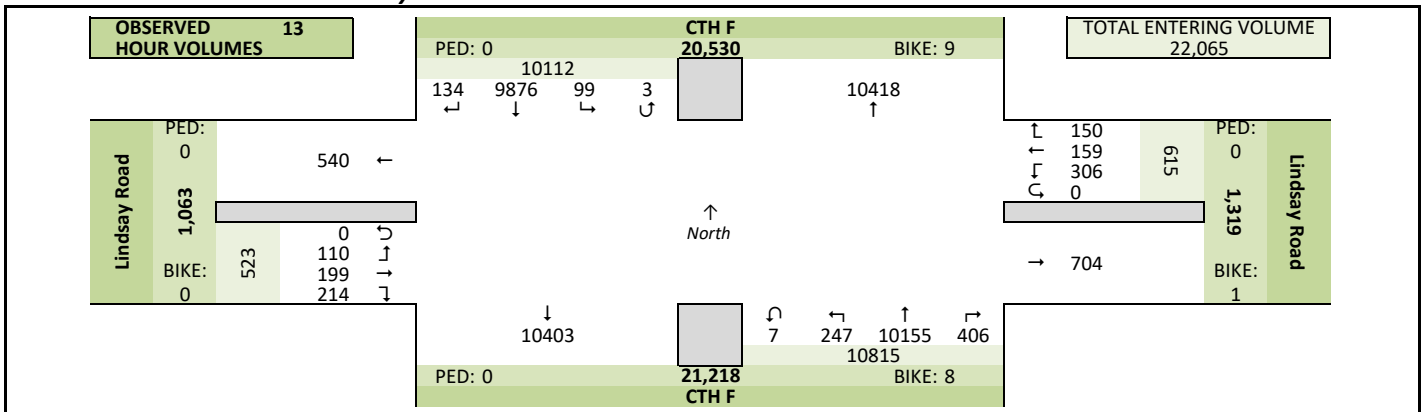
Site Information

Municipality	Pewaukee		
County	Waukesha	WisDOT Region	SE
Traffic Control	Partial Stop Control		
Roadway Names		North Direction	↑
North Leg	CTH F		
East Leg	Lindsay Road		
South Leg	CTH F		
West Leg	Lindsay Road		
Special Considerations			
Schools	In Session		
Holidays	None		
Special Events	None		
Special Pedestrians Observed			
	Pre-school children	None	
	Elementry school age children	None	
	Visually impaired (white cane/helper dog)	None	
	Elderly/disabled (except wheelchairs)	None	
	Wheelchairs/electric scooters	None	
	Other (describe)	None	

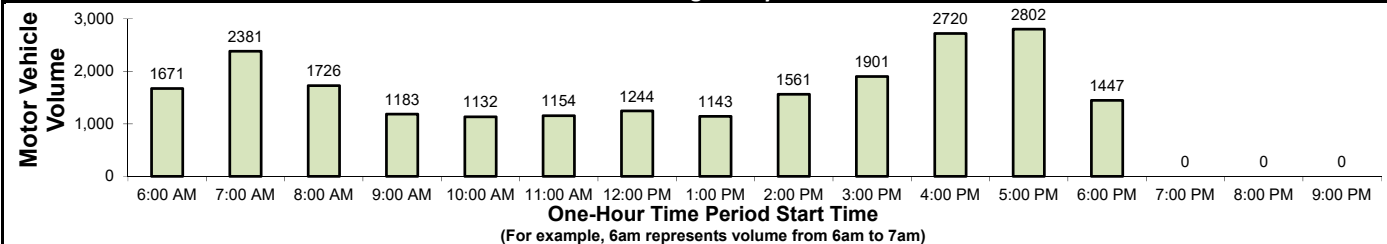
Count Information

Hrs Counted: 6:00 AM-7:00 PM					
1st Day of Count		Monday, September 30, 2019			Weather
AM Peak Period		Friday, October 4, 2019			Clear & Dry
Midday Peak Period		Monday, September 30, 2019			Clear & Dry
PM Peak Period		Monday, September 30, 2019			Clear & Dry
Calculated Peak Hours					
	AM	7:00-8:00am	MD	11:30-12:30am	PM 4:30-5:30pm
Peak Hours Selected for Analysis					
	AM	7:00-8:00am	MD	11:30-12:30am	PM 4:30-5:30pm
Daily/Seasonal Adjustment Group			(4) Rural Arterials & Collectors		
Count Expansion Group			(4) Rural Arterials & Collectors		
Daily/Seasonal Adjustment Factor			0.899	Count Expansion Factor 1.201	
Company Name TADI			Manual Adj. 1.000		
Observers	AM Peak Period		Amy Scheuerlein		
	Midday Peak Period		Ted Atwell		
	PM Peak Period		Wendy Picard		
Comments	2018 DOT Seasonal Factors				

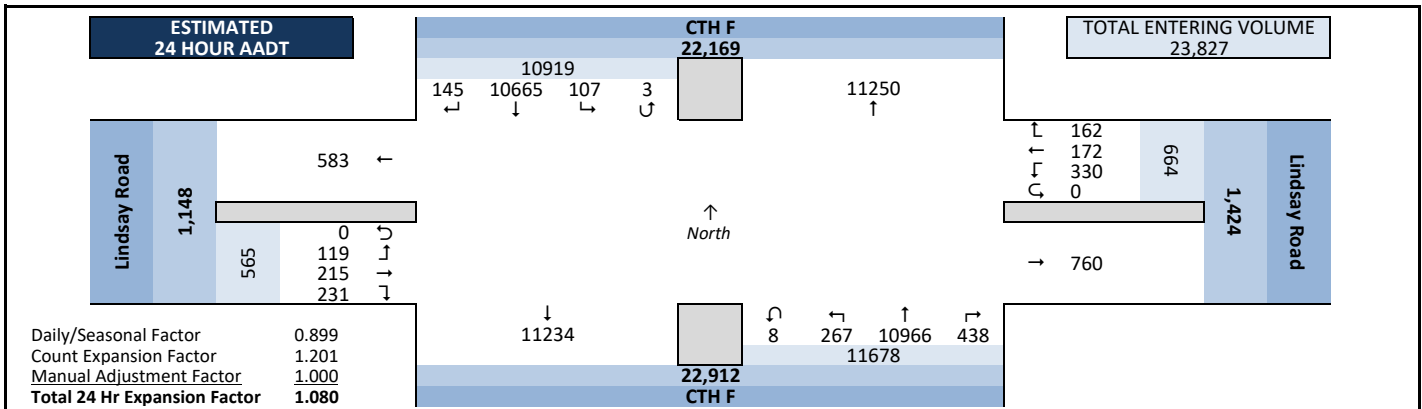
Observed 13 Hour Volume Summary



Total Entering Hourly Volume



Estimated 24 Hour AADT



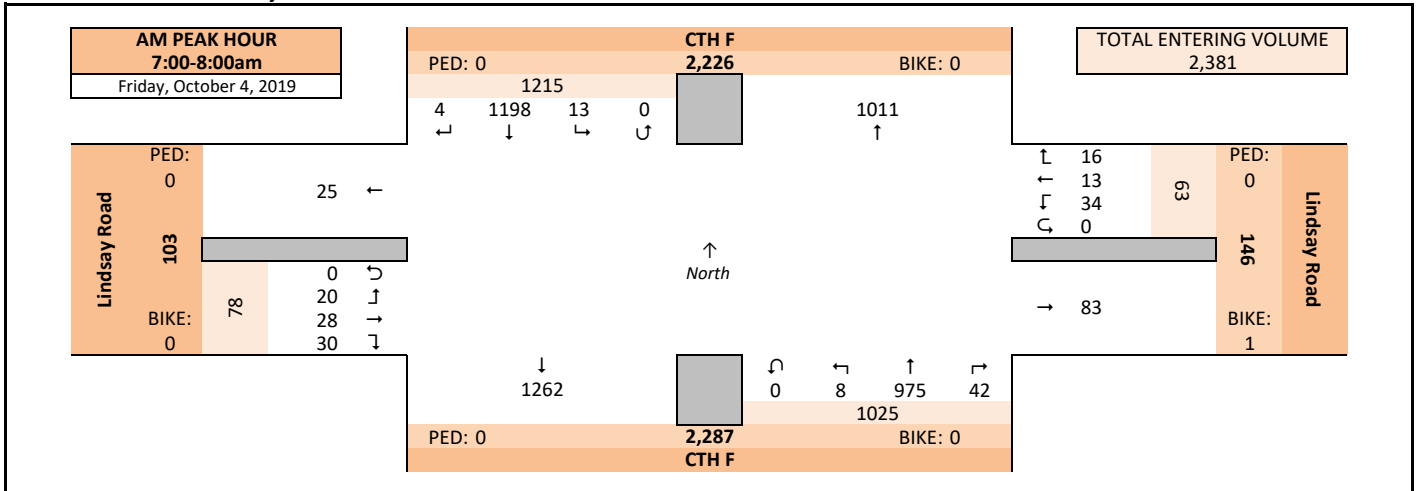
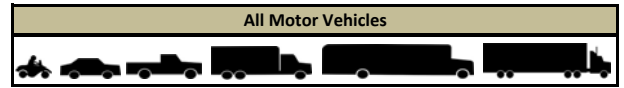
Intersection Traffic Volume Report

Peak Hour Volume Graphical Summary

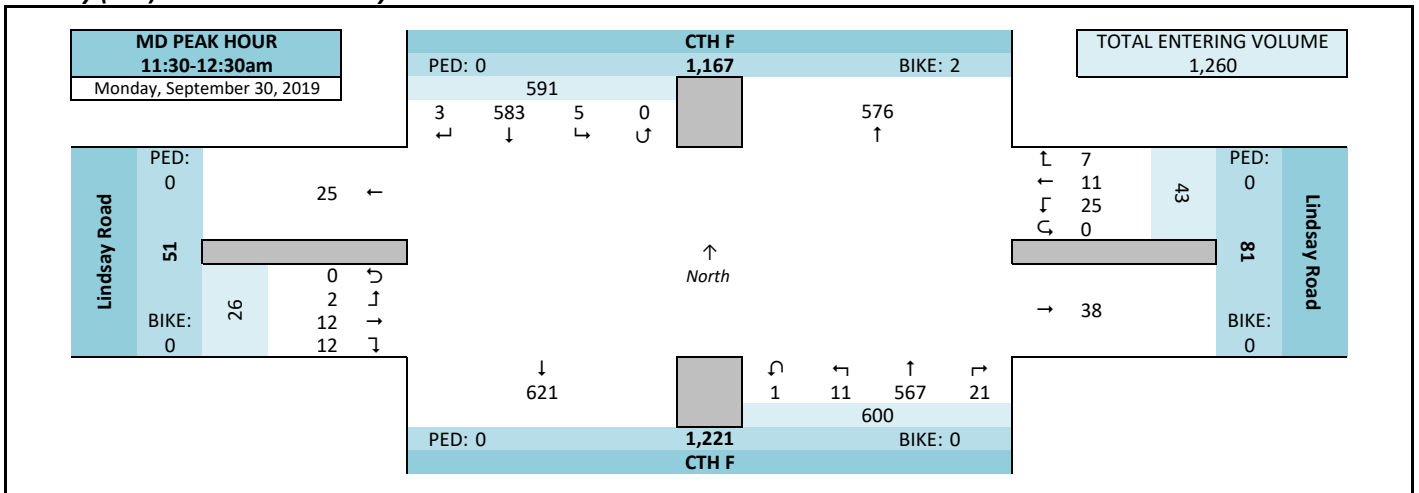
Count Basics		Page 2 of 13	
Start Date:	Monday, September 30, 2019	Weekday	Schools in Session
Total Number of Hours Counted:	13	Non-Holiday	No Special Events

CTH F and Lindsay Road

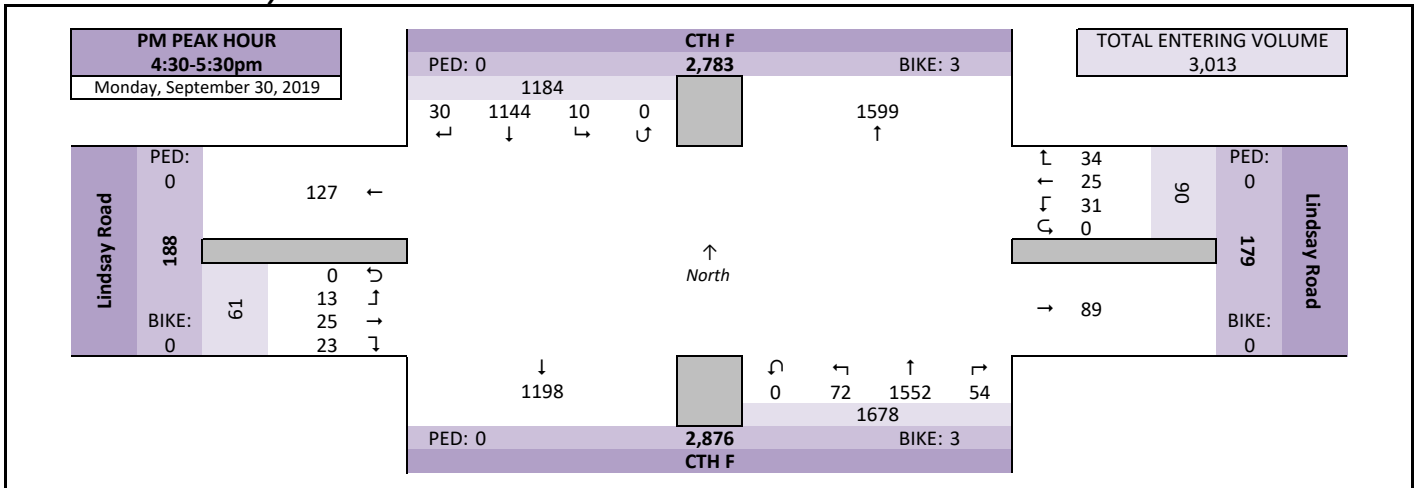
AM Peak Hour Summary



Midday (MD) Peak Hour Summary



PM Peak Hour Summary

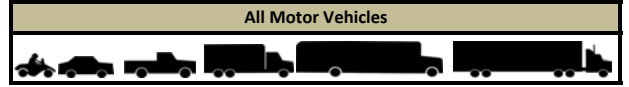


Intersection Traffic Volume Report

Peak Hour Volume Summary

CTH F and Lindsay Road

Count Basics			Page 3 of 13
Start Date:	Monday, September 30, 2019	Weekday	Schools in Session
Total Number of Hours Counted:	13	Non-Holiday	No Special Events



Peak Hour Volumes, Truck Percentages, and PHFs

Friday, October 4, 2019		From North					From East					From South					From West					
AM Peak Hour	AM Peak Hour	CTH F					Lindsay Road					CTH F					Lindsay Road					
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Totals
	7:00 AM	0	286	2	0	288	3	2	9	0	14	7	182	2	0	191	4	6	3	0	13	506
	7:15 AM	2	299	3	0	304	1	3	7	0	11	11	246	1	0	258	8	6	4	0	18	591
	7:30 AM	0	313	4	0	317	5	4	7	0	16	9	278	3	0	290	8	8	6	0	22	645
	7:45 AM	2	300	4	0	306	7	4	11	0	22	15	269	2	0	286	10	8	7	0	25	639
	Peak Hour Volume	4	1198	13	0	1215	16	13	34	0	63	42	975	8	0	1025	30	28	20	0	78	2381
	Rounded Hourly Volume	5	1200	15	0	1220	15	15	35	0	65	40	975	10	0	1025	30	30	20	0	80	2390
	% Single Unit Trucks	0.0	7.1	7.7	0.0	7.1	12.5	7.7	0.0	0.0	4.8	7.1	5.8	0.0	0.0	5.9	0.0	3.6	0.0	0.0	1.3	6.3
	% Heavy Trucks	0.0	1.8	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	2.4	2.5	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	2.0
	% Trucks (Total)	0.0	8.9	7.7	0.0	8.9	12.5	7.7	0.0	0.0	4.8	9.5	8.3	0.0	0.0	8.3	0.0	3.6	0.0	0.0	1.3	8.3
	Peak Hour Factor (PHF)	0.50	0.96	0.81	0.00	0.96	0.57	0.81	0.77	0.00	0.72	0.70	0.88	0.67	0.00	0.88	0.75	0.87	0.71	0.00	0.78	0.92

Monday, September 30, 2019		From North					From East					From South					From West					
Midday (MD) Peak Hour	MD Peak Hour	CTH F					Lindsay Road					CTH F					Lindsay Road					
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Totals
	11:30 AM	1	155	1	0	157	1	2	9	0	12	5	124	4	0	133	1	2	0	0	3	305
	11:45 AM	2	127	0	0	129	2	1	5	0	8	6	157	1	0	164	5	4	0	0	9	310
	12:00 PM	0	147	1	0	148	2	6	4	0	12	7	156	5	0	168	1	4	1	0	6	334
	12:15 PM	0	154	3	0	157	2	2	7	0	11	3	130	1	1	135	5	2	1	0	8	311
	Peak Hour Volume	3	583	5	0	591	7	11	25	0	43	21	567	11	1	600	12	12	2	0	26	1260
	Rounded Hourly Volume	5	585	5	0	595	5	10	25	0	40	20	565	10	0	595	10	10	0	0	20	1250
	% Single Unit Trucks	0.0	15.6	20.0	0.0	15.6	42.9	0.0	16.0	0.0	16.3	9.5	16.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0	0.0	15.2
	% Heavy Trucks	0.0	3.6	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	4.0
	% Trucks (Total)	0.0	19.2	20.0	0.0	19.1	42.9	0.0	16.0	0.0	16.3	9.5	21.3	0.0	0.0	20.5	0.0	0.0	0.0	0.0	0.0	19.3
	Peak Hour Factor (PHF)	0.37	0.94	0.42	0.00	0.94	0.87	0.46	0.69	0.00	0.90	0.75	0.90	0.55	0.25	0.89	0.60	0.75	0.50	0.00	0.72	0.94

Monday, September 30, 2019		From North					From East					From South					From West					
PM Peak Hour	PM Peak Hour	CTH F					Lindsay Road					CTH F					Lindsay Road					
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Totals
	4:30 PM	4	278	3	0	285	7	6	8	0	21	9	389	15	0	413	2	4	2	0	8	727
	4:45 PM	7	260	1	0	268	7	9	12	0	28	11	348	20	0	379	7	9	4	0	20	695
	5:00 PM	8	287	1	0	296	10	5	7	0	22	15	370	17	0	402	5	5	3	0	13	733
	5:15 PM	11	319	5	0	335	10	5	4	0	19	19	445	20	0	484	9	7	4	0	20	858
	Peak Hour Volume	30	1144	10	0	1184	34	25	31	0	90	54	1552	72	0	1678	23	25	13	0	61	3013
	Rounded Hourly Volume	30	1145	10	0	1185	35	25	30	0	90	55	1550	70	0	1675	25	25	15	0	65	3015
	% Single Unit Trucks	0.0	3.8	0.0	0.0	3.6	2.9	4.0	0.0	0.0	2.2	1.9	3.0	1.4	0.0	2.9	4.3	0.0	7.7	0.0	3.3	3.2
	% Heavy Trucks	0.0	0.9	20.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.8
	% Trucks (Total)	0.0	4.6	20.0	0.0	4.6	2.9	4.0	0.0	0.0	2.2	1.9	3.7	1.4	0.0	3.5	4.3	0.0	7.7	0.0	3.3	3.9
	Peak Hour Factor (PHF)	0.68	0.90	0.50	0.00	0.88	0.85	0.69	0.65	0.00	0.80	0.71	0.87	0.90	0.00	0.87	0.64	0.69	0.81	0.00	0.76	0.88

Peak Hour Pedestrian and Bicyclist Volumes

Pedestrians and Bicyclists		Crossing 			Crossing 			Crossing 			Crossing 			Total Ped & Bike Volume
		North Approach			East Approach			South Approach			West Approach			
15-Minute Start Time		CTH F			Lindsay Road			CTH F			Lindsay Road			
		Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	
	7:30 AM	0	0	0	0	1	1	0	0	0	0	0	1	
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	0	0	0	1	1	0	0	0	0	0	1	
MD	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	
	11:45 AM	0	2	2	0	0	0	0	0	0	0	0	2	
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	2	2	0	0	0	0	0	0	0	0	2	
PM	4:30 PM	0	1	1	0	0	0	0	2	2	0	0	3	
	4:45 PM	0	1	1	0	0	0	0	1	1	0	0	2	
	5:00 PM	0	1	1	0	0	0	0	0	0	0	0	1	
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	3	3	0	0	0	0	3	3	0	0	6	

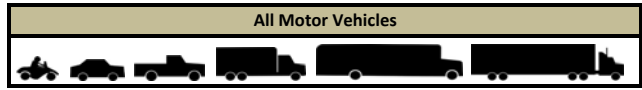
Intersection Traffic Volume Report

Hourly Volume Summary - Motor Vehicle Data

CTH F and Lindsay Road

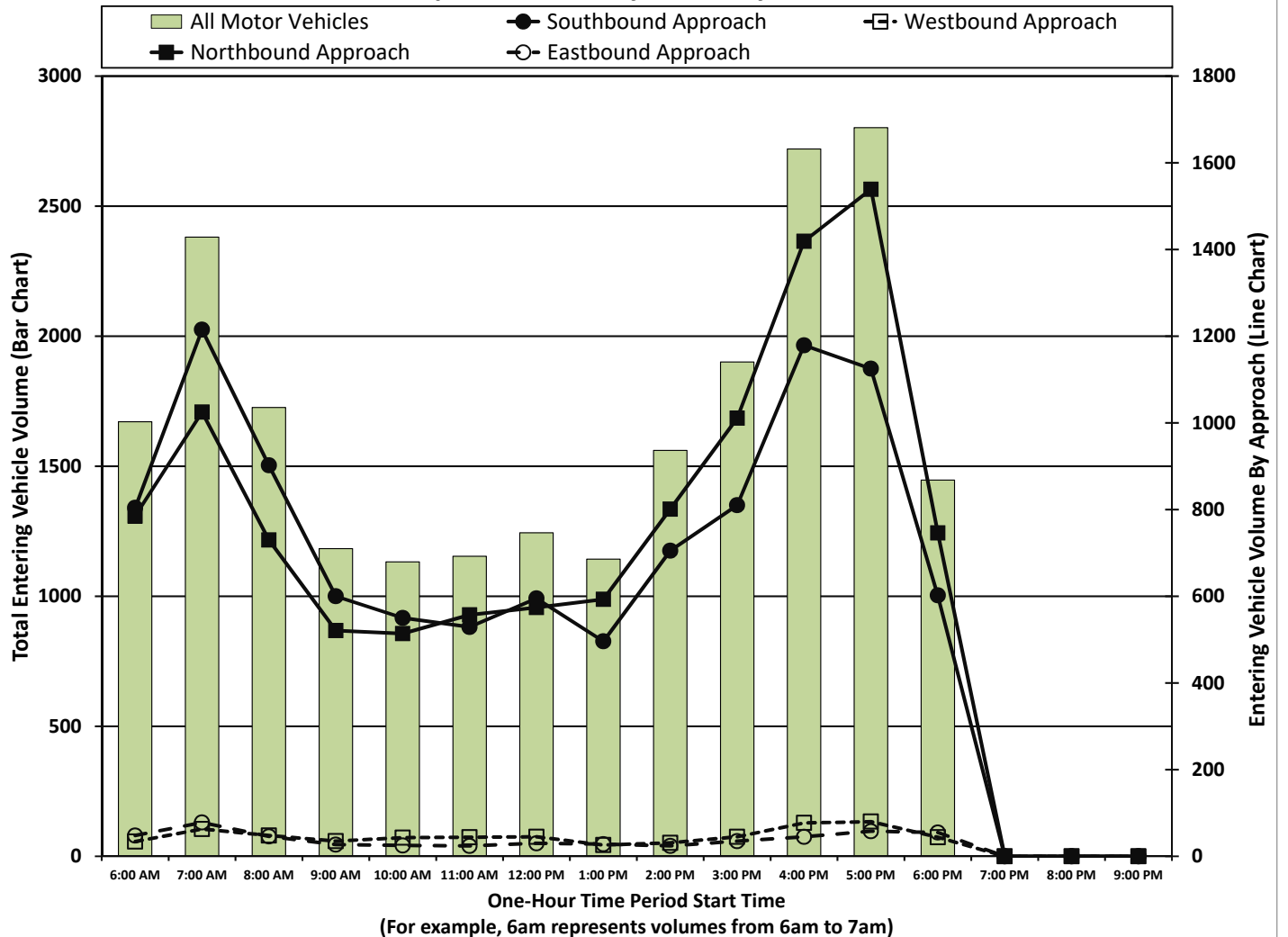
One-Hour Motor Vehicle Data

Count Basics			Page 4 of 13
Start Date:	Monday, September 30, 2019	Weekday	Schools in Session
Total Number of Hours Counted:	13	Non-Holiday	No Special Events



One-Hour Time Period Start Time	From North					From East					From South					From West					Total Vehicle Volume	Directional Volume Totals		
	CTH F					Lindsay Road					CTH F					Lindsay Road								
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		E/W	N/S	
AM	6:00 AM	3	794	7	0	804	9	6	19	0	34	52	731	2	0	785	26	11	11	0	48	1671	82	1589
	7:00 AM	4	1198	13	0	1215	16	13	34	0	63	42	975	8	0	1025	30	28	20	0	78	2381	141	2240
	8:00 AM	5	893	4	0	902	11	9	28	0	48	17	707	6	0	730	15	18	13	0	46	1726	94	1632
	9:00 AM	6	589	5	0	600	8	4	23	0	35	21	495	5	0	521	14	8	5	0	27	1183	62	1121
MD	10:00 AM	3	543	3	1	550	5	11	27	0	43	24	481	8	1	514	11	13	1	0	25	1132	68	1064
	11:00 AM	5	520	4	0	529	8	10	26	0	44	23	522	11	1	557	11	11	2	0	24	1154	68	1086
	12:00 PM	6	583	6	0	595	6	21	18	0	45	19	543	10	2	574	11	16	3	0	30	1244	75	1169
	1:00 PM	9	485	2	0	496	5	10	11	0	26	20	553	19	1	593	14	8	6	0	28	1143	54	1089
PM	2:00 PM	15	683	7	0	705	5	9	17	0	31	25	762	13	1	801	6	11	7	0	24	1561	55	1506
	3:00 PM	11	789	8	2	810	13	9	23	0	45	31	953	27	0	1011	14	13	8	0	35	1901	80	1821
	4:00 PM	23	1143	13	0	1179	24	23	30	0	77	40	1328	51	0	1419	17	19	9	0	45	2720	122	2598
	5:00 PM	29	1079	17	0	1125	30	18	32	0	80	60	1414	65	0	1539	28	17	13	0	58	2802	138	2664
	6:00 PM	15	577	10	0	602	10	16	18	0	44	32	691	22	1	746	17	26	12	0	55	1447	99	1348
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals		134	9876	99	3	10112	150	159	306	0	615	406	10155	247	7	10815	214	199	110	0	523	22065	1138	20927

Graphical Summary of Hourly Volumes



15-Minute Motor Vehicle Data

All Motor Vehicles

CTH F and Lindsay Road

15-Minute Motor Vehicle Data

Peak Hour All Vehicle Volume Summary

Page 27 of 44

Intersection Traffic Volume Report

Count Basics			Page 6 of 13
Start Date:	Monday, September 30, 2019	Weekday	Schools in Session
Total Number of Hours Counted:	13	Non-Holiday	No Special Events

15-Minute Automobile Data

CTH F and Lindsay Road

Automobiles (Cars, Light Trucks, & Motorcycles)		
		

15-Minute Automobile Data

15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	
	CTH F					Lindsay Road					CTH F					Lindsay Road							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
AM Peak Period	6:00 AM	0	110	0	0	110	1	1	7	0	9	11	112	1	0	124	4	0	2	0	6	249	1490
	6:15 AM	0	164	2	0	166	3	2	3	0	8	11	119	1	0	131	5	5	5	0	15	320	1702
	6:30 AM	2	207	3	0	212	1	0	4	0	5	15	203	0	0	218	9	3	0	0	12	447	1925
	6:45 AM	1	228	1	0	230	1	3	1	0	5	13	211	0	0	224	8	3	4	0	15	474	2075
	7:00 AM	0	256	2	0	258	1	2	9	0	12	7	169	2	0	178	4	6	3	0	13	461	2184
	7:15 AM	2	269	3	0	274	1	3	7	0	11	11	228	1	0	240	8	6	4	0	18	543	2170
	7:30 AM	0	294	3	0	297	5	4	7	0	16	7	252	3	0	262	8	8	6	0	22	597	2018
	7:45 AM	2	272	4	0	278	7	3	11	0	21	13	245	2	0	260	10	7	7	0	24	583	1757
	8:00 AM	3	250	1	0	254	3	3	7	0	13	3	166	1	0	170	4	1	5	0	10	447	1483
	8:15 AM	0	192	1	0	193	2	4	7	0	13	5	160	4	0	169	6	9	1	0	16	391	1282
	8:30 AM	0	185	1	0	186	2	0	3	0	5	3	127	1	0	131	3	5	6	0	14	336	1142
	8:45 AM	1	164	1	0	166	1	2	8	0	11	4	124	0	0	128	1	2	1	0	4	309	1035
	9:00 AM	1	117	3	0	121	2	0	10	0	12	2	104	1	0	107	2	3	1	0	6	246	992
	9:15 AM	0	126	0	0	126	1	1	4	0	6	5	110	1	0	116	2	0	1	0	3	251	963
	9:30 AM	2	111	1	0	114	3	3	5	0	11	6	90	2	0	98	2	3	1	0	6	229	906
	9:45 AM	2	153	0	0	155	1	0	3	0	4	5	90	1	0	96	7	2	2	0	11	266	915
Midday Peak Period	10:00 AM	0	112	0	0	112	1	3	5	0	9	4	87	0	0	91	2	3	0	0	5	217	857
	10:15 AM	1	104	2	0	107	0	3	4	0	7	5	68	3	0	76	2	2	0	0	4	194	853
	10:30 AM	1	103	1	1	106	4	1	4	0	9	5	108	2	1	116	3	3	1	0	7	238	880
	10:45 AM	1	95	0	0	96	0	2	11	0	13	5	84	2	0	91	4	4	0	0	8	208	898
	11:00 AM	0	87	0	0	87	4	3	5	0	12	7	98	4	1	110	1	2	1	0	4	213	934
	11:15 AM	2	99	3	0	104	0	3	5	0	8	2	97	2	0	101	4	3	1	0	8	221	991
	11:30 AM	1	130	1	0	132	1	2	8	0	11	4	102	4	0	110	1	2	0	0	3	256	1017
	11:45 AM	2	102	0	0	104	0	1	5	0	6	6	118	1	0	125	5	4	0	0	9	244	1006
	12:00 PM	0	122	1	0	123	2	6	3	0	11	7	118	5	0	130	1	4	1	0	6	270	982
	12:15 PM	0	117	2	0	119	1	2	5	0	8	2	108	1	1	112	5	2	1	0	8	247	948
	12:30 PM	3	104	1	0	108	1	8	5	0	14	2	114	1	0	117	2	4	0	0	6	245	927
	12:45 PM	3	111	1	0	115	0	4	2	0	6	6	81	3	1	91	3	4	1	0	8	220	929
	1:00 PM	1	114	0	0	115	0	2	3	0	5	3	98	3	1	105	6	3	2	0	11	236	933
	1:15 PM	4	87	0	0	91	4	4	1	0	9	3	114	6	0	123	1	1	1	0	3	226	989
	1:30 PM	1	103	1	0	105	1	3	4	0	8	5	121	4	0	130	2	1	1	0	4	247	1060
	1:45 PM	3	90	1	0	94	0	1	1	0	2	6	106	6	0	118	5	3	2	0	10	224	1216
PM Peak Period	2:00 PM	2	135	0	0	137	0	2	2	0	4	5	137	3	0	145	1	5	0	0	6	292	1315
	2:15 PM	4	119	0	0	123	2	2	5	0	9	4	156	4	0	164	0	0	1	0	1	297	1409
	2:30 PM	3	179	3	0	185	1	2	3	0	6	8	191	3	1	203	3	2	4	0	9	403	1498
	2:45 PM	6	135	1	0	142	1	3	4	0	8	6	158	3	0	167	2	2	2	0	6	323	1580
	3:00 PM	4	178	1	0	183	5	2	5	0	12	8	173	5	0	186	2	2	1	0	5	386	1734
	3:15 PM	1	150	1	0	152	1	2	3	0	6	7	208	2	0	217	4	4	3	0	11	386	1920
	3:30 PM	4	215	3	1	223	3	3	7	0	13	5	224	11	0	240	5	3	1	0	9	485	2162
	3:45 PM	1	171	2	1	175	4	1	6	0	11	4	271	8	0	283	3	3	2	0	8	477	2370
	4:00 PM	6	270	5	0	281	3	3	2	0	8	7	257	9	0	273	5	3	2	0	10	572	2564
	4:15 PM	6	291	3	0	300	7	3	7	0	17	10	288	7	0	305	3	2	1	0	6	628	2707
	4:30 PM	4	261	2	0	267	7	6	8	0	21	9	374	15	0	398	2	4	1	0	7	693	2895
	4:45 PM	7	251	0	0	258	7	8	12	0	27	11	336	19	0	366	7	9	4	0	20	671	2878
	5:00 PM	8	280	1	0	289	10	5	7	0	22	15	359	17	0	391	5	5	3	0	13	715	2688
	5:15 PM	11	299	5	0	315	9	5	4	0	18	18	426	20	0	464	8	7	4	0	19	816	2354
	5:30 PM	8	272	4	0	284	4	5	10	0	19	14	324	18	0	356	9	3	5	0	17	676	1902
	5:45 PM	2	176	6	0	184	5	3	11	0	19	9	252	10	0	271	5	1	1	0	7	481	1559
	6:00 PM	2	177	2	0	181	3	6	5	0	14	8	160	2	0	170	5	8	3	0	16	381	1389
	6:15 PM	3	145	2	0	150	0	2	3	0	5	6	187	8	0	201	2	5	1	0	8	364	
	6:30 PM	6	120	5	0	131	5	4	2	0	11	8	165	6	0	179	5	5	2	0	12	333	
	6:45 PM	3	115	0	0	118	2	4	8	0	14	8	146	6	1	161	4	8	6	0	18	311	
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Totals		130	8717	86	3	8936	133	150	281	0	564	363	8924	244	7	9538	210	189	108	0	507	19545	

Peak Hour Automobile Volume Summary

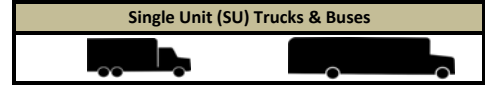
Hourly Time Period	Start Time	From North				From East				From South	
--------------------	------------	------------	--	--	--	-----------	--	--	--	------------	--

Intersection Traffic Volume Report

15-Minute Single Unit (SU) Truck & Bus Data

Count Basics			Page 7 of 13
Start Date:	Monday, September 30, 2019	Weekday	Schools in Session
Total Number of Hours Counted:	13	Non-Holiday	No Special Events

CTH F and Lindsay Road



15-Minute Single Unit (SU) Truck & Bus Data

15-Minute Time Period Start Time	From North						From East					From South					From West					15-Min Totals	Hourly Sum
	CTH F						Lindsay Road					CTH F					Lindsay Road						
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
AM Peak Period	6:00 AM	0	13	0	0	13	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	21	136
	6:15 AM	0	16	0	0	16	2	0	0	0	2	1	10	0	0	11	0	0	0	0	0	29	152
	6:30 AM	0	16	1	0	17	0	0	3	0	3	1	16	0	0	17	0	0	0	0	0	37	164
	6:45 AM	0	17	0	0	17	1	0	1	0	2	0	30	0	0	30	0	0	0	0	0	49	163
	7:00 AM	0	25	0	0	25	2	0	0	0	2	0	10	0	0	10	0	0	0	0	0	37	150
	7:15 AM	0	27	0	0	27	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	41	156
	7:30 AM	0	16	1	0	17	0	0	0	0	0	2	17	0	0	19	0	0	0	0	0	36	163
	7:45 AM	0	17	0	0	17	0	1	0	0	1	1	16	0	0	17	0	1	0	0	1	36	177
	8:00 AM	0	12	0	0	12	1	0	0	0	1	0	30	0	0	30	0	0	0	0	0	43	190
	8:15 AM	1	27	0	0	28	0	0	1	0	1	1	18	0	0	19	0	0	0	0	0	48	184
	8:30 AM	0	10	0	0	10	1	0	1	0	2	1	37	0	0	38	0	0	0	0	0	50	167
	8:45 AM	0	30	0	0	30	1	0	0	0	1	0	16	0	0	16	1	1	0	0	2	49	155
	9:00 AM	1	11	0	0	12	0	0	0	0	0	1	24	0	0	25	0	0	0	0	0	37	140
	9:15 AM	0	15	1	0	16	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	31	153
	9:30 AM	0	19	0	0	19	0	0	0	0	0	1	18	0	0	19	0	0	0	0	0	38	180
9:45 AM	0	17	0	0	17	1	0	1	0	2	0	14	0	0	14	1	0	0	0	1	34	192	
Midday Peak Period	10:00 AM	0	23	0	0	23	0	1	2	0	3	2	22	0	0	24	0	0	0	0	0	50	207
	10:15 AM	0	32	0	0	32	0	0	0	0	0	0	24	1	0	25	0	1	0	0	1	58	202
	10:30 AM	0	21	0	0	21	0	1	1	0	2	1	26	0	0	27	0	0	0	0	0	50	187
	10:45 AM	0	29	0	0	29	0	0	0	0	0	1	19	0	0	20	0	0	0	0	0	49	177
	11:00 AM	0	23	0	0	23	0	1	1	0	2	1	19	0	0	20	0	0	0	0	0	45	176
	11:15 AM	0	20	0	0	20	1	0	1	0	2	2	19	0	0	21	0	0	0	0	0	43	185
	11:30 AM	0	22	0	0	22	0	0	1	0	1	1	16	0	0	17	0	0	0	0	0	40	192
	11:45 AM	0	19	0	0	19	2	0	0	0	2	0	27	0	0	27	0	0	0	0	0	48	206
	12:00 PM	0	22	0	0	22	0	0	1	0	1	0	31	0	0	31	0	0	0	0	0	54	224
	12:15 PM	0	28	1	0	29	1	0	2	0	3	1	17	0	0	18	0	0	0	0	0	50	223
	12:30 PM	0	23	0	0	23	0	0	0	0	0	1	28	0	0	29	0	2	0	0	2	54	213
	12:45 PM	0	38	0	0	38	1	1	0	0	2	0	26	0	0	26	0	0	0	0	0	66	203
	1:00 PM	0	29	0	0	29	0	0	1	0	1	2	21	0	0	23	0	0	0	0	0	53	182
	1:15 PM	0	8	0	0	8	0	0	1	0	1	1	30	0	0	31	0	0	0	0	0	40	186
	1:30 PM	0	24	0	0	24	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	44	205
1:45 PM	0	17	0	0	17	0	0	0	0	0	0	28	0	0	28	0	0	0	0	0	45	202	
PM Peak Period	2:00 PM	0	28	1	0	29	0	0	0	0	0	1	27	0	0	28	0	0	0	0	0	57	201
	2:15 PM	0	29	0	0	29	0	0	3	0	3	1	25	0	0	26	0	1	0	0	1	59	179
	2:30 PM	0	22	1	0	23	0	0	0	0	0	0	18	0	0	18	0	0	0	0	0	41	156
	2:45 PM	0	18	1	0	19	1	0	0	0	1	0	23	0	0	23	0	1	0	0	1	44	149
	3:00 PM	0	17	0	0	17	0	1	0	0	1	1	15	0	0	16	0	0	1	0	1	35	132
	3:15 PM	1	15	1	0	17	0	0	1	0	1	2	15	1	0	18	0	0	0	0	0	36	129
	3:30 PM	0	21	0	0	21	0	0	1	0	1	1	10	0	0	11	0	1	0	0	1	34	128
	3:45 PM	0	14	0	0	14	0	0	0	0	0	2	11	0	0	13	0	0	0	0	0	27	121
	4:00 PM	0	12	0	0	12	0	1	0	0	1	0	18	0	0	18	0	1	0	0	1	32	111
	4:15 PM	0	16	1	0	17	0	1	0	0	1	3	14	0	0	17	0	0	0	0	0	35	92
	4:30 PM	0	13	0	0	13	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	27	95
	4:45 PM	0	8	0	0	8	0	1	0	0	1	0	7	1	0	8	0	0	0	0	0	17	87
	5:00 PM	0	4	0	0	4	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	13	88
	5:15 PM	0	18	0	0	18	1	0	0	0	1	1	17	0	0	18	1	0	0	0	1	38	92
	5:30 PM	0	7	1	0	8	1	0	0	0	1	1	9	0	0	10	0	0	0	0	0	19	65
	5:45 PM	0	10	0	0	10	0	0	0	0	0	2	5	0	0	7	0	1	0	0	1	18	54
	6:00 PM	1	7	1	0	9	0	0	0	0	0	0	7	0	0	7	1	0	0	0	1	17	42
	6:15 PM	0	4	0	0	4	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	11	
	6:30 PM	0	4	0	0	4	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	8	
	6:45 PM	0	0	0	0	0	0	0	0	0	0	1	5	0	0	6	0	0	0	0	0	6	
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Totals		4	933	11	0	948	17	9	23	0	49	39	924	3	0	966	4	10	2	0	16	1979	

Peak Hour Single Unit (SU) Truck & Buses Volume Summary

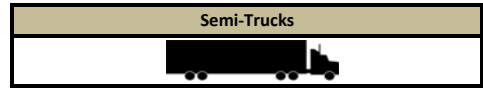
Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume
	CTH F					Lindsay Road					CTH F					Lindsay Road					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:00 AM	0	85	1	0	86	2	1	0	0	3	3	57	0	0	60	0	1	0	0	1	150
MD 11:30 AM	0	91	1	0	92	3	0	4	0	7	2	91	0	0	93	0	0	0	0	0	192
PM 4:30 PM	0	43	0	0	43	1	1	0	0	2	1	46	1	0	48	1	0	1	0	2	99

Intersection Traffic Volume Report

Count Basics			Page 8 of 13
Start Date:	Monday, September 30, 2019	Weekday	Schools in Session
Total Number of Hours Counted:	13	Non-Holiday	No Special Events

15-Minute Semi-Truck Data

CTH F and Lindsay Road



15-Minute Semi-Truck Data

15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	
	CTH F					Lindsay Road					CTH F					Lindsay Road							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
AM Peak Period	6:00 AM	0	3	0	0	3	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	11	45
	6:15 AM	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	12	42
	6:30 AM	0	6	0	0	6	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	14	37
	6:45 AM	0	7	0	0	7	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	8	35
	7:00 AM	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	8	47
	7:15 AM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7	53
	7:30 AM	0	3	0	0	3	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	12	61
	7:45 AM	0	11	0	0	11	0	0	0	0	0	1	8	0	0	9	0	0	0	0	0	20	65
	8:00 AM	0	6	0	0	6	0	0	1	0	1	0	7	0	0	7	0	0	0	0	0	14	53
	8:15 AM	0	5	0	0	5	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	15	54
	8:30 AM	0	7	0	0	7	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	16	45
	8:45 AM	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	8	45
	9:00 AM	0	5	0	0	5	0	0	0	0	0	1	9	0	0	10	0	0	0	0	0	15	51
	9:15 AM	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	6	57
9:30 AM	0	7	0	0	7	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	16	70	
9:45 AM	0	4	0	0	4	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	14	68	
Midday Peak Period	10:00 AM	0	8	0	0	8	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	21	68
	10:15 AM	0	7	0	0	7	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	19	58
	10:30 AM	0	2	0	0	2	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	14	45
	10:45 AM	0	7	0	0	7	0	0	0	0	0	1	6	0	0	7	0	0	0	0	0	14	40
	11:00 AM	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	11	44
	11:15 AM	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	6	43
	11:30 AM	0	3	0	0	3	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	9	51
	11:45 AM	0	6	0	0	6	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	18	46
	12:00 PM	0	3	0	0	3	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	10	38
	12:15 PM	0	9	0	0	9	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	14	33
	12:30 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4	27
	12:45 PM	0	5	0	0	5	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	10	31
	1:00 PM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5	28
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	8	42
1:30 PM	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	8	44	
1:45 PM	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	7	44	
PM Peak Period	2:00 PM	0	8	0	0	8	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	19	45
	2:15 PM	0	5	0	0	5	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	10	37
	2:30 PM	0	1	0	0	1	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	8	33
	2:45 PM	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8	32
	3:00 PM	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	11	35
	3:15 PM	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	6	42
	3:30 PM	0	1	0	0	1	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	7	49
	3:45 PM	0	1	0	0	1	0	0	0	0	0	1	9	0	0	10	0	0	0	0	0	11	49
	4:00 PM	0	10	0	0	10	0	0	1	0	1	0	7	0	0	7	0	0	0	0	0	18	45
	4:15 PM	0	6	0	0	6	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	13	32
	4:30 PM	0	4	1	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	7	23
	4:45 PM	0	1	1	0	2	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	7	21
	5:00 PM	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5	26
	5:15 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4	25
	5:30 PM	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5	25
	5:45 PM	0	5	0	0	5	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	12	23
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	4	16
	6:15 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4	
	6:30 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3	
	6:45 PM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5	
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Totals	0	226	2	0	228	0	0	2	0	2	4	307	0	0	311	0	0	0	0	0	541		

Peak Hour Semi-Truck Volume Summary

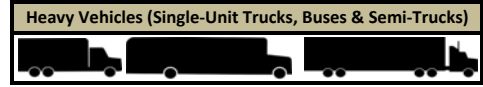
Hourly Time Period Start Time	↓ From North					← From East					↑ From South					→ From West					Total Hourly Volume
	CTH F					Lindsay Road					CTH F					Lindsay Road					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:00 AM	0	25	0	0	25	0	0	1	0	1	1	34	0	0	35	0	0	0	0	0	61
MD 11:30 AM	0	17	0	0	17	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	33
PM 4:30 PM	0	21	1	0	22	0	0	1	0	1	1	25	0	0	26	0	0	0	0	0	49

Intersection Traffic Volume Report

Count Basics			Page 9 of 13
Start Date:	Monday, September 30, 2019	Weekday	Schools in Session
Total Number of Hours Counted:	13	Non-Holiday	No Special Events

15-Minute Heavy Vehicle Data

CTH F and Lindsay Road



15-Minute Heavy Vehicle Data

15-Minute Time Period	Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum
		CTH F					Lindsay Road					CTH F					Lindsay Road						
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
AM Peak Period	6:00 AM	0	16	0	0	16	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	32	181
	6:15 AM	0	23	0	0	23	2	0	0	0	2	1	15	0	0	16	0	0	0	0	0	41	194
	6:30 AM	0	22	1	0	23	0	0	3	0	3	1	24	0	0	25	0	0	0	0	0	51	201
	6:45 AM	0	24	0	0	24	1	0	1	0	2	0	31	0	0	31	0	0	0	0	0	57	198
	7:00 AM	0	30	0	0	30	2	0	0	0	2	0	13	0	0	13	0	0	0	0	0	45	197
	7:15 AM	0	30	0	0	30	0	0	0	0	0	0	18	0	0	18	0	0	0	0	0	48	209
	7:30 AM	0	19	1	0	20	0	0	0	0	0	2	26	0	0	28	0	0	0	0	0	48	224
	7:45 AM	0	28	0	0	28	0	1	0	0	1	2	24	0	0	26	0	1	0	0	1	56	242
	8:00 AM	0	18	0	0	18	1	0	1	0	2	0	37	0	0	37	0	0	0	0	0	57	243
	8:15 AM	1	32	0	0	33	0	0	1	0	1	1	28	0	0	29	0	0	0	0	0	63	238
	8:30 AM	0	17	0	0	17	1	0	1	0	2	1	46	0	0	47	0	0	0	0	0	66	212
	8:45 AM	0	35	0	0	35	1	0	0	0	1	0	19	0	0	19	1	1	0	0	2	57	200
9:00 AM	1	16	0	0	17	0	0	0	0	0	2	33	0	0	35	0	0	0	0	0	52	191	
9:15 AM	0	19	1	0	20	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	37	210	
9:30 AM	0	26	0	0	26	0	0	0	0	0	1	27	0	0	28	0	0	0	0	0	54	250	
9:45 AM	0	21	0	0	21	1	0	1	0	2	0	24	0	0	24	1	0	0	0	1	48	260	
Midday Peak Period	10:00 AM	0	31	0	0	31	0	1	2	0	3	2	35	0	0	37	0	0	0	0	0	71	275
	10:15 AM	0	39	0	0	39	0	0	0	0	0	0	36	1	0	37	0	1	0	0	1	77	260
	10:30 AM	0	23	0	0	23	0	1	1	0	2	1	38	0	0	39	0	0	0	0	0	64	232
	10:45 AM	0	36	0	0	36	0	0	0	0	0	2	25	0	0	27	0	0	0	0	0	63	217
	11:00 AM	0	30	0	0	30	0	1	1	0	2	1	23	0	0	24	0	0	0	0	0	56	220
	11:15 AM	0	22	0	0	22	1	0	1	0	2	2	23	0	0	25	0	0	0	0	0	49	228
	11:30 AM	0	25	0	0	25	0	0	1	0	1	1	22	0	0	23	0	0	0	0	0	49	243
	11:45 AM	0	25	0	0	25	2	0	0	0	2	0	39	0	0	39	0	0	0	0	0	66	252
	12:00 PM	0	25	0	0	25	0	0	1	0	1	0	38	0	0	38	0	0	0	0	0	64	262
	12:15 PM	0	37	1	0	38	1	0	2	0	3	1	22	0	0	23	0	0	0	0	0	64	256
	12:30 PM	0	24	0	0	24	0	0	0	0	0	1	31	0	0	32	0	2	0	0	2	58	240
	12:45 PM	0	43	0	0	43	1	1	0	0	2	0	31	0	0	31	0	0	0	0	0	76	234
1:00 PM	0	31	0	0	31	0	0	1	0	1	2	24	0	0	26	0	0	0	0	0	58	210	
1:15 PM	0	8	0	0	8	0	0	1	0	1	1	38	0	0	39	0	0	0	0	0	48	228	
1:30 PM	0	30	0	0	30	0	0	0	0	0	0	22	0	0	22	0	0	0	0	0	52	249	
1:45 PM	0	22	0	0	22	0	0	0	0	0	0	30	0	0	30	0	0	0	0	0	52	246	
PM Peak Period	2:00 PM	0	36	1	0	37	0	0	0	0	0	1	38	0	0	39	0	0	0	0	0	76	246
	2:15 PM	0	34	0	0	34	0	0	3	0	3	1	30	0	0	31	0	1	0	0	1	69	216
	2:30 PM	0	23	1	0	24	0	0	0	0	0	0	25	0	0	25	0	0	0	0	0	49	189
	2:45 PM	0	22	1	0	23	1	0	0	0	1	0	27	0	0	27	0	1	0	0	1	52	181
	3:00 PM	0	22	0	0	22	0	1	0	0	1	1	21	0	0	22	0	0	1	0	1	46	167
	3:15 PM	1	16	1	0	18	0	0	1	0	1	2	20	1	0	23	0	0	0	0	0	42	171
	3:30 PM	0	22	0	0	22	0	0	1	0	1	1	16	0	0	17	0	1	0	0	1	41	177
	3:45 PM	0	15	0	0	15	0	0	0	0	0	3	20	0	0	23	0	0	0	0	0	38	170
	4:00 PM	0	22	0	0	22	0	1	1	0	2	0	25	0	0	25	0	1	0	0	1	50	156
	4:15 PM	0	22	1	0	23	0	1	0	0	1	3	21	0	0	24	0	0	0	0	0	48	124
	4:30 PM	0	17	1	0	18	0	0	0	0	0	0	15	0	0	15	0	0	1	0	1	34	118
	4:45 PM	0	9	1	0	10	0	1	0	0	1	0	12	1	0	13	0	0	0	0	0	24	108
	5:00 PM	0	7	0	0	7	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	18	114
	5:15 PM	0	20	0	0	20	1	0	0	0	1	1	19	0	0	20	1	0	0	0	1	42	117
	5:30 PM	0	10	1	0	11	1	0	0	0	1	1	11	0	0	12	0	0	0	0	0	24	90
	5:45 PM	0	15	0	0	15	0	0	0	0	0	2	12	0	0	14	0	1	0	0	1	30	77
	6:00 PM	1	7	1	0	9	0	0	0	0	0	0	11	0	0	11	1	0	0	0	1	21	58
	6:15 PM	0	5	0	0	5	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	15	
	6:30 PM	0	6	0	0	6	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	11	
	6:45 PM	0	2	0	0	2	0	0	0	0	0	1	8	0	0	9	0	0	0	0	0	11	
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Totals		4	1159	13	0	1176	17	9	25	0	51	43	1231	3	0	1277	4	10	2	0	16	2520	

Peak Hour Heavy Vehicle Volume Summary

Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume
	CTH F					Lindsay Road					CTH F					Lindsay Road					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:00 AM	0	107	1	0	108	2	1	0	0	3	4	81	0	0	85	0	1	0	0	1	197
MD 11:30 AM	0	112	1	0	113	3	0	4	0	7	2	121	0	0	123	0	0	0	0	0	243
PM 4:30 PM	0	53	2	0	55	1	1	0	0	2	1	57	1	0	59	1	0	1	0	2	118

15-Minute Heavy Vehicle Percentages

Heavy Vehicles (Single-Unit Trucks, Buses & Semi-Trucks)	
%	  

15-Minute Heavy Vehicle Percentages

Peak Hour Heavy Vehicle Percentages Summary

Near North Heavy Vehicle Percentages Summary																						
Hourly Time Period Start Time	From North					From East					From South					From West					Hourly Heavy Vehicle Percentage	
	CTH F					Lindsay Road					CTH F					Lindsay Road						
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
AM 7:00 AM	0.0	8.9	7.7	0.0	8.9	12.5	7.7	0.0	0.0	4.8	9.5	8.3	0.0	0.0	8.3	0.0	3.6	0.0	0.0	1.3	8.0	
MD 11:30 AM	0.0	19.2	20.0	0.0	19.1	42.9	0.0	16.0	0.0	16.3	9.5	21.3	0.0	0.0	20.5	0.0	0.0	0.0	0.0	0.0	19.0	
PM 4:30 PM	0.0	4.6	20.0	0.0	4.6	2.9	4.0	0.0	0.0	2.2	1.9	3.7	1.4	0.0	3.5	4.3	0.0	7.7	0.0	3.3	3.3	

Intersection Traffic Volume Report

15-Minute Pedestrian and Bicyclist Data

Count Basics		Page 11 of 13	
Start Date:	Monday, September 30, 2019	Weekday	Schools in Session
Total Number of Hours Counted:	13	Non-Holiday	No Special Events

CTH F and Lindsay Road



15-Minute Pedestrian and Bicyclist Data

15-Minute Time Period Start Time		Crossing North Approach			Crossing East Approach			Crossing South Approach			Crossing West Approach			15-Min Totals	Hourly Sum
		CTH F			Lindsay Road			CTH F			Lindsay Road				
		Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total		
AM Peak Period	6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	7:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	1
	7:30 AM	0	0	0	0	1	1	0	0	0	0	0	0	1	1
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	9:15 AM	0	1	1	0	0	0	0	0	0	0	0	0	1	1
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Midday Peak Period	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	10:45 AM	0	1	1	0	0	0	0	0	0	0	0	0	1	2
	11:00 AM	0	0	0	0	0	0	0	1	1	0	0	0	1	3
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	11:45 AM	0	2	2	0	0	0	0	0	0	0	0	0	2	2
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	12:45 PM	0	0	0	0	0	0	0	1	1	0	0	0	1	2
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1:30 PM	0	0	0	0	0	0	0	1	1	0	0	0	1	2	
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
PM Peak Period	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	2:15 PM	0	0	0	0	0	0	0	1	1	0	0	0	1	1
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	6
	4:15 PM	0	0	0	0	0	0	0	1	1	0	0	0	1	7
	4:30 PM	0	1	1	0	0	0	0	2	2	0	0	0	3	6
	4:45 PM	0	1	1	0	0	0	0	1	1	0	0	0	2	3
	5:00 PM	0	1	1	0	0	0	0	0	0	0	0	0	1	3
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	5:45 PM	0	2	2	0	0	0	0	0	0	0	0	0	2	2
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals		0	9	9	0	1	1	0	8	8	0	0	0	18	

Special Pedestrians

Pedestrian Type	None	1 or 2	A Few	Several	Many	Unknown
Pre-school Children	x					
Elementary School Age Children	x					
Visually Impaired (white cane/helper dog)	x					
Elderly/Disabled (except wheelchairs)	x					
Wheelchairs/Electric Scooters	x					
Other (None)	x					

APPENDIX C

EXISTING TRAFFIC CONTROL ANALYSIS OUTPUTS

Lanes, Volumes, Timings
3: CTH F & Lindsay Road

2019 Exist TWSC - AM.syn
10/09/2019

	↗	→	↘	↖	←	↙	↘	↖	↗	↘	↖	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	20	30	30	35	15	15	10	975	40	15	1200	5
Future Volume (vph)	20	30	30	35	15	15	10	975	40	15	1200	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	250	225	250	225	225	225
Storage Lanes	0	0	0	0	0	0	1	1	1	1	1	1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.949			0.969				0.850			0.850
Flt Protected		0.988			0.974		0.950			0.950		
Satd. Flow (prot)	0	1764	0	0	1708	0	1671	3343	1495	1656	3312	1482
Flt Permitted		0.988			0.974		0.950			0.950		
Satd. Flow (perm)	0	1764	0	0	1708	0	1671	3343	1495	1656	3312	1482
Link Speed (mph)		35			35			55			55	
Link Distance (ft)		616			668			801			747	
Travel Time (s)		12.0			13.0			9.9			9.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	8%	8%	8%	9%	9%	9%
Adj. Flow (vph)	22	33	33	38	16	16	11	1060	43	16	1304	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	0	0	70	0	11	1060	43	16	1304	5
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

TADI
C:\Egnyte\Shared\W\2419 CTH F with Lindsay Road (Wauk County)\Capacity Analysis\2019 Exist TWSC - AM.syn

Synchro 10 Report

HCM 6th TWSC
3: CTH F & Lindsay Road

2019 Exist TWSC - AM.syn
10/09/2019

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	20	30	30	35	15	15	10	975	40	15	1200	5
Future Vol, veh/h	20	30	30	35	15	15	10	975	40	15	1200	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	-	225	250	-	225	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	5	5	5	8	8	8	9	9	9
Mvmt Flow	22	33	33	38	16	16	11	1060	43	16	1304	5

Major/Minor	Minor2		Minor1		Major1		Major2			
Conflicting Flow All	1896	2461	652	1783	2423	530	1309	0	0	1103
Stage 1	1336	1336	-	1082	1082	-	-	-	-	-
Stage 2	560	1125	-	701	1341	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.6	6.6	7	4.26	-	-	4.28
Critical Hdwy Stg 1	6.52	5.52	-	6.6	5.6	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.6	5.6	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.55	4.05	3.35	2.28	-	-	2.29
Pot Cap-1 Maneuver	43	~ 31	413	50	31	486	494	-	-	589
Stage 1	163	222	-	227	286	-	-	-	-	-
Stage 2	483	281	-	389	214	-	-	-	-	-
Platoon blocked, %								-	-	-
Mov Cap-1 Maneuver	37	~ 30	413	~ 37	30	486	494	-	-	589
Mov Cap-2 Maneuver	143	158	-	168	154	-	-	-	-	-
Stage 1	159	216	-	222	280	-	-	-	-	-
Stage 2	430	275	-	296	208	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	36.4		34		0.1		0.1	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	494	-	-	199	193	589	-	-
HCM Lane V/C Ratio	0.022	-	-	0.437	0.366	0.028	-	-
HCM Control Delay (s)	12.5	-	-	36.4	34	11.3	-	-
HCM Lane LOS	B	-	-	E	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2	1.6	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

TADI
C:\Egnyte\Shared\W\2419 CTH F with Lindsay Road (Wauk County)\Capacity Analysis\2019 Exist TWSC - AM.syn

Synchro 10 Report

Lanes, Volumes, Timings
3: CTH F & Lindsay Road

2019 Exist TWSC - PM.syn
10/09/2019

	↗	→	↘	↖	←	↙	↘	↖	↗	↘	↖	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	15	25	25	30	25	35	70	1550	55	10	1145	30
Future Volume (vph)	15	25	25	30	25	35	70	1550	55	10	1145	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	250	225	250	225	225	225
Storage Lanes	0	0	0	0	0	0	1	1	1	1	1	1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.948			0.947				0.850			0.850
Flt Protected		0.988			0.984		0.950			0.950		
Satd. Flow (prot)	0	1728	0	0	1736	0	1736	3471	1553	1719	3438	1538
Flt Permitted		0.988			0.984		0.950			0.950		
Satd. Flow (perm)	0	1728	0	0	1736	0	1736	3471	1553	1719	3438	1538
Link Speed (mph)		35			35			55			55	
Link Distance (ft)		616			668			801			747	
Travel Time (s)		12.0			13.0			9.9			9.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	5%	5%	5%
Adj. Flow (vph)	17	28	28	34	28	40	80	1761	63	11	1301	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	73	0	0	102	0	80	1761	63	11	1301	34
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM 6th TWSC
3: CTH F & Lindsay Road

2019 Exist TWSC - PM.syn
10/09/2019

Intersection												
Int Delay, s/veh	9.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	15	25	25	30	25	35	70	1550	55	10	1145	30
Future Vol, veh/h	15	25	25	30	25	35	70	1550	55	10	1145	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	250	-	225	250	-	225
Veh in Median Storage, #	-	2	-	-	2	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	2	2	2	4	4	4	5	5	5
Mvmt Flow	17	28	28	34	28	40	80	1761	63	11	1301	34

Major/Minor	Minor2		Minor1		Major1		Major2			
Conflicting Flow All	2378	3307	651	2608	3278	881	1335	0	0	1824
Stage 1	1323	1323	-	1921	1921	-	-	-	-	-
Stage 2	1055	1984	-	687	1357	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.54	6.54	6.94	4.18	-	-	4.2
Critical Hdwy Stg 1	6.56	5.56	-	6.54	5.54	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.54	5.54	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.52	4.02	3.32	2.24	-	-	2.25
Pot Cap-1 Maneuver	18	~ 8	409	~ 12	~ 9	290	502	-	-	319
Stage 1	163	222	-	69	113	-	-	-	-	-
Stage 2	239	104	-	403	215	-	-	-	-	-
Platoon blocked, %								-	-	-
Mov Cap-1 Maneuver	~ 9	~ 6	409	~ 6	~ 7	290	502	-	-	319
Mov Cap-2 Maneuver	80	67	-	53	71	-	-	-	-	-
Stage 1	137	214	-	58	95	-	-	-	-	-
Stage 2	122	87	-	314	208	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	96.3	239	0.6	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	502	-	-	105	87	319	-
HCM Lane V/C Ratio	0.158	-	-	0.703	1.176	0.036	-
HCM Control Delay (s)	13.5	-	-	96.3	239	16.7	-
HCM Lane LOS	B	-	-	F	F	C	-
HCM 95th %tile Q(veh)	0.6	-	-	3.7	7.2	0.1	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

APPENDIX D

TRAFFIC SIGNAL WARRANT DESCRIPTIONS

Traffic Signal Warrant Descriptions

Warrant 1, Eight Hour Vehicular Volume states that a traffic signal may be considered if one of the following conditions exists for at least eight hours of an average day:

- A. The vehicles per hour given on the major street meet or exceed 500 and the vehicles per hour on the minor street meet or exceed 150; or
- B. The vehicles per hour given on the major street meet or exceed 750 and the vehicles per hour on the minor street meet or exceed 75.

Or if the following two conditions exist for eight hours of an average day:

- A. The vehicles per hour on the major street and minor street meet or exceed 80% of the values stated in A (400 major, 120 minor); and
- B. The vehicles per hour on the major street and minor street meet or exceed 80% of the values stated in B (600 major, 60 minor).

Warrant 2, Four Hour Volume is satisfied if during any four hours of an average day the major street and minor street volumes fall above the 100 percent four-hour curves shown on the graph in the Appendix of this report.

Warrant 3, Peak Hour Volume is satisfied if during any hour of an average day the major street and minor street volumes fall above the 100 percent peak hour curves shown on the graph in the Appendix of this report. Note that this signal warrant is typically applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Warrant 4, Pedestrian Volume states that a traffic signal may be considered at an intersection or midblock crossing if one of the following conditions exists for an average day:

- A. For each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street and the corresponding pedestrians per hour crossing the major street (total of all crossings) all fall above the curve in the Appendix of this report; or
- B. For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point representing the vehicles per hour on the major street and the corresponding pedestrians per hour crossing the major street (total of all crossings) falls above the curve in the Appendix of this report.

Warrant 5, School Crossing is satisfied if during any hour of an average day there are inadequate gaps in the traffic stream on the major street as related to the number and size of groups of school crossing children that the number of gaps during the duration when the children are crossing is less than the number of minutes in the same period and there are a minimum of 20 students during the highest crossing hour.

Warrant 6, Coordinated Signal System is satisfied if the adjacent traffic signals are so far apart that they do not provide adequate vehicle platooning (one-way or two-way streets), and the existing and proposed traffic signals would collectively provide a progressive operation (two-way streets). This warrant shall not be applied at locations where the nearest traffic signal on the major street is less than 300 feet.

Warrant 7, Crash Experience states that a traffic signal may be considered if an engineering study finds that all of the following criteria are met:

- A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and
- B. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and
- C. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Warrant 1 Condition A, or the vph in both of the 80 percent columns of Warrant 1 Condition B exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection.

Warrant 8, Roadway Network is satisfied if the common intersection of two or more major routes meets one or both of the following criteria:

- A. The intersection has a total existing, or immediately projected, entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday and has 5-year projected traffic volumes, based on an engineering study, that meet one or more of Warrants 1, 2, and 3 during an average weekday; or
- B. The intersection has a total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a non-normal business day (Saturday or Sunday).

A major route as used in this signal warrant shall have at least one of the following characteristics:

- A. It is part of the street or highway system that serves as the principal roadway network for through traffic flow.
- B. It includes rural or suburban highways outside, entering, or traversing a city.
- C. It appears as a major route on an official plan, such as a major street plan in an urban area traffic and transportation study.

Warrant 9, Intersection Near a Grade Crossing is satisfied if none of the previous eight warrants are met, but the proximity to the intersection of a grade crossing on an intersection approach controlled by a STOP or YIELD sign is the principal reason to consider installing a traffic control signal.

APPENDIX E

TRAFFIC SIGNAL CONTROL ANALYSIS OUTPUTS

Lanes, Volumes, Timings
3: CTH F & Lindsay Road

2019 Exist Signal - AM.syn
10/09/2019

	←	→	↖	↗	←	↖	↗	→	↖	↗	→	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	20	30	30	35	15	15	10	975	40	15	1200	5
Future Volume (vph)	20	30	30	35	15	15	10	975	40	15	1200	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	250	225	250	225	225	225
Storage Lanes	0	0	0	0	0	0	1	1	1	1	1	1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.949			0.969				0.850			0.850
Flt Protected		0.988			0.974		0.950			0.950		
Satd. Flow (prot)	0	1764	0	0	1708	0	1671	3343	1495	1656	3312	1482
Flt Permitted		0.892			0.783		0.169			0.245		
Satd. Flow (perm)	0	1592	0	0	1373	0	297	3343	1495	427	3312	1482
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			55			55	
Link Distance (ft)		616			668			801			747	
Travel Time (s)		12.0			13.0			9.9			9.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	62%	100%	100%	62%
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	8%	8%	8%	9%	9%	9%
Adj. Flow (vph)	22	33	33	38	16	16	11	1060	27	16	1304	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	0	0	70	0	11	1060	27	16	1304	3
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2		6		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	36.0	36.0		36.0	36.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	43.9%	43.9%		43.9%	43.9%		56.1%	56.1%	56.1%	56.1%	56.1%	56.1%
Maximum Green (s)	30.0	30.0		30.0	30.0		40.0	40.0	40.0	40.0	40.0	40.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
v/c Ratio		0.26			0.24		0.06	0.48	0.03	0.06	0.60	0.00
Control Delay		21.3			21.5		5.7	7.2	4.9	5.5	8.5	4.7
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		21.3			21.5		5.7	7.2	4.9	5.5	8.5	4.7
90th %ile Green (s)	11.6	11.6		11.6	11.6		38.2	38.2	38.2	38.2	38.2	38.2
90th %ile Term Code	Gap	Gap		Hold	Hold		Hold	Hold	Hold	Gap	Gap	Gap
70th %ile Green (s)	10.0	10.0		10.0	10.0		30.1	30.1	30.1	30.1	30.1	30.1

TADI
C:\Egnyte\Shared\W\2419 CTH F with Lindsay Road (Wauk County)\Capacity Analysis\2019 Exist Signal - AM.syn

Synchro 10 Report

Lanes, Volumes, Timings
3: CTH F & Lindsay Road

2019 Exist Signal - AM.syn
10/09/2019

	←	→	↖	↗	←	↖	↗	→	↖	↗	→	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
70th %ile Term Code	Min	Min		Min	Min		Hold	Hold	Hold	Gap	Gap	Gap
50th %ile Green (s)	10.0	10.0		10.0	10.0		26.4	26.4	26.4	26.4	26.4	26.4
50th %ile Term Code	Min	Min		Min	Min		Hold	Hold	Hold	Gap	Gap	Gap
30th %ile Green (s)	10.0	10.0		10.0	10.0		25.9	25.9	25.9	25.9	25.9	25.9
30th %ile Term Code	Min	Min		Hold	Hold		Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
10th %ile Green (s)	0.0	0.0		0.0	0.0		30.0	30.0	30.0	30.0	30.0	30.0
10th %ile Term Code	Skip	Skip		Skip	Skip		Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
Queue Length 50th (ft)		21			17		1	91	3	2	125	0
Queue Length 95th (ft)		64			55		7	141	11	8	195	3
Internal Link Dist (ft)		536			588			721			667	
Turn Bay Length (ft)							250		225	250		225
Base Capacity (vph)		1053			908		242	2725	1218	348	2700	1208
Starvation Cap Reductn	0			0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0			0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0			0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.08			0.08		0.05	0.39	0.02	0.05	0.48	0.00

Intersection Summary												
Area Type:	Other											
Cycle Length:	82											
Actuated Cycle Length:	49.2											
Natural Cycle:	60											
Control Type:	Actuated-Uncoordinated											
90th %ile Actuated Cycle:	61.8											
70th %ile Actuated Cycle:	52.1											
50th %ile Actuated Cycle:	48.4											
30th %ile Actuated Cycle:	47.9											
10th %ile Actuated Cycle:	36											

Splits and Phases: 3: CTH F & Lindsay Road



TADI
C:\Egnyte\Shared\W\2419 CTH F with Lindsay Road (Wauk County)\Capacity Analysis\2019 Exist Signal - AM.syn

Synchro 10 Report

HCM 6th Signalized Intersection Summary
3: CTH F & Lindsay Road

2019 Exist Signal - AM.syn
10/09/2019

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (veh/h)	20	30	30	35	15	15	10	975	40	15	1200	5						
Future Volume (veh/h)	20	30	30	35	15	15	10	975	40	15	1200	5						
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0						
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Work Zone On Approach	No			No			No			No								
Adj Sat Flow, veh/h/ln	1885	1885	1885	1826	1826	1826	1781	1781	1781	1767	1767	1767						
Adj Flow Rate, veh/h	22	33	33	38	16	16	11	1060	27	16	1304	3						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92						
Percent Heavy Veh, %	1	1	1	5	5	5	8	8	8	9	9	9						
Cap, veh/h	142	158	121	245	100	66	262	1847	824	324	1832	817						
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.55	0.55	0.55	0.55	0.55	0.55						
Sat Flow, veh/h	224	833	634	645	527	347	401	3385	1510	490	3357	1497						
Grp Volume(v), veh/h	88	0	0	70	0	0	11	1060	27	16	1304	3						
Grp Sat Flow(s),veh/h/ln	1691	0	0	1519	0	0	401	1692	1510	490	1678	1497						
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	1.0	9.4	0.4	1.0	13.1	0.0						
Cycle Q Clear(g_c), s	1.9	0.0	0.0	1.5	0.0	0.0	14.1	9.4	0.4	10.4	13.1	0.0						
Prop In Lane	0.25		0.37	0.54		0.23	1.00		1.00	1.00		1.00						
Lane Grp Cap(c), veh/h	421	0	0	411	0	0	262	1847	824	324	1832	817						
V/C Ratio(X)	0.21	0.00	0.00	0.17	0.00	0.00	0.04	0.57	0.03	0.05	0.71	0.00						
Avail Cap(c_a), veh/h	1187	0	0	1093	0	0	396	2980	1329	489	2956	1318						
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00						
Uniform Delay (d), s/veh	15.7	0.0	0.0	15.5	0.0	0.0	12.9	6.8	4.8	10.3	7.7	4.7						
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.2	0.0	0.0	0.1	0.3	0.0	0.1	0.5	0.0						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.5	0.0	0.0	0.1	1.4	0.1	0.1	2.0	0.0						
Unsig. Movement Delay, s/veh																		
LnGrp Delay(d),s/veh	15.9	0.0	0.0	15.7	0.0	0.0	13.0	7.1	4.8	10.3	8.2	4.7						
LnGrp LOS	B	A	A	B	A	A	B	A	A	B	A	A						
Approach Vol, veh/h	88			70			1098			1323								
Approach Delay, s/veh	15.9			15.7			7.1			8.2								
Approach LOS	B			B			A			A								
Timer - Assigned Phs	2			4			6			8								
Phs Duration (G+Y+Rc), s	30.8			14.6			30.8			14.6								
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0								
Max Green Setting (Gmax), s	40.0			30.0			40.0			30.0								
Max Q Clear Time (g_c+I1), s	16.1			3.9			15.1			3.5								
Green Ext Time (p_c), s	7.4			0.4			9.7			0.3								
Intersection Summary																		
HCM 6th Ctrl Delay	8.2																	
HCM 6th LOS	A																	

Lanes, Volumes, Timings
3: CTH F & Lindsay Road

2019 Exist Signal - PM.syn
10/09/2019

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔		↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	15	25	25	30	25	35	70	1550	55	10	1145	30	
Future Volume (vph)	15	25	25	30	25	35	70	1550	55	10	1145	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		0	0		0	250		225	250		225	
Storage Lanes	0		0	0		0	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frt		0.948				0.947			0.850			0.850	
Flt Protected		0.988				0.984		0.950		0.950			
Satd. Flow (prot)	0	1728	0	0	1736	0	1736	3471	1553	1719	3438	1538	
Flt Permitted		0.911				0.860		0.179		0.093			
Satd. Flow (perm)	0	1593	0	0	1517	0	327	3471	1553	168	3438	1538	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		35			35			55			55		
Link Distance (ft)		616			668			801			747		
Travel Time (s)		12.0			13.0			9.9			9.3		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	62%	100%	100%	62%	
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	5%	5%	5%	
Adj. Flow (vph)	17	28	28	34	28	40	80	1761	39	11	1301	21	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	73	0	0	102	0	80	1761	39	11	1301	21	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm	
Protected Phases		4			8			2		6		6	
Permitted Phases	4			8			2		2	6		6	
Detector Phase	4	4		8	8		2	2	2	6	6	6	
Switch Phase													
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0	15.0	15.0	15.0	15.0	
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0	24.0	24.0	24.0	24.0	
Total Split (s)	36.0	36.0		36.0	36.0		46.0	46.0	46.0	46.0	46.0	46.0	
Total Split (%)	43.9%	43.9%		43.9%	43.9%		56.1%	56.1%	56.1%	56.1%	56.1%	56.1%	
Maximum Green (s)	30.0	30.0		30.0	30.0		40.0	40.0	40.0	40.0	40.0	40.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min	
v/c Ratio		0.27			0.40		0.35	0.72	0.04	0.09	0.53	0.02	
Control Delay		25.4			28.1		11.3	9.9	4.6	7.1	7.0	4.6	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		25.4			28.1		11.3	9.9	4.6	7.1	7.0	4.6	
90th %ile Green (s)	12.8	12.8		12.8	12.8		40.0	40.0	40.0	40.0	40.0	40.0	
90th %ile Term Code	Hold	Hold		Gap	Gap		Max	Max	Max	Hold	Hold	Hold	
70th %ile Green (s)	10.6	10.6		10.6	10.6		40.0	40.0	40.0	40.0	40.0	40.0	

TADI
C:\Egnyte\Shared\W\12419 CTH F with Lindsay Road (Wauk County)\Capacity Analysis\2019 Exist Signal - PM.syn

Synchro 10 Report

Lanes, Volumes, Timings
3: CTH F & Lindsay Road

2019 Exist Signal - PM.syn
10/09/2019

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
70th %ile Term Code	Hold	Hold		Gap	Gap		Max	Max	Max	Hold	Hold	Hold	
50th %ile Green (s)	10.0	10.0		10.0	10.0		40.0	40.0	40.0	40.0	40.0	40.0	
50th %ile Term Code	Min	Min		Min	Min		Max	Max	Max	Hold	Hold	Hold	
30th %ile Green (s)	10.0	10.0		10.0	10.0		40.0	40.0	40.0	40.0	40.0	40.0	
30th %ile Term Code	Hold	Hold		Min	Min		Max	Max	Max	Hold	Hold	Hold	
10th %ile Green (s)	0.0	0.0		0.0	0.0		55.0	55.0	55.0	55.0	55.0	55.0	
10th %ile Term Code	Skip	Skip		Skip	Skip		Dwell	Dwell	Dwell	Dwell	Dwell	Dwell	
Queue Length 50th (ft)		24			35		12	209	4	1	122	2	
Queue Length 95th (ft)		56			73		45	326	14	8	190	9	
Internal Link Dist (ft)		536			588			721			667		
Turn Bay Length (ft)							250		225	250		225	
Base Capacity (vph)		765			728		231	2462	1101	119	2438	1091	
Starvation Cap Reductn		0			0		0	0	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	0	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	0	
Reduced v/c Ratio		0.10			0.14		0.35	0.72	0.04	0.09	0.53	0.02	

Intersection Summary												
Area Type:	Other											
Cycle Length:	82											
Actuated Cycle Length:	62.5											
Natural Cycle:	65											
Control Type:	Actuated-Uncoordinated											
90th %ile Actuated Cycle:	64.8											
70th %ile Actuated Cycle:	62.6											
50th %ile Actuated Cycle:	62											
30th %ile Actuated Cycle:	62											
10th %ile Actuated Cycle:	61											

Splits and Phases: 3: CTH F & Lindsay Road



TADI
C:\Egnyte\Shared\W\12419 CTH F with Lindsay Road (Wauk County)\Capacity Analysis\2019 Exist Signal - PM.syn

Synchro 10 Report

HCM 6th Signalized Intersection Summary
3: CTH F & Lindsay Road

2019 Exist Signal - PM.syn
10/09/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	25	25	30	25	35	70	1550	55	10	1145	30
Future Volume (veh/h)	15	25	25	30	25	35	70	1550	55	10	1145	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1841	1841	1841	1826	1826	1826
Adj Flow Rate, veh/h	17	28	28	34	28	40	80	1761	39	11	1301	21
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	2	2	2	4	4	4	5	5	5
Cap, veh/h	111	137	106	141	107	105	289	2175	970	188	2158	962
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.62	0.62	0.62	0.62	0.62	0.62
Sat Flow, veh/h	196	829	637	340	648	637	408	3497	1560	256	3469	1547
Grp Volume(v), veh/h	73	0	0	102	0	0	80	1761	39	11	1301	21
Grp Sat Flow(s),veh/h/ln	1662	0	0	1624	0	0	408	1749	1560	256	1735	1547
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	8.3	21.7	0.5	1.9	12.8	0.3
Cycle Q Clear(g_c), s	2.1	0.0	0.0	2.9	0.0	0.0	21.1	21.7	0.5	23.6	12.8	0.3
Prop In Lane	0.23		0.38	0.33		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	354	0	0	354	0	0	289	2175	970	188	2158	962
V/C Ratio(X)	0.21	0.00	0.00	0.29	0.00	0.00	0.28	0.81	0.04	0.06	0.60	0.02
Avail Cap(c_a), veh/h	937	0	0	923	0	0	324	2476	1104	210	2456	1095
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	0.0	0.0	20.9	0.0	0.0	12.9	8.1	4.1	17.1	6.5	4.1
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.4	0.0	0.0	0.5	1.9	0.0	0.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	1.1	0.0	0.0	0.6	4.0	0.1	0.1	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	0.0	0.0	21.3	0.0	0.0	13.4	10.0	4.2	17.2	6.8	4.1
LnGrp LOS	C	A	A	C	A	A	B	B	A	B	A	A
Approach Vol, veh/h	73			102			1880			1333		
Approach Delay, s/veh	20.8			21.3			10.0			6.8		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	41.1			15.4			41.1			15.4		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	40.0			30.0			40.0			30.0		
Max Q Clear Time (g_c+I1), s	23.7			4.1			25.6			4.9		
Green Ext Time (p_c), s	11.5			0.3			7.4			0.5		
Intersection Summary												
HCM 6th Ctrl Delay				9.3								
HCM 6th LOS				A								

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 8.**

DATE: March 16, 2020

DEPARTMENT: Clerk/Treasurer

PROVIDED BY:

SUBJECT:

Discussion and Possible Action to Limit Public Meetings or Make Alternative Arrangements to Hold Meetings [Mayor Bierce]

BACKGROUND:

FINANCIAL IMPACT:

RECOMMENDED MOTION: