SAFETY COMMITTEE

SEPTEMBER 25, 2018

The meeting was called to order at 6:03 p.m. by Chairman Haraz N. Ghanbari. Committee members present were Deborah Born and Jim Matuszak. Also present was Bridgette Kabat, City Administrator/Safety Director.

TRAFFIC STUDY REPORT

Ms. Kabat reported that the pedestrian safety study that was done on the Findlay/Indiana/Cherry Street intersection has been completed. The study showed that the intersection does not meet the Uniform Traffic Code warrants for a traffic signal or all way stop. However, based on the configuration of the intersection and the time to cross, a Rectangular Rapid Flash Beacon could be introduced at the Indiana Avenue east crosswalk. Ms. Kabat said that they have gotten a rough cost estimate of $17,000 and are now looking to see if it would have to be removed for a future improvement project on Indiana Avenue. Mr. Ghanbari requested that the study be made a part of the minutes. He also asked about the traffic counts that were done with the speed trailer. Ms. Kabat said she will send those counts out to City Council.

PARKING

Mr. Ghanbari stated that many months ago concerns were raised about trailers and other recreational vehicles being parked on City streets. He reviewed ordinances from other communities and put together draft language that he distributed to the committee. The language would allow trailers, boats, etc. to be parked at a property no longer than 96 hours within any 21 day period. There was some discussion regarding the enforcement of the language. Greg and Nancy Szczublewski, 125 Partridge Lane, said that it would be hard for the police to enforce and other communities don't allow them on the street at all. Mr. Matuszak stated that what Mr. Ghanbari has written is a compromise between what we have and no parking allowed at all. Mr. Ghanbari said that he will work on the language, but we should wait until we have a Law Director so it can be reviewed.

SCBA CASCADE SYSTEM – FIRE

Ms. Kabat distributed draft legislation to purchase a compressed air system for the new fire station. She said that they received pricing from several companies and Breathing Air systems, who did the current fire station, had the lowest price at $38,389.60. Mr. Ghanbari asked if there has been any thought to a mobile unit. Fire Chief Ruiz said that has not been considered at this time because very rarely would they need an on scene refill vehicle. Mr. Matuszak asked if the purchase is in the budget. Ms. Kabat said that it is part of Furniture, Fixtures and Equipment for the new fire station. The Committee agreed 3-0 to recommend approval of the purchase.

DOOR CONTROL SYSTEM

Ms. Kabat distributed draft legislation authorizing the installation of an access control system for the new fire station. She said it would mimic the current system to provide interconnectivity. Torrence Sound Equipment Company will install the system at a price not to exceed $33,000 through the State contract pricing. Mr. Ghanbari asked if this is in the budget. Ms. Kabat said it is included in Furniture, Fixtures and Equipment for the new fire station. Mr. Ghanbari asked when it will be installed. Ms. Kabat said that Transtar will be putting in the runways during the construction phase of the fire station, and Torrence will install the access control system before we occupy the building. The Committee agreed 3-0 to recommend approval.

AFG GRANT – FIRE

Ms. Kabat distributed draft legislation to accept an Assistance to Firefighters Grant (AFG) from FEMA for installation of a vehicle exhaust evacuation system in the current station. The total cost of the project is $48,000 with $43,637 coming from the grant, and the City's participation would be $4,363. Ms. Kabat said that this is just a request to accept the grant, the request to purchase will be next year. Mr. Ghanbari thanked the Fire Division for applying for the grant. The Committee agreed 3-0 to recommend approval of accepting the grant.

WOOD COUNTY HAZARD MITIGATION PLAN

Ms. Kabat said that the staff spent a large amount of time with the Wood County EMA working on the hazard mitigation plan and it is now in its final version. She said that it has already been accepted by FEMA, and the City has to adopt it to receive FEMA funds. Ms. Kabat said that the goal is to have it approved by mid-November. Mr. Matuszak asked that a copy by distributed to all Council members. Mr. Ghanbari tabled it until the October meeting to give everyone time to review it. Ms. Kabat said that she pointed out to the Deputy EMA Director a couple of sections that could be tweaked, but they do us no harm and can be addressed with the next revision.

BUDGET DISCUSSION

Mr. Ghanbari stated that he has previously raised concerns about the lack of a Rescue Task Force and Emergency Medical Dispatching in the City. He said that we need to make sure that police and fire training is funded in the budget. Mr. Ghanbari asked Police Chief Dan Paez and Fire Chief Rudy Ruiz if they are committed to training for and standing up a Rescue Task Force. Chief Paez said, "Absolutely." Chief Ruiz said, "Absolutely, we fully support that. I'm fully in favor of it and we have the mechanisms to do that."

Mr. Ghanbari raised concerns about a recent shooting incident in Perrysburg Township and how our Police Division handled the incident when the Township requested mutual aid from Perrysburg. He said that our communication systems do not work with the 20 plus communities with which we have a signed mutual aid agreement titled the Northwest Ohio Regional Law Enforcement Mutual Aid Agreement. He said the issue that can be addressed at this meeting is to put money in the budget so our radios can

communicate with these other jurisdictions. Police Chief Dan Paez said that several years ago the Township switched their radio system and disconnected the VHF channel. He said that at the time he met with the Wood County Sheriff and the Perrysburg Township Police, and the City offered to pay so that it would have direct communication with the Township; however, Chief Paez said the Township only allowed the City one-way communication. Chief Paez estimated the cost of a new radio system at $400,000. Chief Paez said, "The reality of it is I don't have any dead spots with our radio system, so communication with our officers is very good." Mr. Matuszak asked that Chief Paez get an estimate on the radio issue. Chief Paez said he will contact Bender Communications to get an estimate.

Regarding the Perrysburg response to the mutual aid request from the Township on the August 27, 2018, incident which resulted in a suspect firing a weapon at Township officers, two hostages being taken, and the suspect ultimately being shot and killed by Township officers, Mr. Ghanbari wanted to know why Perrysburg police officers were ordered to stay in the City while the Township officers were screaming for help as shots were being fired.

Chief Paez said, "Now, I don't take issue with what our officer did to get involved in that, of a short pursuit, because of the unsafe condition that he saw there in the Township. So he began that pursuit outside of our jurisdiction and it was for a good reason, I'm not taking issue with that." Chief Paez said, "Initially, the officer that came to me was the officer on duty, you heard him on the tape, asking those officers, he came running in my office. I was not aware of what was going on until that officer came into my office and said our officers are involved in a chase, and I have no clue why they're doing that and I told them to disregard. We have no jurisdiction out in the Township." When Mr. Ghanbari asked if the City of Perrysburg Police should remain part of the Northwest Ohio Regional Law Enforcement Mutual Aid Agreement, Chief Paez said, "I absolutely believe we should be a part of that."

During the meeting Mr. Ghanbari played an audio clip of a telephone conversation between a City dispatcher and Township dispatcher in which it was clear shots are being fired and hostages taken before the order was given for responding Perrysburg Police officers to remain in the City. The City dispatcher can be heard saying "Yeah, they called us a long time ago when I started putting it out." She then reiterates to the officers that the "Township is requesting our assistance with this."

Mr. Ghanbari asked Chief Paez why he ordered our officers back to their vehicles and then back to the police station to wait for him after they had arrived on scene.

Chief Paez explained, "The reason I pulled our people is not because I was denying help, it was out of fear that we had some inexperienced officers that were on the inner perimeter of that crime scene. And what I understand is as an investigator, as a detective is that it's critical, especially in a fatal force situation, to maintain the integrity of that crime scene. What I saw was officers from the Township, some of their command officers on the outside of the tape and my thought was why are our officers inside there? But what I'm saying is my concern was that our officers might be impacting the integrity of that crime scene. I see one of them standing outside the tape. I saw the

sheriff come back and say, he asked and said do you need any help with anything and the response to the sheriff was no, we're all set here. And I see officers from the Township on the outside of the tape. I'm not taking issue with that, I want to make it very clear, that's not my scene to manage, the only thing I can manage is our officers. My concern is that we might negatively impact that so I pulled my officers back. That was my rationale. I apologize to anyone from the Township that thinks that I did it for any other reason."

Chief Paez went onto explain that Police and Dispatch are minimally staffed and personnel costs are already 89% of their total budget. "Right now I'm trying, I'm struggling to get a staffing study done because as I said at the Citizen's Police Academy, and I'll say it here on the record, I believe we are minimally staffed at the police division. We don't have enough dispatchers, and quite honestly we could use more officers but that takes money. That is the largest portion of our budget, about 89 percent of our budget is in personnel costs."

Mr. Ghanbari said that the Township would love to come in and talk to our Mayor and work out some of the issues, and he feels there needs to be an open dialogue. Ms. Kabat said, "I will leave Mr. Celley a message on my way home."

Mr. Matuszak commented that he has not seen lists of spending requests made by department heads that had failed to make it to the Administration's proposed budgets the last couple of years. He recalled seeing lists of items in earlier years that didn't make the Administration's proposed budgets that had been tentatively put on hold for reconsideration during the budget amendment processes. He added that he had asked for that type of information since then during more recent budget discussions and was told there was none. Ms. Born asked Chief Paez where the Police Division does its training. Chief Paez said that there are a variety of places including the Ohio Peace Officer Training Academy, through webinars, and in house training. Ms. Born asked if Chief Ruiz intends on bringing back the Dive Team. Chief Ruiz said that the Fire Division does water rescues, just not underwater rescues. He said that Toledo has a Dive Team and there is a lot of required training and equipment, and the continuing education is extensive and in-depth. Ms. Born asked that the Chief get a cost estimate for the budget.

There being no further business, the meeting adjourned at 8:34 p.m.

Respectfully submitted,

Haraz N. Ghanbari, Chairman
Safety Committee

Next regularly scheduled meeting is Tuesday, October 23, 2018 at 6:00 p.m.

PEDESTRIAN SAFETY STUDY

INDIANA AVE./FINDLAY ST./CHERRY ST. INTERSECTION

PREPARED FOR :

THE CITY OF PERRYSBURG, OHIO

PROUDFOOT

ASSOCIATES, INC.
CONSULTING ENGINEERS

September 2018

DPB
CITY ENGR

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Study Purpose

The City of Perrysburg has requested that the Indiana Avenue / Findlay Street / Cherry Street intersection be studied for the need of any safety treatments for pedestrians crossing Indiana Avenue. Indiana Avenue has a high traffic volume and there is a concern that pedestrian crossing safety could be improved by installing traffic control devices to minimize vehicle / pedestrian conflicts. Traffic control devices that will be studied include the following:

- Installing a traffic signal
- Converting the intersection to a four-way stop control
- Providing additional signage
- Installing a Pedestrian Hybrid Beacon (HAWK Signal)
- Installing a Rectangular Rapid Flashing Beacon (RRFB)

The focus of the study will be the easterly crosswalk of Indiana Avenue as this crosswalk is the longest distance to cross, at 75 feet.

Intersection Conditions

The Indiana Avenue / Findlay Street / Cherry Street intersection was reconstructed in 2005 as a Federal Highway Administration funded safety project. The original intersection had an awkward alignment, with the Findlay Street approach being split off from Cherry Street. The original approach hill on Indiana Avenue just west of Cherry Street had an 8 percent grade. The improvements included flattening the grade to 3.5 percent, and converting the intersection into a typical four-way intersection. As evidence of this safety improvement, there have been no crashes at the intersection for the last three years.

Traffic control at the intersection consists of free flow on Indiana Avenue and stop control on Findlay Street and Cherry Street. Posted speed limits are 25 mph on all streets. Intersection photos are included in Appendix A and an intersection sketch in Appendix B.

The Perrysburg Police Department conducted stealth speed checks on Indiana Avenue on July 30, 2018 in both directions, with the following results:

Location	Average Speed	85th Percentile*	Ten mph Pace**
Westbound	28.11 mph	33 mph	25 to 34 mph
Eastbound	28.44 mph	33 mph	25 to 34 mph

Indiana Avenue has a wide right-of-way of 132 feet, with buildings set back from the road. The ample corridor gives the driver a comfortable, unobstructed view. The speeds noted above are not unreasonable. Many motorists drive at the speed they feel comfortable at, not necessarily the posted speed limit. A change in the posted speed limit is not advocated at this time.

* The 85th Percentile is the speed that 85 percent of drivers do not exceed. It is sometimes used as a guide to set the speed limit.

** Ten mph Pace is the ten mile per hour range of speeds containing the greatest number of observed speeds.

Traffic Volumes

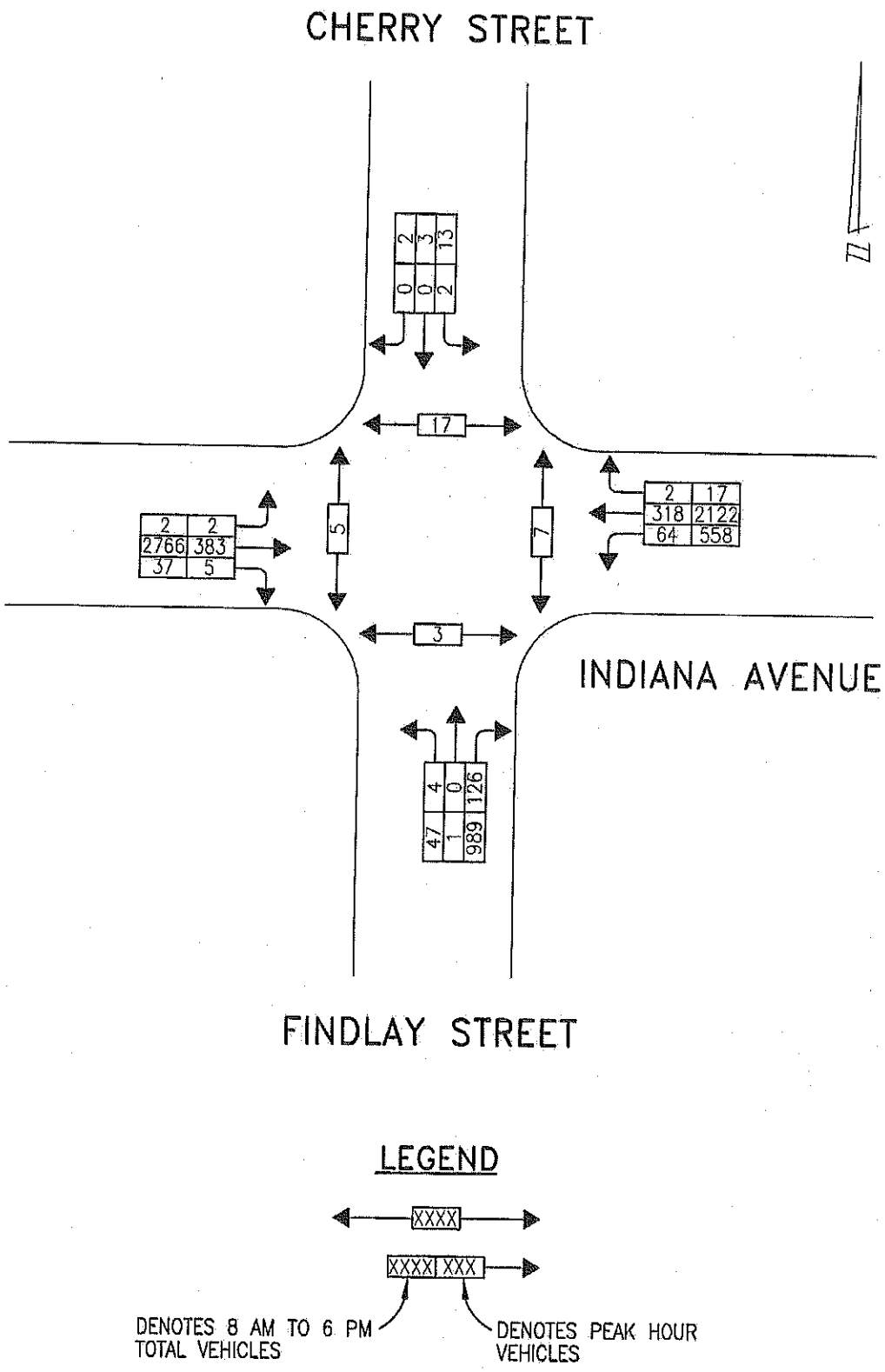
To properly assess the need for various traffic control devices, a manual traffic count of vehicles and pedestrians was conducted from 8 am to 6 pm. The counts were taken during good weather with no rain - favorable conditions for pedestrians. The traffic count printout is included in Appendix C. Pedestrian crosswalk volumes from the count are listed below by hour and crosswalk.

Pedestrian Crosswalk Counts

Hour	Cherry Street North Crosswalk	Findlay Street South Crosswalk	Indiana Ave. East Crosswalk	Indiana Ave. West Crosswalk	Total Count
8 am to 9 am	2	0	2	4	8
9 am to 10 am	2	0	4	0	6
10 am to 11 am	4	1	0	0	5
11 am to noon	1	0	0	0	1
Noon to 1 pm	1	0	0	0	1
1 pm to 2 pm	0	1	0	0	1
2 pm to 3 pm	1	0	0	0	1
3 pm to 4 pm	3	0	0	0	3
4 pm to 5 pm	2	0	0	0	2
5 pm to 6 pm	1	1	1	1	4
Totals	**17**	**3**	**7**	**5**	**32**

The traffic count technician noted there were no school children crossing Indiana Avenue. The pedestrian mix included a young woman pushing a baby stroller, a mailman, older citizens, several runners and dog walkers. None of the crosswalks have a high volume of pedestrians. The Cherry Street crosswalk has the highest volume and the Findlay Street crosswalk the lowest.

The next page depicts the traffic volumes for the 10 hour period and the 5 pm to 6 pm peak hour by movement and approach.



163294 PEAK TRAFFIC SUMMARY

PROUDFOOT ASSOCIATES, INC. CONSULTING ENGINEERS	CITY OF PERRYSBURG INDIANA AVE./FINDLAY ST./CHERRY ST. PEDESTRIAN SAFETY STUDY	FIGURE 1 TRAFFIC VOLUMES

Traffic Signal Justification

The warrants for a traffic signal installation are found in the Ohio Manual of Uniform Traffic Control Devices (Ohio Manual). There are nine warrants to review for a traffic signal, with only one needing to be met. In our case, no warrant is met or even close. See Appendix D for warrant analysis.

Four-Way Stop Justification

The warrants for a four-way (or multi-way) stop are also found in the Ohio Manual. They are as follows, along with the analysis.

Warrant Criteria	Analysis
A. Interim measure where a traffic signal is justified but is delayed	Not Warranted
B. Five or more reported crashes in a 12-month period that are susceptible to correction with the multi-way stop	No Crashes – Not Warranted
C. Minimum Volumes 1. Indiana Ave. traffic volumes average at least 300 vehicles per hour for any 8 hours-**yes** 2. Total vehicular, pedestrian and bike volume from Findlay and Cherry average at least 200 units per hour for the same 8 hours-**no** With average delay for the intersection during highest hour is 30 seconds-**no**	Not Warranted
D. Criteria B, C1 and C2 are all satisfied at 80 percent	Not Warranted

In conclusion, there is no warrant to justify a four-way stop.

Pedestrian Crossing Time Versus Gaps

A critical factor in determining pedestrian crossing safety is if there are sufficient gaps in the vehicle movements on Indiana Avenue for a pedestrian to safely cross. As we are focusing on the east crosswalk, which is 75 feet in length, the crossing time is as follows

Item	Time
• Perception / Reaction Time needed to judge a safe gap in traffic	2 seconds
• Time to Cross = 75 feet ÷ 4.0 feet per second	18.8 seconds
Total Crossing Time Needed	20.8 seconds

To determine the number of gaps in traffic that exceed 20.8 seconds is to use probability theory and Poisson distribution. This assumes vehicles are randomly distributed and not consolidated into smaller time periods, such as at a factory shift or following a train crossing.

The Poisson equation is: $P = e^{-qt}$ where P = Probability of an acceptable gap; e =2.71828 t = time of crossing = 20.8 seconds; and q = vehicles per second.

Looking at the four highest traffic volume hours and applying the equation, the number of acceptable gaps is calculated.

Hour	Vehicles per Hour on Findlay Street	P (probability of acceptable gap)	Number of Gaps in Hour	Average Wait for Gap
8 am to 9 am	549	$e^{-0.152x20.8}$=4.2%	23	2.6 minutes
3 pm to 4 pm	639	$e^{-0.178x20.8}$=2.5%	16	3.8 minutes
4 pm to 5 pm	679	$e^{-0.189x20.8}$=2.0%	14	4.3 minutes
5 pm to 6 pm	774	$e^{-0.215x20.8}$=1.1%	9	6.7 minutes

Summarizing the above, for the four busiest hours of the day, a pedestrian would theoretically have to wait an average of 2.6, 3.8, 4.3 and 6.7 minutes for an acceptable gap. For a pedestrian to wait this long will likely result in the pedestrian crossing without an acceptable gap by running, walking fast, or assuming drivers will slow down. None of these conditions are acceptable. Typically for a school crossing, the child should have more gaps than minutes in the hour; for example at least 60 gaps per hour. As this location is not a school crossing, a typical wait time for a gap can be two minutes. Since the wait times for an acceptable gap far exceeds the two minutes, it is desirable to provide some protection for the pedestrian. As a traffic signal or multi-way stop has been ruled out, the other potential treatments are:

1. Signage that indicates it is a state law to yield to pedestrians within the crosswalk
2. Pedestrian Hybrid Beacon installation
3. Rectangular Rapid Flash Beacon installation

Upon reviewing the listed treatments, the following discussion is provided:

Signage

Although the signage has some benefit in increasing driver awareness, as well as the driver yielding to the pedestrian, most pedestrians are hesitant in trusting that signage will always result in the driver yielding to the pedestrian. As a result, most pedestrians would understandably rather wait for an acceptable gap.

Pedestrian Hybrid Beacon Installation

This installation includes overhead yellow and red signal heads for the driver when activated by a pedestrian push button. The signal heads stay dark until the pedestrian push button is activated and then a flashing yellow to steady yellow to steady red to flashing red sequence is displayed. Pedestrians then receive a ***Walk*** (during vehicular red signal), then flashing ***Don't Walk*** (during vehicular flashing red signal), signal sequence for the pedestrian signal heads mounted at the roadside. There are a few of these signals in Northwest Ohio – in Waterville, Delta and Bowling Green. The Ohio Manual recommends they be installed with at least 20 crossing pedestrians per hour and they not be utilized at an intersection. Since the Indiana Ave. crossing does not approach the 20 pedestrians per hour, and the location is an intersection, this solution would not be recommended.

Rectangular Rapid Flash Beacon (RRFB)

This installation includes pedestrian crossing signs with pedestrian activated yellow flashing lights mounted underneath the sign. At each sign there are two rectangular flashing yellow lights that have an irregular flash pattern (stutter flash) that is similar to emergency flashers on police vehicles. The Federal Highway Administration (FHWA) has recently issued a second interim approval of the RRFB. The FHWA lists the following potential benefits of the RRFB:

- RRFBs are a lower cost alternative to traffic signals and hybrid signals that are shown to increase driver yielding behavior at crosswalks significantly when supplementing standard pedestrian crossing warning signs and markings.
- An official FHWA-sponsored experimental implementation and evaluation conducted in St. Petersburg, Florida found that RRFBs at pedestrian crosswalks are dramatically more effective at increasing driver yielding rates to pedestrians than traditional overhead beacons.
- The novelty and unique nature of the stutter flash may elicit a greater response from drivers than traditional methods.

RRFB's are gaining popularity across the United States: Ada County, Idaho has 40 of the signals and St. Petersburg, Florida has 19. The City of Waterville, Ohio has two. There are numerous others. A photo of an RRFB in Waterville is shown in Appendix E. Based on the above benefits, the RRFB installation is recommended for the Indiana Avenue east crosswalk. As the flashing lights are LED units, they can be powered by a solar panel mounted at the top of the beacons. A Waterville system was installed in 2017 for $13,900. A standard set of specifications for an RRFB is included in Appendix F.

Recommendation

Based on the data collected and analysis undertaken, it is concluded that there are an insufficient number of gaps in vehicular traffic on Indiana Avenue for pedestrians to safely cross in a reasonable amount of time. Calculations based on field observations indicate pedestrians can wait up to 6.7 minutes during the peak traffic hour for a safe crossing gap in traffic. In order to provide a safer crossing for pedestrians that would reduce their wait time, the following traffic control devices were evaluated:

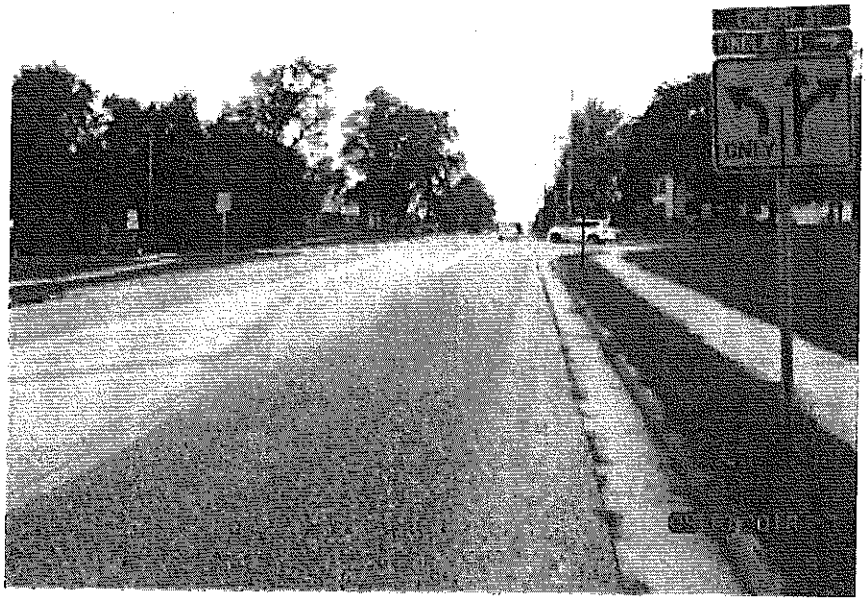
- Traffic Signal – Not Warranted
- Four-Way Stop Signs – Not Warranted
- Additional Signage – Not Recommended
- Pedestrian Hybrid Beacon Signal – Not Warranted
- Rectangular Rapid Flashing Beacon – Recommended

In conclusion, the Rectangular Rapid Flashing Beacon is recommended to be installed at the Indiana Avenue east crosswalk, combined with adding advance crosswalk signage on Indiana Avenue.

Appendix A

Photographs

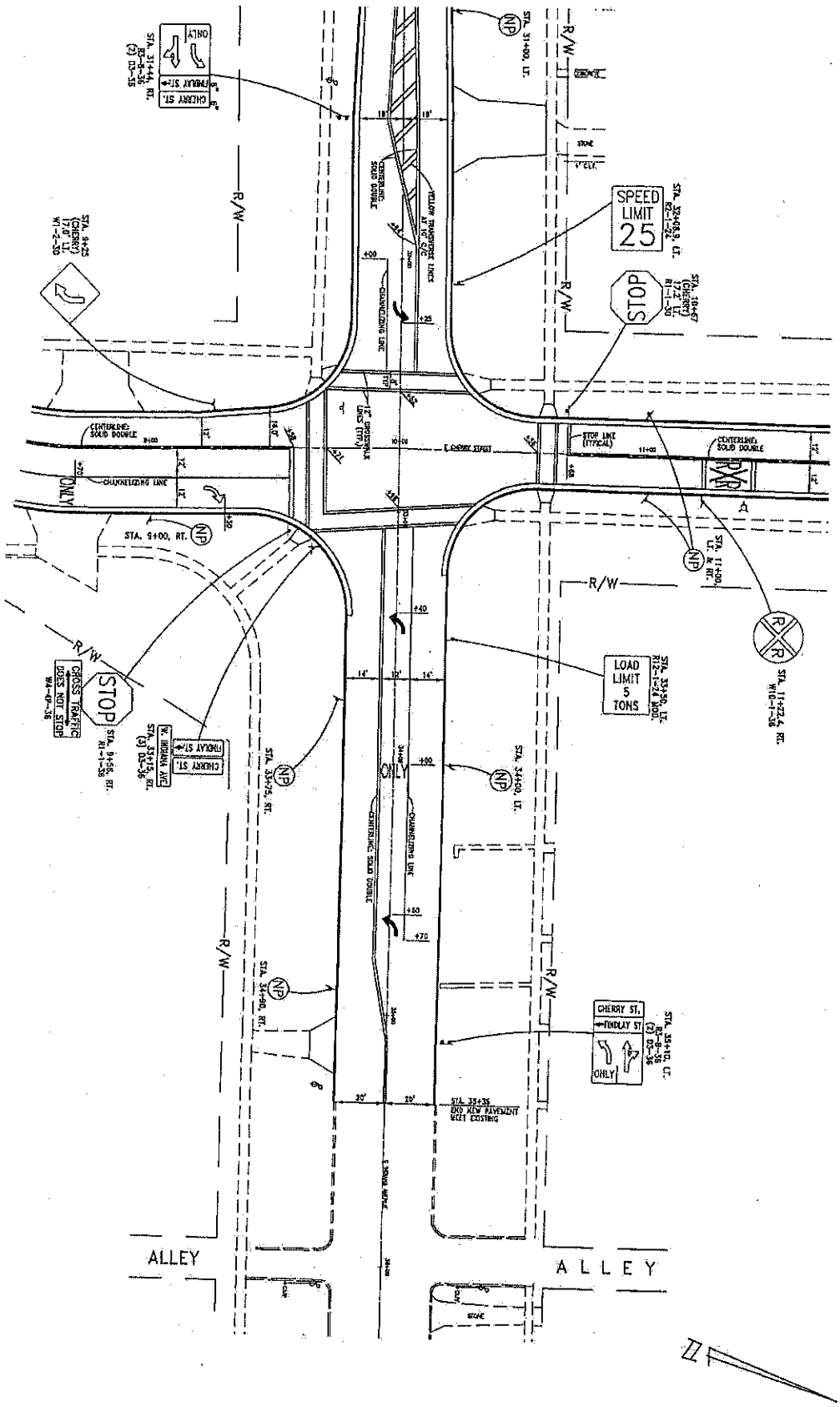
Indiana Avenue Facing West



Indiana Avenue Facing East

Appendix B

Intersection Sketch



WOO–CHERRY/FINDLAY/INDIANA

INDIANA AVENUE
SIGNING & STRIPING PLAN

SCALE IN FEET
0 10 20 40

DESIGNED THY
DRAWN DAM

Appendix C

Traffic Count Summaries

City of Perrysburg
Indiana-Cherry-Findlay Int.
Pedestrian Study-P1
Field Tech: Doug Marty

File Name : PB Indiana-Cherry-Findlay P1
Site Code : 08888888
Start Date : 08/30/2018
Page No : 1

Groups Printed- Cars - Trucks

	Cherry Street Southbound				Indiana Avenue Westbound				Findlay Avenue Northbound				Indiana Avenue Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
08:00 AM	0	0	0	0	22	53	0	1	1	0	21	0	0	70	2	0	170
08:15 AM	0	0	0	0	8	39	0	0	2	0	18	0	0	68	2	0	137
08:30 AM	0	0	0	2	6	37	1	0	1	0	22	0	0	83	0	0	152
08:45 AM	1	0	0	0	17	40	1	1	2	0	27	0	0	100	0	4	193
Total	1	0	0	2	53	169	2	2	6	0	88	0	0	321	4	4	652
09:00 AM	1	0	0	0	10	52	0	0	0	0	24	0	0	60	0	0	147
09:15 AM	0	0	0	0	12	43	1	0	0	0	21	0	0	72	0	0	149
09:30 AM	0	0	0	1	6	28	0	2	2	0	11	0	0	44	0	0	94
09:45 AM	0	0	0	1	11	48	0	2	1	0	16	0	0	54	0	0	133
Total	1	0	0	2	39	171	1	4	3	0	72	0	0	230	0	0	523
10:00 AM	1	0	0	0	15	38	1	0	1	0	14	0	0	54	1	0	125
10:15 AM	0	0	0	0	8	35	0	0	0	0	15	1	0	62	1	0	122
10:30 AM	0	0	0	2	14	40	0	0	1	0	21	0	0	49	1	0	128
10:45 AM	0	0	0	2	10	29	0	0	1	0	16	0	0	50	0	0	108
Total	1	0	0	4	47	142	1	0	3	0	66	1	0	215	3	0	483
11:00 AM	0	0	0	0	9	49	0	0	0	0	19	0	0	44	0	0	121
11:15 AM	0	0	0	1	8	57	0	0	1	0	24	0	0	59	0	0	150
11:30 AM	0	0	0	0	24	44	1	0	3	0	25	0	0	74	1	0	172
11:45 AM	0	0	0	0	6	53	0	0	1	0	33	0	0	75	0	0	168
Total	0	0	0	1	47	203	1	0	5	0	101	0	0	252	1	0	611
12:00 PM	3	0	0	0	16	55	0	0	1	0	30	0	0	65	1	0	171
12:15 PM	0	0	1	1	24	41	1	0	0	0	15	0	0	58	4	0	145
12:30 PM	0	0	0	0	15	52	2	0	0	0	19	0	0	70	0	0	158
12:45 PM	1	0	0	0	14	55	1	0	0	0	18	0	0	69	2	0	160
Total	4	0	1	1	69	203	4	0	1	0	82	0	0	262	7	0	634
Grand Total	7	0	1	10	255	888	9	6	18	0	409	1	0	1280	15	4	2903
Apprch %	38.9	0.0	5.6	55.6	22.0	76.7	0.8	0.5	4.2	0.0	95.6	0.2	0.0	98.5	1.2	0.3	
Total %	0.2	0.0	0.0	0.3	8.8	30.6	0.3	0.2	0.6	0.0	14.1	0.0	0.0	44.1	0.5	0.1	

City of Perrysburg
Indiana-Cherry-Findlay Int.
Pedestrian Study-P1
Field Tech: Doug Marty

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08:00 AM	0	0	0	0	22	51	0	1	1	0	21	0	0	67	2	0	165
08:15 AM	0	0	0	0	8	37	0	0	1	0	17	0	0	67	2	0	132
08:30 AM	0	0	0	2	6	34	1	0	1	0	20	0	0	77	0	0	141
08:45 AM	1	0	0	0	16	40	1	1	2	0	26	0	0	95	0	4	186
Total	1	0	0	2	52	162	2	2	5	0	84	0	0	306	4	4	624
09:00 AM	1	0	0	0	10	51	0	0	0	0	23	0	0	59	0	0	144
09:15 AM	0	0	0	0	12	42	1	0	0	0	20	0	0	66	0	0	141
09:30 AM	0	0	0	1	6	28	0	2	2	0	11	0	0	43	0	0	93
09:45 AM	0	0	0	1	11	48	0	2	1	0	15	0	0	51	0	0	129
Total	1	0	0	2	39	169	1	4	3	0	69	0	0	219	0	0	507
10:00 AM	1	0	0	0	12	35	1	0	0	0	14	0	0	52	1	0	116
10:15 AM	0	0	0	0	8	34	0	0	0	0	13	1	0	60	1	0	117
10:30 AM	0	0	0	2	13	38	0	0	1	0	21	0	0	48	1	0	124
10:45 AM	0	0	0	2	9	29	0	0	1	0	16	0	0	50	0	0	107
Total	1	0	0	4	42	136	1	0	2	0	64	1	0	210	3	0	464
11:00 AM	0	0	0	0	9	47	0	0	0	0	18	0	0	42	0	0	116
11:15 AM	0	0	0	1	7	56	0	0	1	0	24	0	0	58	0	0	147
11:30 AM	0	0	0	0	23	42	1	0	3	0	25	0	0	72	1	0	167
11:45 AM	0	0	0	0	6	51	0	0	1	0	31	0	0	75	0	0	164
Total	0	0	0	1	45	196	1	0	5	0	98	0	0	247	1	0	594
12:00 PM	3	0	0	0	15	54	0	0	1	0	28	0	0	61	1	0	163
12:15 PM	0	0	1	1	24	38	1	0	0	0	15	0	0	57	3	0	140
12:30 PM	0	0	0	0	14	52	2	0	0	0	18	0	0	68	0	0	154
12:45 PM	1	0	0	0	14	54	1	0	0	0	18	0	0	68	2	0	158
Total	4	0	1	1	67	198	4	0	1	0	79	0	0	254	6	0	615
Grand Total	7	0	1	10	245	861	9	6	16	0	394	1	0	1236	14	4	2804
Apprch %	38.9	0.0	5.6	55.6	21.9	76.8	0.8	0.5	3.9	0.0	95.9	0.2	0.0	98.6	1.1	0.3	
Total %	0.2	0.0	0.0	0.4	8.7	30.7	0.3	0.2	0.6	0.0	14.1	0.0	0.0	44.1	0.5	0.1	

City of Perrysburg
Indiana-Cherry-Findlay Int.
Pedestrian Study-P1
Field Tech: Doug Marty

File Name : PB Indiana-Cherry-Findlay P1
Site Code : 08888888
Start Date : 08/30/2018
Page No : 1

Groups Printed- Trucks

	Cherry Street Southbound				Indiana Avenue Westbound				Findlay Avenue Northbound				Indiana Avenue Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
08:00 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	5
08:15 AM	0	0	0	0	0	2	0	0	1	0	1	0	0	1	0	0	5
08:30 AM	0	0	0	0	0	3	0	0	0	0	2	0	0	6	0	0	11
08:45 AM	0	0	0	0	1	0	0	0	0	0	1	0	0	5	0	0	7
Total	0	0	0	0	1	7	0	0	1	0	4	0	0	15	0	0	28
09:00 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	3
09:15 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	6	0	0	8
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
09:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0	4
Total	0	0	0	0	0	2	0	0	0	0	3	0	0	11	0	0	16
10:00 AM	0	0	0	0	3	3	0	0	1	0	0	0	0	2	0	0	9
10:15 AM	0	0	0	0	0	1	0	0	0	0	2	0	0	2	0	0	5
10:30 AM	0	0	0	0	1	2	0	0	0	0	0	0	0	1	0	0	4
10:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	5	6	0	0	1	0	2	0	0	5	0	0	19
11:00 AM	0	0	0	0	0	2	0	0	0	0	1	0	0	2	0	0	5
11:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	3
11:30 AM	0	0	0	0	1	2	0	0	0	0	0	0	0	2	0	0	5
11:45 AM	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	4
Total	0	0	0	0	2	7	0	0	0	0	3	0	0	5	0	0	17
12:00 PM	0	0	0	0	1	1	0	0	0	0	2	0	0	4	0	0	8
12:15 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	1	1	0	5
12:30 PM	0	0	0	0	1	0	0	0	0	0	1	0	0	2	0	0	4
12:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
Total	0	0	0	0	2	5	0	0	0	0	3	0	0	8	1	0	19
Grand Total	0	0	0	0	10	27	0	0	2	0	15	0	0	44	1	0	99
Apprch %	0.0	0.0	0.0	0.0	27.0	73.0	0.0	0.0	11.8	0.0	88.2	0.0	0.0	97.8	2.2	0.0	
Total %	0.0	0.0	0.0	0.0	10.1	27.3	0.0	0.0	2.0	0.0	15.2	0.0	0.0	44.4	1.0	0.0	

City of Perrysburg
Indiana-Cherry-Findlay Int.
Pedestrian Study-PM
Field Tech: Doug Marty

File Name : PB Indiana-Cherry-Findlay P2
Site Code : 07777777
Start Date : 09/11/2018
Page No : 1

Groups Printed- Cars - Trucks

	Cherry Street Southbound				Indiana Avenue Westbound				Findlay Street Northbound				Indiana Avenue Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
01:00 PM	1	2	1	0	10	50	4	0	1	1	37	0	0	54	1	0	162
01:15 PM	2	1	0	0	12	44	0	0	2	0	26	1	0	52	1	0	141
01:30 PM	0	0	0	0	7	43	0	0	4	0	33	0	0	63	1	0	151
01:45 PM	1	0	0	0	11	45	1	0	0	0	30	0	0	52	1	0	141
Total	4	3	1	0	40	182	5	0	7	1	126	1	0	221	4	0	595
02:00 PM	0	0	0	0	11	41	0	0	2	0	26	0	0	58	1	0	139
02:15 PM	0	0	0	1	14	50	0	0	0	0	22	0	0	60	0	0	147
02:30 PM	1	0	0	0	12	57	0	0	1	0	27	0	0	59	0	0	157
02:45 PM	0	0	0	0	10	59	0	0	3	0	14	0	0	79	0	0	165
Total	1	0	0	1	47	207	0	0	6	0	89	0	0	256	1	0	608
03:00 PM	0	0	0	0	19	45	0	0	1	0	25	0	0	58	1	0	149
03:15 PM	0	0	0	1	20	54	0	0	5	0	34	0	0	86	1	0	201
03:30 PM	1	0	0	1	30	68	0	0	1	0	29	0	0	76	2	0	208
03:45 PM	0	0	0	1	22	73	0	0	1	0	32	0	0	83	1	0	213
Total	1	0	0	3	91	240	0	0	8	0	120	0	0	303	5	0	771
04:00 PM	0	0	0	0	13	74	1	0	2	0	34	0	0	74	1	0	199
04:15 PM	1	0	0	1	10	80	0	0	1	0	23	0	0	68	4	0	188
04:30 PM	0	0	0	0	25	68	0	0	0	0	31	0	0	96	1	0	221
04:45 PM	0	0	0	1	13	65	0	0	1	0	31	0	0	85	1	0	197
Total	1	0	0	2	61	287	1	0	4	0	119	0	0	323	7	0	805
05:00 PM	0	0	0	0	17	100	1	0	3	0	30	0	0	108	0	0	259
05:15 PM	0	0	0	0	16	83	0	1	0	0	34	0	1	95	2	0	232
05:30 PM	0	0	0	0	18	75	0	0	1	0	29	0	0	87	1	0	211
05:45 PM	2	0	0	1	13	60	1	0	0	0	33	1	1	93	2	1	208
Total	2	0	0	1	64	318	2	1	4	0	126	1	2	383	5	1	910
Grand Total	9	3	1	7	303	1234	8	1	29	1	580	2	2	1486	22	1	3689
Apprch %	45.0	15.0	5.0	35.0	19.6	79.8	0.5	0.1	4.7	0.2	94.8	0.3	0.1	98.3	1.5	0.1	
Total %	0.2	0.1	0.0	0.2	8.2	33.5	0.2	0.0	0.8	0.0	15.7	0.1	0.1	40.3	0.6	0.0	

City of Perrysburg
Indiana-Cherry-Findlay Int.
Pedestrian Study-PM
Field Tech: Doug Marty

File Name : PB Indiana-Cherry-Findlay P2
Site Code : 07777777
Start Date : 09/11/2018
Page No : 1

Groups Printed- Cars

	Cherry Street Southbound				Indiana Avenue Westbound				Findlay Street Northbound				Indiana Avenue Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
01:00 PM	1	2	0	0	9	48	3	0	0	0	36	0	0	51	1	0	
01:15 PM	1	1	0	0	12	42	0	0	2	0	26	1	0	49	1	0	151
01:30 PM	0	0	0	0	7	42	0	0	4	0	33	0	0	63	1	0	135
01:45 PM	1	0	0	0	11	44	1	0	0	0	27	0	0	52	1	0	150
Total	3	3	0	0	39	176	4	0	6	0	122	1	0	215	4	0	137
																	573
02:00 PM	0	0	0	0	11	41	0	0	2	0	26	0	0	53	1	0	
02:15 PM	0	0	0	1	14	50	0	0	0	0	21	0	0	60	0	0	134
02:30 PM	1	0	0	0	12	55	0	0	1	0	25	0	0	58	0	0	146
02:45 PM	0	0	0	0	10	58	0	0	3	0	14	0	0	77	0	0	152
Total	1	0	0	1	47	204	0	0	6	0	86	0	0	248	1	0	162
																	594
03:00 PM	0	0	0	0	18	41	0	0	1	0	25	0	0	57	1	0	
03:15 PM	0	0	0	1	18	51	0	0	4	0	34	0	0	80	1	0	143
03:30 PM	1	0	0	1	30	67	0	0	1	0	29	0	0	73	2	0	189
03:45 PM	0	0	0	1	22	68	0	0	1	0	32	0	0	80	1	0	204
Total	1	0	0	3	88	227	0	0	7	0	120	0	0	290	5	0	205
																	741
04:00 PM	0	0	0	0	13	70	1	0	2	0	34	0	0	72	1	0	
04:15 PM	1	0	0	1	10	79	0	0	1	0	23	0	0	67	4	0	193
04:30 PM	0	0	0	0	25	68	0	0	0	0	31	0	0	94	1	0	186
04:45 PM	0	0	0	1	13	63	0	0	1	0	31	0	0	83	1	0	219
Total	1	0	0	2	61	280	1	0	4	0	119	0	0	316	7	0	193
																	791
05:00 PM	0	0	0	0	17	98	1	0	3	0	30	0	0	108	0	0	
05:15 PM	0	0	0	0	16	82	0	1	0	0	33	0	1	93	2	0	257
05:30 PM	0	0	0	0	18	73	0	0	1	0	29	0	0	87	1	0	228
05:45 PM	2	0	0	1	13	59	1	0	0	0	33	1	1	93	2	1	209
Total	2	0	0	1	64	312	2	1	4	0	125	1	2	381	5	1	207
																	901
Grand Total	8	3	0	7	299	1199	7	1	27	0	572	2	2	1450	22	1	3600
Apprch %	44.4	16.7	0.0	38.9	19.9	79.6	0.5	0.1	4.5	0.0	95.2	0.3	0.1	98.3	1.5	0.1	
Total %	0.2	0.1	0.0	0.2	8.3	33.3	0.2	0.0	0.8	0.0	15.9	0.1	0.1	40.3	0.6	0.0	

City of Perrysburg
Indiana-Cherry-Findlay Int.
Pedestrian Study-PM
Field Tech: Doug Marty

File Name : PB Indiana-Cherry-Findlay P2
Site Code : 07777777
Start Date : 09/11/2018
Page No : 1

Groups Printed- Trucks

	Cherry Street Southbound				Indiana Avenue Westbound				Findlay Street Northbound				Indiana Avenue Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
01:00 PM	0	0	1	0	1	2	1	0	1	1	1	0	0	3	0	0	11
01:15 PM	1	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	6
01:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
01:45 PM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	4
Total	1	0	1	0	1	6	1	0	1	1	4	0	0	6	0	0	22
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5
02:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
02:30 PM	0	0	0	0	0	2	0	0	0	0	2	0	0	1	0	0	5
02:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
Total	0	0	0	0	0	3	0	0	0	0	3	0	0	8	0	0	14
03:00 PM	0	0	0	0	1	4	0	0	0	0	0	0	0	1	0	0	6
03:15 PM	0	0	0	0	2	3	0	0	1	0	0	0	0	6	0	0	12
03:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	4
03:45 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	3	0	0	8
Total	0	0	0	0	3	13	0	0	1	0	0	0	0	13	0	0	30
04:00 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	2	0	0	6
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
04:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
Total	0	0	0	0	0	7	0	0	0	0	0	0	0	7	0	0	14
05:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	2	0	0	4
05:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	6	0	0	0	0	1	0	0	2	0	0	9
Grand Total	1	0	1	0	4	35	1	0	2	1	8	0	0	36	0	0	89
Apprch %	50.0	0.0	50.0	0.0	10.0	87.5	2.5	0.0	18.2	9.1	72.7	0.0	0.0	100.0	0.0	0.0	
Total %	1.1	0.0	1.1	0.0	4.5	39.3	1.1	0.0	2.2	1.1	9.0	0.0	0.0	40.4	0.0	0.0	

Appendix D

Signal Warrant Analysis

SIGNAL WARRANT ANALYSIS

Intersection of: Indiana Avenue / Findlay Street / Cherry Street

Prepared by: Proudfoot Associates **Seasonal Adj. Factor:** N/A **Count Date:** 8/30/18 & 9/11/18

No. Lanes/Approach: 2 **Presently Signalized:** No **70% Warrant Apply:** No

Adjusted Hourly Volumes *					WARRANT 1-A				WARRANT 1-B				WARRANT 4			
					100%		80%		100%		80%					
Condition - 100%	Number of Lanes = 2	Major 2-Way - Indiana	Minor - Cherry	Minor - Findlay	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	4-Hour Warrant		Peak Hour Warrant	
													Meets Threshold		Meets Threshold	
					600	200	480	160	900	100	720	80	Vehicles Per Hour	Peds Per Hour	Vehicles Per Hour	Peds Per Hour
Time																
8.00	549	1	94				✓					✓				
9.00	441	1	75													
10.00	408	1	69													
11.00	504	0	106				✓			✓		✓				
12.00	545	5	83				✓					✓				
13.00	452	8	134							✓		✓				
14.00	511	1	95				✓					✓				
15.00	639	1	128	✓			✓			✓		✓				
16.00	679	1	123	✓			✓			✓		✓				
17.00	774	2	130	✓			✓			✓	✓	✓				
				3	0	7	0	0	5	1	8					
Number of Hours Met				0		0		0		0						
WARRANT SATISFIED				NO		NO		NO		NO			NO		NO	

WARRANT 5 (SCHOOL CROSSING)

On Approved School Route?	NO	Gap Analysis Made During Period	to
No. of Vehicles During Analysis Period		Pedestrian Crossing (t)	
No. of Gaps (T) Greater Than (t)		Approximate Vehicular Speed	
No. of Children Crossing During Period		Length of Cross Walk	
WARRANT 5 SATISFIED	NO		

SIGNAL WARRANT ANALYSIS (CONTINUED)

WARRANT 6 (COORDINATED SIGNAL SYSTEM)

Major Street is in a coordination system No Distance to nearest signal is 0.25 and 0.43 Miles

Time/space diagram (attached) shows intersection can be impletented: No

WARRANT 6 SATISFIED No

WARRANT 7 (CRASH EXPERIENCE)

Adequate trial of less restrictive measures: No No. of preventable accidents per year: 0

80% of warrant 1 or 4 satisfied? No

WARRANT 7 SATISFIED No

WARRANT 8 (ROADWAY NETWORK)

Both streets are considered Major? Yes

At least 1000 v.p.h. during weekday peak hour: No

At least 1000 v.p.h. for any 5 hours on Saturday or Sunday:

Five year projection will meet Warrants 1, 2, and/or 3: No

WARRANT 8 SATISFIED No

WARRANT 2 & 3 (4 HOUR VOLUMES & PEAK HOUR VOLUME)

TIME BEG.	MAJOR 2-WAY	MINOR 1-WAY (A)	MINOR 1-WAY (B)	WARRANT 2					WARRANT 3			
				100%		80%			100%		80%	
				(a)	(b)	(a)	(b)		(a)	(b)	(a)	(b)
8.00	549	1	94									
9.00	441	1	75									
10.00	408	1	69									
11.00	504	0	106									
12.00	545	5	83									
13.00	492	8	134									
14.00	511	1	95									
15.00	639	3	128									
16.00	679	1	123									
17.00	774	2	130									
Number of Hours Met				0	0				0	0		
WARRANT SATISFIED				No					No			

Appendix E

Photo of RRFB Installation

Appendix F

RRFB Specifications

RRFB NOTES AND DETAILS

THIS WORK SHALL CONSIST OF FURNISHING AND INSTALLING A SOLAR POWERED RECTANGULAR RAPID FLASHING BEACON (RRFB) SIGN ASSEMBLY. THE FLASHING UNIT SHALL BE 2-SIDED LED, SOLAR POWERED AND PEDESTRIAN ACTIVATED. MULTIPLE UNITS SHALL BE WIRELESSLY CONTROLLED AND SYNCHRONIZED. THE UNIT SHALL BE COMPLIANT WITH THE MOST CURRENT OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD).

GENERAL REQUIREMENTS

EACH RRFB SHALL CONSIST OF TWO RAPIDLY AND ALTERNATELY FLASHING RECTANGULAR YELLOW INDICATIONS HAVING LED ARRAY BASED PULSING LIGHT SOURCES.

EACH RRFB SHALL BE A COMPLETE ASSEMBLY, CONSISTING OF BUT NOT LIMITED TO, SIGNAGE, SIGN MOUNTING HARDWARE, INDICATIONS AND ELECTRICAL COMPONENTS (WIRING, SOLID-STATE CIRCUIT BOARDS, ETC.).

FUNCTIONAL REQUIREMENTS

EACH RRFB SHALL UTILIZE SOLAR POWER.

EACH RRFB SHALL BE ACTIVATED BY ADA COMPLIANT PUSHBUTTONS.

THE RRFB SHALL BE NORMALLY DARK, SHALL INITIATE OPERATION ONLY UPON PEDESTRIAN ACTUATION, AND SHALL CEASE OPERATION AFTER A PREDETERMINED TIME LIMIT (BASED ON OMUTCD PROCEDURES).

EACH REMOTE RRFB SHALL BE WIRELESSLY ACTIVATED.

WHEN ACTIVATED, THE RRFB UNIT INDICATIONS SHALL FLASH IN A RAPIDLY ALTERNATING WIG-WAG" FLASHING SEQUENCE (LEFT LIGHT ON, THEN RIGHT LIGHT ON).

ALL RRFB LIGHT INDICATIONS SHALL BE WIRELESSLY SYNCHRONIZED (ALL LIGHTS WILL TURN ON WITHIN 120 MSEC AND REMAIN SYNCHRONIZED THROUGHOUT THE DURATION OF THE FLASHING CYCLE).

EACH OF THE RRFB'S INDICATIONS SHALL FLASH AT 70 TO 80 FLASHES PER MINUTE.

THE UNIT SHALL BE LOW CURRENT/HIGH OUTPUT INCLUDING AUTOMATIC DIMMING CAPABILITIES FOR DAY AND NIGHT VISIBILITY.

THE UNIT SHALL BE CAPABLE OF RUNNING UP TO 30 DAYS WITHOUT SUNLIGHT.

MATERIALS

FURNISH A COMPLETE ASSEMBLY, CONSISTING OF BUT NOT LIMITED TO, SIGNAGE, SIGN MOUNTING HARDWARE, INDICATIONS, AND ELECTRICAL COMPONENTS (WIRING, SOLID-STATE CIRCUIT BOARDS, ETC.). THE RRFB ASSEMBLY INCLUDES THE FOLLOWING ITEMS:

1. RRFB INDICATIONS
   - A. EACH RRFB INDICATIONS LENS SHALL BE A MINIMUM SIZE OF APPROXIMATELY 5" WIDE X 2" HIGH.
   - B. THE RRFB INDICATIONS SHALL BE ALIGNED HORIZONTALLY, WITH THE LONGER DIMENSIONS OF THE INDICATION HORIZONTAL. THERE SHALL BE TWO INDICATIONS ON THE FRONT AND TWO INDICATIONS ON THE BACK.
   - C. EACH RRFB SHALL BE SUPPLIED WITH ALL REQUIRED HARDWARE TO INSTALL ASSEMBLY. ALL EXPOSED HARDWARE SHALL BE ANTI-VANDAL.
   - D. EACH RRFB SHALL BE LOCATED BETWEEN THE BOTTOM OF THE CROSSING WARNING SIGN AND THE TOP OF THE SUPPLEMENTAL DOWNWARD DIAGONAL ARROW PLAQUE.
   - E. THE LIGHT INTENSITY OF THE YELLOW INDICATIONS SHALL MEET THE MINIMUM SPECIFICATIONS OF SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) STANDARD J595 (DIRECTIONAL FLASHING OPTICAL WARNING DEVICES FOR AUTHORIZED EMERGENCY, MAINTENANCE, AND SERVICE VEHICLES) DATED JANUARY, 2005.
   - F. A SMALL CONFIRMATION LIGHT DIRECTED AT AND VISIBLE TO PEDESTRIANS IN THE CROSSWALK SHALL BE INSTALLED INTEGRAL TO THE RRFB OR PUSHBUTTON TO GIVE CONFIRMATION THAT THE RRFB IS IN OPERATION.
2. SIGNS
   - A. ALL SIGN ASSEMBLIES SHALL USE ANTI-VANDAL FASTENERS TO MOUNT COMPONENTS TO SIGN AND SIGN TO FIXTURE.
   - B. PEDESTRIAN PUSHBUTTONS SIGNS SHALL BE PROVIDED AND INCLUDE THE LEGEND "PUSH BUTTON TO TURN ON WARNING LIGHTS". SIGNS SHOULD BE MOUNTED ADJACENT TO OR INTEGRAL WITH EACH PEDESTRIAN PUSHBUTTON.
   - C. TWO SETS OF SIGNS SHALL BE REQUIRED PER UNIT FOR VIEW FROM EACH APPROACH.
3. CONTROL CIRCUIT
   - A. WHEN ACTIVATED, THE TWO YELLOW INDICATIONS IN EACH RRFB SHALL FLASH IN A RAPIDLY ALTERNATING "WIG-WAG" FLASHING SEQUENCES (LEFT LIGHT ON, THEN RIGHT LIGHT ON).
   - B. THE CONTROL CIRCUIT SHALL HAVE THE CAPABILITY OF INDEPENDENTLY FLASHING UP TO TWO INDEPENDENT OUTPUTS. THE LED LIGHT OUTPUTS AND FLASH PATTERN SHALL BE COMPLETELY PROGRAMMABLE.
   - C. AS A SPECIFIC EXCEPTION TO THE 2003 MUTCD SECTION 4K.01 REQUIREMENTS FOR THE FLASH RATE OF BEACONS, RRFB'S SHALL USE A MUCH FASTER FLASH RATE. EACH OF THE TWO YELLOW INDICATIONS OF AN RRFB SHALL HAVE 70 TO 80 PERIODS OF FLASHING PER MINUTE AND SHALL HAVE ALTERNATING, BUT APPROXIMATELY EQUAL, PERIODS OF FLASHING LIGHT EMISSIONS AND DARK OPERATION. DURING EACH OF ITS 70 TO 80 FLASHING PERIODS PER MINUTE, THE YELLOW INDICATIONS ON THE LEFT SIDE OF THE RRFB SHALL EMIT TWO SLOW PULSES OF LIGHT AFTER WHICH AND THE YELLOW INDICATIONS ON THE RIGHT SIDE OF THE RRFB SHALL EMIT FOUR RAPID PULSES OF LIGHT FOLLOWED BY A LONG PULSE.
   - D. THE FLASH RATE OF EACH INDIVIDUAL YELLOW INDICATION, AS APPLIED OVER THE FULL ON-OFF SEQUENCE OF A FLASHING PERIOD OF THE INDICATION, SHALL NOT BE BETWEEN 5 AND 30 FLASHES PER SECOND, TO AVOID FREQUENCIES THAT MIGHT CAUSE SEIZURES.
   - E. THE CONTROL CIRCUIT SHALL BE SEALED WATERTIGHT TO ELIMINATE DIRT CONTAMINATION AND ALLOW FOR SAFE HANDLING IN ALL WEATHER CONDITIONS.
   - F. THE LED'S SHALL BE SEALED AGAINST DUST AND MOISTURE INTRUSION AS PER THE REQUIREMENTS OF NEMA STANDARD 250-1991 FOR TYPE 4 ENCLOSURE AND TO PROTECT ALL INTERNAL LED AND ELECTRICAL COMPONENTS.
4. BATTERY AND SOLAR PANELS
   - A. BATTERY UNIT SHALL BE A 12VDC, 40 AHR MINIMUM, SEALED GEL OR AGM LEAD ACID BATTERY. BATTERIES SHALL HAVE A WRITTEN TWO YEAR FULL REPLACEMENT WARRANTY.
   - B. THE SOLAR PANEL SHALL PROVIDE A MINIMUM OF 55 WATTS PEAK TOTAL OUTPUT.
   - C. THE SOLAR PANEL SHALL BE MOUNTED TO AN ALUMINUM PLATE AND BRACKET AT AN ANGLE OF 45 DEGREES TO 60 DEGREES TO PROVIDE MAXIMUM OUTPUT.
   - D. ALL FASTENERS USED SHALL BE ANTI-VANDAL.
5. WIRELESS RADIO
   - A. RADIO CONTROL SHALL OPERATE ON A 900 MHZ FREQUENCY HOPPING SPREAD SPECTRUM NETWORK, WI-FI OR APPROVED EQUAL.
   - B. RADIO SHALL INTEGRATE COMMUNICATION OF RRFB CONTROL CIRCUIT TO ACTIVATE SIGN FROM PUSHBUTTON INPUT.
   - C. THE RADIO SHALL BE SYNCHRONIZED SO ALL OF THE REMOTE RRFB LIGHT INDICATIONS WILL TURN ON WITHIN 120 MSEC OF EACH OTHER AND REMAIN SYNCHRONIZED THROUGHOUT THE DURATION OF THE FLASHING CYCLE.
   - D. RADIO SYSTEMS SHALL OPERATE FROM: 3VDC TO 15VDC.
6. PUSHBUTTON
   - A. THE PUSHBUTTON SHALL BE CAPABLE OF CONTINUOUS OPERATION OVER A TEMPERATURE OF -30 DEGREES F TO +165 DEGREES F.
   - B. PUSHBUTTON SHALL BE ADA COMPLIANT.
7. PEDESTAL SHAFT AND BASE - MOUNT ON A STANDARD 4.5 INCH OD ALUMINUM PEDESTAL POLE WITH BREAKAWAY BASE. A 14 FOOT POLE SHALL BE PROVIDED AND FIELD ADJUSTED TO MAINTAIN THE PROPER SIGN MOUNTING HEIGHTS, UNLESS SPECIFIED OTHERWISE IN THE PLANS. POLE AND BASE MANUFACTURER SHALL BE LISTED ON ODOT'S QUALIFIED PRODUCTS LIST.

CONSTRUCTION

THE RRFB SHALL BE ASSEMBLED AND CONSTRUCTED BY THE CONTRACTOR AS SHOWN AND SPECIFIED ON THE PLANS.

WARRANTY

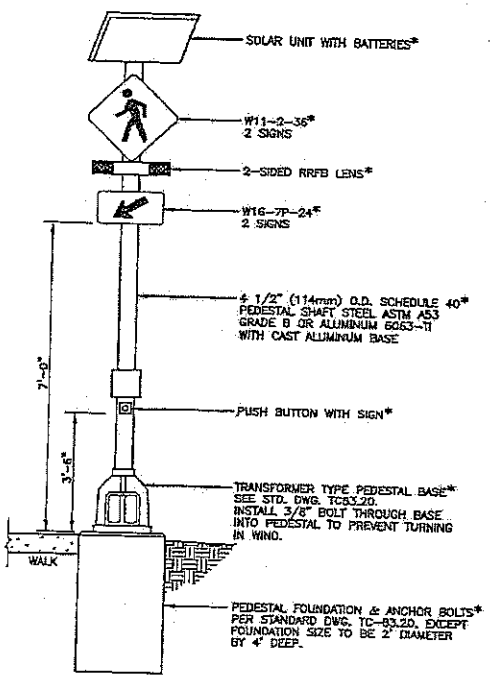
WARRANTY SHALL BE TWO YEARS FROM THE DATE OF FINAL ACCEPTANCE.

MEASUREMENT

THE DEPARTMENT WILL MEASURE THE ITEM COMPLETE IN PLACE, INCLUDING ALL MATERIALS, TESTING, LABOR AND SOFTWARE FOR A FULLY FUNCTIONAL UNIT.

PAYMENT

PAYMENT WILL BE AT THE CONTRACT UNIT PRICE PER EACH FOR ITEM 630 "SIGNING MISC.: SOLAR POWERED RECTANGULAR RAPID FLASHING BEACON (RRFB) SIGN ASSEMBLY".



SOLAR POWERED - RECTANGULAR RAPID FLASHING BEACON ASSEMBLY DETAIL

* PAY ITEM : 630 SIGNING MISC.: SOLAR POWERED RECTANGULAR RAPID FLASHING BEACON (RRFB) SIGN ASSEMBLY

DESIGN THY CHECKED DAM

RRFB NOTES AND DETAILS

LUC-ANTHONY WAYNE TRAIL/ SOUTH RIVER ROAD

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