Isolated Intersections

Intersection of South Street and Wayne Street

Intersection of South Street and Downing Street

Intersection of South Street and Roosevelt Avenue

Intersection of Wood Street and Roosevelt Avenue

Intersection of College Street and Wood Street

Intersection of College Street and Young Street

Intersection of South Street and Brice Avenue

Intersection of McKinley Avenue and Grant Street

Intersection of McKinley Avenue and Clark Avenue

South Street & Wayne Street

Aerial Photo:

Existing Conditions Discussion

The intersection of South Street with Wayne Street is signal controlled and has four approaches intersecting at a 90-degree angle. There is a single lane on each approach. The intersection is located in a residential area. The pretimed signal has a 70-second cycle length with two phases. Parking restrictions vary near the intersection and are provided in detail on the existing conditions diagram. A home in the northeast corner and shrubbery on the northwest corner partially restrict visibility at the intersection. The primary concern at this intersection is the warrant status of the existing traffic signal. This signal may have been installed initially to provide for vehicular and pedestrian traffic associated with a school that used to be located near this intersection.

Photo: Looking North

Public Comments

– "Traffic signal is not needed due to low traffic volumes."

Analyses Results

– Traffic signal warrants are not met
– Three reported crashes at the intersection from Jan. 2005 to June 2008
– Four-way stop control provides adequate capacity

Recommendations

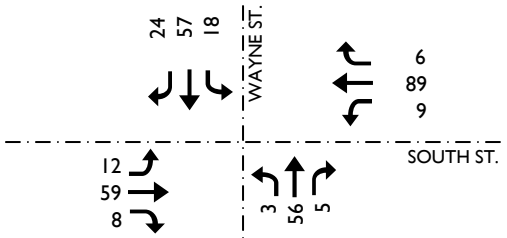
It is recommended that consideration be given to the removal of the traffic signal at this intersection. Based on the relatively balanced traffic volumes on the intersection approaches and the sight distance restriction in the northeast corner, four-way stop control is recommended. Also, curb bump-outs should be considered to provide adequate locations for stop sign visibility.

Intersection at a Glance

Existing Conditions

- Span-wire traffic signal
- Single lane approaches
- Located in residential area

Counted Traffic Volumes (peak hour)



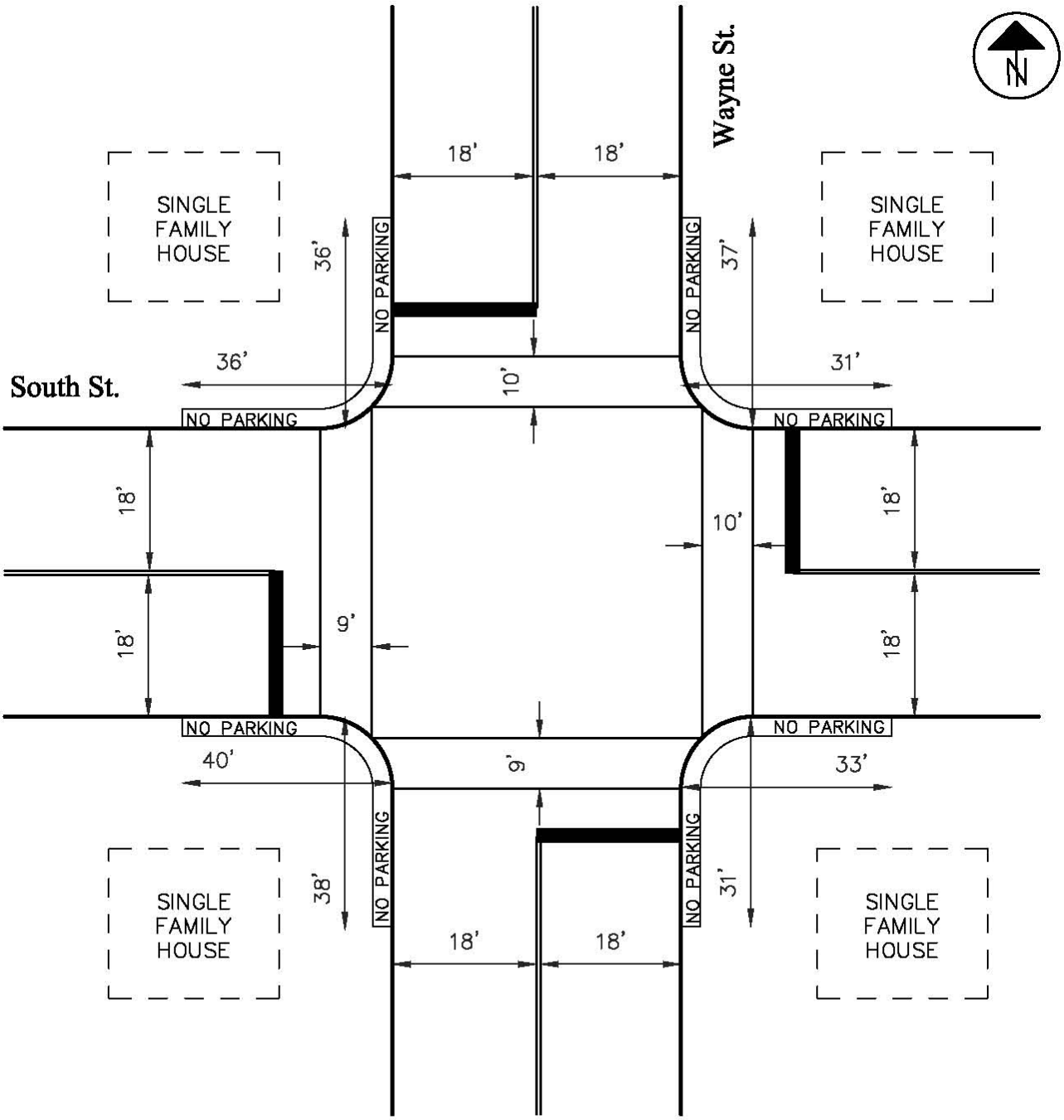
Crash History

- 3 reported crashes from 2005-2008
- Primarily rear-end type crashes

Recommendation

- Consider replacing traffic signal with four-way stop

INTERSECTION DIAGRAM



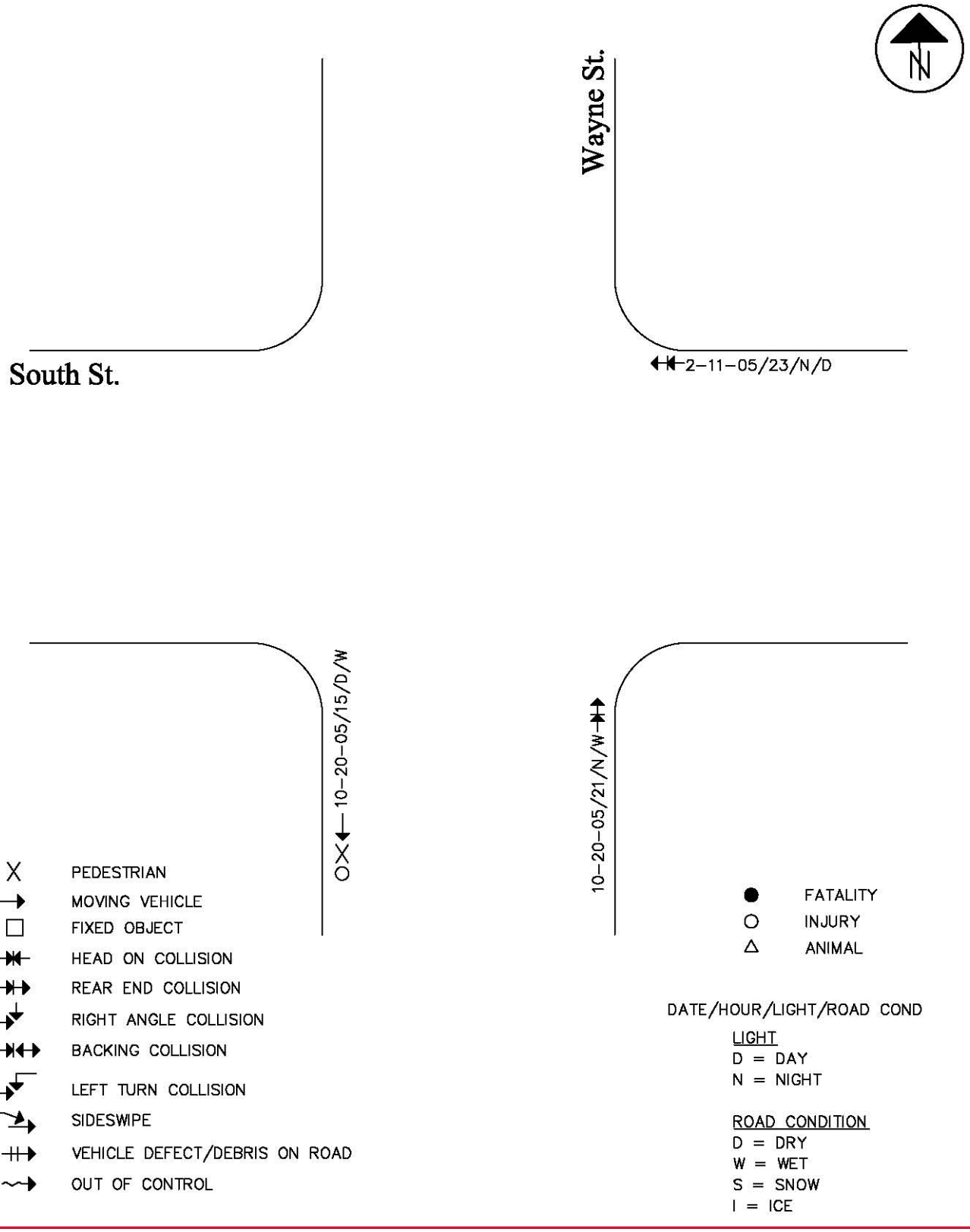
PRETIMED 2 PHASE SIGNAL

70 SEC CYCLE

35 SEC N/S SPLIT

35 SEC E/W SPLIT

CRASH DIAGRAM



Turning Movement Counts Summary Table

Location: South Street at Wayne Street

Date of Counts: Thursday 10/9/2008

	SB Wayne St				WB South St				NB Wayne St				EB South St				Major	Minor St	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Street	#1	#2
7:00 to 7:15 am	1	15	5	0	1	6	2	1	0	3	0	1	1	3	0	3			
7:15 to 7:30 am	2	9	1	0	0	7	1	0	0	3	0	1	0	9	1	0			
7:30 to 7:45 am	1	7	5	0	1	6	3	0	0	8	0	0	3	6	0	1			
7:45 to 8:00 am	1	10	0	1	0	5	0	1	1	3	0	1	5	11	1	7			
Total	5	41	11	1	2	24	6	2	1	17	0	3	9	29	2	11	72	57	18
8:00 to 8:15 am	0	11	1	0	0	15	1	0	0	9	0	0	2	15	0	7			
8:15 to 8:30 am	3	7	1	0	2	25	0	0	6	4	1	0	4	10	4	6			
8:30 to 8:45 am	0	11	2	0	3	21	1	0	3	3	0	0	1	7	0	0			
8:45 to 9:00 am	0	10	1	0	1	7	0	0	0	6	0	0	4	9	1	0			
Total	3	39	5	0	6	68	2	0	9	22	1	0	11	41	5	13	133	47	32
2:00 to 2:15 pm	2	6	4	1	0	8	2	1	0	14	0	1	2	10	2	1			
2:15 to 2:30 pm	4	12	10	0	2	12	5	0	1	7	0	0	1	17	1	0			
2:30 to 2:45 pm	0	8	3	0	1	18	1	0	0	11	2	1	5	16	0	0			
2:45 to 3:00 pm	2	11	5	0	2	24	2	0	2	5	1	4	1	9	1	8			
Total	8	37	22	1	5	62	10	1	3	37	3	6	9	52	4	9	142	67	43
3:00 to 3:15 pm	5	11	6	2	3	22	2	5	0	12	1	2	4	18	2	2			
3:15 to 3:30 pm	4	13	4	2	1	21	2	2	1	11	1	1	4	13	2	5			
3:30 to 3:45 pm	3	22	2	4	5	21	1	2	2	19	1	4	2	18	1	24			
3:45 to 4:00 pm	0	11	6	0	0	25	1	6	0	14	2	3	2	10	3	7			
Total	12	57	18	8	9	89	6	15	3	56	5	10	12	59	8	38	183	87	64
Grand Total	28	174	56	10	22	243	24	18	16	132	9	19	41	181	19	71			

SIGNAL WARANT ANALYSIS SUMMARY

South Street / Wayne Street Intersection

This signal warrant analysis is based on the guidelines in Chapter 4C of the 2003 Ohio MUTCD. The existing intersection has one approach lane from each direction and was analyzed with the counted traffic volumes.

Warrant 1, Eight-Hour Vehicular Warrant – *Warrant is NOT Satisfied*

Counted volumes from four hours in the AM and PM peak do not meet the eight-hour warrant thresholds. The remaining hours are expected to be lower in volume than the counted hours and will not meet the thresholds.

Time Period	Condition A			Condition B			Combination of Conditions A & B
	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	(80% of Each) Criteria Satisfied?
Warrant Threashold	500	150		750	75		
7 AM to 8 AM	72	57	No	72	57	No	No
8 AM to 9 AM	133	47	No	133	47	No	No
9 AM to 10 AM			No			No	No
10 AM to 11 AM			No			No	No
11 AM to 12 PM			No			No	No
12 PM to 1 PM			No			No	No
1 PM to 2 PM			No			No	No
2 PM to 3 PM			No			No	No
3 PM to 4 PM			No			No	No
4 PM to 5 PM	142	67	No	142	67	No	No
5 PM to 6 PM	183	87	No	183	87	No	No

Warrant 2, Four-Hour Vehicular Volume – *Warrant is NOT Satisfied*

Counted volumes from the four hours with the highest counted volumes were plotted on the Warrant 2 Table (attached). None of the four plotted points are above the warrant threshold line for "1 lane & 1 lane".

Warrant 3, Peak Hour Vehicular Volume – *Warrant is NOT Satisfied*

The counted PM peak hour volumes were plotted on the Warrant 3 Table (attached). The plotted point is not above the warrant threshold line for "1 lane & 1 lane".

Warrant 4, Pedestrian Volume – *Warrant is NOT Satisfied*

The pedestrian crossings in each of the counted hours do not meet the minimum requirement of 100 or more for each of four hours of the day. The available gaps were not measured.

Warrant 5, School Crossing – *Warrant is NOT Satisfied*

No schools are currently located or planned in the city blocks adjacent to this intersection. Therefore, this warrant is not expected to be satisfied.

Warrant 6, Coordinated Signal System – *Warrant is NOT Satisfied*

This intersection is not located at a critical point along a coordinated signal system.

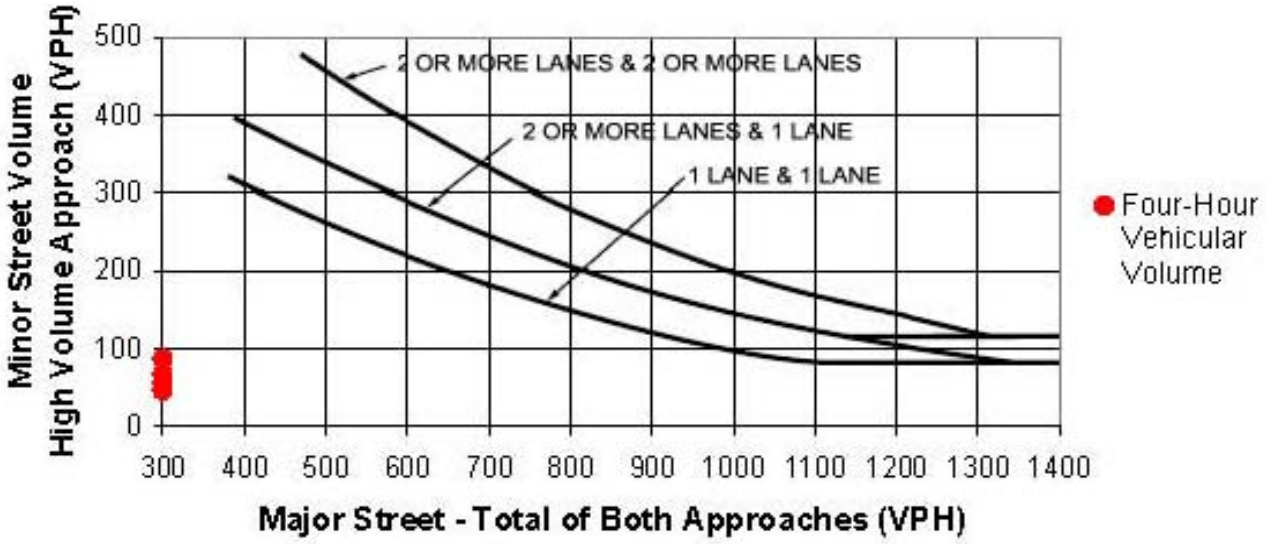
Warrant 7, Crash Experience – *Warrant is NOT Satisfied*

According to the crash data provided by the city of Piqua, no crashes were reported in the vicinity of this intersection within that could be fixed by traffic signal control. Although signals can help with reducing some types of crashes, it is not likely that removal of the signal will result in five or more crashes of those types in one calendar year to meet the signal warrant thresholds.

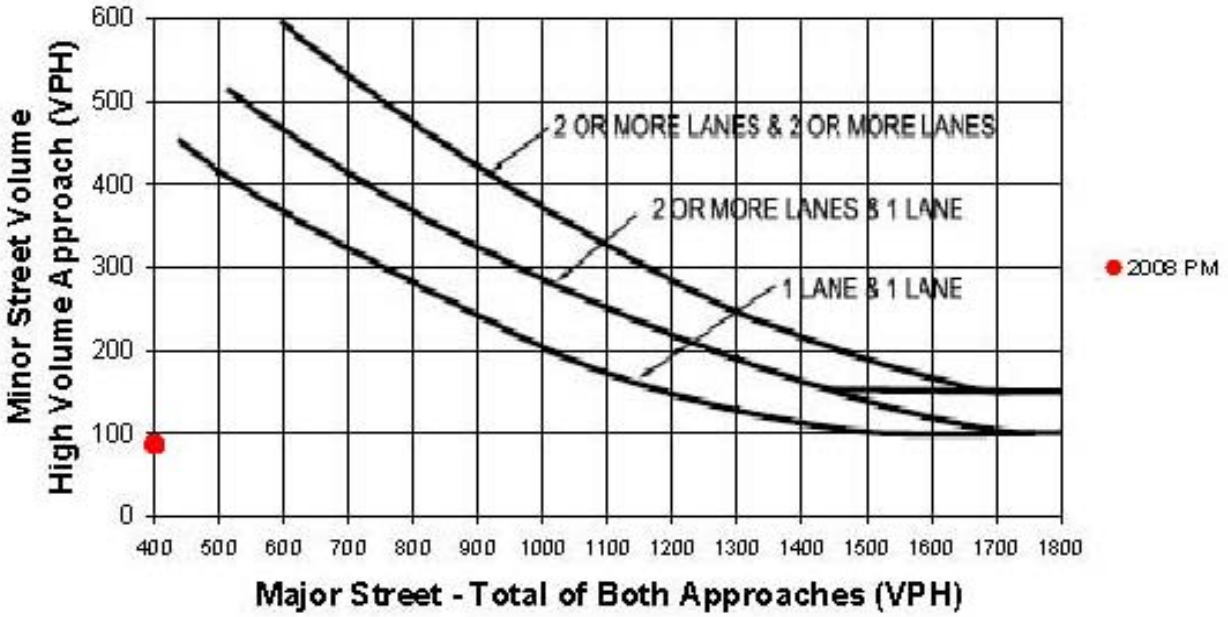
Warrant 8, Roadway Network – *Warrant is NOT Satisfied*

The hour with the largest traffic volumes (5-6 PM) has less than 350 total approaching trips. This is less than the required 1000 approaching trips.

Warrant 2, Four-Hour Vehiclar Volume



Warrant 3, Peak Hour



ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	M. Nolt
Agency/Co.	Kleingers & Associates
Date Performed	11/13/2008
Analysis Time Period	PM Peak

Site Information

Intersection	South at Wayne
Jurisdiction	City of Piqua
Analysis Year	2008

Project ID

East/West Street: *South Street* | North/South Street: *Wayne Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	12	59	8	9	89	6
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	3	56	5	12	57	18
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.90		0.90		0.90		0.90	
Flow Rate (veh/h)	86		114		70		96	
% Heavy Vehicles	3		9		3		6	
No. Lanes	1		1		1		1	
Geometry Group	1		1		1		1	
Duration, T	0.25							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.2		0.1		0.0		0.1	
Prop. Right-Turns	0.1		0.1		0.1		0.2	
Prop. Heavy Vehicle	0.0		0.1		0.0		0.1	
hLT-adj	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.0		0.1		0.0		0.0	

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20		3.20	
x, initial	0.08		0.10		0.06		0.09	
hd, final value (s)	4.45		4.53		4.50		4.46	
x, final value	0.11		0.14		0.09		0.12	
Move-up time, m (s)	2.0		2.0		2.0		2.0	
Service Time, t_s (s)	2.5		2.5		2.5		2.5	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	336		364		320		346	
Delay (s/veh)	7.98		8.29		7.94		8.06	
LOS	A		A		A		A	
Approach: Delay (s/veh)	7.98		8.29		7.94		8.06	
LOS	A		A		A		A	
Intersection Delay (s/veh)	8.09							
Intersection LOS	A							

HCS+™ Version 5.21 Generated: 11/14/2008 11:45 AM

South Street & Downing Street

Aerial Photo:

Existing Conditions Discussion

The intersection of South Street with Downing Street is four-way stop controlled and has four approaches intersecting at a 90-degree angle. There is a single lane on each approach. There are overhead flashing red beacons facing each approach. The intersection is located in a residential area. Parking restrictions vary near the intersection and are provided in detail on the existing conditions diagram. A home in the northeast corner and shrubbery on the southeast corner partially restrict visibility at the intersection. The primary concern at this intersection is whether or not a four-way stop is the most appropriate and effective traffic control device.

Photo: Looking East

Public Comments

- "There was a school located near this intersection."
- "Traffic patterns are affected by changes in business/operation at Hartzell facilities."

Analyses Results

- Three reported crashes at the intersection from Jan. 2005 to June 2008
- Overhead flashing beacons may indicate a past safety problem

Recommendations

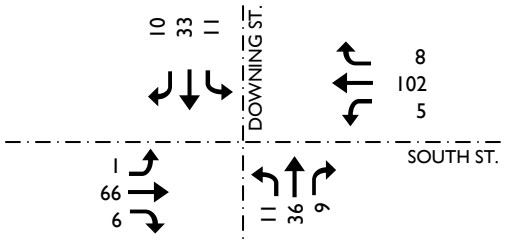
Due to the relatively balanced traffic volumes, the intersection's location in a residential area, and the possibility that there was a previous safety problem at this location, it is recommended that four-way stop control at this intersection be retained.

Intersection at a Glance

Existing Conditions

- Four-way stop control
- Single lane approaches
- Overhead flashing beacons

Counted Traffic Volumes (peak hour)



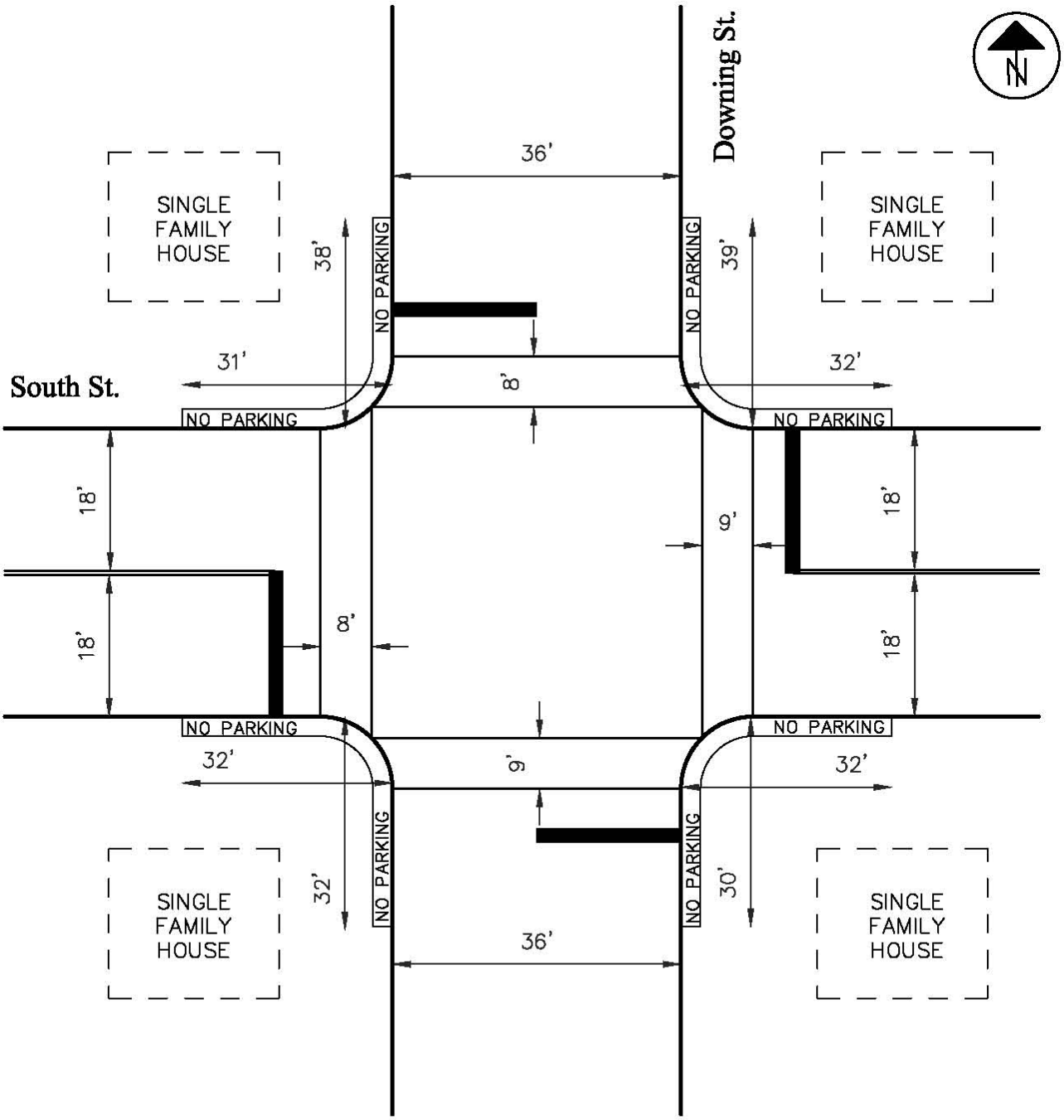
Crash History

- 3 reported crashes from 2005-2008
- Primarily angle type crashes

Recommendation

- Retain four-way stop control

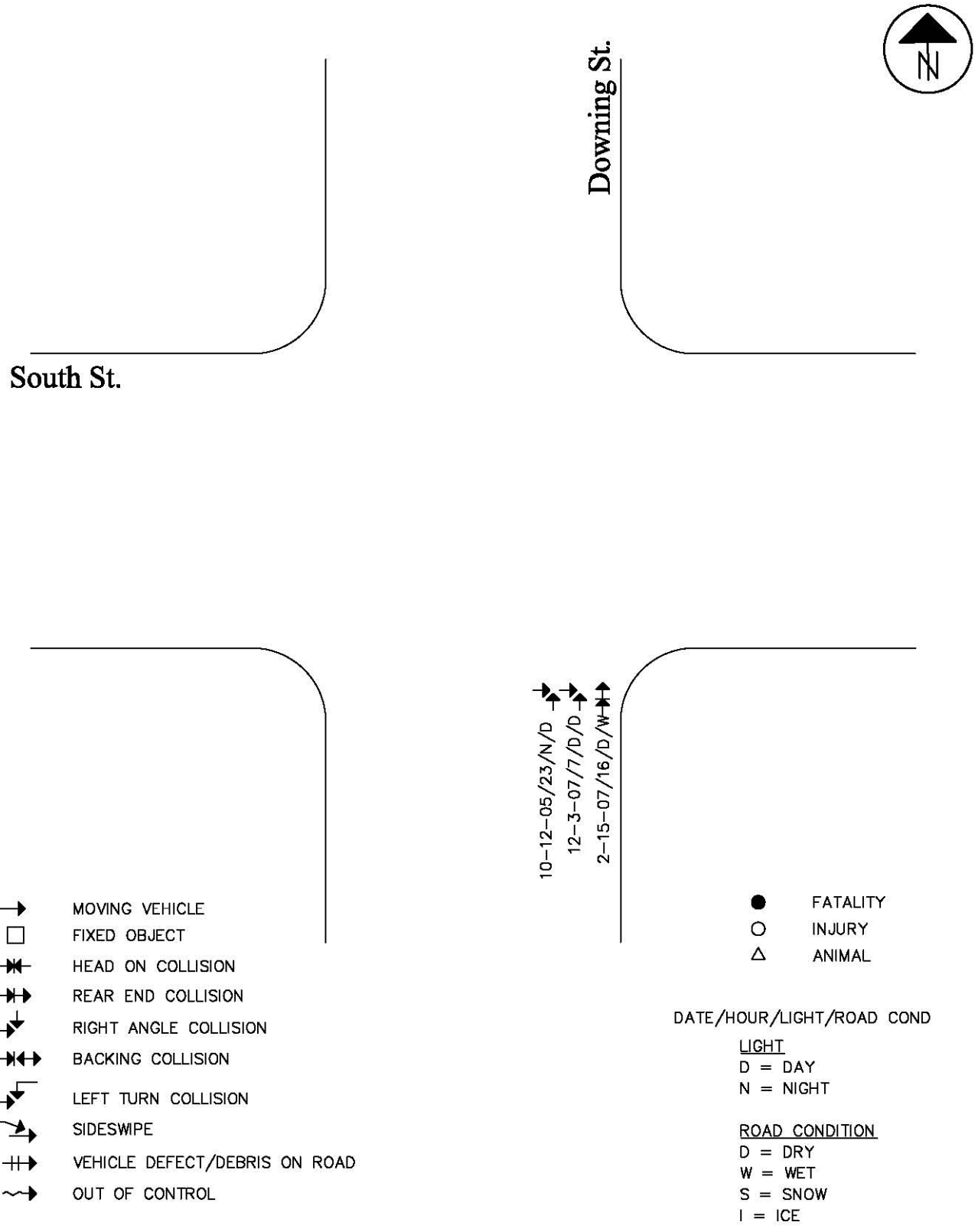
INTERSECTION DIAGRAM



4-WAY STOP CONTOLLED

OVERHEAD RED FLASHERS

CRASH DIAGRAM



Turning Movement Counts Summary Table

Location: South Street at Downing Street

Date of Counts: Thursday 8/13/2008

	SB Downing St				WB South St				NB Downing St				EB South St				Major	Minor St	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Street	#1	#2
7:00 to 7:15 am	0	3	0	0	0	1	0	0	0	2	0	0	1	3	1	0			
7:15 to 7:30 am	0	6	0	0	1	5	0	0	0	3	1	0	1	6	0	0			
7:30 to 7:45 am	1	5	1	0	0	3	1	0	1	2	0	0	0	12	0	0			
7:45 to 8:00 am	2	9	0	0	0	6	1	0	0	1	0	0	0	14	0	0			
Total	3	23	1	0	1	15	2	0	1	8	1	0	2	35	1	0	56	27	10
8:00 to 8:15 am	1	6	2	0	0	11	0	0	1	1	0	0	0	10	0	0			
8:15 to 8:30 am	0	3	0	0	0	4	2	0	1	0	0	0	0	5	0	0			
8:30 to 8:45 am	0	5	1	0	1	5	0	1	0	5	1	1	0	12	0	0			
8:45 to 9:00 am	0	8	0	0	0	4	0	1	1	3	0	1	2	10	1	0			
Total	1	22	3	0	1	24	2	2	3	9	1	2	2	37	1	0	67	26	13
4:00 to 4:15 pm	1	9	4	0	0	20	1	2	3	10	0	0	1	17	0	1			
4:15 to 4:30 pm	2	5	1	0	1	24	0	4	1	9	1	0	1	21	0	1			
4:30 to 4:45 pm	3	4	4	1	0	13	4	3	2	8	2	0	1	20	2	1			
4:45 to 5:00 pm	3	8	3	0	1	24	2	12	4	4	1	0	1	21	1	1			
Total	9	26	12	1	2	81	7	21	10	31	4	0	4	79	3	4	176	47	45
5:00 to 5:15 pm	5	11	6	0	2	30	0	0	4	13	1	0	1	23	1	1			
5:15 to 5:30 pm	2	8	2	0	0	24	2	0	2	10	3	0	0	15	2	0			
5:30 to 5:45 pm	2	7	1	0	3	29	1	0	3	5	4	1	0	14	1	1			
5:45 to 6:00 pm	2	7	1	0	0	19	5	1	2	8	1	6	0	14	2	0			
Total	11	33	10	0	5	102	8	1	11	36	9	7	1	66	6	2	188	54	56
Grand Total	24	104	26	1	9	222	19	24	25	84	15	9	9	217	11	6			

South Street & Roosevelt Ave

Aerial Photo:

Existing Conditions Discussion

The intersection of South Street with Roosevelt Avenue is signal controlled and has four approaches intersecting at a 90-degree angle. There is a single lane on each approach. The intersection is located in a residential area. The pretimed signal has a 50-second cycle length with two phases. Parking restrictions vary near the intersection and are provided in detail on the existing conditions diagram. A home on the southwest corner and a slope on the northeast corner partially restrict visibility at the intersection; however, visibility is adequate if motorists stop beyond the stop bar closer to the intersection. There is a building on the southeast corner that was formally used as a school. The primary concern at this intersection is the warrant status of the existing traffic signal. This signal may have been installed initially to provide for vehicular and pedestrian traffic associated with a school that used to be located near this intersection.

Photo: Looking South

Public Comments

- "Traffic signal is not needed due to low traffic volumes."
- "There used to be a school located near the intersection."
- "Traffic signal is not warranted."
- "Signal was installed due to school - school is no longer there."
- "Two-way stop would function appropriately."

Analyses Results

- Traffic signal warrants are not met
- Two reported crashes at the intersection from Jan. 2005 to June 2008
- Two-way stop control provides adequate capacity

Recommendations

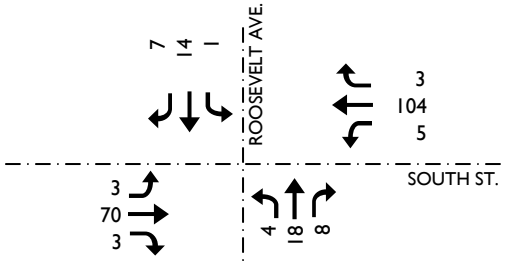
It is recommended that consideration be given to the removal of the traffic signal at this intersection. Two-way stop control is recommended where traffic on South Street does not stop. Also, curb bump-outs should be considered to provide adequate locations for stop sign visibility. Consideration should be given to improving intersection sight distance if practical.

Intersection at a Glance

Existing Conditions

- Span-wire traffic signal
- Single lane approaches
- Located in residential area

Counted Traffic Volumes (peak hour)



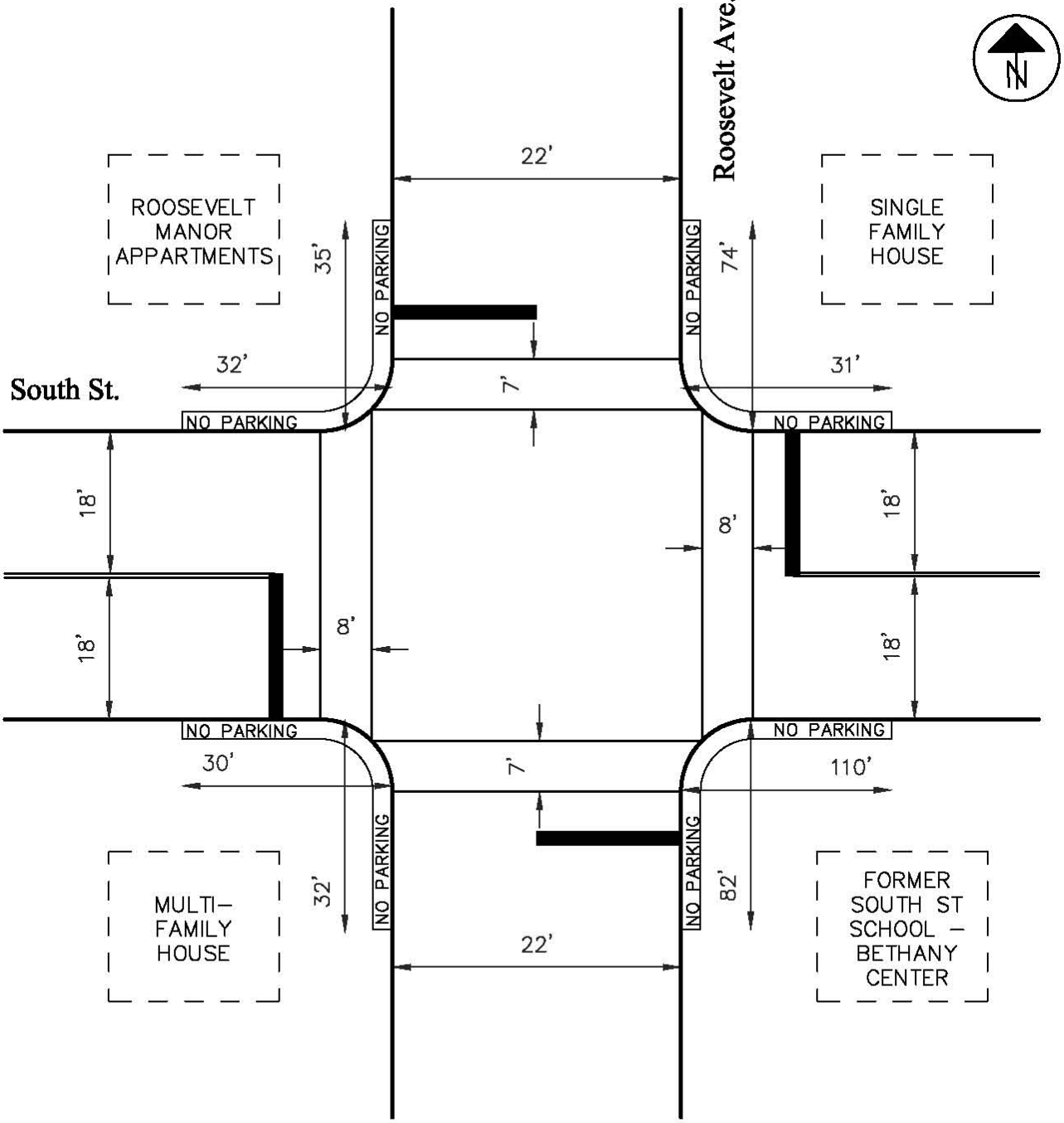
Crash History

- 2 reported crashes from 2005-2008
- Angle type crashes

Recommendation

- Consider replacing traffic signal with two-way stop

INTERSECTION DIAGRAM



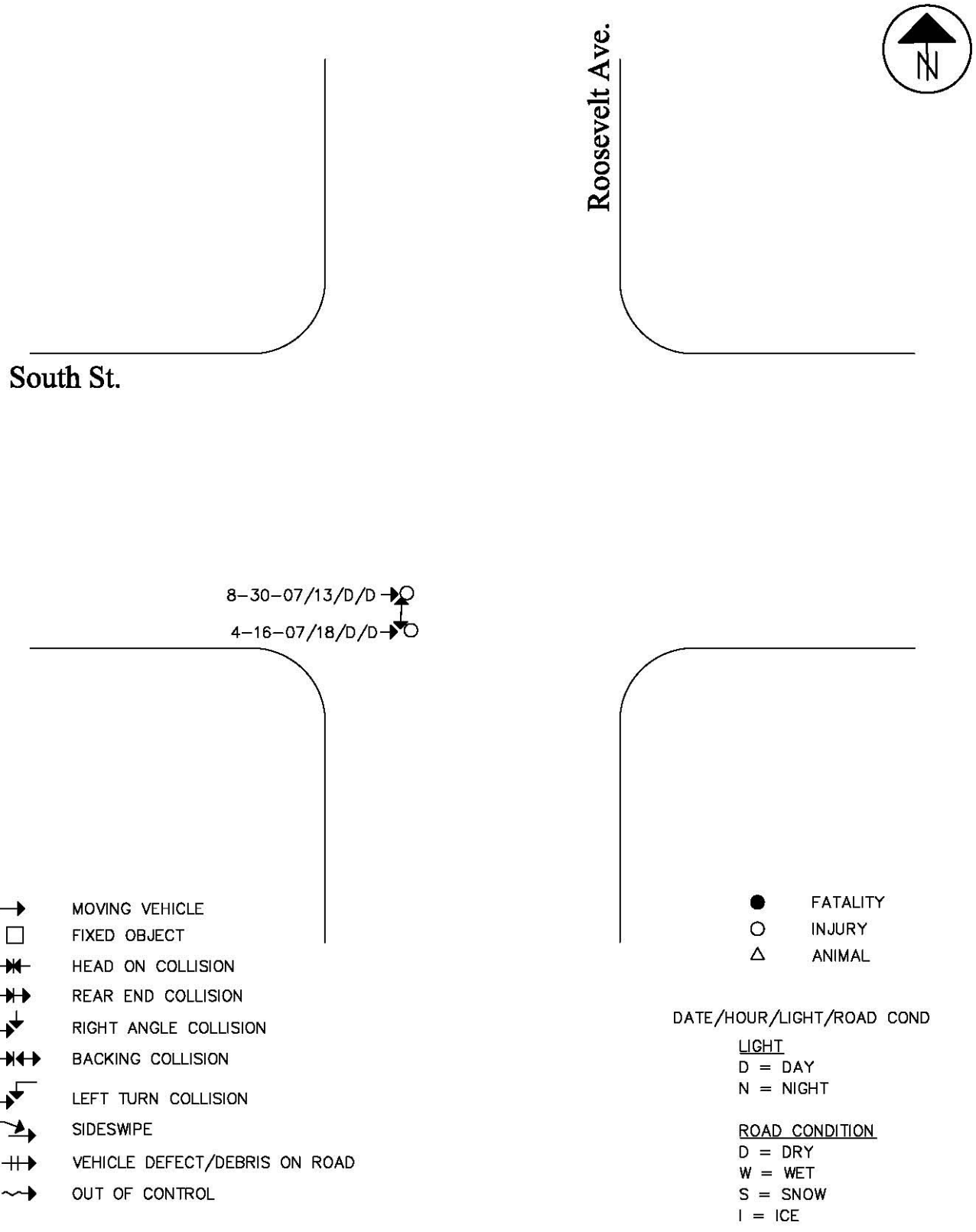
PRETIMED 2 PHASE SIGNAL

50 SEC CYCLE

25 SEC N/S SPLIT

25 SEC E/W SPLIT

CRASH DIAGRAM



Turning Movement Counts Summary Table

Location: South Street at Roosevelt Avenue

Date of Counts: Thursday 8/13/2008

	SB Roosevelt Ave				WB South St				NB Roosevelt Ave				EB South St				Major	Minor St	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Street	#1	#2
7:00 to 7:15 am	0	3	1	0	0	3	0	0	1	3	0	0	0	4	0	0			
7:15 to 7:30 am	0	2	0	0	0	5	0	0	1	1	0	0	0	8	0	0			
7:30 to 7:45 am	0	0	1	0	0	5	0	0	0	2	1	0	2	11	1	0			
7:45 to 8:00 am	0	7	2	0	1	5	0	0	0	1	1	0	0	13	1	0			
Total	0	12	4	0	1	18	0	0	2	7	2	0	2	36	2	0	59	16	11
8:00 to 8:15 am	0	2	0	0	1	11	1	0	0	2	0	0	0	10	0	0			
8:15 to 8:30 am	0	1	2	0	0	4	0	0	0	1	0	0	1	5	0	0			
8:30 to 8:45 am	0	2	1	0	1	5	0	0	0	1	0	0	2	11	0	0			
8:45 to 9:00 am	0	2	0	0	1	4	1	1	0	0	0	2	0	13	0	0			
Total	0	7	3	0	3	24	2	1	0	4	0	2	3	39	0	0	71	10	4
4:00 to 4:15 pm	3	5	1	0	0	23	0	1	0	7	0	1	0	15	1	1			
4:15 to 4:30 pm	3	3	0	0	0	19	1	5	0	5	0	0	4	21	0	0			
4:30 to 4:45 pm	0	2	3	0	2	16	1	0	3	2	1	0	1	25	0	1			
4:45 to 5:00 pm	1	1	2	0	0	27	1	12	0	1	6	0	2	20	0	2			
Total	7	11	6	0	2	85	3	18	3	15	7	1	7	81	1	4	179	24	25
5:00 to 5:15 pm	0	8	3	0	3	29	1	0	2	5	2	0	2	27	1	0			
5:15 to 5:30 pm	0	2	1	0	0	23	2	0	0	5	4	0	1	15	1	1			
5:30 to 5:45 pm	0	1	1	0	1	30	0	0	0	4	0	2	0	14	0	1			
5:45 to 6:00 pm	1	3	2	1	1	22	0	0	2	4	2	1	0	14	1	0			
Total	1	14	7	1	5	104	3	0	4	18	8	3	3	70	3	2	188	22	30
Grand Total	8	44	20	1	11	231	8	19	9	44	17	6	15	226	6	6			

SIGNAL WARANT ANALYSIS SUMMARY

South Street / Roosevelt Avenue Intersection

This signal warrant analysis is based on the guidelines in Chapter 4C of the 2003 Ohio MUTCD. The existing intersection has one approach lane from each direction and was analyzed with the counted traffic volumes.

Warrant 1, Eight-Hour Vehicular Warrant – *Warrant is NOT Satisfied*

Counted volumes from four hours in the AM and PM peak do not meet the eight-hour warrant thresholds. The remaining hours are expected to be lower in volume than the counted hours and will not meet the thresholds.

Time Period	Condition A			Condition B			Combination of Conditions A & B
	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	(80% of Each) Criteria Satisfied?
Warrant Threashold	500	150		750	75		
7 AM to 8 AM	59	16	No	59	16	No	No
8 AM to 9 AM	71	10	No	71	10	No	No
9 AM to 10 AM			No			No	No
10 AM to 11 AM			No			No	No
11 AM to 12 PM			No			No	No
12 PM to 1 PM			No			No	No
1 PM to 2 PM			No			No	No
2 PM to 3 PM			No			No	No
3 PM to 4 PM			No			No	No
4 PM to 5 PM	179	25	No	179	25	No	No
5 PM to 6 PM	188	30	No	188	30	No	No

Warrant 2, Four-Hour Vehicular Volume – *Warrant is NOT Satisfied*

Counted volumes from the four hours with the highest counted volumes were plotted on the Warrant 2 Table (attached). None of the four plotted points are above the warrant threshold line for "1 lane & 1 lane".

Warrant 3, Peak Hour Vehicular Volume – *Warrant is NOT Satisfied*

The counted PM peak hour volumes were plotted on the Warrant 3 Table (attached). The plotted point is not above the warrant threshold line for "1 lane & 1 lane".

Warrant 4, Pedestrian Volume – *Warrant is NOT Satisfied*

The pedestrian crossings in each of the counted hours do not meet the minimum requirement of 100 or more for each of four hours of the day. The available gaps were not measured.

Warrant 5, School Crossing – *Warrant is NOT Satisfied*

No schools are currently located or planned in the city blocks adjacent to this intersection. Therefore, this warrant is not expected to be satisfied.

Warrant 6, Coordinated Signal System – *Warrant is NOT Satisfied*

This intersection is not located at a critical point along a coordinated signal system.

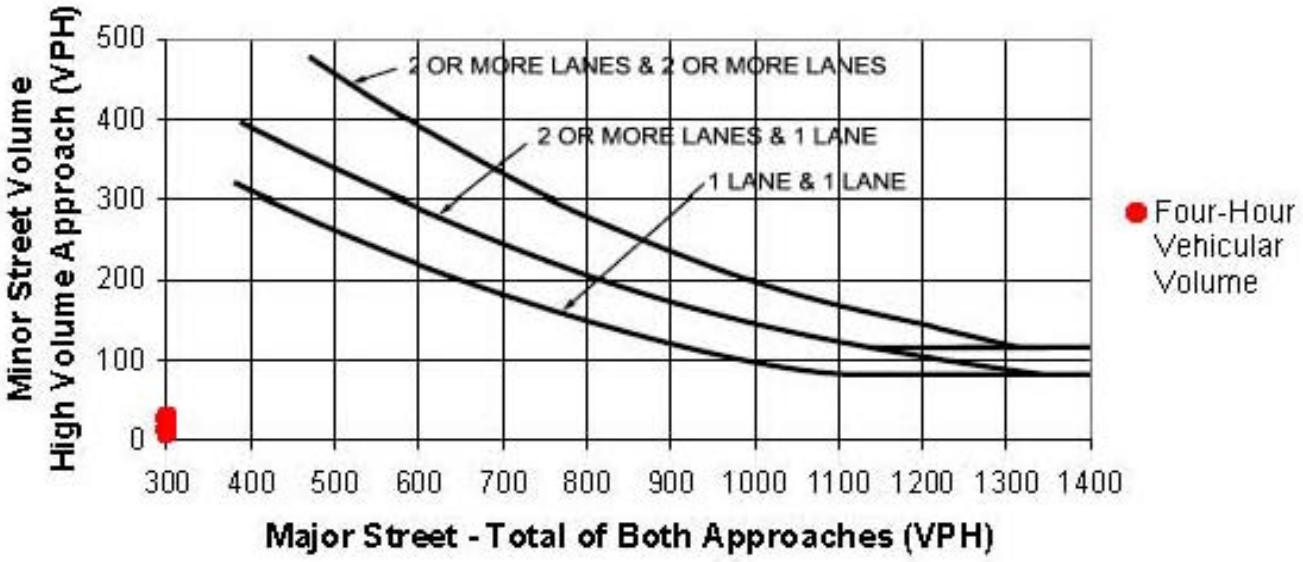
Warrant 7, Crash Experience – *Warrant is NOT Satisfied*

According to the crash data provided by the city of Piqua, two right-angle crashes were reported in the vicinity of this intersection within a three year period. Although signals can help with reducing right-angle crashes, it is not likely that removal of the signal will result in five or more crashes of that type in one calendar year to meet the signal warrant thresholds.

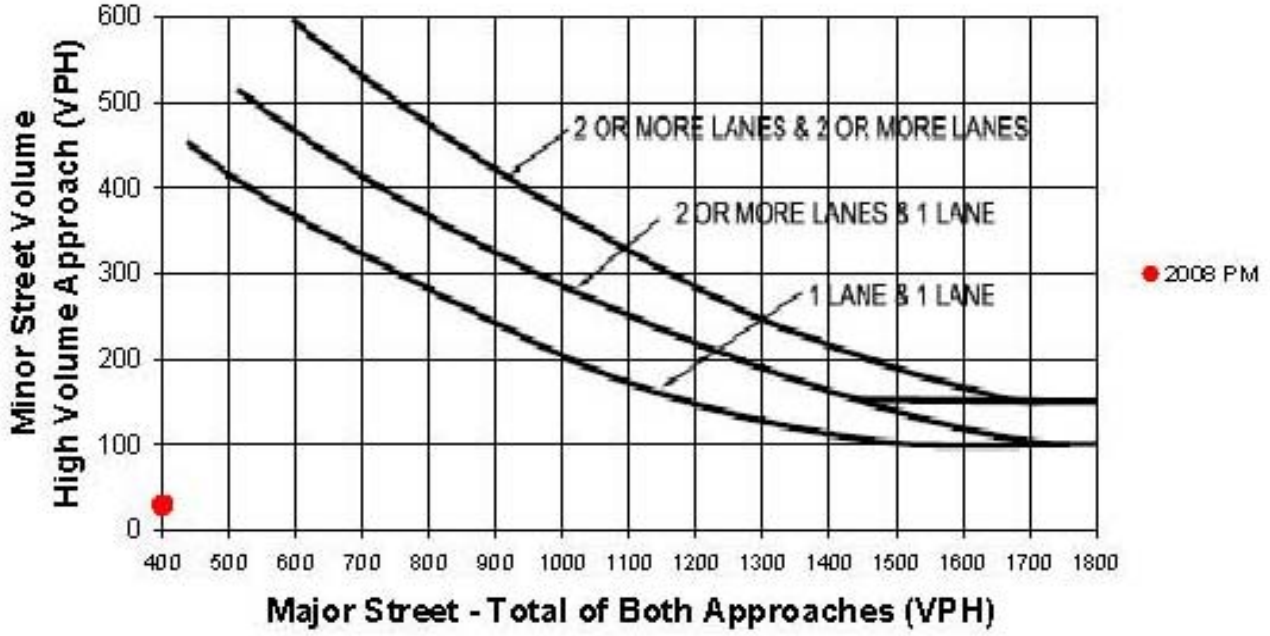
Warrant 8, Roadway Network – *Warrant is NOT Satisfied*

The hour with the largest traffic volumes (5-6 PM) has 250 total approaching trips. This is less than the required 1000 approaching trips.

Warrant 2, Four-Hour Vehiclar Volume



Warrant 3, Peak Hour



TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*M. Nolt*	Intersection	*South at Roosevelt*
Agency/Co.	*Kleingers & Associates*	Jurisdiction	*City of Piqua*
Date Performed	*11/13/2008*	Analysis Year	*2008*
Analysis Time Period	*PM Peak*		

Project Description

East/West Street: *South Street*	North/South Street: *Roosevelt Avenue*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*3*	*70*	*3*	*5*	*104*	*3*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*3*	*77*	*3*	*5*	*115*	*3*
Percent Heavy Vehicles	*7*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*4*	*18*	*8*	*1*	*14*	*7*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*4*	*20*	*8*	*1*	*15*	*7*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*3*	*5*		*32*			*23*	
C (m) (veh/h)	*1437*	*1523*		*739*			*742*	
v/c	*0.00*	*0.00*		*0.04*			*0.03*	
95% queue length	*0.01*	*0.01*		*0.14*			*0.10*	
Control Delay (s/veh)	*7.5*	*7.4*		*10.1*			*10.0*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay (s/veh)	--	--	*10.1*			*10.0*		
Approach LOS	--	--	*B*			*B*		

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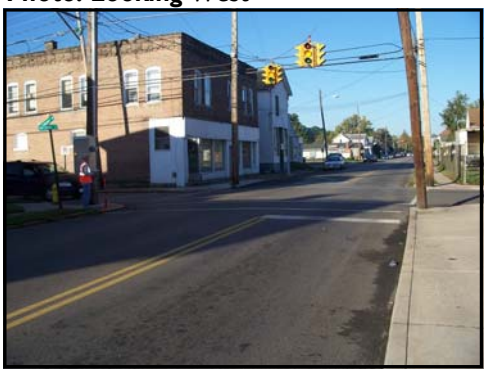
Wood Street & Roosevelt Ave

Aerial Photo:

Existing Conditions Discussion

The intersection of Wood Street with Roosevelt Avenue is signal controlled and has four approaches intersecting at a 90-degree angle. There is a single lane on each approach. The intersection is located in a residential area with businesses located on two of the corners. The pretimed signal has a 75-second cycle length with two phases. Parking restrictions vary near the intersection and are provided in detail on the existing conditions diagram. Buildings located directly behind the sidewalk on the southwest corner and the northeast corner significantly limit visibility at the intersection. The primary concern at this intersection is the warrant status of the existing traffic signal. This signal may have been installed initially due to visibility problems and to provide for pedestrian crossings.

Photo: Looking West



Public Comments

- "There is poor visibility at the intersection."
- "There are high pedestrian volumes late at night."
- "The traffic signal helps to slow traffic."
- "The streets are narrow, making turns difficult."
- "Traffic signal is redundant."
- "There are low traffic volumes."
- "There are sight distance restrictions - may need four-way stop."
- "This may need to be a one-way street due to the narrow width."
- "Traffic signal is not warranted."
- "Two-way stop would be adequate."
-

Analyses Results

- Traffic signal warrants are not met
- Four reported crashes at the intersection from Jan. 2005 to June 2008
- Four-way stop control provides adequate capacity

Recommendations

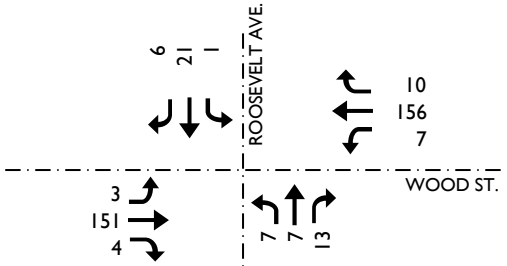
It is recommended that consideration be given to the removal of the traffic signal at this intersection. Due to the existing sight distance restrictions at the intersection, four-way stop control is recommended. Some parking may need to be removed to ensure adequate stop sign visibility. A four-way stop at this location will help to discourage through traffic on Wood Street.

Intersection at a Glance

Existing Conditions

- Span-wire traffic signal
- Single lane approaches
- Corner development restricts visibility

Counted Traffic Volumes (peak hour)



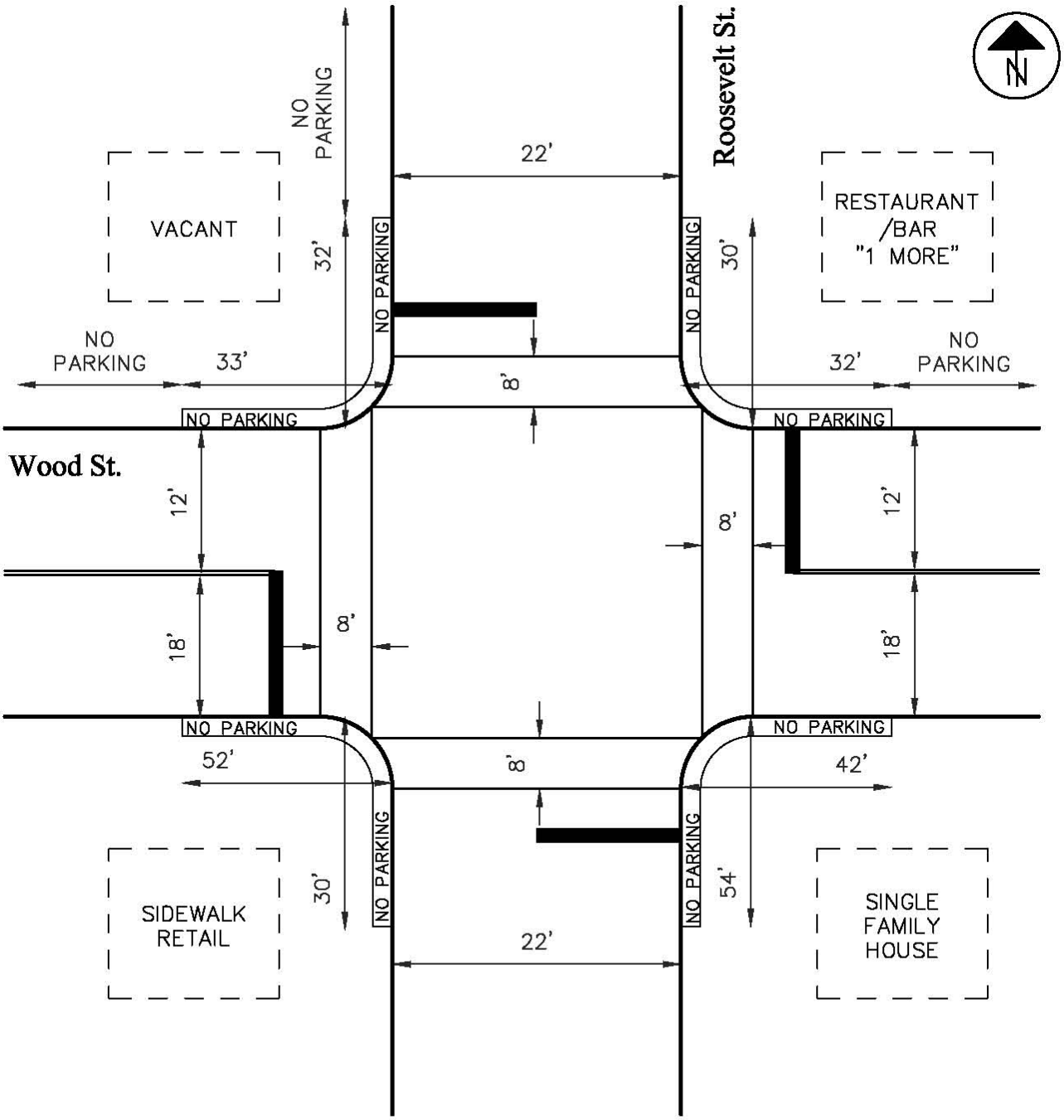
Crash History

- 4 reported crashes from 2005-2008
- Primarily angle type crashes

Recommendation

- Consider replacing traffic signal with four-way stop

INTERSECTION DIAGRAM



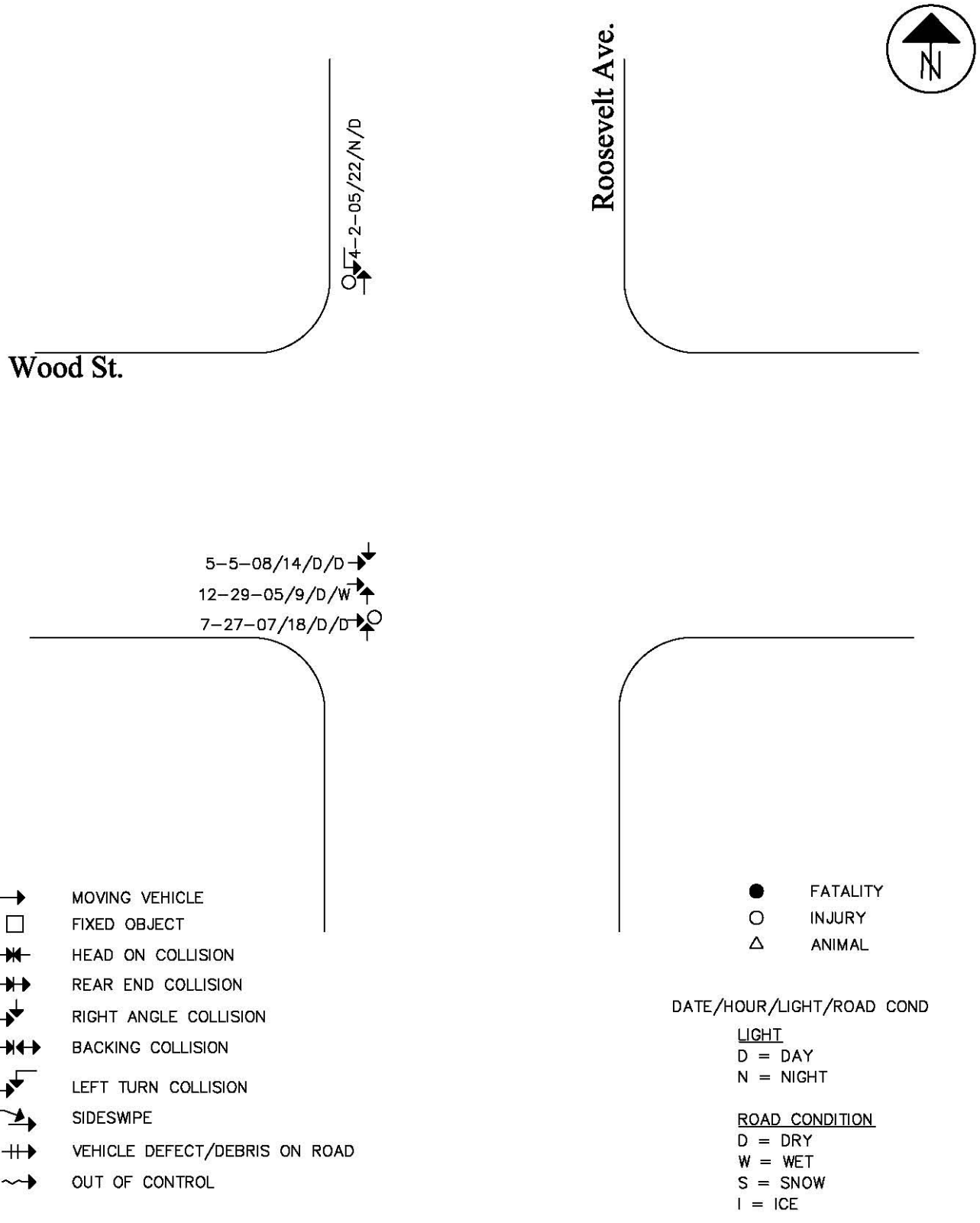
PRETIMED 2 PHASE SIGNAL

75 SEC CYCLE

20 SEC N/S SPLIT

55 SEC E/W SPLIT

CRASH DIAGRAM



Turning Movement Counts Summary Table

Location: Roosevelt Avenue at Wood Street

Date of Counts: Thursday 8/7/2008

	SB Roosevelt Ave				WB Wood St				NB Roosevelt Ave				EB Wood St				Major	Minor St	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Street	#1	#2
7:00 to 7:15 am	0	1	2	0	0	3	0	0	1	1	1	0	0	12	0	0			
7:15 to 7:30 am	0	2	0	0	0	5	0	0	0	0	0	0	0	18	3	0			
7:30 to 7:45 am	0	2	0	0	1	4	1	1	1	3	1	0	1	29	0	0			
7:45 to 8:00 am	1	8	0	0	0	12	0	0	1	1	1	0	0	37	1	0			
Total	1	13	2	0	1	24	1	1	3	5	3	0	1	96	4	0	127	16	11
8:00 to 8:15 am	1	1	1	0	1	4	0	0	0	4	1	0	0	13	0	0			
8:15 to 8:30 am	0	2	1	0	1	6	0	0	0	1	1	0	0	30	0	0			
8:30 to 8:45 am	0	1	0	0	2	16	1	0	1	2	1	1	1	23	1	0			
8:45 to 9:00 am	0	1	0	0	1	11	0	1	1	4	0	0	0	27	1	0			
Total	1	5	2	0	5	37	1	1	2	11	3	1	1	93	2	0	139	8	16
4:00 to 4:15 pm	0	5	2	2	1	44	2	0	0	3	0	0	1	41	0	0			
4:15 to 4:30 pm	0	8	0	0	2	34	3	1	3	1	5	0	0	34	3	1			
4:30 to 4:45 pm	1	1	2	1	4	38	1	1	1	1	5	1	1	42	1	2			
4:45 to 5:00 pm	0	7	2	0	0	40	4	1	3	2	3	0	1	34	0	2			
Total	1	21	6	3	7	156	10	3	7	7	13	1	3	151	4	5	331	28	27
5:00 to 5:15 pm	0	7	2	0	0	40	4	1	3	2	3	0	1	34	0	2			
5:15 to 5:30 pm	1	3	1	2	3	18	2	0	0	1	1	0	2	49	0	0			
5:30 to 5:45 pm	1	3	1	2	3	18	2	0	0	1	1	0	2	49	0	0			
5:45 to 6:00 pm	1	2	0	3	2	33	1	1	0	4	1	2	1	28	1	0			
Total	3	15	4	7	8	109	9	2	3	8	6	2	6	160	1	2	293	22	17
Grand Total	6	54	14	10	21	326	21	7	15	31	25	4	11	500	11	7			

SIGNAL WARANT ANALYSIS SUMMARY

Roosevelt Avenue / Wood Street Intersection

This signal warrant analysis is based on the guidelines in Chapter 4C of the 2003 Ohio MUTCD. The existing intersection has one approach lane from each direction and was analyzed with the counted traffic volumes.

Warrant 1, Eight-Hour Vehicular Warrant – *Warrant is NOT Satisfied*

Counted volumes from four hours in the AM and PM peak do not meet the eight-hour warrant thresholds. The remaining hours are expected to be lower in volume than the counted hours and will not meet the thresholds.

Time Period	Condition A			Condition B			Combination of Conditions A & B
	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	(80% of Each) Criteria Satisfied?
Warrant Threashold	500	150		750	75		
7 AM to 8 AM	127	16	No	127	16	No	No
8 AM to 9 AM	139	16	No	139	16	No	No
9 AM to 10 AM			No			No	No
10 AM to 11 AM			No			No	No
11 AM to 12 PM			No			No	No
12 PM to 1 PM			No			No	No
1 PM to 2 PM			No			No	No
2 PM to 3 PM			No			No	No
3 PM to 4 PM			No			No	No
4 PM to 5 PM	331	28	No	331	28	No	No
5 PM to 6 PM	293	22	No	293	22	No	No

Warrant 2, Four-Hour Vehicular Volume – *Warrant is NOT Satisfied*

Counted volumes from the four hours with the highest counted volumes were plotted on the Warrant 2 Table (attached). Two of the four plotted points are above the warrant threshold line for "1 lane & 1 lane".

Warrant 3, Peak Hour Vehicular Volume – *Warrant is NOT Satisfied*

The counted PM peak hour volumes were plotted on the Warrant 3 Table (attached). The plotted point is not above the warrant threshold line for "1 lane & 1 lane".

Warrant 4, Pedestrian Volume – *Warrant is NOT Satisfied*

The pedestrian crossings in each of the counted hours do not meet the minimum requirement of 100 or more for each of four hours of the day. The available gaps were not measured.

Warrant 5, School Crossing – *Warrant is NOT Satisfied*

No schools are currently located or planned in the city blocks adjacent to this intersection. Therefore, this warrant is not expected to be satisfied.

Warrant 6, Coordinated Signal System – *Warrant is NOT Satisfied*

This intersection is not located at a critical point along a coordinated signal system.

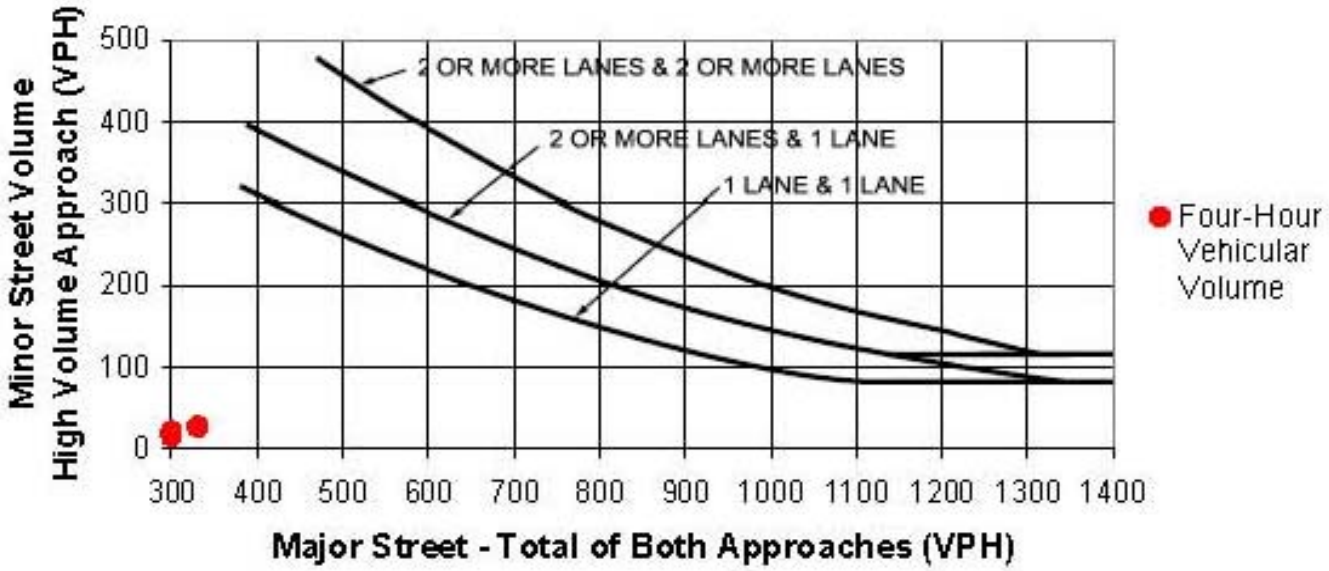
Warrant 7, Crash Experience – *Warrant is NOT Satisfied*

According to the crash data provided by the city of Piqua, three right-angle crashes and one left-turn crash were reported in the vicinity of this intersection within a three year period. This intersection has not experienced five or more crashes of those types in one 12-month period to meet the signal warrant thresholds.

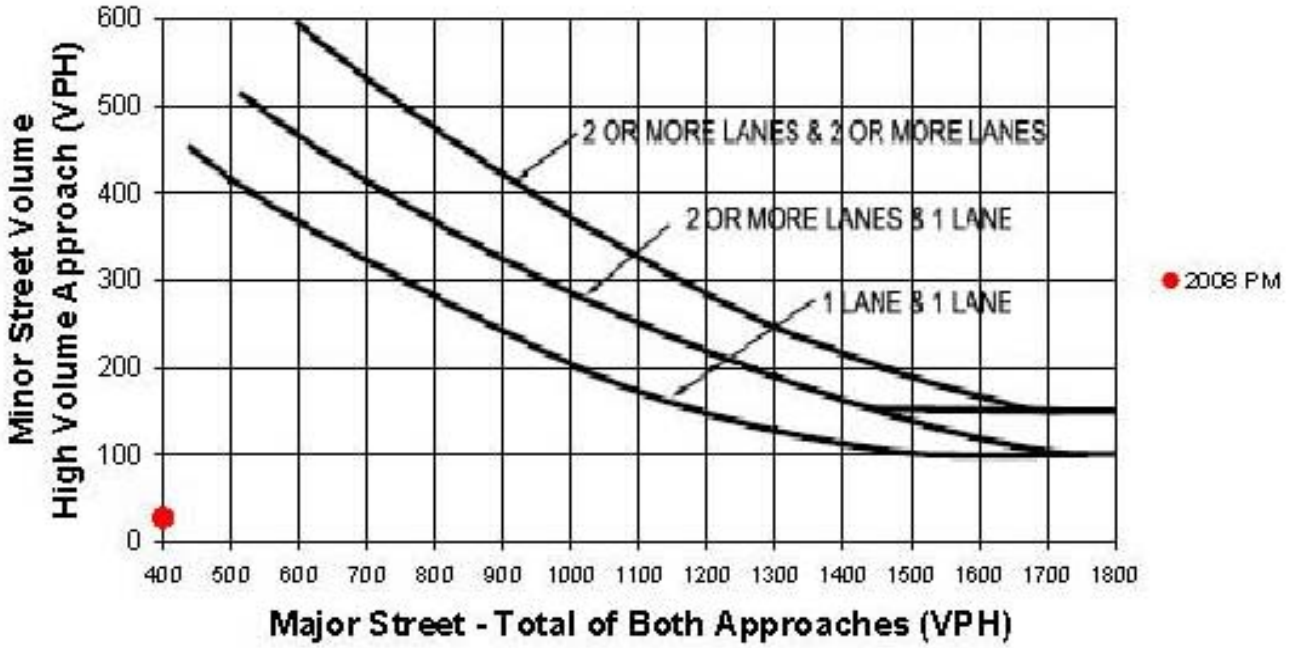
Warrant 8, Roadway Network – *Warrant is NOT Satisfied*

The hour with the largest traffic volumes (4-5 PM) has less than 400 total approaching trips. This is less than the required 1000 approaching trips.

Warrant 2, Four-Hour Vehiclar Volume



Warrant 3, Peak Hour



ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	M. Nolt
Agency/Co.	Kleingers & Associates
Date Performed	11/13/2008
Analysis Time Period	PM Peak

Site Information

Intersection	Roosevelt at Wood
Jurisdiction	City of Piqua
Analysis Year	2008

Project ID

East/West Street: *Wood Street* | North/South Street: *Roosevelt Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	3	151	4	7	156	10
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	7	7	13	1	21	6
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.90		0.90		0.90		0.90	
Flow Rate (veh/h)	174		191		28		30	
% Heavy Vehicles	1		2		1		4	
No. Lanes	1		1		1		1	
Geometry Group	1		1		1		1	
Duration, T	0.25							

Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
Prop. Left-Turns	0.0		0.0		0.3		0.0	
Prop. Right-Turns	0.0		0.1		0.5		0.2	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
hLT-adj	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.0		0.0		-0.2		-0.0	

Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
hd, initial value (s)	3.20		3.20		3.20		3.20	
x, initial	0.15		0.17		0.02		0.03	
hd, final value (s)	4.24		4.23		4.51		4.69	
x, final value	0.21		0.22		0.04		0.04	
Move-up time, m (s)	2.0		2.0		2.0		2.0	
Service Time, t_s (s)	2.2		2.2		2.5		2.7	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	424		441		278		280	
Delay (s/veh)	8.33		8.44		7.67		7.88	
LOS	A		A		A		A	
Approach: Delay (s/veh)	8.33		8.44		7.67		7.88	
LOS	A		A		A		A	
Intersection Delay (s/veh)	8.31							
Intersection LOS	A							

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College Street & Wood Street

Aerial Photo:

Existing Conditions Discussion

The intersection of College Street with Wood Street is four-way stop controlled. The east, west, and south legs intersect at 90-degree angles while the north leg is slightly skewed. There is a single lane on each approach. The intersection is located between residential and commercial areas. Parking restrictions vary near the intersection and are provided in detail on the existing conditions diagram. The primary concern at this intersection is whether or not a four-way stop is the most appropriate and effective traffic control device.

Photo: Looking East

Public Comments

- "This intersection is used to bypass the traffic signal at Covington and College."
- "There needs to be a public education/awareness effort if and when changes are made."

Analyses Results

- Nine reported crashes at the intersection from Jan. 2005 to June 2008
- Four-way stop control provides adequate capacity

Recommendations

Due to the relatively high traffic volumes and the fact that the existing four-way stop control accommodates traffic at an acceptable level of service, it is recommended that four-way stop control be retained at this intersection.

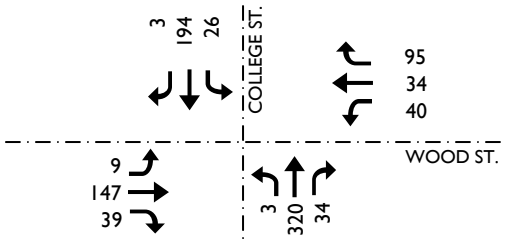
Note: During this study, it was noted that there is a desire to discourage through traffic from using Wood Street. In order to deemphasize Wood Street as a through route, consideration should be given to reducing roadway widths and curb radii at the intersection of Wayne Street and Wood Street. Currently, this intersection is relatively wide and tends to promote through traffic.

Intersection at a Glance

Existing Conditions

- Four-way stop control
- Single lane approaches
- Relatively high traffic volumes

Counted Traffic Volumes (peak hour)



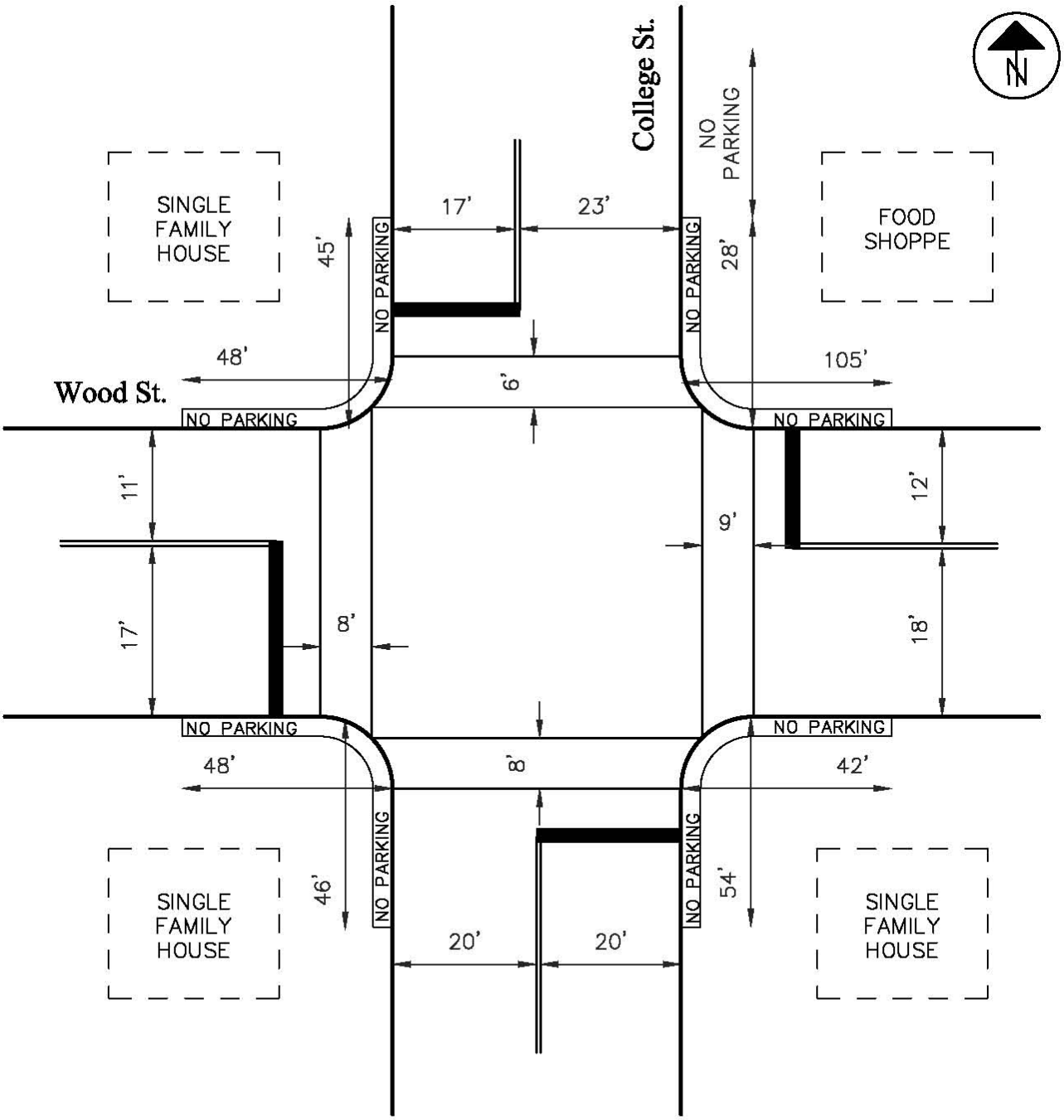
Crash History

- 9 reported crashes from 2005-2008
- Primarily angle type crashes

Recommendation

- Retain four-way stop control

INTERSECTION DIAGRAM



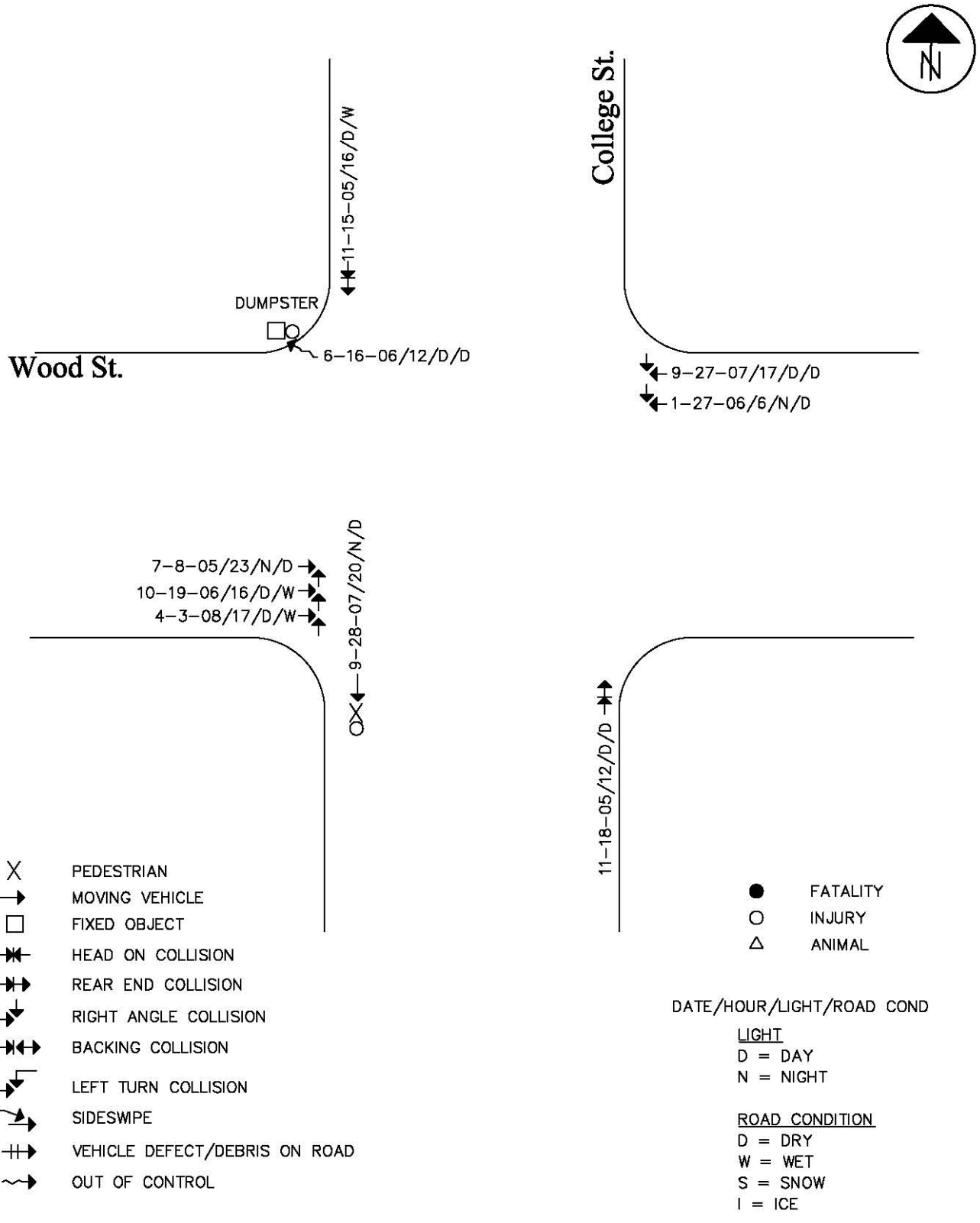
PRETIMED 2 PHASE SIGNAL

70 SEC CYCLE

30 SEC N/S SPLIT

40 SEC E/W SPLIT

CRASH DIAGRAM



Turning Movement Counts Summary Table

Location: College Street at Wood Street

Date of Counts: Thursday 8/13/2008 (7-9am & 4-6pm) and Thursday 10/9/2008 (11am-4pm)

	SB College St				WB Wood St				NB College St				EB Wood St				Major	Minor St	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Street	#1	#2
7:00 to 7:15 am	1	26	0	0	2	4	3	0	0	21	6	0	1	18	5	0			
7:15 to 7:30 am	6	29	0	0	1	3	3	0	0	28	2	0	1	16	4	0			
7:30 to 7:45 am	3	40	0	0	2	1	4	0	1	29	4	1	2	26	6	0			
7:45 to 8:00 am	1	50	0	0	4	0	2	0	1	33	2	0	1	22	6	0			
Total	11	145	0	0	9	8	12	0	2	111	14	1	5	82	21	0	283	29	108
8:00 to 8:15 am	5	26	0	0	5	7	3	0	0	23	3	0	1	18	5	0			
8:15 to 8:30 am	0	29	0	0	3	2	6	0	0	29	3	0	0	20	5	0			
8:30 to 8:45 am	4	44	0	1	0	0	8	0	1	39	4	0	1	13	7	0			
8:45 to 9:00 am	3	27	0	0	1	3	8	0	0	28	5	0	1	14	1	0			
Total	12	126	0	1	9	12	25	0	1	119	15	0	3	65	18	0	273	46	86
11:00 to 11:15 am	2	44	0	0	7	4	11	0	1	48	6	0	1	20	9	0			
11:15 to 11:30 am	4	33	0	0	4	3	13	0	1	48	5	0	5	16	6	0			
11:30 to 11:45 am	7	31	0	0	5	7	13	0	0	44	7	0	3	19	4	1			
11:45 to 12:00 am	6	43	0	0	8	4	16	0	3	52	4	1	2	27	10	2			
Total	19	151	0	0	24	18	53	0	5	192	22	1	11	82	29	3	389	95	122
12:00 to 12:15 pm	4	38	0	1	6	6	22	1	1	43	6	1	4	23	16	0			
12:15 to 12:30 pm	7	34	0	0	4	9	18	0	3	43	4	0	5	18	7	0			
12:30 to 12:45 pm	11	37	0	2	5	4	17	1	0	43	7	0	3	26	10	1			
12:45 to 13:00 pm	9	30	0	0	3	6	14	0	1	44	3	0	1	24	7	0			
Total	31	139	0	3	18	25	71	2	5	173	20	1	13	91	40	1	368	114	144
2:00 to 2:15 pm	7	27	0	0	5	3	17	1	1	39	1	0	0	26	6	0			
2:15 to 2:30 pm	9	45	1	0	7	8	18	1	1	55	9	0	2	30	9	0			
2:30 to 2:45 pm	12	42	1	0	6	10	15	0	2	42	4	0	0	28	11	1			
2:45 to 3:00 pm	6	42	1	0	8	4	20	0	1	53	13	0	2	26	4	1			
Total	34	156	3	0	26	25	70	2	5	189	27	0	4	110	30	2	414	121	144
3:00 to 3:15 pm	7	54	2	0	10	9	20	0	1	81	10	3	2	39	10	3			
3:15 to 3:30 pm	7	54	1	0	12	8	17	0	1	84	3	1	0	26	9	3			
3:30 to 3:45 pm	7	38	0	0	9	6	25	1	1	71	11	1	2	44	9	0			
3:45 to 4:00 pm	5	48	0	0	9	11	33	0	0	84	10	0	5	38	11	0			
Total	26	194	3	0	40	34	95	1	3	320	34	5	9	147	39	6	580	169	195
4:00 to 4:15 pm	10	48	1	0	8	7	32	0	2	81	7	0	2	25	5	0			
4:15 to 4:30 pm	10	43	3	0	13	9	9	0	2	77	12	1	3	25	11	0			
4:30 to 4:45 pm	10	49	0	1	11	7	23	0	0	64	6	0	0	35	14	0			
4:45 to 5:00 pm	8	41	0	0	8	10	23	0	1	69	8	0	1	26	4	0			
Total	38	181	4	1	40	33	87	0	5	291	33	1	6	111	34	0	552	160	151
5:00 to 5:15 pm	5	53	0	2	10	3	25	0	2	68	6	3	2	29	9	0			
5:15 to 5:30 pm	3	48	0	2	5	7	22	1	1	69	3	7	1	22	14	1			
5:30 to 5:45 pm	4	47	1	2	12	6	20	0	1	72	5	0	1	29	3	1			
5:45 to 6:00 pm	7	62	0	2	5	8	16	0	0	61	3	0	1	21	9	0			
Total	19	210	1	8	32	24	83	1	4	270	17	10	5	101	35	2	521	139	141
Grand Total	190	1302	11	13	198	179	496	6	30	1665	182	19	56	789	246	14			

ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	M. Nolt
Agency/Co.	Kleingers & Associates
Date Performed	11/13/2008
Analysis Time Period	PM Peak

Site Information

Intersection	College at Wood
Jurisdiction	City of Piqua
Analysis Year	2008

Project ID

East/West Street: *Wood Street* | North/South Street: *College Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	9	147	39	40	34	95
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	3	320	34	26	194	3
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.90		0.90		0.90		0.90	
Flow Rate (veh/h)	216		186		395		246	
% Heavy Vehicles	3		2		3		3	
No. Lanes	1		1		1		1	
Geometry Group	1		1		1		1	
Duration, T	0.25							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.0		0.2		0.0		0.1	
Prop. Right-Turns	0.2		0.6		0.1		0.0	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
hLT-adj	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	-0.1		-0.3		-0.0		0.1	

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20		3.20	
x, initial	0.19		0.17		0.35		0.22	
hd, final value (s)	6.14		6.03		5.65		5.98	
x, final value	0.37		0.31		0.62		0.41	
Move-up time, m (s)	2.0		2.0		2.0		2.0	
Service Time, t_s (s)	4.1		4.0		3.6		4.0	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	466		436		608		496	
Delay (s/veh)	12.68		11.73		17.39		13.05	
LOS	B		B		C		B	
Approach: Delay (s/veh)	12.68		11.73		17.39		13.05	
LOS	B		B		C		B	
Intersection Delay (s/veh)	14.38							
Intersection LOS	B							

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College Street & Young Street

Aerial Photo:

Existing Conditions Discussion

The intersection of College Street with Young Street is four-way stop controlled and has four approaches intersecting at a 90-degree angle. There is a single lane on each approach. The intersection is located in an area that has residential and industrial uses. Parking restrictions vary near the intersection and are provided in detail on the existing conditions diagram. On-street parking along College Street restricts visibility of approaching traffic. The primary concern at this intersection is whether or not a four-way stop is the most appropriate and effective traffic control device.

Photo: Looking North

Public Comments

- "Four-way stop is not necessary."
- "The surrounding land use has changed. Manufacturing land uses are no longer there."

Analyses Results

- Three reported crashes at the intersection from Jan. 2005 to June 2008
- Two-way stop control with stop signs on Young Street provides adequate capacity

Recommendations

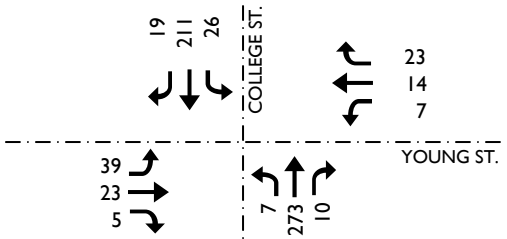
Due to the relatively low traffic volumes approaching the intersection on Young Street, it is recommended that consideration be given to converting this intersection into a two-way stop with stop signs on Young Street. If this modification is implemented, it should be accompanied by the removal of some of the on-street parking along College Street to provide adequate sight distance.

Intersection at a Glance

Existing Conditions

- Four-way stop control
- Single lane approaches
- Adjacent to residential and industrial land uses

Counted Traffic Volumes (peak hour)



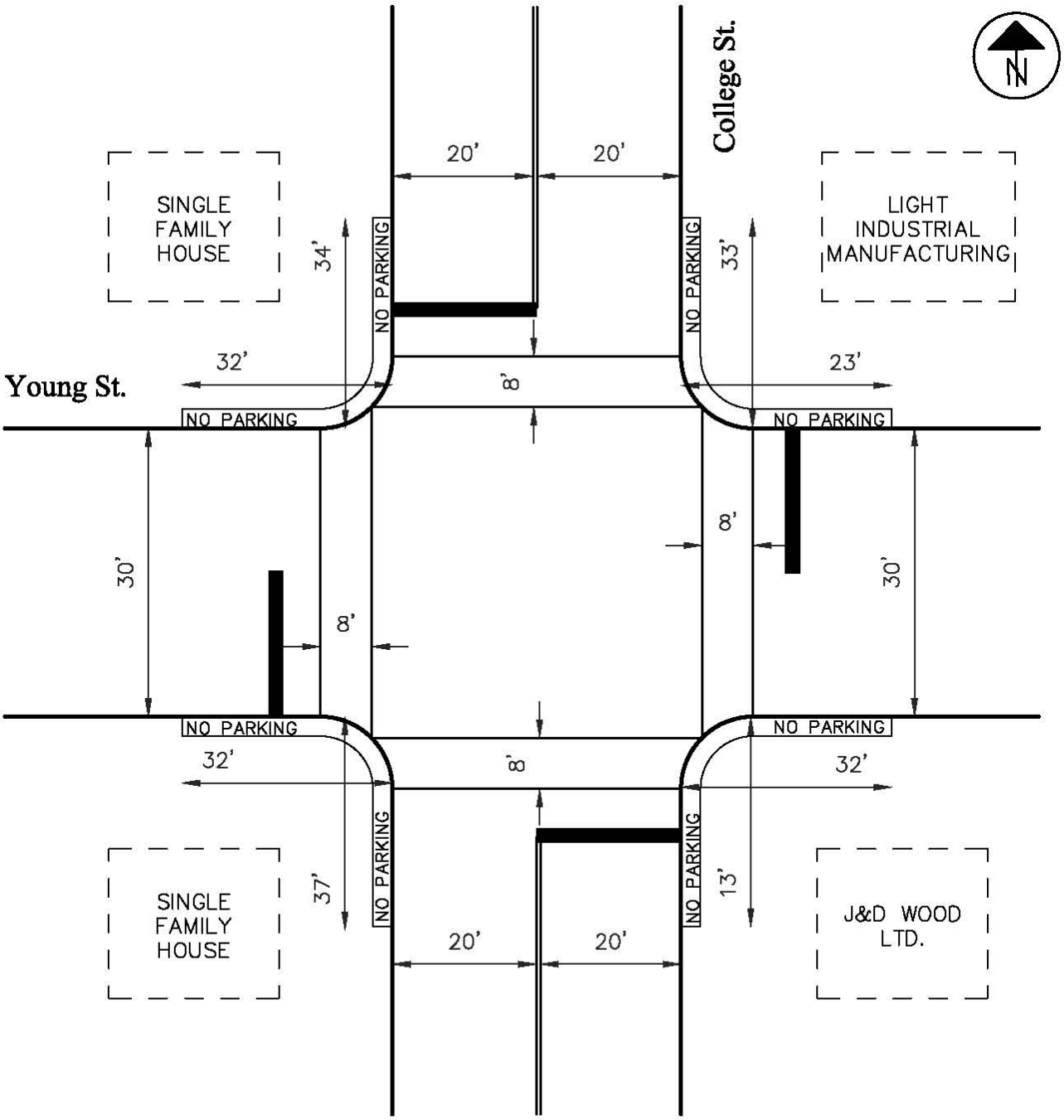
Crash History

- 3 reported crashes from 2005-2008
- Primarily angle type crashes

Recommendation

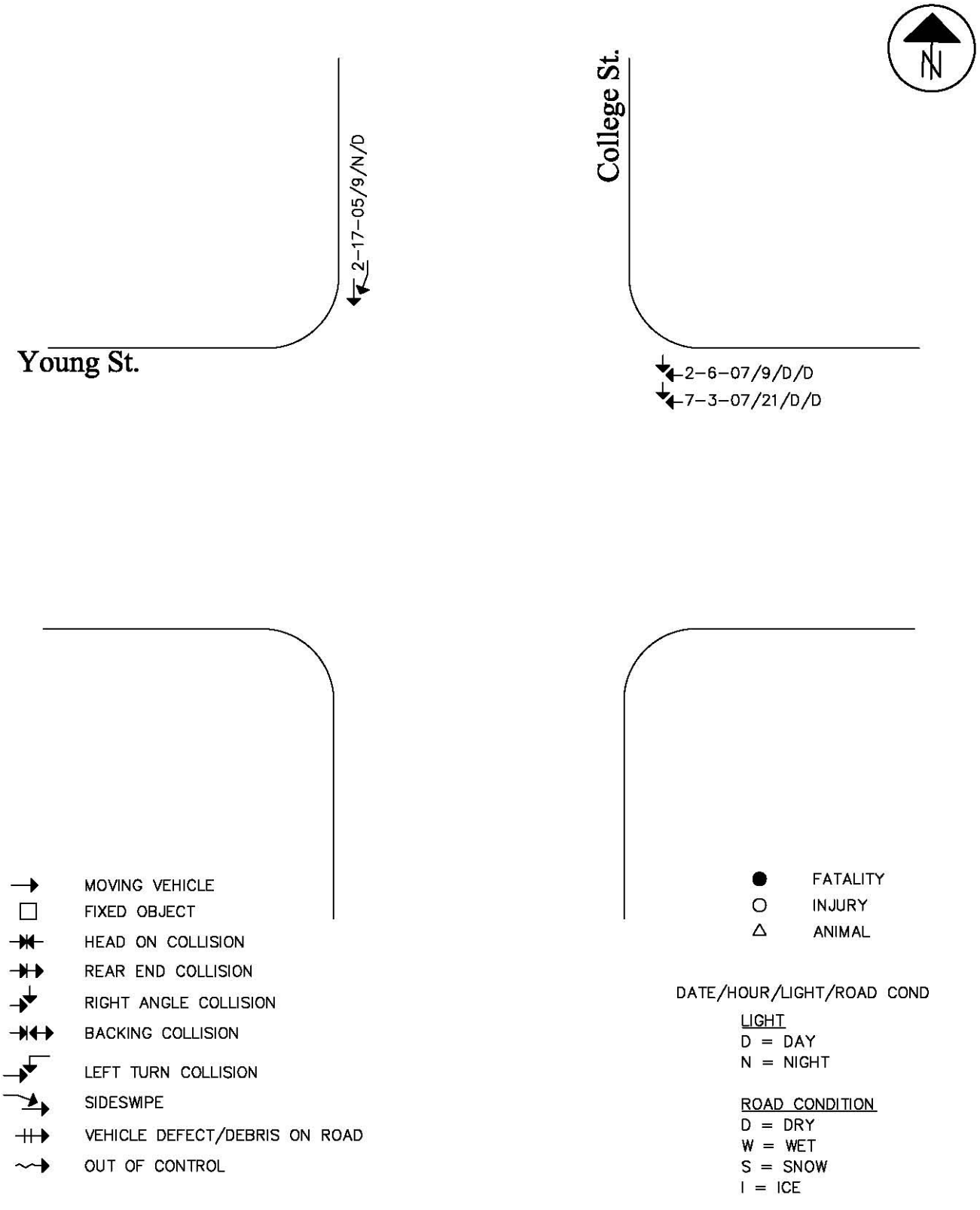
- Consider converting intersection to two-way stop, with stop signs on Young Street

INTERSECTION DIAGRAM



4-WAY STOP CONTOLLED

CRASH DIAGRAM



Turning Movement Counts Summary Table

Location: College Street at Young Street

Date of Counts: Thursday 8/13/2008

	SB College St				WB Young St				NB College St				EB Young St				Major	Minor St	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Street	#1	#2
7:00 to 7:15 am	1	32	2	0	0	3	1	0	1	25	1	0	2	0	1	0			
7:15 to 7:30 am	3	33	0	0	0	0	2	0	1	25	2	0	6	2	0	0			
7:30 to 7:45 am	1	44	2	0	1	3	5	0	0	25	1	0	4	2	4	0			
7:45 to 8:00 am	5	52	4	0	0	0	1	0	1	30	0	0	2	0	2	0			
Total	10	161	8	0	1	6	9	0	3	105	4	0	14	4	7	0	291	16	25
8:00 to 8:15 am	1	33	3	0	0	1	0	0	1	21	1	0	3	2	2	0			
8:15 to 8:30 am	2	36	0	0	2	0	0	0	0	33	1	0	1	3	0	0			
8:30 to 8:45 am	6	45	1	1	1	1	6	0	0	30	0	0	7	4	0	0			
8:45 to 9:00 am	4	23	2	0	2	1	2	0	0	25	0	0	4	0	2	0			
Total	13	137	6	1	5	3	8	0	1	109	2	0	15	9	4	0	268	16	28
4:00 to 4:15 pm	5	52	5	0	1	2	6	4	3	69	5	0	15	6	2	0			
4:15 to 4:30 pm	7	56	4	1	2	2	10	1	1	75	1	1	11	10	3	0			
4:30 to 4:45 pm	8	63	5	2	1	5	4	2	2	60	2	1	7	4	0	4			
4:45 to 5:00 pm	6	40	5	0	3	5	3	0	1	69	2	0	6	3	0	1			
Total	26	211	19	3	7	14	23	7	7	273	10	2	39	23	5	5	546	44	67
5:00 to 5:15 pm	8	58	3	1	2	4	8	0	1	69	3	4	1	2	2	1			
5:15 to 5:30 pm	5	54	5	2	0	1	7	0	1	64	0	6	5	11	1	4			
5:30 to 5:45 pm	2	49	9	0	1	5	7	0	1	68	0	0	7	2	1	2			
5:45 to 6:00 pm	3	65	7	1	0	2	9	2	0	56	0	0	2	3	0	0			
Total	18	226	24	4	3	12	31	2	3	257	3	10	15	18	4	7	531	46	37
Grand Total	67	735	57	8	16	35	71	9	14	744	19	12	83	54	20	12			

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*M. Nolt*	Intersection	*College at Young*
Agency/Co.	*Kleingers & Associates*	Jurisdiction	*City of Piqua*
Date Performed	*11/13/2008*	Analysis Year	*2008*
Analysis Time Period	*PM Peak*		

Project Description

East/West Street: *Young Street*	North/South Street: *College Street*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*7*	*273*	*10*	*26*	*211*	*19*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*7*	*303*	*11*	*28*	*234*	*21*
Percent Heavy Vehicles	*0*	--	--	*5*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*39*	*23*	*5*	*7*	*14*	*23*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*43*	*25*	*5*	*7*	*15*	*25*
Percent Heavy Vehicles	*0*	*0*	*5*	*13*	*0*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*7*	*28*		*47*			*73*	
C (m) (veh/h)	*1311*	*1215*		*492*			*370*	
v/c	*0.01*	*0.02*		*0.10*			*0.20*	
95% queue length	*0.02*	*0.07*		*0.32*			*0.72*	
Control Delay (s/veh)	*7.8*	*8.0*		*13.1*			*17.1*	
LOS	*A*	*A*		*B*			*C*	
Approach Delay (s/veh)	--	--	*13.1*			*17.1*		
Approach LOS	--	--	*B*			*C*		

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South Street & Brice Ave

Aerial Photo:

Existing Conditions Discussion

The intersection of South Street with Brice Avenue is signal controlled and has three approaches with Brice Avenue intersecting South Street at a slightly skewed angle. There is a single lane on each approach. The intersection is located in a residential area and is adjacent to Favorite Hill School. The actuated signal has pedestrian push buttons and pedestrian signal indications. The speed limit along South Street is reduced during school arrival and dismissal periods with signs and flashing beacons. Parking restrictions vary near the intersection and are provided in detail on the existing conditions diagram. The primary concern at this intersection is the warrant status of the existing traffic signal. This signal may have been installed initially to provide for pedestrian crossings between the school and the residential district on the opposite side of South Street.

Photo: Looking West

Public Comments

- "Traffic signal is needed for student crossings."
- "There is a crossing guard that pushes the pedestrian button."
- "Pedestrian crossings used to occur at a mid-block location."
- "Operational changes may be needed."
- "Traffic signal provides a safe crossing for school students."
- "Motorist confusion may be a problem."
- "Alternate traffic control may be appropriate."

Analyses Results

- Traffic Signal Warrant 5 may be met
- One reported crash at the intersection from Jan. 2005 to June 2008
- Very low vehicular traffic volumes on Brice Avenue
- Significant number of pedestrian crossings during school arrival and dismissal periods.

Recommendations

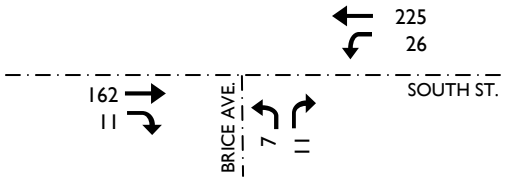
Due to the number of pedestrians observed crossing the intersection during school arrival and dismissal periods, it is recommended that the traffic signal at this intersection be retained.

Intersection at a Glance

Existing Conditions

- Span-wire traffic signal
- Single lane approaches
- Adjacent to Favorite Hill School
- Low vehicular traffic volumes

Counted Traffic Volumes (peak hour)



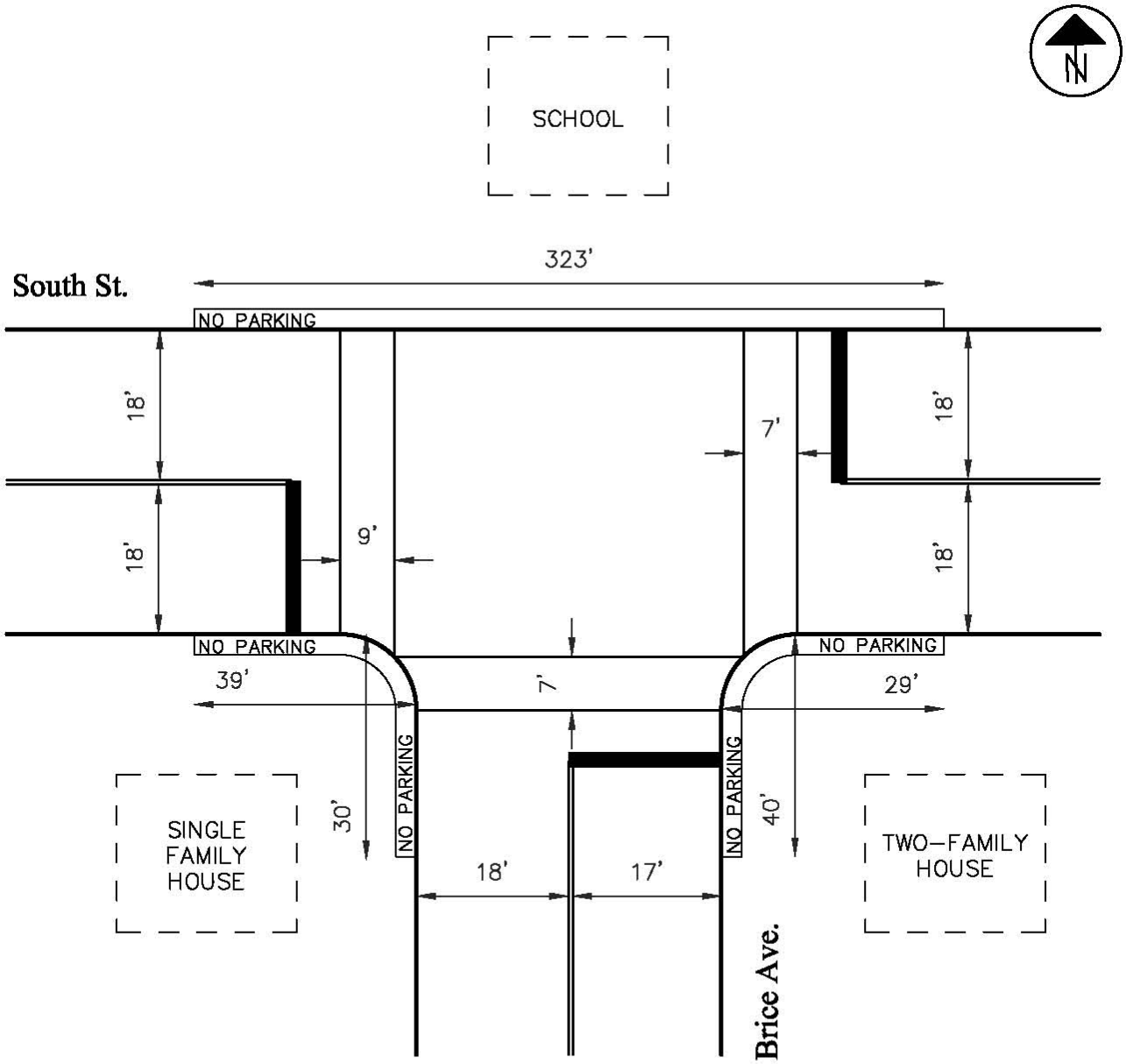
Crash History

- 1 reported crash from 2005-2008
- Rear-end type crash

Recommendation

- Retain traffic signal

INTERSECTION DIAGRAM

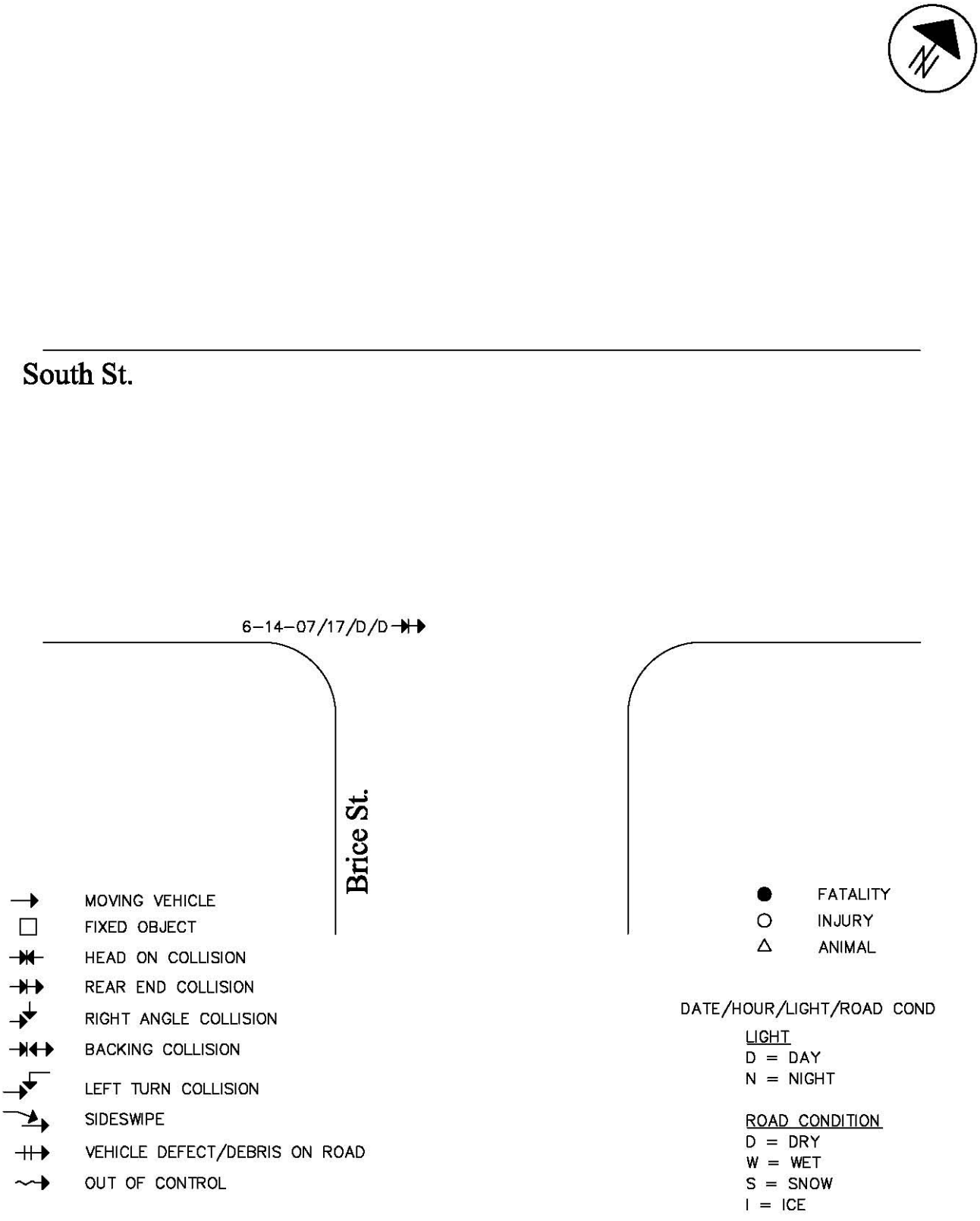


ACTUATED SIGNAL

UNKNOWN CYCLE

MIN 21 SEC BRICE AVE INTERVAL

CRASH DIAGRAM



Turning Movement Counts Summary Table

Location: South Street at Brice Avenue

Date of Counts: Thursday 10/9/2008

	WB South St				NB Brice Ave				EB South St				Major Street	Minor St	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		#1	#2
7:00 to 7:15 am	0	0	0	0	1	13	0	2	0	0	5	1	0	18	2	1			
7:15 to 7:30 am	0	0	0	0	1	8	0	0	0	0	1	0	0	24	0	0			
7:30 to 7:45 am	0	0	0	1	0	23	0	2	0	0	2	0	0	39	0	0			
7:45 to 8:00 am	0	0	0	1	2	17	0	1	0	0	0	0	0	24	0	0			
Total	0	0	0	2	4	61	0	5	0	0	8	1	0	105	2	1	172	0	8
8:00 to 8:15 am	0	0	0	3	7	25	0	3	1	0	2	3	0	22	1	0			
8:15 to 8:30 am	0	0	0	7	3	38	0	1	1	0	2	2	0	20	1	0			
8:30 to 8:45 am	0	0	0	1	6	36	1	0	0	0	5	4	0	19	3	0			
8:45 to 9:00 am	0	0	0	0	1	23	0	0	0	0	0	0	0	19	0	0			
Total	0	0	0	11	17	122	1	4	2	0	9	9	0	80	5	0	225	0	11
2:00 to 2:15 pm	0	0	0	0	1	30	0	0	0	0	1	0	0	38	1	0			
2:15 to 2:30 pm	0	0	0	0	2	33	0	0	1	0	2	0	0	36	2	0			
2:30 to 2:45 pm	0	0	0	0	2	31	0	0	1	0	3	0	0	35	4	0			
2:45 to 3:00 pm	0	0	0	1	2	41	0	0	2	0	1	1	0	24	1	0			
Total	0	0	0	1	7	135	0	0	4	0	7	1	0	133	8	0	283	0	11
3:00 to 3:15 pm	0	0	0	2	6	45	0	0	0	0	3	5	0	44	3	1			
3:15 to 3:30 pm	0	0	0	11	7	47	0	0	3	0	5	23	0	40	2	3			
3:30 to 3:45 pm	0	0	0	14	9	69	0	0	3	0	3	9	0	34	4	2			
3:45 to 4:00 pm	0	0	0	3	4	64	0	0	1	0	0	5	0	44	2	1			
Total	0	0	0	30	26	225	0	0	7	0	11	42	0	162	11	7	424	0	18
Grand Total	0	0	0	44	54	543	1	9	13	0	35	53	0	480	26	8			

SIGNAL WARANT ANALYSIS SUMMARY

South Street / Brice Avenue Intersection

This signal warrant analysis is based on the guidelines in Chapter 4C of the 2003 Ohio MUTCD. The existing intersection has one approach lane from each direction and was analyzed with the counted traffic volumes.

Warrant 1, Eight-Hour Vehicular Warrant – *Warrant is NOT Satisfied*

Counted volumes from four hours in the AM and PM peak do not meet the eight-hour warrant thresholds. The remaining hours are expected to be lower in volume than the counted hours and will not meet the thresholds.

Time Period	Condition A			Condition B			Combination of Conditions A & B
	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	(80% of Each) Criteria Satisfied?
Warrant Threashold	500	150		750	75		
7 AM to 8 AM	172	8	No	172	8	No	No
8 AM to 9 AM	225	11	No	225	11	No	No
9 AM to 10 AM			No			No	No
10 AM to 11 AM			No			No	No
11 AM to 12 PM			No			No	No
12 PM to 1 PM			No			No	No
1 PM to 2 PM			No			No	No
2 PM to 3 PM	283	11	No	283	11	No	No
3 PM to 4 PM	424	18	No	424	18	No	No
4 PM to 5 PM			No			No	No
5 PM to 6 PM			No			No	No

Warrant 2, Four-Hour Vehicular Volume – *Warrant is NOT Satisfied*

Counted volumes from the four hours with the highest counted volumes were plotted on the Warrant 2 Table (attached). Two of the four plotted points are above the warrant threshold line for "1 lane & 1 lane".

Warrant 3, Peak Hour Vehicular Volume – *Warrant is NOT Satisfied*

The counted PM peak hour volumes were plotted on the Warrant 3 Table (attached). The plotted point is not above the warrant threshold line for "1 lane & 1 lane".

Warrant 4, Pedestrian Volume – *Warrant is NOT Satisfied*

The pedestrian crossings in each of the counted hours do not meet the minimum requirement of 100 or more for each of four hours of the day. The available gaps were not measured.

Warrant 5, School Crossing – *Warrant MAY be Satisfied*

Favorite Hill Elementary School is located adjacent to the intersection. The majority of pedestrian crossings during the traffic counts were school related; however, the total number of minor street crossings during the afternoon peak was 72 – more than the minimum required. Available crossing gaps were not measured.

Warrant 6, Coordinated Signal System – *Warrant is NOT Satisfied*

This intersection is not located at a critical point along a coordinated signal system.

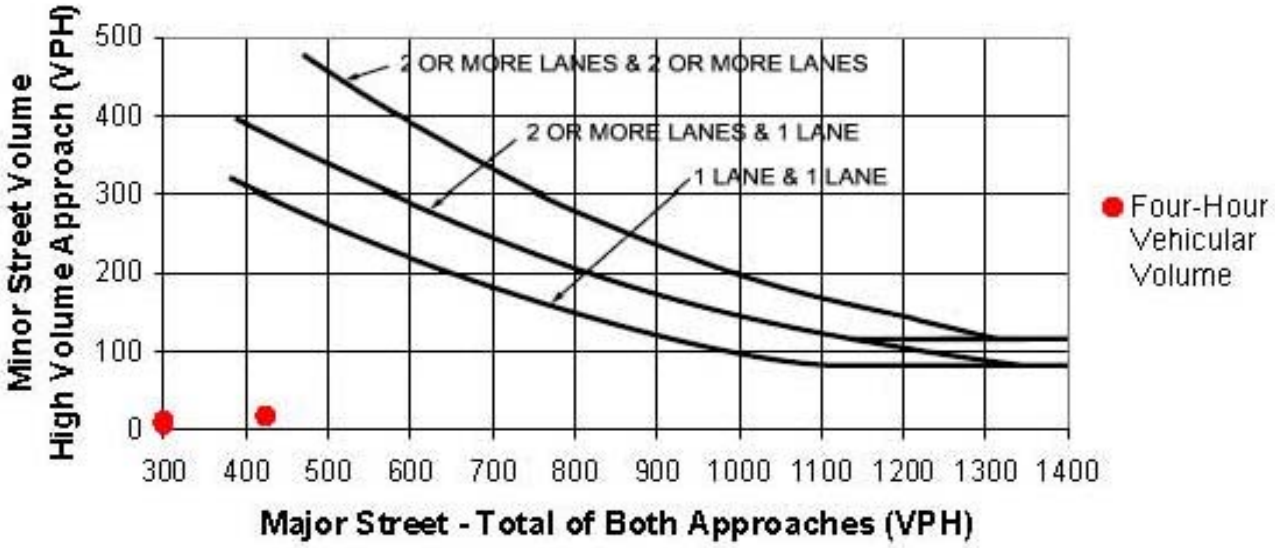
Warrant 7, Crash Experience – *Warrant is NOT Satisfied*

According to the crash data provided by the city of Piqua, no crashes that could be corrected by traffic signal control were reported in the vicinity of this intersection within a three year period.

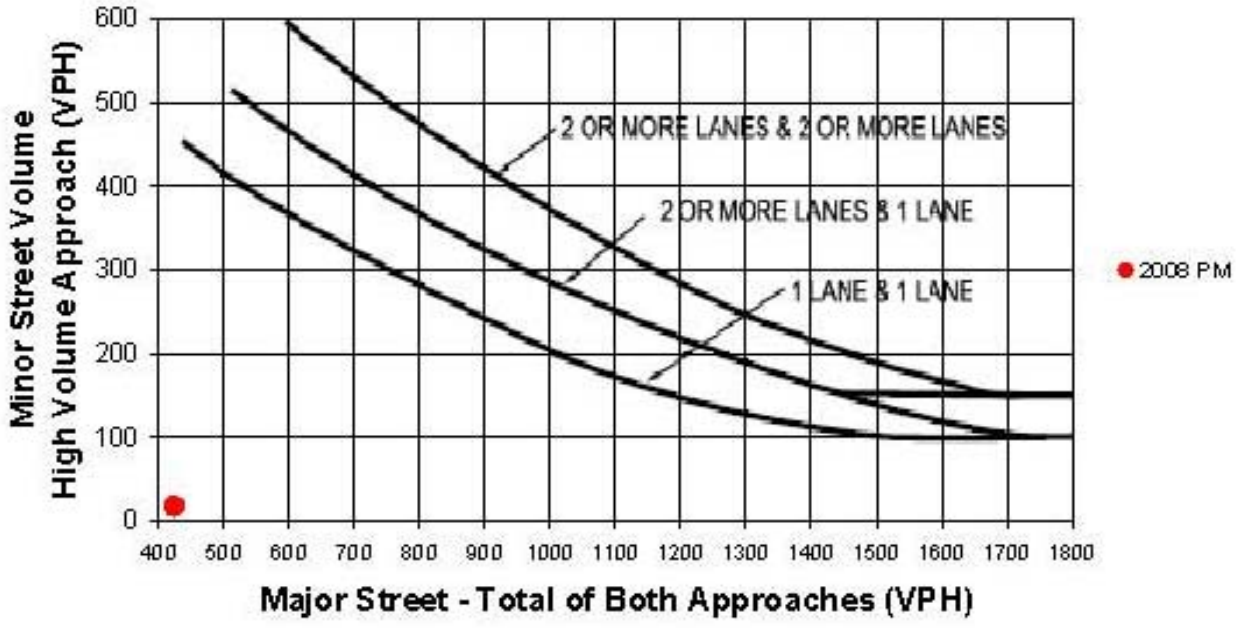
Warrant 8, Roadway Network – *Warrant is NOT Satisfied*

The hour with the largest traffic volumes (3-4 PM) has less than 450 total approaching trips. This is less than the required 1000 approaching trips.

Warrant 2, Four-Hour Vehiclar Volume



Warrant 3, Peak Hour



McKinley Ave & Grant Street

Aerial Photo:

Existing Conditions Discussion

The intersection of McKinley Avenue with Grant Street is signal controlled and has four approaches that intersect at a 90-degree angle. There is a single lane on each approach. The intersection is located in a residential area. The actuated signal has pedestrian push buttons and pedestrian signal indications. A home and fence in the southeast corner of the intersection and parking along McKinley Avenue restrict visibility. The primary concern at this intersection is the warrant status of the existing traffic signal.

Note: This intersection was added as a study area intersection toward the end of this project. All data for this intersection was collected by the City of Piqua and provided for use in this study.

Photo: Looking South

Public Comments

- This intersection was not included in the study at the time of the Input/Awareness meeting. Therefore, no public comments were received.

Analyses Results

- Traffic signal warrants are not met
- One reported crash at the intersection from Jan. 2005 to June 2008
- Two-way stop control provides adequate capacity

Recommendations

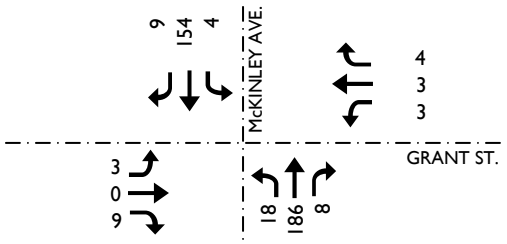
It is recommended that consideration be given to the removal of the traffic signal at this intersection and the implementation of two-way stop control with stop signs on Grant Street. However, before this modification is implemented, the existing sight distance restrictions should be removed. Also, curb bump-outs should be considered to narrow the intersection and provide adequate locations for stop sign visibility.

Intersection at a Glance

Existing Conditions

- Span-wire traffic signal
- Single lane approaches
- Low vehicular traffic volumes on Grant
- On-street parking and adjacent home and fence restrict visibility

Counted Traffic Volumes (peak hour)



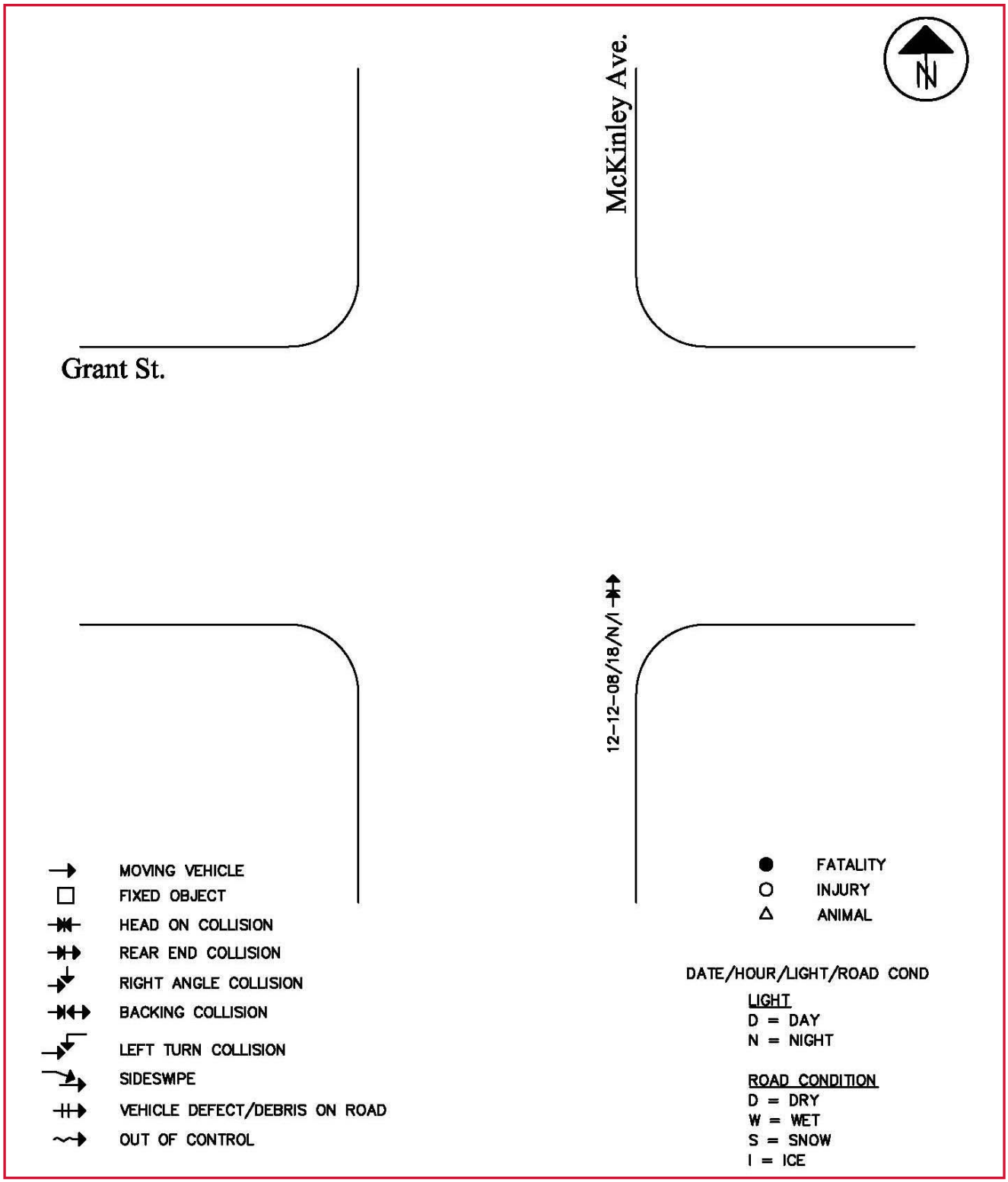
Crash History

- 1 reported crash from 2005-2008
- Rear-end crash

Recommendations

- Consider replacing traffic signal with two-way stop if sight distance restrictions can be eliminated.

CRASH DIAGRAM



TRAFFIC COUNT
Location: MCKINLEY & GRANT, Piqua, OH
Date: Tuesday, 02 December 2008
Weather: Cold 31F, Light Snow & Windy

0700 TO 0900

	MCKINLEY S/B			MCKINLEY N/B			GRANT W/B			GRANT E/B		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
0700	0	15	0	0	15	0	0	0	0	0	1	4
0715	0	15	0	0	30	0	0	0	0	0	0	2
0730	1	18	0	3	27	0	2	0	2	1	0	3
0745	0	29	1	5	36	1	0	0	1	1	0	1
0800	2	22	0	1	32	0	2	2	1	1	0	0
0815	1	23	2	1	26	1	1	1	0	1	0	1
0830	1	21	2	5	33	1	2	1	4	4	0	4
0845	0	32	1	1	27	0	0	0	0	0	0	1
TOTALS	5	175	6	16	226	3	7	4	8	8	1	16

1600 TO 1800

1600	1	36	2	7	56	1	0	2	1	1	0	4
1615	1	35	3	3	47	1	1	0	0	2	0	1
1630	0	37	2	3	46	3	0	0	3	0	0	1
1645	2	46	2	5	37	3	2	1	0	0	0	3
1700	1	42	2	5	48	0	2	0	0	0	0	2
1715	2	36	1	1	48	2	1	0	0	3	0	5
1730	2	40	0	7	25	0	0	0	1	4	0	2
1745	2	24	0	7	33	0	0	0	0	1	1	2
TOTALS	11	296	12	38	340	10	6	3	5	11	1	20

GRAND TOTALS	16	471	18	54	566	13	13	7	13	19	2	36

SIGNAL WARANT ANALYSIS SUMMARY

McKinley Avenue / Grant Street Intersection

This signal warrant analysis is based on the guidelines in Chapter 4C of the 2003 Ohio MUTCD. The existing intersection has one approach lane from each direction and was analyzed with the counted traffic volumes.

Warrant 1, Eight-Hour Vehicular Warrant – *Warrant is NOT Satisfied*

Counted volumes from four hours in the AM and PM peak do not meet the eight-hour warrant thresholds. The remaining hours are expected to be lower in volume than the counted hours and will not meet the thresholds.

Time Period	Condition A			Condition B			Combination of Conditions A & B
	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	(80% of Each) Criteria Satisfied?
Warrant Threashold	500	150		750	75		
7 AM to 8 AM	196	13	No	196	13	No	No
8 AM to 9 AM	235	14	No	235	14	No	No
9 AM to 10 AM			No			No	No
10 AM to 11 AM			No			No	No
11 AM to 12 PM			No			No	No
12 PM to 1 PM			No			No	No
1 PM to 2 PM			No			No	No
2 PM to 3 PM			No			No	No
3 PM to 4 PM			No			No	No
4 PM to 5 PM	379	12	No	379	12	No	No
5 PM to 6 PM	328	20	No	328	20	No	No

Warrant 2, Four-Hour Vehicular Volume – *Warrant is NOT Satisfied*

Counted volumes from the four hours with the highest counted volumes were plotted on the Warrant 2 Table (attached). No plotted points are above the warrant threshold line for "1 lane & 1 lane".

Warrant 3, Peak Hour Vehicular Volume – *Warrant is NOT Satisfied*

The counted PM peak hour volumes were plotted on the Warrant 3 Table (attached). The plotted point is not above the warrant threshold line for "1 lane & 1 lane".

Warrant 4, Pedestrian Volume –

Pedestrian volumes were not counted as part of the data collection.

Warrant 5, School Crossing – *Warrant is NOT Satisfied*

No schools are currently located or planned in the city blocks adjacent to this intersection. Therefore, this warrant is not expected to be satisfied.

Warrant 6, Coordinated Signal System – *Warrant is NOT Satisfied*

This intersection is not located at a critical point along a coordinated signal system.

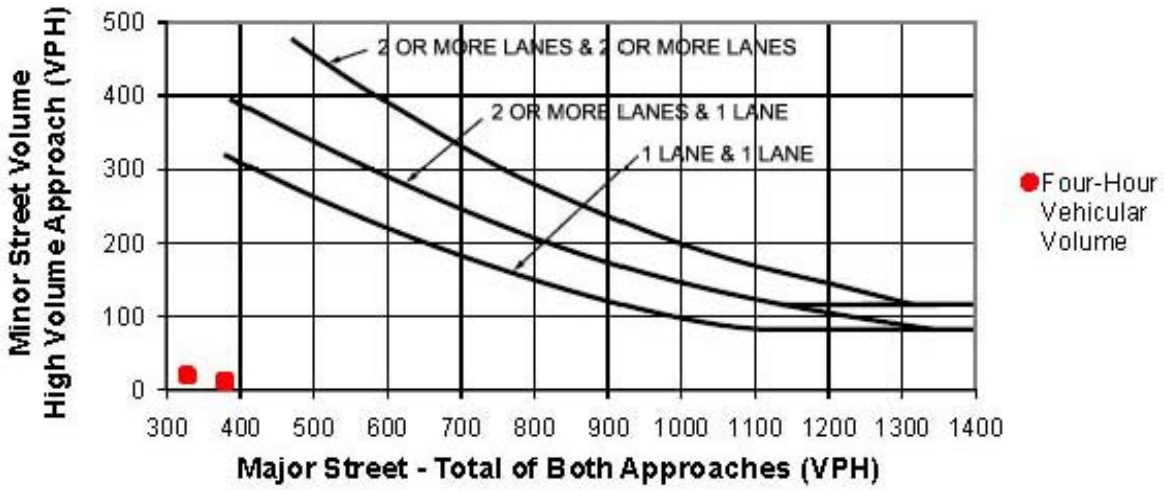
Warrant 7, Crash Experience – *Warrant is NOT Satisfied*

According to the crash data provided by the city of Piqua, only one crash was reported in the vicinity of this intersection within a three year period.

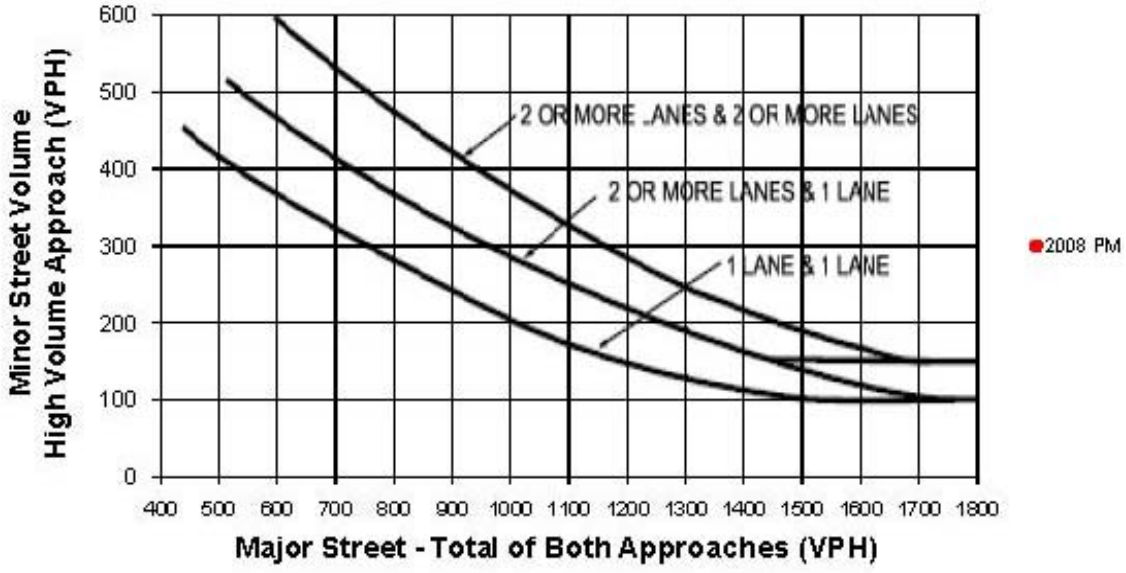
Warrant 8, Roadway Network – *Warrant is NOT Satisfied*

The hour with the largest traffic volumes (4-5 PM) has 401 total approaching trips. This is less than the required 1000 approaching trips.

Warrant 2, Four-Hour Vehiclar Volume



Warrant 3, Peak Hour



TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*M. Nolt*	Intersection	*McKinley at Grant*
Agency/Co.	*Kleingers & Associates*	Jurisdiction	*City of Piqua*
Date Performed	*11/13/2008*	Analysis Year	*2008*
Analysis Time Period	*PM Peak*		

Project Description

East/West Street: *Grant Street* | North/South Street: *McKinley Avenue*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*18*	*186*	*8*	*4*	*154*	*9*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*20*	*206*	*8*	*4*	*171*	*10*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*1*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*3*	*0*	*9*	*3*	*3*	*4*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*3*	*0*	*10*	*3*	*3*	*4*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*20*	*4*		*10*			*13*	
C (m) (veh/h)	*1407*	*1356*		*596*			*751*	
v/c	*0.01*	*0.00*		*0.02*			*0.02*	
95% queue length	*0.04*	*0.01*		*0.05*			*0.05*	
Control Delay (s/veh)	*7.6*	*7.7*		*11.1*			*9.9*	
LOS	*A*	*A*		*B*			*A*	
Approach Delay (s/veh)	--	--	*11.1*			*9.9*		
Approach LOS	--	--	*B*			*A*		

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McKinley Ave & Clark Ave

Aerial Photo:

Existing Conditions Discussion

The intersection of McKinley Avenue with Clark Avenue is two-way stop controlled with stop signs on Clark Avenue. The intersection has four approaches intersecting at a 90-degree angle. The west leg of Clark Avenue serves as the entrance to Pitsenbarger Park. There is a single lane on each approach. The intersection is located in an area that has residential, recreational and commercial land uses. Parking restrictions vary near the intersection and are provided in detail on the existing conditions diagram. On-street parking along McKinley Avenue and a fence bordering the property on the southeast corner of the intersection restrict visibility of approaching traffic. Traffic volumes on McKinley Avenue are significantly higher than those on Clark Avenue. The primary concern at this intersection is whether or not a two-way stop is the most appropriate and effective traffic control device.

Photo: Looking South

Public Comments

- "There are sight distance concerns at the intersection."
- "Traffic signal may be needed."
- "Concerns regarding safety of children going to park."
- "If traffic signal were to be considered, the installation and maintenance costs should be considered."

Analyses Results

- Traffic signal warrants are not met
- No reported crashes at the intersection from Jan. 2005 to June 2008
- Existing two-way stop control provides adequate capacity

Recommendations

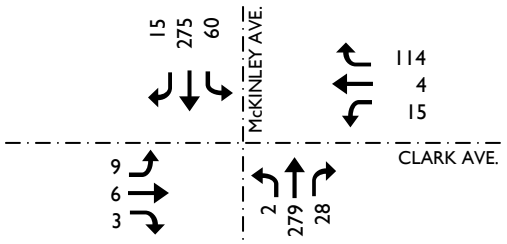
Existing two-way stop appears to be operating appropriately. As a result, it is recommended that two-way stop control be retained. It is recommended that consideration be given to addressing the sight distance restrictions at the intersection. It is also recommended that consideration be given to the installation of advance signing to warn motorists on McKinley Avenue of the potential for pedestrian crossings and vehicles entering or exiting the park facility.

Intersection at a Glance

Existing Conditions

- Two-way stop control
- Single lane approaches
- Adjacent to Pitsenbarger Park
- On-street parking and adjacent fence restrict visibility

Counted Traffic Volumes (peak hour)



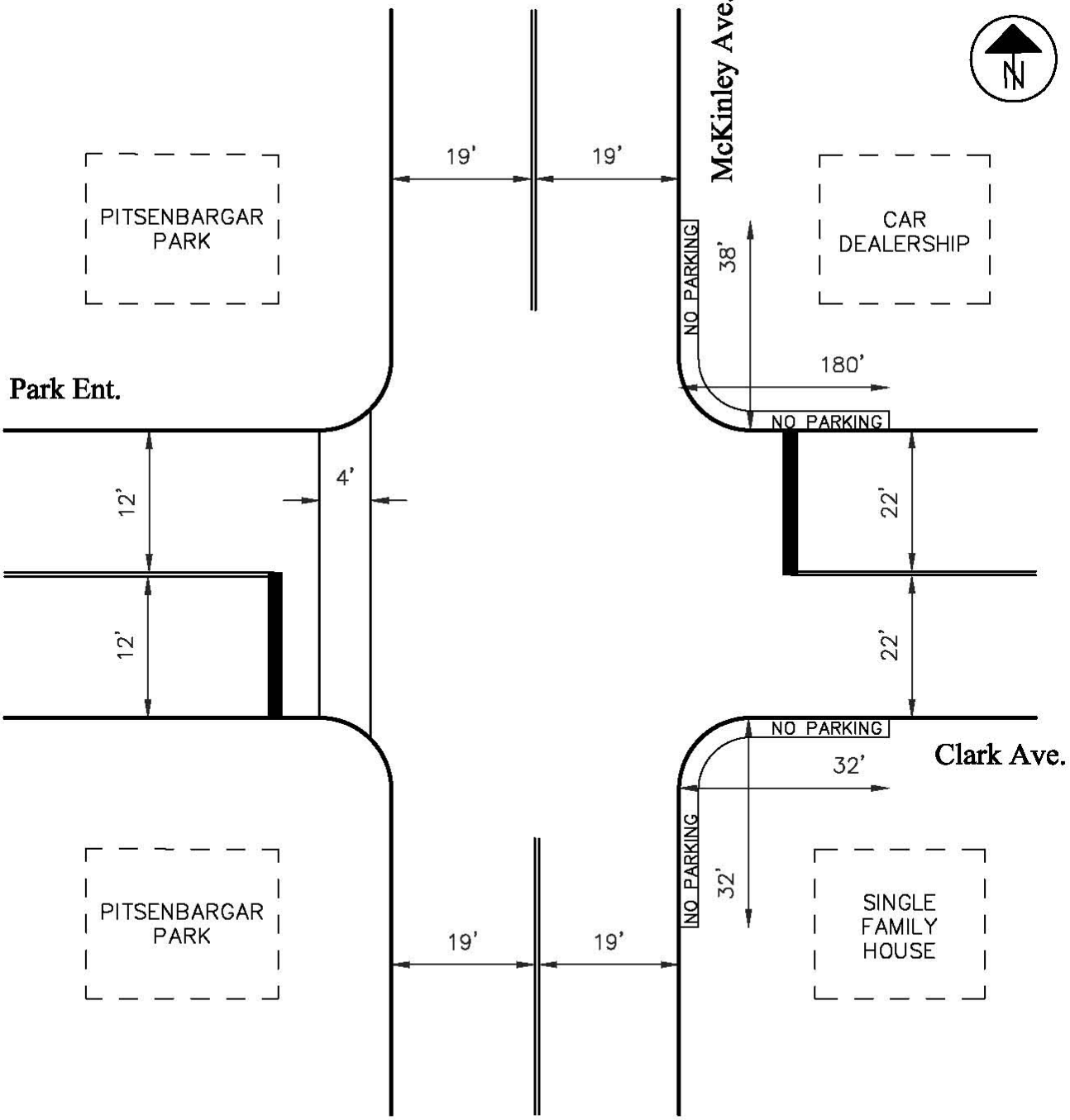
Crash History

- 0 reported crashes from 2005-2008

Recommendations

- Retain two-way stop
- Address sight distance restrictions
- Consider advance signing to warn of pedestrian crossings and park vehicles

INTERSECTION DIAGRAM



2-WAY STOP CONTOLLED

Turning Movement Counts Summary Table

Location: McKinley Avenue at Clark Avenue

Date of Counts: Thursday 8/13/2008 (7-9am & 4-6pm) and Thursday 10/9/2008 (2-4pm)

	SB McKinley Ave				WB Clark Ave				NB McKinley Ave				EB Clark Ave				Major	Minor St	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Street	#1	#2
7:00 to 7:15 am	19	39	0	0	3	0	10	0	0	36	3	0	0	0	0	0			
7:15 to 7:30 am	21	57	0	2	0	1	16	0	0	23	6	0	0	0	0	0			
7:30 to 7:45 am	23	61	1	0	1	0	14	0	0	40	5	0	0	0	0	0			
7:45 to 8:00 am	12	52	0	4	3	0	10	2	0	48	0	2	0	2	0	0			
Total	75	209	1	6	7	1	50	2	0	147	14	2	0	2	0	0	446	58	2
8:00 to 8:15 am	12	51	0	1	0	1	12	0	0	24	4	0	0	0	0	0			
8:15 to 8:30 am	12	33	0	0	3	0	7	0	0	23	5	3	0	0	1	0			
8:30 to 8:45 am	11	38	0	0	2	0	5	0	1	27	0	1	0	0	1	0			
8:45 to 9:00 am	9	23	1	0	2	0	10	0	0	36	3	0	0	0	0	0			
Total	44	145	1	1	7	1	34	0	1	110	12	4	0	0	2	0	313	42	2
2:00 to 2:15 pm	8	48	0	0	1	1	14	0	0	45	2	0	1	0	0	0			
2:15 to 2:30 pm	18	53	0	0	4	1	17	0	0	45	3	0	0	0	0	0			
2:30 to 2:45 pm	11	50	0	0	3	0	5	1	0	47	2	0	0	0	0	0			
2:45 to 3:00 pm	14	49	0	0	2	0	23	0	1	53	2	0	0	1	1	0			
Total	51	200	0	0	10	2	59	1	1	190	9	0	1	1	1	0	451	71	3
3:00 to 3:15 pm	24	50	0	0	5	0	27	0	0	52	6	0	0	0	0	0			
3:15 to 3:30 pm	17	51	0	0	5	0	27	0	0	55	7	0	0	0	0	0			
3:30 to 3:45 pm	13	64	1	0	4	0	32	0	0	67	6	0	0	0	0	0			
3:45 to 4:00 pm	24	65	0	0	4	1	37	0	0	61	3	0	0	0	0	0			
Total	78	230	1	0	18	1	123	0	0	235	22	0	0	0	0	0	566	142	0
4:00 to 4:15 pm	20	63	5	2	4	1	35	0	0	77	5	0	2	0	0	0			
4:15 to 4:30 pm	18	61	0	0	5	0	22	1	0	59	6	0	0	0	0	0			
4:30 to 4:45 pm	21	58	1	0	2	1	31	0	0	55	5	1	0	0	2	0			
4:45 to 5:00 pm	14	52	0	0	6	2	24	0	1	66	2	0	1	1	1	0			
Total	73	234	6	2	17	4	112	1	1	257	18	1	3	1	3	0	589	133	7
5:00 to 5:15 pm	15	76	4	0	5	0	33	0	0	62	5	0	4	3	1	0			
5:15 to 5:30 pm	9	78	2	3	3	1	34	5	0	79	4	0	2	1	0	0			
5:30 to 5:45 pm	18	74	4	1	4	0	28	0	1	60	11	0	0	0	0	0			
5:45 to 6:00 pm	18	47	5	0	3	3	19	0	1	78	8	0	3	2	2	0			
Total	60	275	15	4	15	4	114	5	2	279	28	0	9	6	3	0	659	133	18
Grand Total	381	1293	24	13	74	13	492	9	5	1218	103	7	13	10	9	0			

SIGNAL WARANT ANALYSIS SUMMARY

McKinley Avenue / Clark Avenue Intersection

This signal warrant analysis is based on the guidelines in Chapter 4C of the 2003 Ohio MUTCD. The existing intersection has one approach lane from each direction and was analyzed with the counted traffic volumes.

Warrant 1, Eight-Hour Vehicular Warrant – *Warrant is NOT Satisfied*

Counted volumes from four hours in the AM and PM peak do not meet the eight-hour warrant thresholds. The remaining hours are expected to be lower in volume than the counted hours and will not meet the thresholds.

Time Period	Condition A			Condition B			Combination of Conditions A & B
	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	Major St Hourly Volume	Minor St Hourly Volume	Criteria Satisfied?	(80% of Each) Criteria Satisfied?
Warrant Threashold	500	150		750	75		
7 AM to 8 AM	446	58	No	446	58	No	No
8 AM to 9 AM	131	42	No	131	42	No	No
9 AM to 10 AM			No			No	No
10 AM to 11 AM			No			No	No
11 AM to 12 PM			No			No	No
12 PM to 1 PM			No			No	No
1 PM to 2 PM			No			No	No
2 PM to 3 PM	451	71	No	451	71	No	No
3 PM to 4 PM	566	142	No	566	142	No	No
4 PM to 5 PM	589	133	No	589	133	No	No
5 PM to 6 PM	659	133	No	659	133	No	Yes

Warrant 2, Four-Hour Vehicular Volume – *Warrant is NOT Satisfied*

Counted volumes from the four hours with the highest counted volumes were plotted on the Warrant 2 Table (attached). Two of the four plotted points are above the warrant threshold line for "1 lane & 1 lane".

Warrant 3, Peak Hour Vehicular Volume – *Warrant is NOT Satisfied*

The counted PM peak hour volumes were plotted on the Warrant 3 Table (attached). The plotted point is not above the warrant threshold line for "1 lane & 1 lane".

Warrant 4, Pedestrian Volume – *Warrant is NOT Satisfied*

The pedestrian crossings in each of the counted hours do not meet the minimum requirement of 100 or more for each of four hours of the day. The available gaps were not measured.

Warrant 5, School Crossing – *Warrant is NOT Satisfied*

No schools are currently located or planned in the city blocks adjacent to this intersection. Therefore, this warrant is not expected to be satisfied.

Warrant 6, Coordinated Signal System – *Warrant is NOT Satisfied*

This intersection is not located at a critical point along a coordinated signal system.

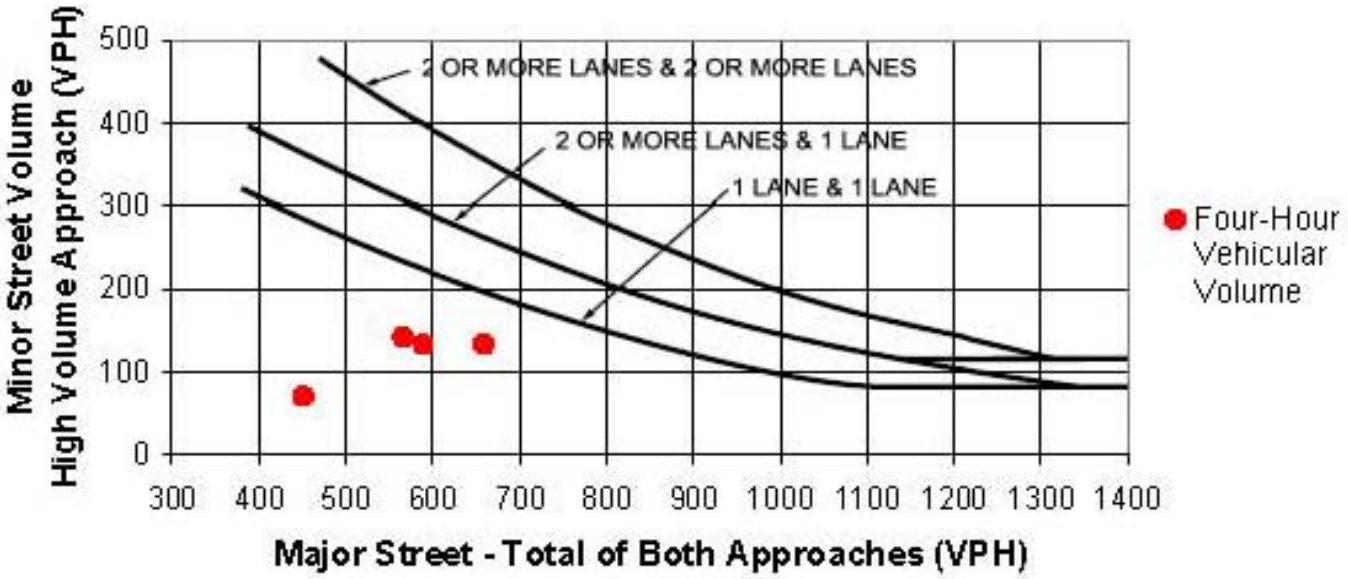
Warrant 7, Crash Experience – *Warrant is NOT Satisfied*

According to the crash data provided by the city of Piqua, no crashes were reported in the vicinity of this intersection within a three year period.

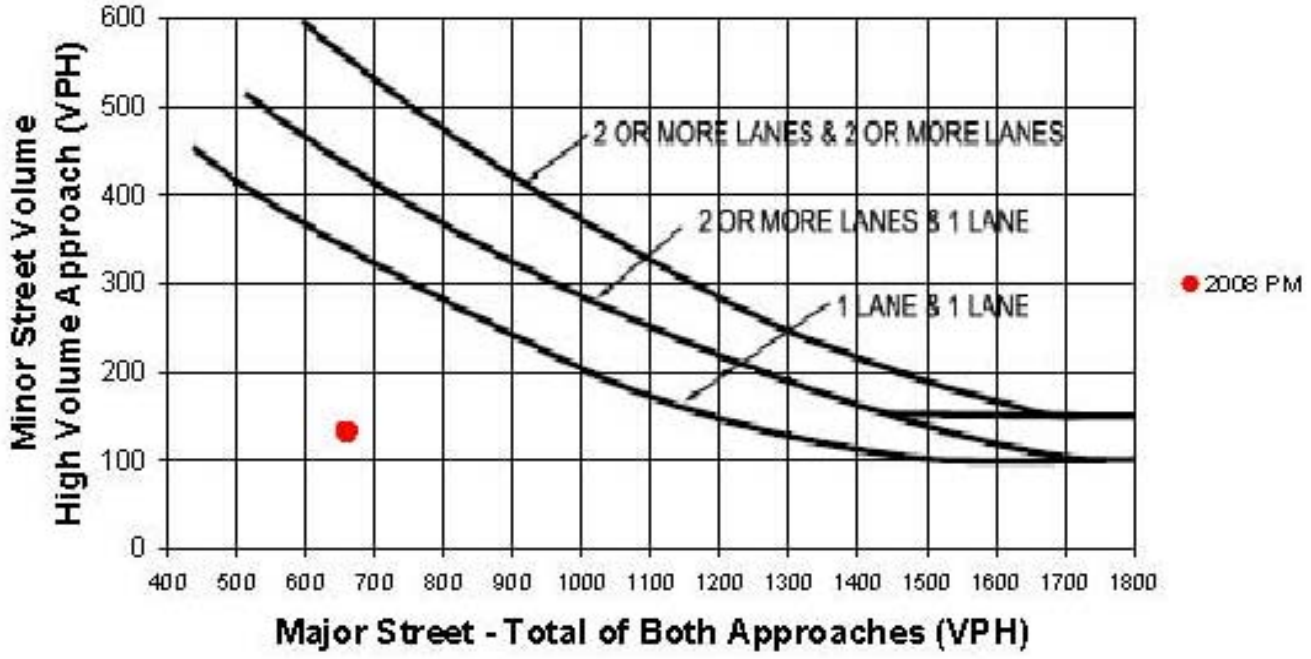
Warrant 8, Roadway Network – *Warrant is NOT Satisfied*

The hour with the largest traffic volumes (5-6 PM) has 810 total approaching trips. This is less than the required 1000 approaching trips.

Warrant 2, Four-Hour Vehiclar Volume



Warrant 3, Peak Hour



TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*M. Nolt*	Intersection	*McKinley at Clark*
Agency/Co.	*Kleingers & Associates*	Jurisdiction	*City of Piqua*
Date Performed	*11/13/2008*	Analysis Year	*2008*
Analysis Time Period	*PM Peak*		

Project Description

East/West Street: *Clark Avenue*	North/South Street: *McKinley Avenue*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*2*	*279*	*28*	*60*	*275*	*15*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*2*	*310*	*31*	*66*	*305*	*16*
Percent Heavy Vehicles	*0*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*1*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*9*	*6*	*3*	*15*	*4*	*114*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*10*	*6*	*3*	*16*	*4*	*126*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*2*	*66*		*146*			*19*	
C (m) (veh/h)	*1250*	*1214*		*589*			*272*	
v/c	*0.00*	*0.05*		*0.25*			*0.07*	
95% queue length	*0.00*	*0.17*		*0.97*			*0.22*	
Control Delay (s/veh)	*7.9*	*8.1*		*13.1*			*19.2*	
LOS	*A*	*A*		*B*			*C*	
Approach Delay (s/veh)	--	--	*13.1*			*19.2*		
Approach LOS	--	--	*B*			*C*		

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