TMS Engineers, Inc

Pedestrian Hybrid Beacon Justification Study

SR 91 and Aurora Street Crosswalks
Hudson, Ohio

November 14, 2024

DRAFT

Prepared for:

City of Hudson
Hudson Engineering Department
140 Terex Road
Hudson, Ohio 44236

PEDESTRIAN HYBRID BEACON JUSTIFICATION STUDY

SR 91 & Aurora Street Crosswalks

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Prepared For:

City of Hudson
Hudson Engineering Department
140 Terex Road
Hudson, Ohio 44236

Prepared By:

TMS Engineers, Inc.
2112 Case Parkway South
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Twinsburg, Ohio 44087

REGISTERED ENGINEER NO. E56982
CERTIFICATION NO. 2234

"This document was prepared consistent with local agency requirements and/or applicable guidelines contained in this report."

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Chapter 1
Introduction

1.1 Purpose of Report

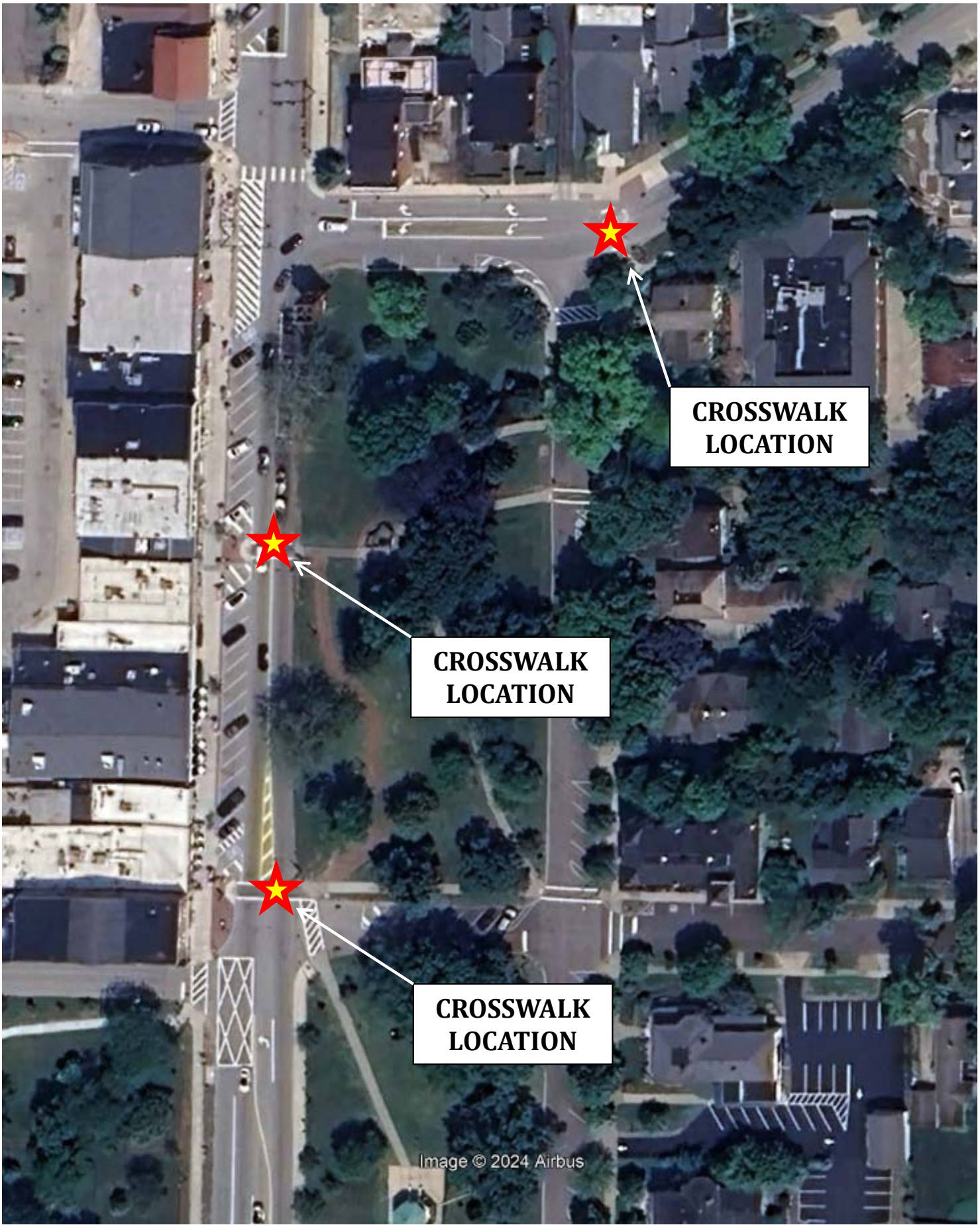
This Pedestrian Hybrid Beacon Justification Analysis has been prepared at the request of the City of Hudson for the following three existing crosswalks:

1. Aurora Street & E. Main Street
2. North Main Street (SR 91) & Mid-Block Crosswalk (116 N. Main Street)
3. North Main Street (SR 91) & Church Street / Park Lane (80 N. Main Street)

Figure 1.1, Page 2 shows the location of the study crosswalks.

The study crosswalks are being utilized by a sight impaired individual who frequently uses the study crosswalks to access downtown Hudson. Their travel route which the visual impaired person takes is shown in **Appendix A**. It has been requested that additional crosswalk signal equipment be installed to stop motorists at the crosswalks since the sight impaired individual can not ascertain if safe gaps in traffic are available. This engineering study of the crosswalks is required to determine if a Pedestrian Hybrid Beacon (PHB) (sometimes referred to as a HAWK signal) should be installed.

The goal of this study is to analyze traffic volume data, crash records and other engineering data to determine if a PHB signal criteria is met in accordance with the requirements listed in the **OMUTCD** or if there are other engineering circumstances that would justify the signalization of the crosswalks.



TMS Engineers, Inc. 2112 Case Parkway S., Unit 7, Twinsburg, Ohio 44087 www.TMSEngineers.com	**SR 91 & Aurora Street** **Hudson, Ohio** **Crosswalk Signalization Study**	**Location Map**	**NORTH** NOT TO SCALE	**Figure 1.1** **Page 2**

1.2 Study Objectives

This study is structured for the following purposes;

- to adequately assess the existing conditions at the three crosswalks,
- to evaluate and document the benefits of a pedestrian hybrid beacon based upon established criteria and other engineering factors,

This study documents the methodologies, findings and conclusions of the analysis, including the basis for all assumptions, traffic parameters utilized and conclusions reached.

The pedestrian hybrid beacon justification will be determined by comparing the existing traffic and pedestrian volumes to the ODOT **Traffic Engineering Manual, Form 496-19 (Pedestrian Hybrid Evaluation Matrix)**.

The **NCHRP Report 562** criteria and the number of pedestrian gaps will also be reviewed to determine if pedestrian signalization should be considered.

Chapter 2
Area Conditions

2.1 Transportation Network Study Area

SR 91 is a two-lane, two-way undivided roadway (one lane in each direction) with a posted speed limit of 25 miles per hour (mph). It has a south to north orientation and is classified as an urban principal arterial roadway according to the Ohio Department of Transportation. It has an average daily traffic of approximately 13,700 vehicles per day based on the recent traffic count collected on October 22, 2024 at the Church Street intersection.

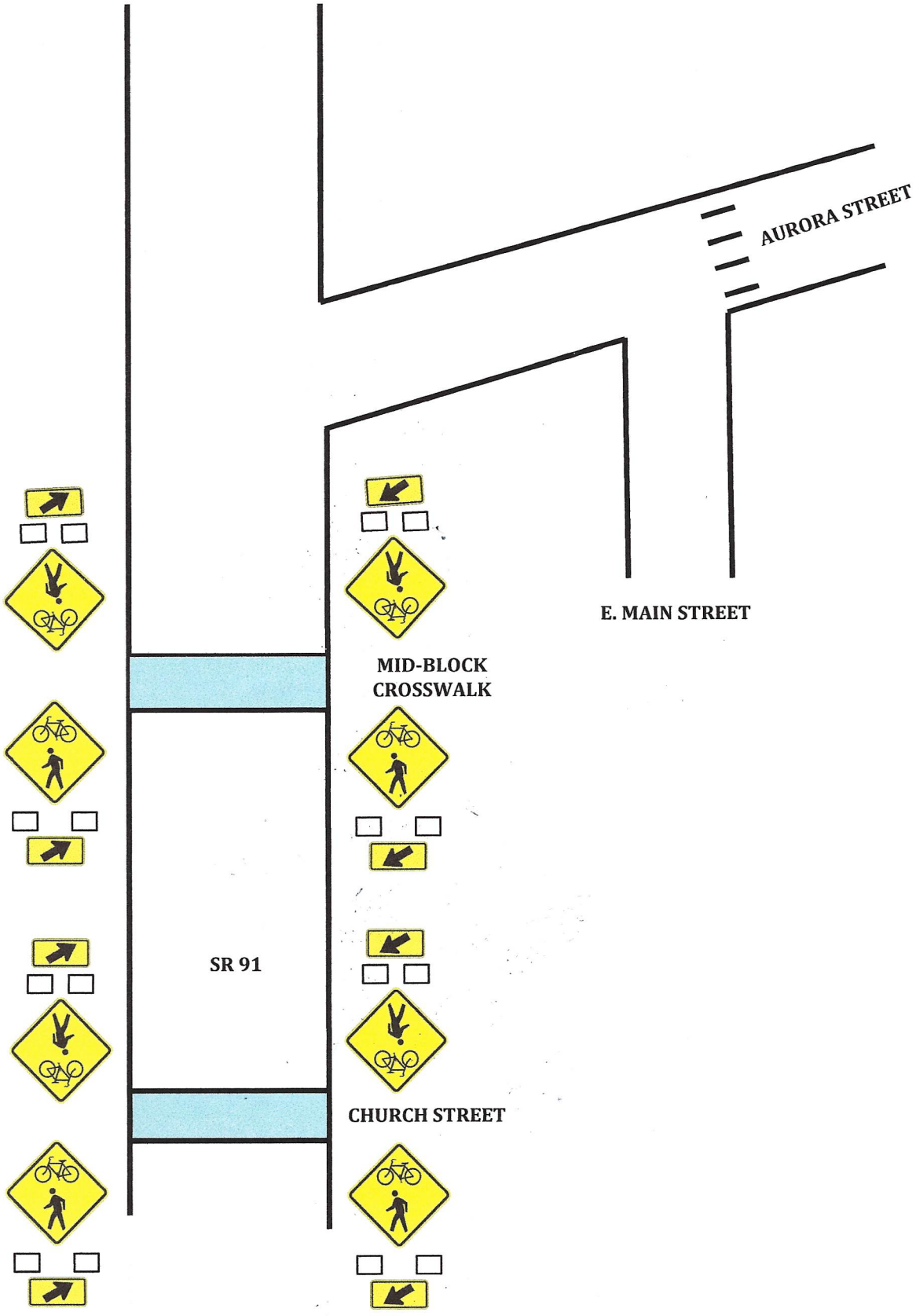
Aurora Street is a two-lane, two-way undivided roadway (one lane in each direction) with a posted speed limit of 25 miles per hour (mph). It has a west to east orientation and is classified as an urban Major Collector roadway according to the Ohio Department of Transportation. It has an average daily traffic of approximately 5,100 vehicles per day based on the recent traffic count collected on October 29, 2024 at the East Main Street intersection.

The crosswalk across Aurora Street at the East Main Street intersection currently has no crosswalk signage or additional pavement markings to alert motorists to the crosswalk.

The existing crosswalk across North Main Street (SR 91) at the mid-block crossing at 116 N. Main Street has been upgraded to have crosswalk signage with rectangular rapid flashing beacons (RRFB) on the east and west side of the roadway. The flashing beacons were tested and they are operational. The pavement markings at this crosswalk are in good condition and plainly visible to motorists.

The existing crosswalk across North Main Street (SR 91) at the Church Street intersection has also been upgraded to have crosswalk signage with rectangular rapid flashing beacons (RRFB) on the east and west side of the roadway. The flashing beacons were tested and the are operational. The pavement markings at this crosswalk are in good condition and plainly visible to motorists.

Figure 2.1, Page 5 shows the crosswalk pavement markings and pedestrian traffic signage in the study area.



TMS Engineers, Inc. 2112 Case Parkway S., Unit 7, Twinsburg, Ohio 44087 www.TMSEngineers.com	SR 91 & Aurora Street Hudson, Ohio PHB Justification Study	**Existing Crosswalk Pavement Markings & Signage**	⇧ NORTH NOT TO SCALE	Figure 2.1
				Page 5

2.2 Sight Distance Analyses

A primary feature in roadway design is the arrangement of the geometric elements so that sufficient sight distance is provided for safe and efficient operation. The most important sight distance considerations are: distance required for stopping and distance required for operation at intersections.

The available stopping sight distance will be evaluated for vehicles traveling on Aurora Street and SR 91 at the three study crosswalks. The necessary stopping sight distance will be based on the guidelines found in the ODOT **Location and Design Manual, Volume 1**. The material in this manual is based upon accepted engineering practice developed by the American Association of State Highway Transportation Officials (AASHTO).

Stopping Sight Distance

Stopping sight distance is the sum of two distances. The first distance is the distance traversed by a vehicle from the instant the driver sights an object (such as a pedestrian in the crosswalk) that requires a stop, to the instant the brakes are applied. The second distance is the distance needed to stop the vehicle from the instant the brakes are applied. Recommended stopping sight distances are provided in the Ohio Department of Transportation's **Location & Design Manual, Volume 1**.

The necessary stopping sight distance requirements for the vehicles approaching the crosswalks will be compared to the 25 mile per hour requirements. *Figure 201-1* found in *Section 200* of the **Location and Design Manual, Volume 1** indicates that for a 25 mile per hour roadway, 155 feet is the recommended stopping sight distance.

Field measurements were taken to determine the amount of available stopping sight distance for vehicles traveling on SR 91 and Aurora Street as they approaching the study crosswalks. The tables shown below and the next page details the available stopping sight distance as compared to the recommendations found in the **Location and Design Manual, Volume 1.**

Table 1 - Crosswalk on Aurora Street

ROADWAY & APPROACH	AVAILABLE SSD	25 MPH 155 FEET
Aurora Street - East Approach	>200'	✔
Aurora Street - West Approach	> 200'	✔

✔ Indicates Criteria is Met **X** Indicates Criteria is Not Met

Table 2 - Mid-Block Crosswalk on SR 91 near Howard Hanna

ROADWAY & APPROACH	AVAILABLE SSD	25 MPH 155 FEET
SR 91 - North Approach	>200'	✔
SR 91 - South Approach	> 200'	✔

✔ Indicates Criteria is Met **X** Indicates Criteria is Not Met

Table 3 - Crosswalk on SR 91 at Church Street

ROADWAY & APPROACH	AVAILABLE SSD	25 MPH 155 FEET
SR 91 - North Approach	>200'	✔
SR 91 - South Approach	> 200'	✔

✔ Indicates Criteria is Met **X** Indicates Criteria is Not Met

The stopping sight distances are not constrained by severe vertical or horizontal curves on SR 91 and Aurora Street. Photographs of the stopping sight distance along the study area roadways can be seen in **Appendix B**. The study area roadways provide adequate visibility of the existing crosswalks for approaching motorists since the recommended stopping sight distance requirements are met. Restricted stopping sight distance is not present therefor a PHB would not be recommended at the three crosswalks.

2.3 Manual Traffic Counts

Nine-hour weekday turning movement counts were performed at the three existing crosswalks. The traffic and pedestrian surveys were taken on Tuesday, October 22, 2024 and on Tuesday October 29, 2024. The traffic counts were conducted in fifteen (15) minute intervals between the hours of 7:00 - 9:00 AM, 10:00 - 2:00 PM and 3:00 - 6:00 PM, then hourly totals were calculated. A copy of the intersection turn movement counts are included in **Appendix C**.

Average daily traffic was calculated for the roadways using expansion factors to account for daily and seasonal variations according to the recommendations and latest data from the Ohio Department of Transportation.

The following tables shows the corresponding traffic volumes for the 9 hours that will be compared to the various traffic signal warrants.

Traffic Count Collected on Tuesday October 29, 2024

Time Period	Major Street (Aurora Street)	Pedestrians (E. Main Street)
7:00	503	0
8:00	439	3
9:00	338	6
11:00	313	17
12:00	328	13
13:00	292	12
15:00	452	4
16:00	550	5
17:00	502	12

Traffic Count Collected on Tuesday October 22, 2024

Time Period	Major Street (SR 91)	Pedestrians (Mid-Block)
7:00	1134	5
8:00	1176	12
9:00	1019	31
11:00	1117	30
12:00	1126	50
13:00	1092	22
15:00	1232	27
16:00	1298	28
17:00	1371	38

Traffic Count Collected on Tuesday October 22, 2024

Time Period	Major Street (SR 91)	Pedestrians (Church Street)
7:00	1054	3
8:00	1102	6
9:00	1003	9
11:00	1021	16
12:00	1076	28
13:00	963	20
15:00	1030	6
16:00	1124	15
17:00	1080	17

2.4 Crash Data

Crash Data

The Ohio Department of Transportation provides a tool to retrieve crash data. The ODOT GIS Crash Analyses Tool (GCAT) was used to collect crash information at the three study crosswalks. The current web address for the ODOT GIS Crash Analyses Tool can be seen below**:**

https://gis.dot.state.oh.us/tims/

The crash data for years 2021 through 2023 were reviewed and there was no crashes reported at the three study crosswalks during these years. The lack of crashes indicates there is currently no crash hazard at the crosswalks so it is anticipated that a PHB wouldn't increase the safety to pedestrians crossing the streets.

Chapter 3
Pedestrian Crosswalk Analyses

3.1 Pedestrian Hybrid Beacon Evaluation

A pedestrian hybrid beacon (PHB), sometimes referred to as a HAWK signal, is a traffic control device which is designed to assist pedestrians to cross a roadway by stopping traffic utilizing beacons. The beacons are similar to traffic signal heads which are utilized at signalized intersections but they are dark until actuated by a pedestrian who is attempting to cross the roadway. The beacons then initiate a yellow to red lighting that directs motorists to stop prior to the crosswalk. The Federal Highway Administration has stated "the PHB is an intermediate option between a flashing beacon and a full pedestrian traffic signal because it assigns right of way and provides positive stop control. It also allows motorists to proceed once the pedestrian has cleared their side of travel lane(s), reducing vehicle delay."

The Ohio Department of Transportation (ODOT) has included **Form 496-19 (Pedestrian Hybrid Evaluation Matrix)** in the **Traffic Engineering Manual** which can be used to evaluate a crosswalk to determine if a PHB should be installed. Form 496-19 considers factors such as crashes, traffic volumes, travel speed, roadway geometry and nearby population volumes. This evaluation matrix contains **Figure 4F-1** which is a chart which compared the major street traffic volumes to the total pedestrians crossing the major street per hour.

An analyses of the three existing pedestrian crosswalks across Aurora Street and SR 91 were performed. A copy of the Pedestrian Hybrid Evaluation Matrixes is shown in **Appendix D**. The results of the evaluation indicates that the crosswalks do not currently meet the criteria for the installation of a pedestrian hybrid beacon. A significant increase in pedestrians (approximately double) at each of the crosswalks would be necessary to have the criteria be met which is not anticipated in the future.

3.2 NCHRP Report 562 Analyses

Although numerous treatments exist at unsignalized crossings, there is growing concern about their effectiveness and just what should be used in any given location. A recent research project jointly sponsored by the National Cooperative Highway Research Program (NCHRP) was initiated to address this particular need. The research was conducted by the Texas Transportation Institute (TTI). The project resulted in the publication of **NCHRP Report 562 - Improving Pedestrian Safety at Unsignalized Crossings**.

The research team developed guidelines for selecting pedestrian crossing treatments for unsignalized intersections and mid-block locations. Quantitative procedures in the guidelines use key input variables (such as, pedestrian volume, street crossing width, and traffic volume) to recommend one of four possible crossing treatment categories:

- Marked crosswalk;
- Enhanced, high-visibility, or "active when present" traffic control device;
- Red signal or beacon device; or
- Conventional traffic control signal.

The use of enhanced traffic control devices related to pedestrian control, beacons and conventional traffic control signals will be discussed in greater detail later in this report. The sections will discuss recommended criteria needed for attaining good design while being sensitive to the needs of both the pedestrian and the motorist.

The guidelines found in **NCHRP Report 562** are divided into broad classes of elements and devices. Elements are used either uniquely or to supplement a device. A device represents the primary component of a pedestrian treatment.

Devices have been divided into the following categories:

- **No Treatment**: "Do Nothing"

- **Crosswalk**: The category includes standard crosswalk markings and pedestrian crossing signs, as opposed to unmarked crossings.

- **Enhanced**: An enhanced treatment includes devices that enhance the visibility of the

crossing location and pedestrians waiting to cross. Warning signs, markings, or beacons in this category are present and active at the crossing location at all times.

- **Active**: An active treatment, also called "active when present" includes devices designed to display a warning only when pedestrians are present or crossing the street.

- **Red**: This category includes those devices that display a circular red indication (signal or beacon) to motorists at the crossing location. (ie PHB)

- **Signal**: This category pertains to traffic control signals

The **NCHRP Report 562** worksheets were completed with the existing peak hour traffic and pedestrian volumes at the three study crosswalks. Copies of the **NCHRP Report 562** worksheets can be found in **Appendix E**.

The pedestrian treatment analysis worksheet determined that the **"No Treatment"** level category is met for the existing crosswalk across Aurora Street at the East Main Street intersection. The amount of vehicular and pedestrian traffic was found to be insufficient to require a PHB or any other enhancements.

The pedestrian treatment analysis worksheet determined that the **"Active or Enhanced"** level category is met for the existing crosswalk across SR 91 at the mid-block crosswalk. The amount of vehicular and pedestrian traffic was found to be sufficient to install enhanced pavement markings and signage such as rectangular rapid flashing beacons. The enhancements have already be installed at this crosswalk and no additional crosswalk improvements are necessary. The amount of vehicular and pedestrian traffic was found to be insufficient to require a PHB or any other additional enhancements like traffic signalization.

The pedestrian treatment analysis worksheet determined that the **"Active or Enhanced"** level category is met for the existing crosswalk across SR 91 at the Church Street intersection. The amount of vehicular and pedestrian traffic was found to be sufficient to install enhanced pavement markings and signage such as rectangular rapid flashing beacons. The enhancements have already be installed at this crosswalk and no additional crosswalk improvements are necessary. The amount of vehicular and pedestrian traffic was found to be insufficient to require a PHB or any other additional enhancements like traffic signalization..

3.3 Pedestrian Gap Analysis

Pedestrians need to wait for a gap in the traffic that is of sufficient duration to permit a reasonably safe crossing. Alternate gaps and blockades are inherent in the traffic stream and are different at each crossing location. When the delay between the occurrence of adequate gaps becomes excessive, pedestrians may become impatient and endanger themselves by attempting to the cross the roadway during inadequate gaps in the traffic stream.

The Institute of Transportation Engineers states that on average, at least one adequate gap should occur each minute to allow for pedestrians to cross without undue delay or risk. An analysis of the available gaps during the peak hour of each of the study crosswalks was conducted. A copy of the gap analysis worksheets for the crosswalks can be seen in **Appendix F**. The gap analyses were based upon the peak vehicular and pedestrian 30 minute interval.

The results of the peak hour gap analysis is shown below:

Aurora Street & East Main Street - 42.8 Gaps Per 30 Minutes
SR 91 & Mid-Block Crosswalk - 11.5 Gaps Per 30 Minutes
SR 91 & Church Street Crosswalk - 9.44 Gaps Per 30 Minutes

The gap analyses determined that pedestrians crossing Aurora Street have sufficient gaps in traffic during the peak periods. The analysis indicates that there are not sufficient adequate gaps in the through traffic stream on SR 91 for the safe crossing of pedestrians at the two study crosswalks. The lack of gaps is the reason rectangular rapid flashing beacons have already been installed at these two crosswalks.

3.4 Negative Impacts of Pedestrian Hybrid Beacons

While Pedestrian Hybrid Beacons can provide some relief to pedestrian's attempting to cross busy streets, there can be negative consequences due to the stopping of vehicles at the crosswalks. The following is a list of possible negative consequences of installing PHBs.

1. The installation of PHBs has the negative consequence of causing motorists to suddenly stop at the crosswalk which could cause an increase in rear-end crashes.

2. The installation of PHBs on busy roadways such as SR 91 causes additional stopping locations for motorists which can cause increased delay and congestion on the roadways.

3. An interconnected signal system like SR 91 would have a decrease in progression along the corridor if PHBs are installed. The yellow phases at the intersections along the corridor have been designated to occur at specific times to allow the least amount of stoppages and increase the flow of traffic through the City. The installation of the PHB would increase the number of closely spaced stopping locations which would reduce the progression of traffic and could significantly increase the queues during the congested peak hours.

Chapter 4
Conclusions and Recommendations

Based on the results of the analyses, we offer the following conclusions and recommendations:

4.1 This Pedestrian Hybrid Beacon Justification Analyses has been prepared at the request of the City of Hudson for the following three existing crosswalks:

1. Aurora Street & E. Main Street
2. North Main Street (SR 91) & Mid-Block Crosswalk (116 N. Main Street)
3. North Main Street (SR 91) & Church Street / Park Lane (80 N. Main Street)

4.2 Intersection and stopping sight distance for the study crosswalks are not constrained by horizontal or vertical curves in the roadway. Sufficient sight distance is being provided on all approaches of the crosswalk and signalization of the crosswalks for this reason is not justified. The stopping sight distance was determined to be sufficient so motorists on Aurora Street and SR 91 should have distance to see pedestrians in the crosswalks or see the RRFBs which have been installed.

4.3 A turning movement count was taken at the crosswalks on October 22, 2024 and on October 29, 2024.

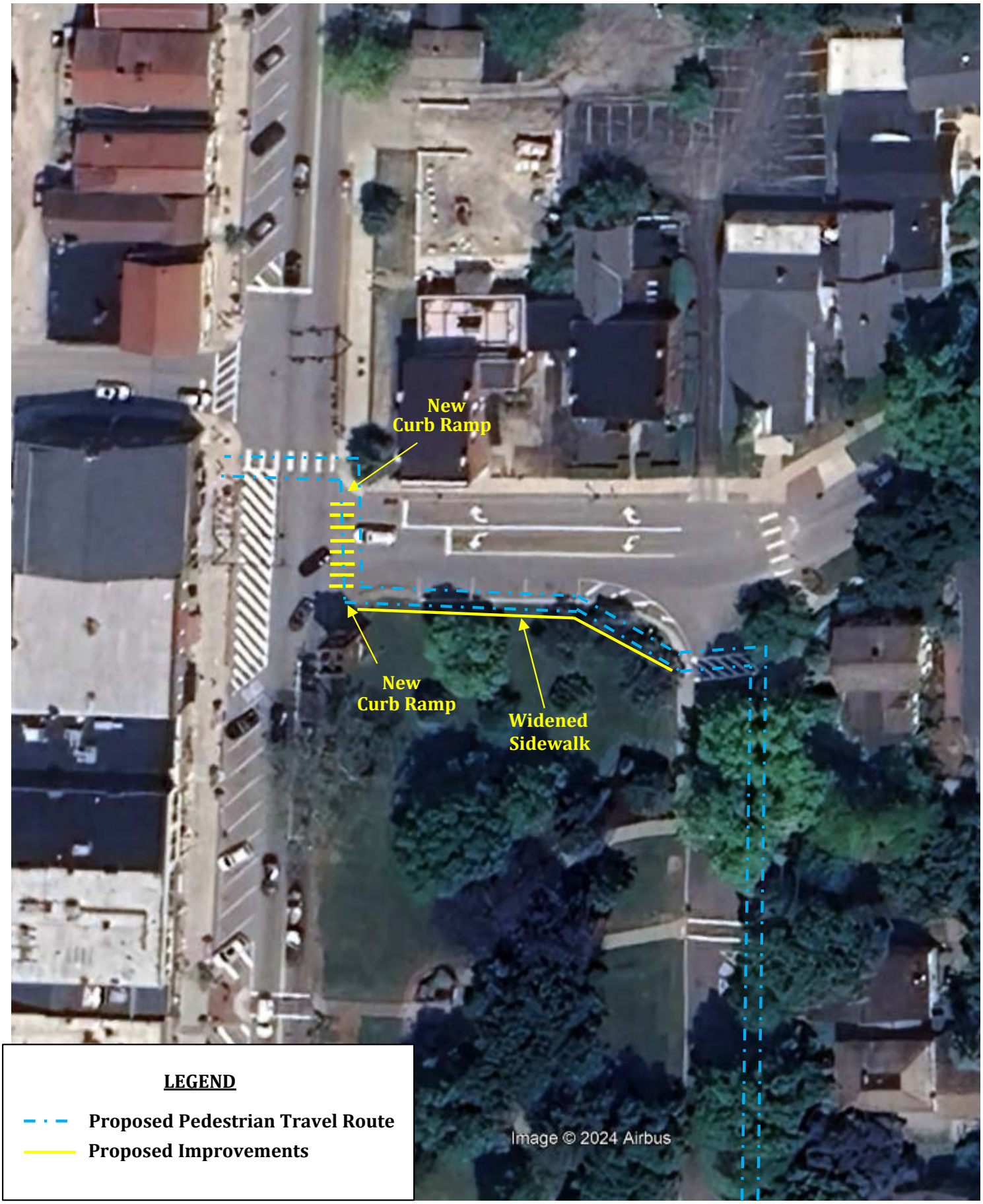
4.4 The Ohio Department of Transportation (ODOT) has included **Form 496-19 (Pedestrian Hybrid Evaluation Matrix)** in the **Traffic Engineering Manual** which can be used to evaluate a crosswalk to determine if a PHB should be installed. This evaluation matrix contains **Figure 4F-1** which is a chart which compared the major street traffic volumes to the total pedestrians crossing the major street per hour. An analyses of the three existing pedestrian crosswalks across Aurora Street and SR 91 were performed and the results of the evaluation indicates that the crosswalks do not currently meet the criteria for the installation of a pedestrian hybrid beacon. A significant increase in pedestrians (approximately double) at each of the crosswalks would be necessary to have the criteria be met which is not anticipated in the future.

4.5 The **NCHRP Report 562** worksheets were completed with the existing peak hour traffic and pedestrian volumes at the three study crosswalks. The pedestrian treatment analysis worksheet determined that the **"No Treatment"** level category is met for the existing crosswalk across Aurora Street at the East Main Street intersection. The amount of vehicular and pedestrian traffic was found to not be sufficient to require a PHB signal or any other enhancements like RRFBs.

The pedestrian treatment analysis worksheet determined that the **"Active or Enhanced"** level category is met for the existing crosswalks across SR 91 at the mid-block crosswalk and at Church Street. The amount of vehicular and pedestrian traffic was found to be sufficient to install enhanced pavement markings and signage such as rectangular rapid flashing beacons. The enhancements have already been installed at these crosswalks and no additional crosswalk improvements are necessary.

4.6 The Institute of Transportation Engineers states that on average, at least one adequate gap should occur each minute to allow for pedestrians to cross without undue delay or risk. The results of the peak hour gap analysis that the pedestrians crossing Aurora Street have sufficient gaps in traffic during the peak periods. The analysis indicates that there are not sufficient adequate gaps in the through traffic stream on SR 91 for the safe crossing of pedestrians at the two study crosswalks. The lack of gaps is the reason rectangular rapid flashing beacons have been installed at these two crosswalks.

4.7 The various analyses have all determined that the three study crosswalks do not meet the criteria to install a Pedestrian Hybrid Beacon or any new pedestrian signage. This unfortunately does not address the issues experienced by the visually impaired individual who walks to town. A possible future pedestrian route with improvements is shown in **Figure 4.1**. The sidewalk along the south side of Aurora Street could be widened which would allow access to a proposed curb ramp and crosswalk which could be installed on the east side of SR 91. It is recommended that a crosswalk not be installed on the south side of Aurora Street since the additional driveway would increase the possible conflict points between pedestrians and motorists turning from Aurora Street. The additional crosswalk across SR 91 would also increase the green time necessary for the Aurora Street approach which could further restrict the green time available for the already congested SR 91 approaches. The proposed crosswalk across Aurora Street should not impede the progression of traffic on SR 91 since pedestrians would cross Aurora Street during the SR 91 phases. These improvements may not be feasible due to the clock tower but they should be further studied.



LEGEND

- Proposed Pedestrian Travel Route
- Proposed Improvements

TMS Engineers, Inc. 2112 Case Parkway S., Unit 7, Twinsburg, Ohio 44087 www.TMSEngineers.com	SR 91 & Aurora Street Hudson, Ohio PHB Justification Study	**Improvement Alternative**	**NORTH** NOT TO SCALE	**Figure 4.1** **Page 18**

Appendix A
Sight Impaired Individual Walking Route


CLINTON ST.
AURORA ST.
CHURCH ST.
PARK LN.
N MAIN ST.
E MAIN ST.
PARKING TERRACE ALLEY
PARKING TERRACE ALLEY
DIVISION S
Requested L
of HAWK Sig
186
178
164
156
156
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144
140
140
138
134
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122
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Appendix B
Stopping Sight Distance Photos

Looking Eastbound on Aurora Street at East Main Street

Looking Westbound on Aurora Street at East Main Street

Looking Northbound on SR 91 at Mid-Block Crosswalk

Looking Southbound on SR 91 at Mid-Block Crosswalk

Looking Northbound on SR 91 at Church Street Crosswalk

Looking Southbound on SR 91 at Church Street Crosswalk

Appendix C
Manual Traffic Counts

VEHICULAR TRAFFIC COUNT SUMMARY

Municipality: Hudson **At Intersection of:** Aurora Street **and** East Main Street

Date: 10/29/2024 **Day:** Tue. **Comments:** **Project:** 24-129

Weather: Clear **Recorder(s):** DJS **Data entry by:** JJO **Date entered:** Oct. 30, 2024 Aurora St & E. Main St 102924

TIME BEGINS	Aurora St. FROM NORTH						Aurora St. FROM SOUTH						TOTAL NORTH SOUTH	E. Main St. FROM EAST						FROM WEST						TOTAL EAST WEST	TOTAL ALL DIREC.	PEAK HOUR FACTOR			
	Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus		Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus			North	South	East	West
06:00																														
07:00	18	272	0	290	4	8	0	207	6	213	5	7	503	1	0	3	4	0	0							4	507	0.863	0.772	0.333	0.000
08:00	9	243	0	252	3	2	0	179	8	187	7	2	439	0	0	1	1	0	0							1	440	0.797	0.766	0.250	0.000
09:00	16	203	0	219	7	5	0	112	5	117	1	0	336	3	0	3	6	0	0							6	342	0.720	0.860	0.375	0.000
10:00																														
11:00	10	170	0	180	4	2	0	126	7	133	7	0	313	8	0	6	14	1	0							14	327	0.789	0.853	0.583	0.000
12:00	5	171	0	176	8	1	0	134	12	146	5	3	322	2	0	0	2	0	0							2	324	0.898	0.869	0.500	0.000
1:00	6	152	0	158	7	0	0	121	8	129	5	2	287	2	0	1	3	0	0							3	290	0.898	0.921	0.375	0.000
2:00																														
3:00	16	226	0	242	1	8	0	198	7	205	1	1	447	2	0	2	4	0	0							4	451	0.877	0.884	0.333	0.000
4:00	24	324	0	348	4	3	0	184	14	198	2	0	546	4	0	4	8	0	0							8	554	0.861	0.917	0.500	0.000
5:00	14	298	0	312	4	1	0	179	8	187	1	0	499	2	0	1	3	0	0							3	502	0.907	0.917	0.375	0.000
6:00																														
7:00																														
8:00																														
9:00																														
TOTALS	118	2059	0	2177	42	30	0	1440	75	1515	34	15	3692	24	0	21	45	1	0							45	3737				
ADT	162	2828	0	2990	3.3%		0	1978	103	2081	3.2%		5070	34	0	29	63	2.2%								63	5133				

N Leg Hourly Factor:	1.54	E Leg Hourly Factor:	1.57
S Leg Hourly Factor:	1.54	W leg Hourly Factor:	0.00
N Leg Monthly Factor:	0.89	E Leg Monthly Factor:	0.89
S Leg Monthly Factor:	0.89	W Leg Monthly Factor:	0.00

N Leg Combined Factor:	1.37	E Leg Combined Factor:	1.40
S Leg Combined Factor:	1.37	W Leg Combined Factor:	

TMS ENGINEERS, INC.

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Figure #:

Page #:

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

City: Hudson
Intersection: Aurora St & E. Main St
Counter: DJS
Day of the Week: Tuesday

File Name : TC 1 Aurora St and E Main St 102924 DJS
Site Code : 00000000
Start Date : 10/29/2024
Page No : 1

Groups Printed- Cars - Trucks - Buses

	AURORA STREET From North					EAST MAIN STREET From East					AURORA STREET From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	51	3	0	54	0	0	0	0	0	3	30	0	0	33	0	0	0	0	0	87
07:15 AM	0	64	5	0	69	0	0	0	0	0	3	53	0	0	56	0	0	0	0	0	125
07:30 AM	0	79	4	0	83	1	0	0	0	1	0	69	0	0	69	0	0	0	0	0	153
07:45 AM	0	78	6	0	84	2	0	1	0	3	0	55	0	0	55	0	0	0	0	0	142
Total	0	272	18	0	290	3	0	1	0	4	6	207	0	0	213	0	0	0	0	0	507
08:00 AM	0	75	4	0	79	0	0	0	1	1	0	27	0	0	27	0	0	0	2	2	109
08:15 AM	0	46	2	0	48	0	0	0	0	0	1	42	0	0	43	0	0	0	0	0	91
08:30 AM	0	47	1	0	48	1	0	0	0	1	4	52	0	0	56	0	0	0	0	0	105
08:45 AM	0	75	2	0	77	0	0	0	0	0	3	58	0	0	61	0	0	0	0	0	138
Total	0	243	9	0	252	1	0	0	1	2	8	179	0	0	187	0	0	0	2	2	443
09:00 AM	0	71	5	0	76	2	0	2	1	5	1	33	0	0	34	0	0	0	0	0	115
09:15 AM	0	43	3	0	46	0	0	1	1	2	1	27	0	2	30	0	0	0	0	0	78
09:30 AM	0	38	5	0	43	1	0	0	3	4	0	22	0	0	22	0	0	0	0	0	69
09:45 AM	0	51	3	0	54	0	0	0	1	1	3	30	0	0	33	0	0	0	0	0	88
Total	0	203	16	0	219	3	0	3	6	12	5	112	0	2	119	0	0	0	0	0	350
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

File Name : TC 1 Aurora St and E Main St 102924 DJS
Site Code : 00000000
Start Date : 10/29/2024

Groups Printed- Cars - Trucks - Buses

	AURORA STREET From North					EAST MAIN STREET From East					AURORA STREET From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	37	4	0	41	3	0	3	3	9	2	30	0	0	32	0	0	0	0	0	82
11:15 AM	0	42	4	0	46	0	0	2	1	3	3	30	0	0	33	0	0	0	0	0	82
11:30 AM	0	36	0	0	36	2	0	2	1	5	0	29	0	0	29	0	0	0	0	0	70
11:45 AM	0	55	2	0	57	1	0	1	12	14	2	37	0	0	39	0	0	0	0	0	110
Total	0	170	10	0	180	6	0	8	17	31	7	126	0	0	133	0	0	0	0	0	344
12:00 PM	0	42	3	0	45	0	0	1	0	1	4	32	0	3	39	0	0	0	0	0	85
12:15 PM	0	48	1	0	49	0	0	1	8	9	1	33	0	0	34	0	0	0	0	0	92
12:30 PM	0	45	0	0	45	0	0	0	4	4	3	31	0	0	34	0	0	0	0	0	83
12:45 PM	0	36	1	2	39	0	0	0	1	1	4	38	0	1	43	0	0	0	0	0	83
Total	0	171	5	2	178	0	0	2	13	15	12	134	0	4	150	0	0	0	0	0	343
01:00 PM	0	37	1	1	39	1	0	0	8	9	0	35	0	0	35	0	0	0	0	0	83
01:15 PM	0	35	2	4	41	0	0	2	1	3	4	25	0	0	29	0	0	0	0	0	73
01:30 PM	0	36	3	0	39	0	0	0	3	3	3	27	0	0	30	0	0	0	0	0	72
01:45 PM	0	44	0	0	44	0	0	0	0	0	1	34	0	0	35	0	0	0	0	0	79
Total	0	152	6	5	163	1	0	2	12	15	8	121	0	0	129	0	0	0	0	0	307
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

File Name : TC 1 Aurora St and E Main St 102924 DJS
Site Code : 00000000
Start Date : 10/29/2024
Page No : 3

Groups Printed- Cars - Trucks - Buses

	AURORA STREET From North					EAST MAIN STREET From East					AURORA STREET From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	64	5	2	71	2	0	1	1	4	1	53	0	3	57	0	0	0	0	0	132
03:15 PM	0	49	3	0	52	0	0	1	1	2	3	55	0	0	58	0	0	0	0	0	112
03:30 PM	0	63	5	0	68	0	0	0	0	0	2	49	0	0	51	0	0	0	0	0	119
03:45 PM	0	50	3	0	53	0	0	0	2	2	1	41	0	0	42	0	0	0	0	0	97
Total	0	226	16	2	244	2	0	2	4	8	7	198	0	3	208	0	0	0	0	0	460
04:00 PM	0	97	4	0	101	0	0	2	2	4	4	50	0	2	56	0	0	0	0	0	161
04:15 PM	0	72	13	0	85	1	0	0	1	2	6	42	0	1	49	0	0	0	0	0	136
04:30 PM	0	73	4	1	78	3	0	1	2	6	1	51	0	0	52	0	0	0	0	0	136
04:45 PM	0	82	3	0	85	0	0	1	0	1	3	41	0	0	44	0	0	0	0	0	130
Total	0	324	24	1	349	4	0	4	5	13	14	184	0	3	201	0	0	0	0	0	563
05:00 PM	0	66	2	0	68	0	0	0	5	5	2	43	0	1	46	0	0	0	0	0	119
05:15 PM	0	84	1	0	85	1	0	1	4	6	3	38	0	2	43	0	0	0	0	0	134
05:30 PM	0	82	4	0	86	0	0	0	2	2	1	49	0	0	50	0	0	0	0	0	138
05:45 PM	0	66	7	0	73	0	0	1	1	2	2	49	0	0	51	0	0	0	0	0	126
Total	0	298	14	0	312	1	0	2	12	15	8	179	0	3	190	0	0	0	0	0	517
Grand Total	0	2059	118	10	2187	21	0	24	70	115	75	1440	0	15	1530	0	0	0	2	2	3834
Apprch %	0	94.1	5.4	0.5		18.3	0	20.9	60.9		4.9	94.1	0	1		0	0	0	100		
Total %	0	53.7	3.1	0.3	57	0.5	0	0.6	1.8	3	2	37.6	0	0.4	39.9	0	0	0	0.1	0.1	
Cars	0	1991	114	10	2115	20	0	24	64	108	73	1393	0	15	1481	0	0	0	2	2	3706
% Cars	0	96.7	96.6	100	96.7	95.2	0	100	91.4	93.9	97.3	96.7	0	100	96.8	0	0	0	100	100	96.7
Trucks	0	42	0	0	42	1	0	0	6	7	2	32	0	0	34	0	0	0	0	0	83
% Trucks	0	2	0	0	1.9	4.8	0	0	8.6	6.1	2.7	2.2	0	0	2.2	0	0	0	0	0	2.2
Buses	0	26	4	0	30	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	45

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

% Buses	0	1.3	3.4	0	1.4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1.2

	AURORA STREET From North					EAST MAIN STREET From East					AURORA STREET From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	64	5	0	69	0	0	0	0	0	**3**	53	0	0	56	0	0	0	0	0	125
07:30 AM	0	**79**	4	0	83	1	0	0	0	1	0	**69**	0	0	**69**	0	0	0	0	0	**153**
07:45 AM	0	78	**6**	0	**84**	**2**	0	**1**	0	**3**	0	55	0	0	55	0	0	0	0	0	142
08:00 AM	0	75	4	0	79	0	0	0	**1**	1	0	27	0	0	27	0	0	0	**2**	**2**	109
Total Volume	0	296	19	0	315	3	0	1	1	5	3	204	0	0	207	0	0	0	2	2	529
% App. Total	0	94	6	0		60	0	20	20		1.4	98.6	0	0		0	0	0	100		
PHF	.000	.937	.792	.000	.938	.375	.000	.250	.250	.417	.250	.739	.000	.000	.750	.000	.000	.000	.250	.250	.864
Cars	0	285	18	0	303	3	0	1	1	5	3	193	0	0	196	0	0	0	2	2	506
% Cars	0	96.3	94.7	0	96.2	100	0	100	100	100	100	94.6	0	0	94.7	0	0	0	100	100	95.7
Trucks	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
% Trucks	0	1.0	0	0	1.0	0	0	0	0	0	0	2.0	0	0	1.9	0	0	0	0	0	1.3
Buses	0	8	1	0	9	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	16
% Buses	0	2.7	5.3	0	2.9	0	0	0	0	0	0	3.4	0	0	3.4	0	0	0	0	0	3.0
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	**97**	4	0	**101**	0	0	**2**	**2**	4	4	50	0	**2**	**56**	0	0	0	0	0	**161**
04:15 PM	0	72	**13**	0	85	1	0	0	1	2	**6**	42	0	1	49	0	0	0	0	0	136
04:30 PM	0	73	4	**1**	78	**3**	0	1	2	**6**	1	**51**	0	0	52	0	0	0	0	0	136
04:45 PM	0	82	3	0	85	0	0	1	0	1	3	41	0	0	44	0	0	0	0	0	130
Total Volume	0	324	24	1	349	4	0	4	5	13	14	184	0	3	201	0	0	0	0	0	563
% App. Total	0	92.8	6.9	0.3		30.8	0	30.8	38.5		7	91.5	0	1.5		0	0	0	0		
PHF	.000	.835	.462	.250	.864	.333	.000	.500	.625	.542	.583	.902	.000	.375	.897	.000	.000	.000	.000	.000	.874
Cars	0	317	24	1	342	4	0	4	5	13	13	183	0	3	199	0	0	0	0	0	554
% Cars	0	97.8	100	100	98.0	100	0	100	100	100	92.9	99.5	0	100	99.0	0	0	0	0	0	98.4
Trucks	0	4	0	0	4	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	6
% Trucks	0	1.2	0	0	1.1	0	0	0	0	0	7.1	0.5	0	0	1.0	0	0	0	0	0	1.1
Buses	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% Buses	0	0.9	0	0	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5

VEHICULAR TRAFFIC COUNT SUMMARY

Municipality: Hudson **At Intersection of:** North Main Street (SR 91) **and** Mid-Block Crosswalk

Date: 10/22/2024 **Day:** Tue. **Comments:** **Project:** 24-129

Weather: Clear **Recorder(s):** DJS **Data entry by:** JJO **Date entered:** Oct. 23, 2024

N. Main St & Mid-Block Crosswalk 102224

TIME BEGINS	N. Main St. (SR 91) FROM NORTH						N. Main St. (SR 91) FROM SOUTH						TOTAL NORTH SOUTH	Mid-Block Crosswalk FROM EAST						Mid-Block Crosswalk FROM WEST						TOTAL EAST WEST	TOTAL ALL DIREC.	PEAK HOUR FACTOR			
	Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus		Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus			North	South	East	West
06:00																														
07:00	0	548	0	548	25	8	0	594	0	594	16	12	1142	0	0	0	0	0	0	0	0	0	0	0	0	0	1142	0.801	0.946	0.000	0.000
08:00	0	577	0	577	24	8	0	597	0	597	46	11	1174	0	0	0	0	0	0	0	0	0	0	0	0	0	1174	0.919	0.951	0.000	0.000
09:00	0	566	0	566	43	15	0	453	0	453	40	2	1019	0	0	0	0	0	0	0	0	0	0	0	0	0	1019	0.907	0.839	0.000	0.000
10:00																														
11:00	0	602	8	610	38	3	0	514	0	514	44	1	1124	0	0	0	0	0	0	0	0	0	0	0	0	0	1124	0.847	0.918	0.000	0.000
12:00	0	614	0	614	44	5	0	512	0	512	32	2	1126	0	0	0	0	0	0	0	0	0	0	0	0	0	1126	0.953	0.901	0.000	0.000
1:00	0	580	0	580	34	2	0	512	0	512	38	7	1092	0	0	0	0	0	0	0	0	0	0	0	0	0	1092	0.954	0.908	0.000	0.000
2:00																														
3:00	0	669	0	669	22	7	0	563	0	563	15	5	1232	0	0	0	0	0	0	0	0	0	0	0	0	0	1232	0.899	0.891	0.000	0.000
4:00	0	727	0	727	12	16	0	571	0	571	6	0	1298	0	0	0	0	0	0	0	0	0	0	0	0	0	1298	0.972	0.784	0.000	0.000
5:00	0	736	0	736	9	1	0	635	0	635	5	2	1371	0	0	0	0	0	0	0	0	0	0	0	0	0	1371	0.925	0.980	0.000	0.000
6:00																														
7:00																														
8:00																														
9:00																														
TOTALS	0	5619	8	5627	251	65	0	4951	0	4951	242	42	10578	0	0	0	0	0	0	0	0	0	0	0	0	0	10578				
ADT	0	8211	12	8223	5.6%		0	7235	0	7235	5.7%		15458	0	0	0	0			0	0	0	0			0	15458				

N Leg Hourly Factor:	1.61	E Leg Hourly Factor:	1.57
S Leg Hourly Factor:	1.61	W leg Hourly Factor:	1.57
N Leg Monthly Factor:	0.91	E Leg Monthly Factor:	0.89
S Leg Monthly Factor:	0.91	W Leg Monthly Factor:	0.89

N Leg Combined Factor:	1.46	E Leg Combined Factor:	1.40
S Leg Combined Factor:	1.46	W Leg Combined Factor:	1.40

TMS ENGINEERS, INC.

2112 Case Parkway South #7

Twinsburg, Ohio 44087

(330) 686-6402 FAX: (330) 686-6417

Figure #:

Page #:

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

City: Hudson
Intersection: SR 91 & Mid-Block Crosswalk
Counter: DJS
Day of the Week: Tuesday

File Name : TC 2 SR91 and Mid Block Crosswalk 102224 DJS
Site Code : 00000000
Start Date : 10/22/2024

Groups Printed- Cars - Trucks - Buses

	NORTH MAIN STREET (SR 91) From North					MID BLOCK CROSSWALK From East					NORTH MAIN STREET (SR 91) From South					MID BLOCK CROSSWALK From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	127	0	0	127	0	0	0	1	1	0	157	0	0	157	0	0	0	1	1	286
07:15 AM	0	128	0	0	128	0	0	0	0	0	0	135	0	0	135	0	0	0	1	1	264
07:30 AM	0	114	0	0	114	0	0	0	1	1	0	149	0	0	149	0	0	0	1	1	265
07:45 AM	0	171	0	0	171	0	0	0	0	0	0	153	0	0	153	0	0	0	0	0	324
Total	0	540	0	0	540	0	0	0	2	2	0	594	0	0	594	0	0	0	3	3	1139
08:00 AM	1	140	0	0	141	0	0	0	2	2	0	146	0	0	146	0	0	0	2	2	291
08:15 AM	0	149	0	0	149	0	0	0	0	0	0	149	0	0	149	0	0	0	2	2	300
08:30 AM	0	131	0	0	131	0	0	0	4	4	0	145	0	0	145	0	0	0	0	0	280
08:45 AM	0	157	1	0	158	0	0	0	0	0	0	157	0	0	157	0	0	0	2	2	317
Total	1	577	1	0	579	0	0	0	6	6	0	597	0	0	597	0	0	0	6	6	1188
09:00 AM	0	143	0	0	143	0	0	0	3	3	0	135	0	0	135	0	0	0	1	1	282
09:15 AM	0	127	0	0	127	0	0	0	6	6	0	93	0	0	93	0	0	0	3	3	229
09:30 AM	0	140	0	0	140	0	0	0	3	3	0	107	0	0	107	0	0	0	0	0	250
09:45 AM	0	156	0	0	156	0	0	0	4	4	0	118	0	0	118	0	0	0	11	11	289
Total	0	566	0	0	566	0	0	0	16	16	0	453	0	0	453	0	0	0	15	15	1050
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

File Name : TC 2 SR91 and Mid Block Crosswalk 102224 DJS
Site Code : 00000000
Start Date : 10/22/2024

Groups Printed- Cars - Trucks - Buses

	NORTH MAIN STREET (SR 91) From North					MID BLOCK CROSSWALK From East					NORTH MAIN STREET (SR 91) From South					MID BLOCK CROSSWALK From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	119	0	0	119	0	0	0	2	2	0	125	0	0	125	0	0	0	6	6	252
11:15 AM	0	180	0	0	180	0	0	0	3	3	0	140	0	0	140	0	0	0	3	3	326
11:30 AM	0	147	0	0	147	0	0	0	4	4	0	123	0	0	123	0	0	0	2	2	276
11:45 AM	1	156	0	0	157	0	0	0	10	10	0	126	0	0	126	0	0	0	0	0	293
Total	1	602	0	0	603	0	0	0	19	19	0	514	0	0	514	0	0	0	11	11	1147
12:00 PM	0	148	0	0	148	0	0	0	27	27	0	134	0	0	134	0	0	0	0	0	309
12:15 PM	0	146	0	0	146	0	0	0	11	11	0	142	0	0	142	0	0	0	2	2	301
12:30 PM	0	161	0	0	161	0	0	0	5	5	0	117	0	0	117	0	0	0	2	2	285
12:45 PM	0	159	0	0	159	0	0	0	2	2	0	119	0	0	119	0	0	0	1	1	281
Total	0	614	0	0	614	0	0	0	45	45	0	512	0	0	512	0	0	0	5	5	1176
01:00 PM	0	152	0	0	152	0	0	0	1	1	0	138	0	0	138	0	0	0	7	7	298
01:15 PM	0	150	0	0	150	0	0	0	1	1	0	141	0	0	141	0	0	0	0	0	292
01:30 PM	0	135	0	0	135	0	0	0	3	3	0	117	0	0	117	0	0	0	0	0	255
01:45 PM	0	143	0	0	143	0	0	0	7	7	0	116	0	0	116	0	0	0	3	3	269
Total	0	580	0	0	580	0	0	0	12	12	0	512	0	0	512	0	0	0	10	10	1114
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

File Name : TC 2 SR91 and Mid Block Crosswalk 102224 DJS
Site Code : 00000000
Start Date : 10/22/2024
Page No : 3

Groups Printed- Cars - Trucks - Buses

	NORTH MAIN STREET (SR 91) From North					MID BLOCK CROSSWALK From East					NORTH MAIN STREET (SR 91) From South					MID BLOCK CROSSWALK From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	151	0	0	151	0	0	0	4	4	0	129	0	0	129	0	0	0	0	0	284
03:15 PM	0	149	0	0	149	0	0	0	5	5	0	142	0	0	142	0	0	0	4	4	300
03:30 PM	0	183	0	0	183	0	0	0	0	0	0	158	0	0	158	0	0	0	2	2	343
03:45 PM	0	186	0	0	186	0	0	0	10	10	0	134	0	0	134	0	0	0	2	2	332
Total	0	669	0	0	669	0	0	0	19	19	0	563	0	0	563	0	0	0	8	8	1259
04:00 PM	0	187	0	0	187	0	0	0	2	2	0	106	0	0	106	0	0	0	10	10	305
04:15 PM	0	184	0	0	184	0	0	0	0	0	0	130	0	0	130	0	0	0	1	1	315
04:30 PM	0	169	0	0	169	0	0	0	3	3	0	153	0	0	153	0	0	0	7	7	332
04:45 PM	0	187	0	0	187	0	0	0	1	1	0	182	0	0	182	0	0	0	4	4	374
Total	0	727	0	0	727	0	0	0	6	6	0	571	0	0	571	0	0	0	22	22	1326
05:00 PM	0	199	0	0	199	0	0	0	6	6	0	151	0	0	151	0	0	0	4	4	360
05:15 PM	0	196	0	0	196	0	0	0	1	1	0	162	0	0	162	0	0	0	3	3	362
05:30 PM	0	171	0	0	171	0	0	0	9	9	0	162	0	0	162	0	0	0	5	5	347
05:45 PM	0	170	0	0	170	0	0	0	8	8	0	160	0	0	160	0	0	0	2	2	340
Total	0	736	0	0	736	0	0	0	24	24	0	635	0	0	635	0	0	0	14	14	1409
Grand Total	2	5611	1	0	5614	0	0	0	149	149	0	4951	0	0	4951	0	0	0	94	94	10808
Apprch %	0	99.9	0	0		0	0	0	100		0	100	0	0		0	0	0	100		
Total %	0	51.9	0	0	51.9	0	0	0	1.4	1.4	0	45.8	0	0	45.8	0	0	0	0.9	0.9	
Cars	0	5295	0	0	5295	0	0	0	143	143	0	4667	0	0	4667	0	0	0	94	94	10199
% Cars	0	94.4	0	0	94.3	0	0	0	96	96	0	94.3	0	0	94.3	0	0	0	100	100	94.4
Trucks	2	251	0	0	253	0	0	0	6	6	0	242	0	0	242	0	0	0	0	0	501
% Trucks	100	4.5	0	0	4.5	0	0	0	4	4	0	4.9	0	0	4.9	0	0	0	0	0	4.6
Buses	0	65	1	0	66	0	0	0	0	0	0	42	0	0	42	0	0	0	0	0	108

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

% Buses	0	1.2	100	0	1.2	0	0	0	0	0	0	0.8	0	0	0.8	0	0	0	0	0	1

	NORTH MAIN STREET (SR 91) From North					MID BLOCK CROSSWALK From East					NORTH MAIN STREET (SR 91) From South					MID BLOCK CROSSWALK From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	**171**	0	0	**171**	0	0	0	0	0	0	**153**	0	0	**153**	0	0	0	0	0	**324**
08:00 AM	**1**	140	0	0	141	0	0	0	2	2	0	146	0	0	146	0	0	0	**2**	**2**	291
08:15 AM	0	149	0	0	149	0	0	0	0	0	0	149	0	0	149	0	0	0	2	2	300
08:30 AM	0	131	0	0	131	0	0	0	**4**	**4**	0	145	0	0	145	0	0	0	0	0	280
Total Volume	1	591	0	0	592	0	0	0	6	6	0	593	0	0	593	0	0	0	4	4	1195
% App. Total	0.2	99.8	0	0		0	0	0	100		0	100	0	0		0	0	0	100		
PHF	.250	.864	.000	.000	.865	.000	.000	.000	.375	.375	.000	.969	.000	.000	.969	.000	.000	.000	.500	.500	.922
Cars	0	559	0	0	559	0	0	0	5	5	0	540	0	0	540	0	0	0	4	4	1108
% Cars	0	94.6	0	0	94.4	0	0	0	83.3	83.3	0	91.1	0	0	91.1	0	0	0	100	100	92.7
Trucks	1	25	0	0	26	0	0	0	1	1	0	43	0	0	43	0	0	0	0	0	70
% Trucks	100	4.2	0	0	4.4	0	0	0	16.7	16.7	0	7.3	0	0	7.3	0	0	0	0	0	5.9
Buses	0	7	0	0	7	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	17
% Buses	0	1.2	0	0	1.2	0	0	0	0	0	0	1.7	0	0	1.7	0	0	0	0	0	1.4
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	187	0	0	187	0	0	0	1	1	0	**182**	0	0	**182**	0	0	0	4	4	**374**
05:00 PM	0	**199**	0	0	**199**	0	0	0	6	6	0	151	0	0	151	0	0	0	4	4	360
05:15 PM	0	196	0	0	196	0	0	0	1	1	0	162	0	0	162	0	0	0	3	3	362
05:30 PM	0	171	0	0	171	0	0	0	**9**	**9**	0	162	0	0	162	0	0	0	**5**	**5**	347
Total Volume	0	753	0	0	753	0	0	0	17	17	0	657	0	0	657	0	0	0	16	16	1443
% App. Total	0	100	0	0		0	0	0	100		0	100	0	0		0	0	0	100		
PHF	.000	.946	.000	.000	.946	.000	.000	.000	.472	.472	.000	.902	.000	.000	.902	.000	.000	.000	.800	.800	.965
Cars	0	742	0	0	742	0	0	0	16	16	0	649	0	0	649	0	0	0	16	16	1423
% Cars	0	98.5	0	0	98.5	0	0	0	94.1	94.1	0	98.8	0	0	98.8	0	0	0	100	100	98.6
Trucks	0	10	0	0	10	0	0	0	1	1	0	7	0	0	7	0	0	0	0	0	18
% Trucks	0	1.3	0	0	1.3	0	0	0	5.9	5.9	0	1.1	0	0	1.1	0	0	0	0	0	1.2
Buses	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Buses	0	0.1	0	0	0.1	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0.1

VEHICULAR TRAFFIC COUNT SUMMARY

Municipality: Hudson **At Intersection of:** North Main Street (SR 91) **and** Church Street / Park Lane

Date: 10/22/2024 **Day:** Tue. **Comments:** **Project:** 24-129

Weather: Clear **Recorder(s):** KPB **Data entry by:** JJO **Date entered:** Oct. 23, 2024

N. Main St & Church St + Park Ln 102224

TIME BEGINS	N. Main St. (SR 91) FROM NORTH						N. Main St. (SR 91) FROM SOUTH						TOTAL NORTH SOUTH	Church St. FROM EAST						Park Ln. FROM WEST						TOTAL EAST WEST	TOTAL ALL DIREC.	PEAK HOUR FACTOR			
	Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus		Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus			North	South	East	West
06:00																														
07:00	0	495	2	497	23	7	13	530	7	550	17	11	1047	0	0	0	0	0	0	0	0	11	11	1	0	11	1058	0.823	0.982	0.000	0.688
08:00	0	523	6	529	22	7	28	535	10	573	40	12	1102	0	0	0	0	0	0	0	0	6	6	1	0	6	1108	0.938	0.949	0.000	0.750
09:00	5	495	5	505	37	14	53	426	16	495	36	2	1000	0	0	0	0	0	0	0	0	16	16	0	0	16	1016	0.915	0.809	0.000	0.364
10:00																														
11:00	4	495	16	515	28	3	62	427	8	497	37	1	1012	0	0	0	0	0	0	0	0	31	31	1	0	31	1043	0.847	0.894	0.000	0.596
12:00	5	535	14	554	33	4	69	428	14	511	29	1	1065	0	0	0	0	0	0	1	0	53	54	2	0	54	1119	0.923	0.919	0.000	0.675
1:00	2	472	19	493	24	2	35	406	12	453	32	7	946	0	0	0	0	0	0	0	0	43	43	1	0	43	989	0.948	0.815	0.000	0.632
2:00																														
3:00	3	502	13	518	19	3	41	452	14	507	15	4	1025	0	0	0	0	0	0	0	0	25	25	1	0	25	1050	0.906	0.905	0.000	0.694
4:00	2	562	12	576	9	14	71	449	13	533	5	0	1109	0	0	0	0	0	0	0	0	48	48	0	0	48	1157	0.947	0.888	0.000	0.800
5:00	1	505	12	518	9	1	62	468	16	546	3	2	1064	0	0	0	0	0	0	0	0	46	46	0	0	46	1110	0.906	0.922	0.000	0.605
6:00																														
7:00																														
8:00																														
9:00																														
TOTALS	22	4584	99	4705	204	55	434	4121	110	4665	214	40	9370	0	0	0	0	0	0	1	0	279	280	7	0	280	9650				
ADT	32	6699	145	6875	5.5%		634	6022	161	6817	5.4%		13692	0	0	0	0			1	0	392	393	2.5%		393	14085				

N Leg Hourly Factor:	1.61	E Leg Hourly Factor:	1.57
S Leg Hourly Factor:	1.61	W leg Hourly Factor:	1.57
N Leg Monthly Factor:	0.91	E Leg Monthly Factor:	0.89
S Leg Monthly Factor:	0.91	W Leg Monthly Factor:	0.89

N Leg Combined Factor:	1.46	E Leg Combined Factor:	1.40
S Leg Combined Factor:	1.46	W Leg Combined Factor:	1.40

TMS ENGINEERS, INC.

2112 Case Parkway South #7

Twinsburg, Ohio 44087

(330) 686-6402 FAX: (330) 686-6417

Figure #:

Page #:

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

City: Hudson
Intersection: SR 91 & Church St + Park Ln
Counter: KPB
Day of the Week: Tuesday

File Name : N Main St and Church St-Park Lane 10-22-2024 KB
Site Code : 00000000
Start Date : 10/22/2024

Groups Printed- Cars - Trucks - Busses

	NORTH MAIN STREET (SR 91) From North					CHURCH STREET From East					NORTH MAIN STREET (SR 91) From South					PARK LANE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	110	0	1	111	0	0	0	0	0	2	136	2	1	141	2	0	0	0	2	254
07:15 AM	1	120	0	1	122	0	0	0	2	2	2	130	1	2	135	4	0	0	1	5	264
07:30 AM	1	114	0	1	116	0	0	0	0	0	3	131	6	0	140	3	0	0	0	3	259
07:45 AM	0	151	0	1	152	0	0	0	0	0	0	133	4	0	137	2	0	0	0	2	291
Total	2	495	0	4	501	0	0	0	2	2	7	530	13	3	553	11	0	0	1	12	1068
08:00 AM	0	121	0	0	121	0	0	0	1	1	2	134	5	0	141	0	0	0	0	0	263
08:15 AM	2	138	0	0	140	0	0	0	1	1	2	141	8	0	151	2	0	0	0	2	294
08:30 AM	2	125	0	0	127	0	0	0	0	0	2	129	7	0	138	2	0	0	0	2	267
08:45 AM	2	139	0	0	141	0	0	0	3	3	4	131	8	0	143	2	0	0	1	3	290
Total	6	523	0	0	529	0	0	0	5	5	10	535	28	0	573	6	0	0	1	7	1114
09:00 AM	1	136	1	0	138	0	0	0	0	0	5	132	16	0	153	2	0	0	0	2	293
09:15 AM	1	118	0	1	120	0	0	0	1	1	4	89	7	0	100	11	0	0	0	11	232
09:30 AM	1	124	4	1	130	0	0	0	1	1	2	95	7	0	104	3	0	0	0	3	238
09:45 AM	2	117	0	1	120	0	0	0	3	3	5	110	23	0	138	0	0	0	4	4	265
Total	5	495	5	3	508	0	0	0	5	5	16	426	53	0	495	16	0	0	4	20	1028
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

File Name : N Main St and Church St-Park Lane 10-22-2024 KB
Site Code : 00000000
Start Date : 10/22/2024

Groups Printed- Cars - Trucks - Busses

	NORTH MAIN STREET (SR 91) From North					CHURCH STREET From East					NORTH MAIN STREET (SR 91) From South					PARK LANE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	98	1	2	101	0	0	0	2	2	2	110	12	2	126	5	0	0	2	7	236
11:15 AM	1	150	1	0	152	0	0	0	6	6	4	121	14	2	141	5	0	0	0	5	304
11:30 AM	7	114	1	0	122	0	0	0	0	0	1	99	15	0	115	13	0	0	0	13	250
11:45 AM	8	133	1	2	144	0	0	0	5	5	1	97	21	1	120	8	0	0	1	9	278
Total	16	495	4	4	519	0	0	0	13	13	8	427	62	5	502	31	0	0	3	34	1068
12:00 PM	3	140	1	1	145	0	0	0	3	3	2	117	20	0	139	20	0	0	0	20	307
12:15 PM	6	118	1	1	126	0	0	0	5	5	7	111	20	2	140	9	0	0	3	12	283
12:30 PM	1	134	0	1	136	0	0	0	1	1	1	97	13	1	112	13	0	1	6	20	269
12:45 PM	4	143	3	2	152	0	0	0	9	9	4	103	16	3	126	11	0	0	1	12	299
Total	14	535	5	5	559	0	0	0	18	18	14	428	69	6	517	53	0	1	10	64	1158
01:00 PM	4	119	0	2	125	0	0	0	4	4	4	123	12	2	141	10	0	0	6	16	286
01:15 PM	4	112	0	9	125	0	0	0	1	1	2	93	12	0	107	6	0	0	1	7	240
01:30 PM	3	121	0	0	124	0	0	0	0	0	1	98	5	2	106	10	0	0	4	14	244
01:45 PM	8	120	2	2	132	0	0	0	4	4	5	92	6	0	103	17	0	0	0	17	256
Total	19	472	2	13	506	0	0	0	9	9	12	406	35	4	457	43	0	0	11	54	1026
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

File Name : N Main St and Church St-Park Lane 10-22-2024 KB
Site Code : 00000000
Start Date : 10/22/2024
Page No : 3

Groups Printed- Cars - Trucks - Busses

	NORTH MAIN STREET (SR 91) From North					CHURCH STREET From East					NORTH MAIN STREET (SR 91) From South					PARK LANE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	4	117	0	2	123	0	0	0	2	2	3	112	15	0	130	9	0	0	0	9	264
03:15 PM	2	140	1	0	143	0	0	0	0	0	5	128	7	3	143	6	0	0	0	6	292
03:30 PM	5	124	2	0	131	0	0	0	2	2	0	111	9	0	120	6	0	0	0	6	259
03:45 PM	2	121	0	0	123	0	0	0	1	1	6	101	10	0	117	4	0	0	1	5	246
Total	13	502	3	2	520	0	0	0	5	5	14	452	41	3	510	25	0	0	1	26	1061
04:00 PM	1	134	0	3	138	0	0	0	6	6	3	83	12	3	101	12	0	0	0	12	257
04:15 PM	4	147	1	0	152	0	0	0	2	2	3	111	22	1	137	10	0	0	0	10	301
04:30 PM	4	140	0	2	146	0	0	0	1	1	4	124	22	0	150	11	0	0	1	12	309
04:45 PM	3	141	1	1	146	0	0	0	3	3	3	131	15	5	154	15	0	0	2	17	320
Total	12	562	2	6	582	0	0	0	12	12	13	449	71	9	542	48	0	0	3	51	1187
05:00 PM	3	134	0	0	137	0	0	0	4	4	7	128	13	2	150	19	0	0	0	19	310
05:15 PM	4	139	0	3	146	0	0	0	1	1	0	111	15	0	126	3	0	0	1	4	277
05:30 PM	2	112	0	6	120	0	0	0	2	2	2	107	17	0	126	8	0	0	1	9	257
05:45 PM	3	120	1	5	129	0	0	0	6	6	7	122	17	0	146	16	0	0	2	18	299
Total	12	505	1	14	532	0	0	0	13	13	16	468	62	2	548	46	0	0	4	50	1143
Grand Total	99	4584	22	51	4756	0	0	0	82	82	110	4121	434	32	4697	279	0	1	38	318	9853
Apprch %	2.1	96.4	0.5	1.1		0	0	0	100		2.3	87.7	9.2	0.7		87.7	0	0.3	11.9		
Total %	1	46.5	0.2	0.5	48.3	0	0	0	0.8	0.8	1.1	41.8	4.4	0.3	47.7	2.8	0	0	0.4	3.2	
Cars	97	4328	21	51	4497	0	0	0	82	82	107	3882	422	32	4443	272	0	1	38	311	9333
% Cars	98	94.4	95.5	100	94.6	0	0	0	100	100	97.3	94.2	97.2	100	94.6	97.5	0	100	100	97.8	94.7
Trucks	1	202	1	0	204	0	0	0	0	0	1	202	11	0	214	7	0	0	0	7	425
% Trucks	1	4.4	4.5	0	4.3	0	0	0	0	0	0.9	4.9	2.5	0	4.6	2.5	0	0	0	2.2	4.3
Busses	1	54	0	0	55	0	0	0	0	0	2	37	1	0	40	0	0	0	0	0	95

TMS Engineers, Inc.

2112 Case Parkway South #7
Twinsburg, Ohio 44087
Transportation Management Services

% Busses	1	1.2	0	0	1.2	0	0	0	0	0	1.8	0.9	0.2	0	0.9	0	0	0	0	0	1

	NORTH MAIN STREET (SR 91) From North					CHURCH STREET From East					NORTH MAIN STREET (SR 91) From South					PARK LANE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	**2**	138	0	0	140	0	0	0	1	1	2	**141**	8	0	151	**2**	0	0	0	2	**294**
08:30 AM	2	125	0	0	127	0	0	0	0	0	2	129	7	0	138	2	0	0	0	2	267
08:45 AM	2	**139**	0	0	**141**	0	0	0	**3**	**3**	4	131	8	0	143	2	0	0	**1**	**3**	290
09:00 AM	1	136	**1**	0	138	0	0	0	0	0	**5**	132	**16**	0	**153**	2	0	0	0	2	293
Total Volume	7	538	1	0	546	0	0	0	4	4	13	533	39	0	585	8	0	0	1	9	1144
% App. Total	1.3	98.5	0.2	0		0	0	0	100		2.2	91.1	6.7	0		88.9	0	0	11.1		
PHF	.875	.968	.250	.000	.968	.000	.000	.000	.333	.333	.650	.945	.609	.000	.956	1.00	.000	.000	.250	.750	.973
Cars	7	498	1	0	506	0	0	0	4	4	12	483	37	0	532	7	0	0	1	8	1050
% Cars	100	92.6	100	0	92.7	0	0	0	100	100	92.3	90.6	94.9	0	90.9	87.5	0	0	100	88.9	91.8
Trucks	0	23	0	0	23	0	0	0	0	0	1	41	1	0	43	1	0	0	0	1	67
% Trucks	0	4.3	0	0	4.2	0	0	0	0	0	7.7	7.7	2.6	0	7.4	12.5	0	0	0	11.1	5.9
Busses	0	17	0	0	17	0	0	0	0	0	0	9	1	0	10	0	0	0	0	0	27
% Busses	0	3.2	0	0	3.1	0	0	0	0	0	0	1.7	2.6	0	1.7	0	0	0	0	0	2.4
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	**4**	**147**	**1**	0	**152**	0	0	0	2	2	3	111	**22**	1	137	10	0	0	0	10	301
04:30 PM	4	140	0	**2**	146	0	0	0	1	1	4	124	22	0	150	11	0	0	1	12	309
04:45 PM	3	141	1	1	146	0	0	0	3	3	3	**131**	15	**5**	**154**	15	0	0	**2**	17	**320**
05:00 PM	3	134	0	0	137	0	0	0	**4**	**4**	**7**	128	13	2	150	**19**	0	0	0	**19**	310
Total Volume	14	562	2	3	581	0	0	0	10	10	17	494	72	8	591	55	0	0	3	58	1240
% App. Total	2.4	96.7	0.3	0.5		0	0	0	100		2.9	83.6	12.2	1.4		94.8	0	0	5.2		
PHF	.875	.956	.500	.375	.956	.000	.000	.000	.625	.625	.607	.943	.818	.400	.959	.724	.000	.000	.375	.763	.969
Cars	13	546	2	3	564	0	0	0	10	10	17	490	71	8	586	55	0	0	3	58	1218
% Cars	92.9	97.2	100	100	97.1	0	0	0	100	100	100	99.2	98.6	100	99.2	100	0	0	100	100	98.2
Trucks	0	7	0	0	7	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	11
% Trucks	0	1.2	0	0	1.2	0	0	0	0	0	0	0.6	1.4	0	0.7	0	0	0	0	0	0.9
Busses	1	9	0	0	10	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	11
% Busses	7.1	1.6	0	0	1.7	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0.9

Appendix D
PHB Evaluation Results

Form 496-19 Pedestrian Hybrid Evaluation Matrix

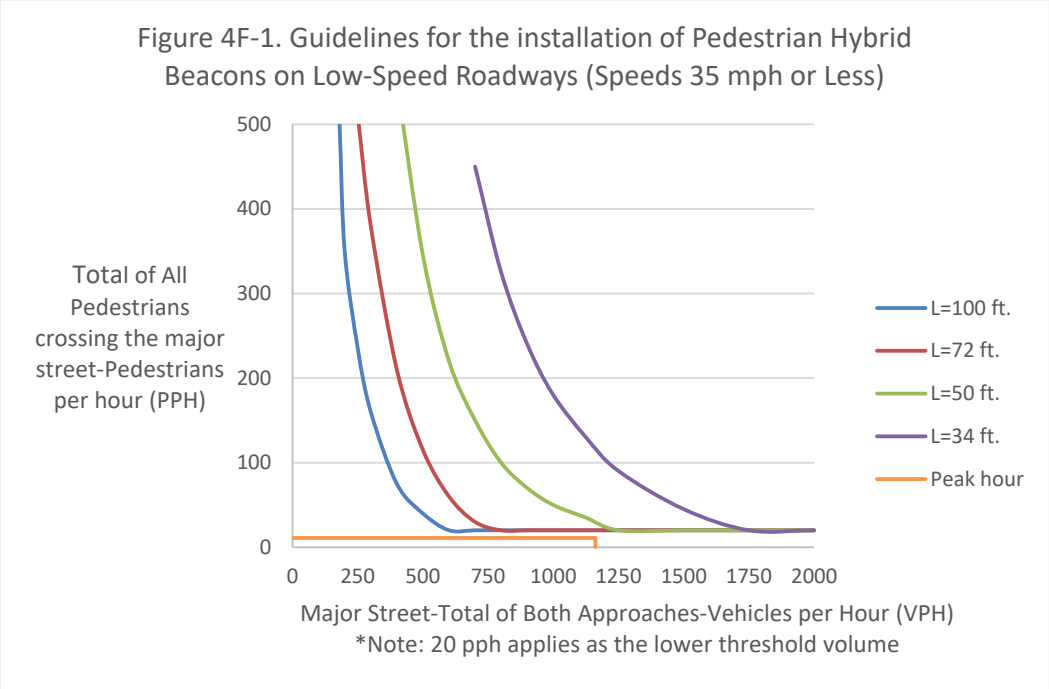
The study and completed form shall be sent to the Office of Traffic Operations for review and approval of the proposed PHB that will be ODOT owned and maintained. Additionally, in cases with Federal and State funding, the Office of Traffic Operations shall review the study and justification.

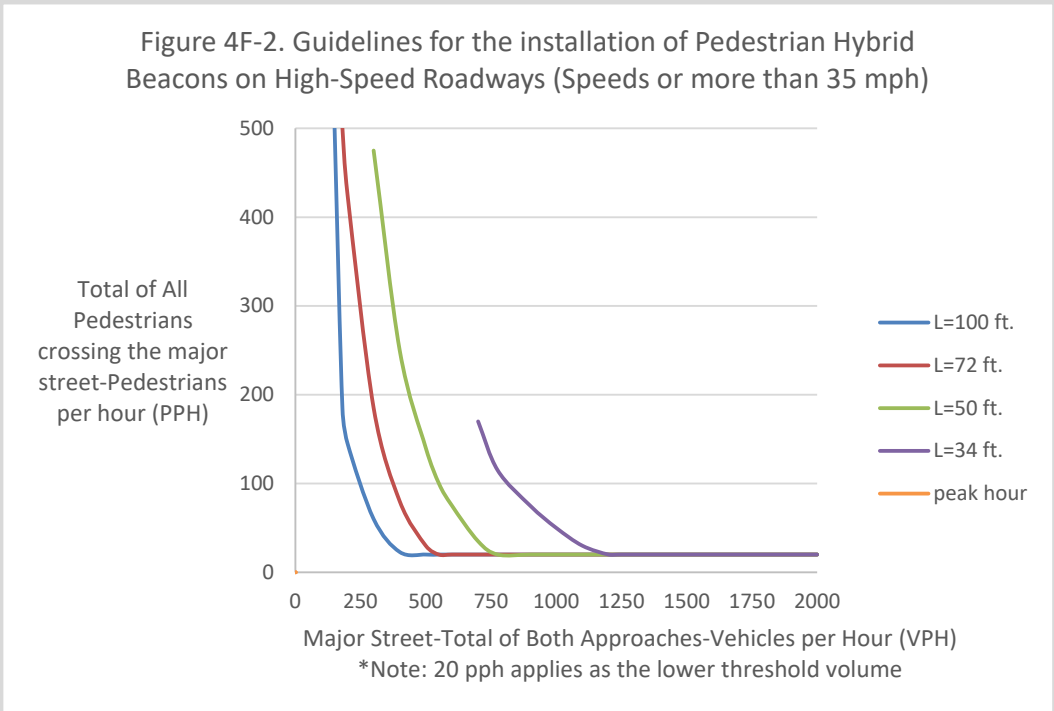
Location:	Aurora Street & E. Main Street Intersection
Date:	11/8/2024
Analyzed:	AJP

	Points and considerations	Inputs		Points Awarded	Max Points Possible
Pedestrian and Bicycle Crashes at intersection	Crashes over a recent 3 year period: 5 points per crash	0		0	**20**
Vehicular crashes at intersection	Crashes over a recent 3 year period: 2 points per crash	0		0	**10**
Street Traffic Volume	<12,000=0 pts 12,000-15,000 w/median=10 pts >15,000 w/median=20 pts >15,000 w/o median=30 pts	<12,000		0	**30**
Number of lanes at peak hour	2 lanes in each direction=20 pts Each additional lane=5 pts If one-way, 1 lane=10 pts, each additional lane=10 pts	1	Each Direction	20	**30**
Elderly/disabled population density (65+, based on 2010 census tracts)	<5%=0 pts 5-11%=5 pts >11%=10 pts	>11%		10	**10**
Proximity to school (pre-K-HS)	5 pts per school w/in 1/4 mile 2 pts per school w/in 1/2 mile	2		2	**15**
Connection to parks, rec ctr, libraries, commercial zone, or other large ped generator	5 pts per facility or zone w/in 1/4 mile, 2 pts per facility or zone w/in 1/2 mile	5		5	**15**
Metro Station Bus Stop presence and use (each stop)	<50 daily boardings=5 pts 50-150 daily boardings=10 pts >150 daily boardings or Metro Station w/in 2 blocks=20 pts	<50 daily boardings		5	**20**
Posted speed limit	25-30 mph=10 pts >30 mph=15 pts	25-30 mph		10	**15**
Distance to nearest signalized intersection	<300 ft.=0 pts 300-500 ft.=20 pts >500 ft.=30 pts	300-500 ft.		20	**30**
Crossing part of designated bike route	Yes=5 pts	No		0	**5**
		TOTAL LOCATION SCORE:		**72**	200
Notes and comments:				**Score:**	**36.00%**

Speed limit	25

Figure 4F-1		Figure 4F-2	
Plot Points		Plot Points	
0	11	1161	0
1161	11	1161	11





Form 496-19 Pedestrian Hybrid Evaluation Matrix

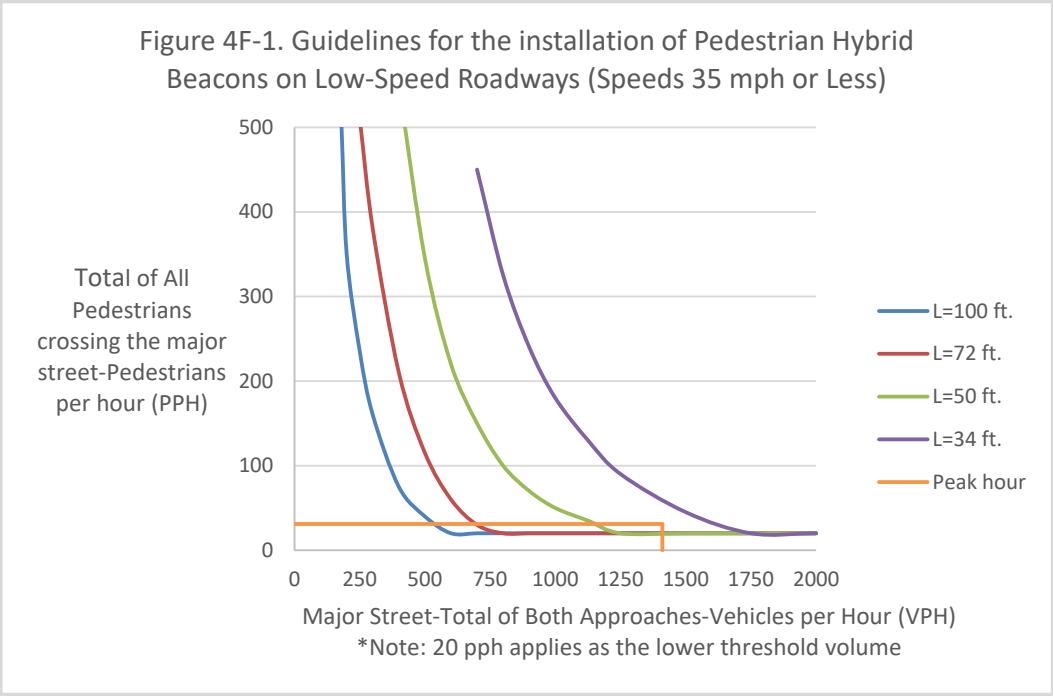
The study and completed form shall be sent to the Office of Traffic Operations for review and approval of the proposed PHB that will be ODOT owned and maintained. Additionally, in cases with Federal and State funding, the Office of Traffic Operations shall review the study and justification.

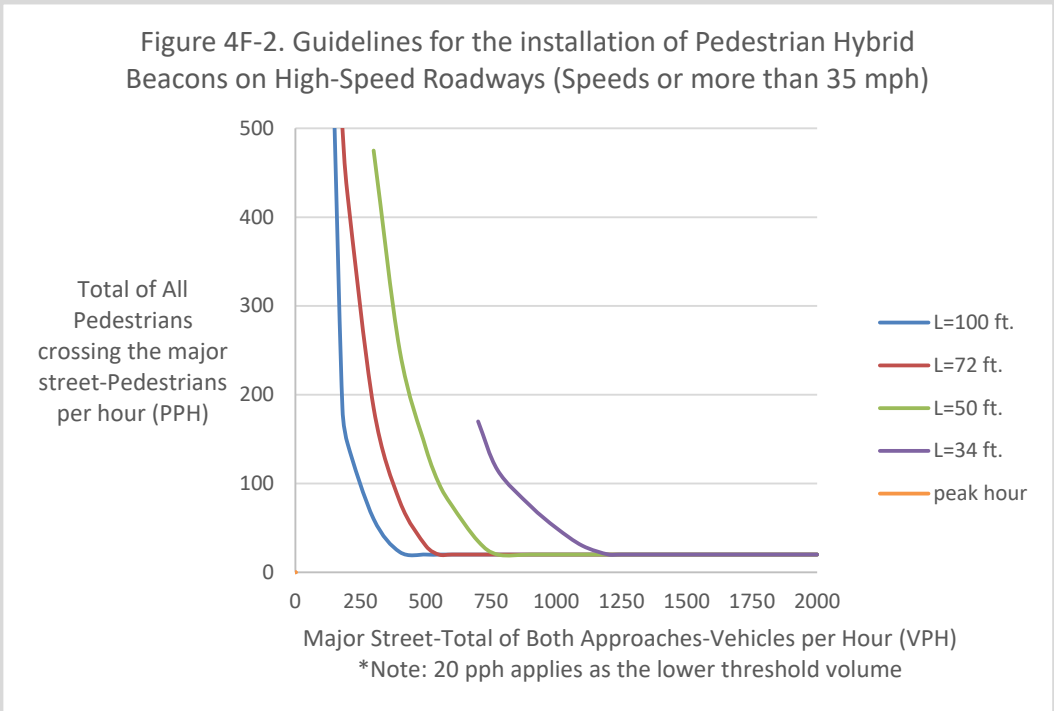
Location:	SR 91 & Mid-Block Crosswalk
Date:	11/8/2024
Analyzed:	AJP

	Points and considerations	Inputs		Points Awarded	Max Points Possible
Pedestrian and Bicycle Crashes at intersection	Crashes over a recent 3 year period: 5 points per crash	0		0	**20**
Vehicular crashes at intersection	Crashes over a recent 3 year period: 2 points per crash	0		0	**10**
Street Traffic Volume	<12,000=0 pts 12,000-15,000 w/median=10 pts >15,000 w/median=20 pts >15,000 w/o median=30 pts	>15,000 w/o median		30	**30**
Number of lanes at peak hour	2 lanes in each direction=20 pts Each additional lane=5 pts If one-way, 1 lane=10 pts, each additional lane=10 pts	1	Each Direction	20	**30**
Elderly/disabled population density (65+, based on 2010 census tracts)	<5%=0 pts 5-11%=5 pts >11%=10 pts	>11%		10	**10**
Proximity to school (pre-K-HS)	5 pts per school w/in 1/4 mile 2 pts per school w/in 1/2 mile	2		2	**15**
Connection to parks, rec ctr, libraries, commercial zone, or other large ped generator	5 pts per facility or zone w/in 1/4 mile, 2 pts per facility or zone w/in 1/2 mile	5		5	**15**
Metro Station Bus Stop presence and use (each stop)	<50 daily boardings=5 pts 50-150 daily boardings=10 pts >150 daily boardings or Metro Station w/in 2 blocks=20 pts	<50 daily boardings		5	**20**
Posted speed limit	25-30 mph=10 pts >30 mph=15 pts	25-30 mph		10	**15**
Distance to nearest signalized intersection	<300 ft.=0 pts 300-500 ft.=20 pts >500 ft.=30 pts	300-500 ft.		20	**30**
Crossing part of designated bike route	Yes=5 pts	No		0	**5**
			TOTAL LOCATION SCORE:	**102**	200
Notes and comments:				**Score:**	**51.00%**

Speed limit	25

Figure 4F-1				Figure 4F-2	
Plot Points		Plot Points		Plot Points	Plot Points
0	31	1410	0		
1410	31	1410	31		





Form 496-19 Pedestrian Hybrid Evaluation Matrix

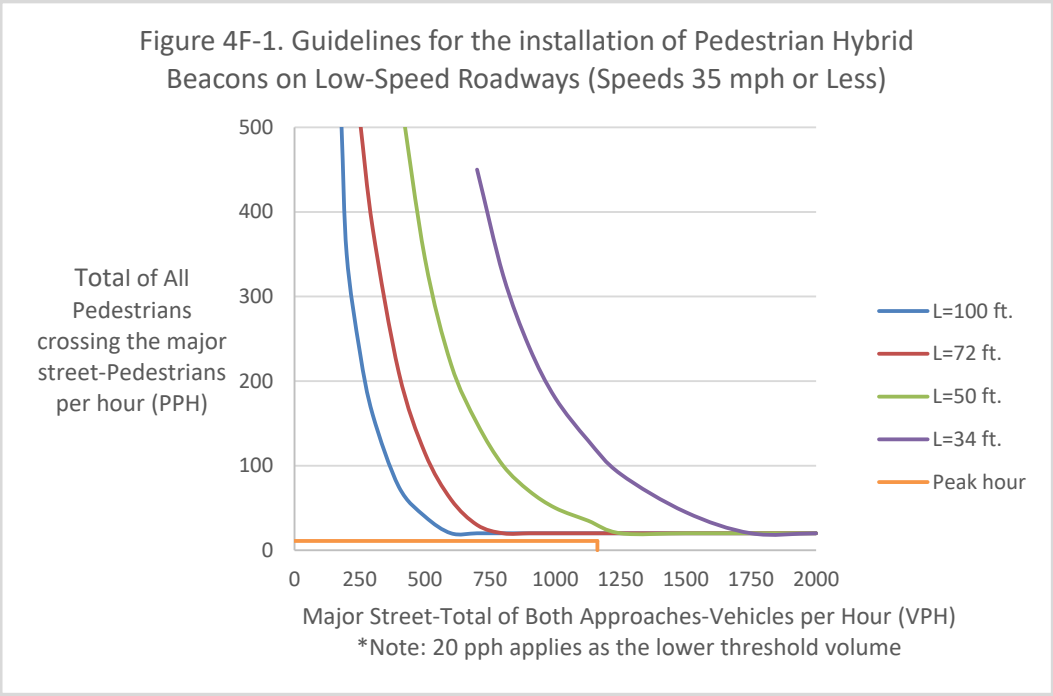
The study and completed form shall be sent to the Office of Traffic Operations for review and approval of the proposed PHB that will be ODOT owned and maintained. Additionally, in cases with Federal and State funding, the Office of Traffic Operations shall review the study and justification.

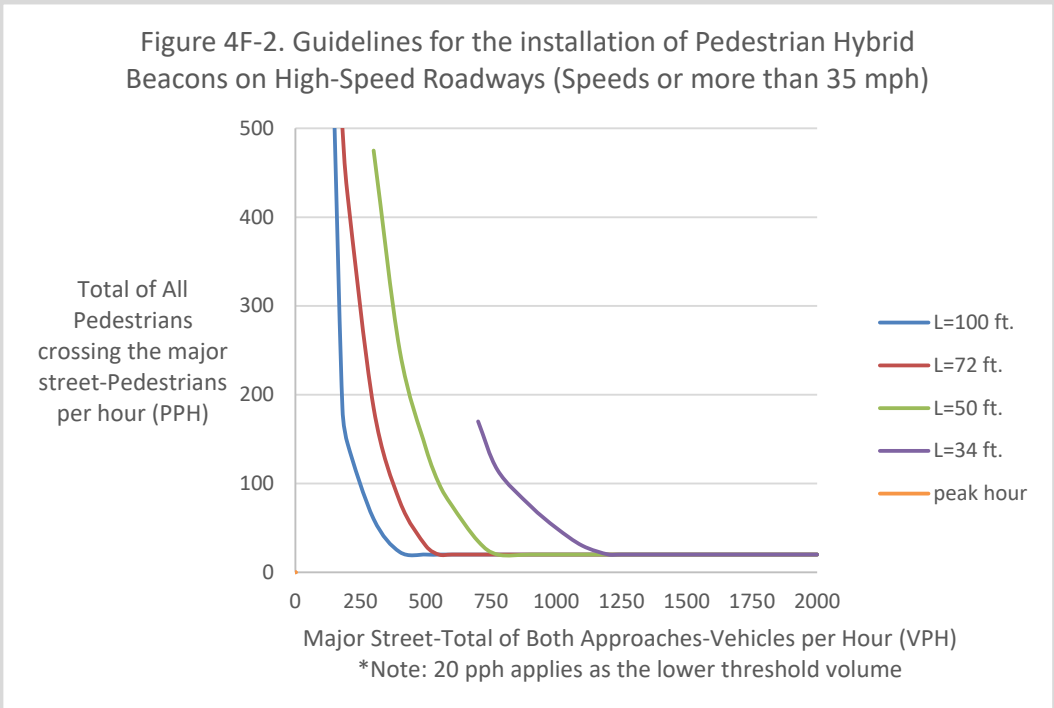
Location:	SR 91 & Church Street
Date:	11/8/2024
Analyzed:	AJP

	Points and considerations	Inputs		Points Awarded	Max Points Possible
Pedestrian and Bicycle Crashes at intersection	Crashes over a recent 3 year period: 5 points per crash	0		0	**20**
Vehicular crashes at intersection	Crashes over a recent 3 year period: 2 points per crash	0		0	**10**
Street Traffic Volume	<12,000=0 pts 12,000-15,000 w/median=10 pts >15,000 w/median=20 pts >15,000 w/o median=30 pts	>15,000 w/o median		30	**30**
Number of lanes at peak hour	2 lanes in each direction=20 pts Each additional lane=5 pts If one-way, 1 lane=10 pts, each additional lane=10 pts	1	Each Direction	20	**30**
Elderly/disabled population density (65+, based on 2010 census tracts)	<5%=0 pts 5-11%=5 pts >11%=10 pts	>11%		10	**10**
Proximity to school (pre-K-HS)	5 pts per school w/in 1/4 mile 2 pts per school w/in 1/2 mile	2		2	**15**
Connection to parks, rec ctr, libraries, commercial zone, or other large ped generator	5 pts per facility or zone w/in 1/4 mile, 2 pts per facility or zone w/in 1/2 mile	5		5	**15**
Metro Station Bus Stop presence and use (each stop)	<50 daily boardings=5 pts 50-150 daily boardings=10 pts >150 daily boardings or Metro Station w/in 2 blocks=20 pts	<50 daily boardings		5	**20**
Posted speed limit	25-30 mph=10 pts >30 mph=15 pts	25-30 mph		10	**15**
Distance to nearest signalized intersection	<300 ft.=0 pts 300-500 ft.=20 pts >500 ft.=30 pts	300-500 ft.		20	**30**
Crossing part of designated bike route	Yes=5 pts	No		0	**5**
		TOTAL LOCATION SCORE:		**102**	200
Notes and comments:				**Score:**	**51.00%**

Speed limit	25

Figure 4F-1				Figure 4F-2	
Plot Points		Plot Points		Plot Points	Plot Points
0	11	1161	0		
1161	11	1161	11		





Appendix E
NCHRP Report 562 Results

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in conjunction with, and not independent of, Appendix A documentation.

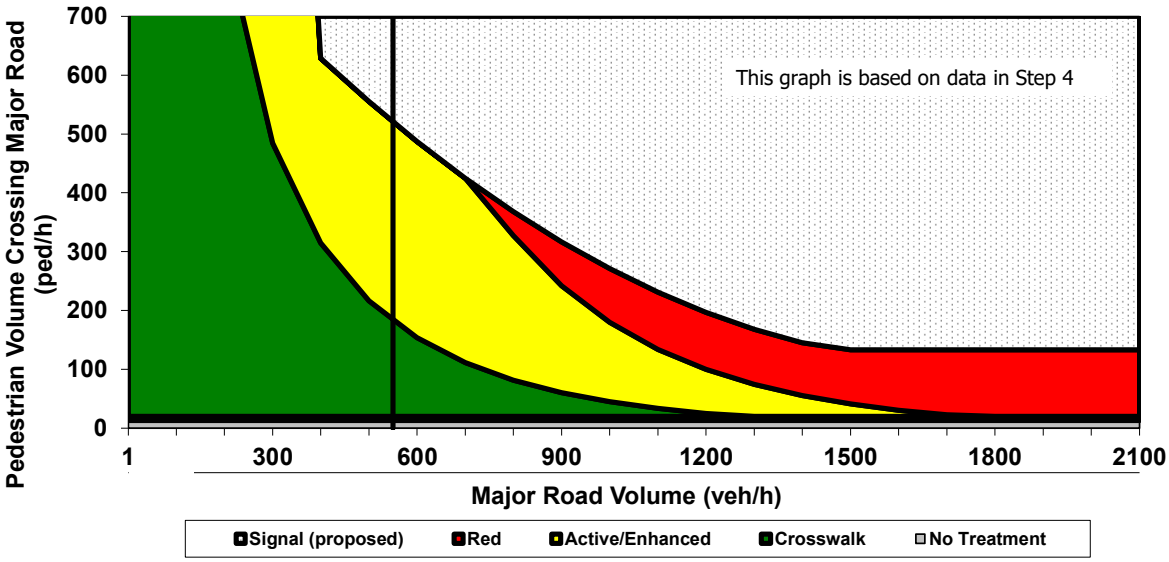
This spreadsheet is still under development, please inform TTI if errors are identified.

Key

- Blue fields contain descriptive information.
- Green fields are required and must be completed.
- Tan fields are adjustments that are filled out only under certain conditions (follow instructions to the left of the cell).
- Gray fields are automatically calculated and should not be edited.

Analyst and Site Information			
Analyst	AJP	Major Street	Aurora Street
Analysis Date	November 8, 2024	Minor Street or Location	E. Main Street
Data Collection Date	October 29, 2024	Peak Hour	PM Peak

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	25
Is the population of the surrounding area <10,000? (enter ***YES*** or ***NO***)		*1b*	no
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		*2a*	13
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), $V_{maj\text{-}s}$		*3a*	550
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	520
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	520
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce *3c* by up to 50%.	% rate of reduction for *3c* (up to 50%)	*3e*	10%
	Reduced value or *3c*	*3f*	520
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		*4a*	34
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		*4b*	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		*4c*	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		*4d*	13
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), $V_{maj\text{-}d}$		*4e*	550
Major road flow rate (veh/s), v		*4f*	0.15
Average pedestrian delay (s/person), d_p		*4g*	26
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		*4h*	0.1
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter ***HIGH for High Compliance*** or ***LOW for Low Compliance***		*5a*	low
Treatment Category:	**Consider raised median islands, curb extensions, traffic calming, etc. as feasible.**		



This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in conjunction with, and not independent of, Appendix A documentation.

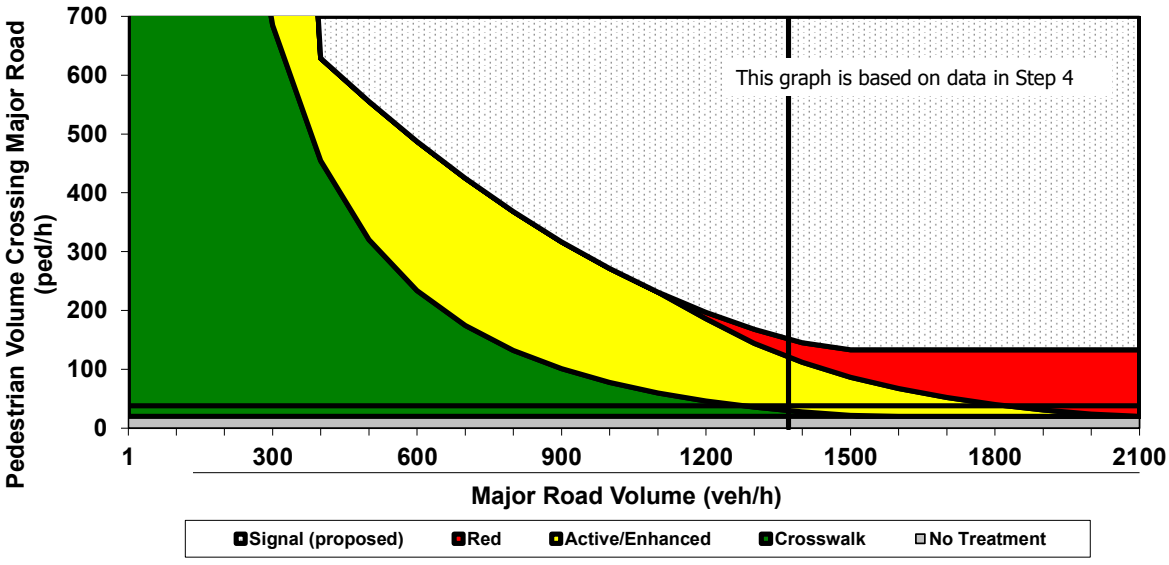
This spreadsheet is still under development, please inform TTI if errors are identified.

Key

- Blue fields contain descriptive information.
- Green fields are required and must be completed.
- Tan fields are adjustments that are filled out only under certain conditions (follow instructions to the left of the cell).
- Gray fields are automatically calculated and should not be edited.

Analyst and Site Information			
Analyst	AJP	Major Street	SR 91
Analysis Date	November 8, 2024	Minor Street or Location	Mid-Block Crossing
Data Collection Date	October 22, 2024	Peak Hour	PM Peak

Step 1: Select worksheet:		
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)	*1a*	25
Is the population of the surrounding area <10,000? (enter ***YES*** or ***NO***)	*1b*	no
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?		
Peak-hour pedestrian volume (ped/h), V_p	*2a*	38
Result: Go to step 3.		
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?		
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}	*3a*	1371
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant	*3b*	151
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant	*3c*	151
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)	*3d*	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce *3c* by up to 50%. — % rate of reduction for *3c* (up to 50%)	*3e*	10%
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce *3c* by up to 50%. — Reduced value or *3c*	*3f*	151
Result: The signal warrant is not met. Go to step 4.		
Step 4: Estimate pedestrian delay.		
Pedestrian crossing distance, curb to curb (ft), L	*4a*	28
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)	*4b*	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)	*4c*	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c	*4d*	11
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}	*4e*	1371
Major road flow rate (veh/s), v	*4f*	0.38
Average pedestrian delay (s/person), d_p	*4g*	158
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.	*4h*	1.7
	4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.		
Expected motorist compliance at pedestrian crossings in region: enter ***HIGH for High Compliance*** or ***LOW for Low Compliance***	*5a*	low
Treatment Category:		**ACTIVE OR ENHANCED**



This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

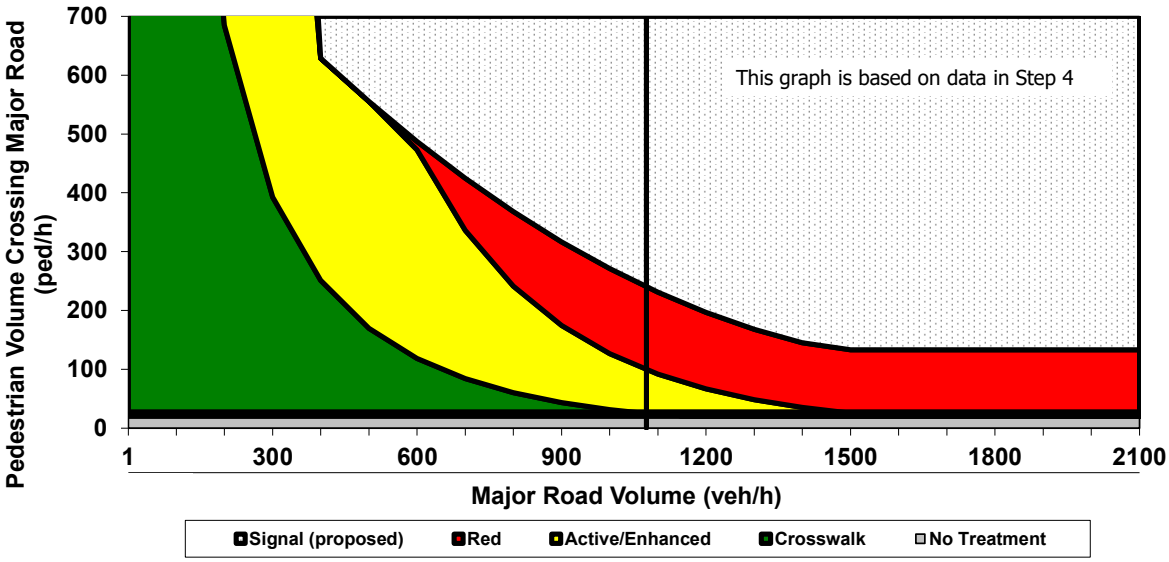
This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in conjunction with, and not independent of, Appendix A documentation.

This spreadsheet is still under development, please inform TTI if errors are identified.

Key

- Blue fields contain descriptive information.
- Green fields are required and must be completed.
- Tan fields are adjustments that are filled out only under certain conditions (follow instructions to the left of the cell).
- Gray fields are automatically calculated and should not be edited.

Analyst and Site Information					
Analyst	AJP		Major Street	SR 91	
Analysis Date	November 8, 2024		Minor Street or Location	Church	
Data Collection Date	October 22, 2024		Peak Hour	Mid-Day Peak	
Step 1: Select worksheet:					
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)				*1a*	25
Is the population of the surrounding area <10,000? (enter ***YES*** or ***NO***)				*1b*	no
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?					
Peak-hour pedestrian volume (ped/h), V_p				*2a*	28
Result: Go to step 3.					
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?					
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}				*3a*	1076
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant				*3b*	240
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant				*3c*	240
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)				*3d*	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce *3c* by up to 50%.		% rate of reduction for *3c* (up to 50%)		*3e*	10%
		Reduced value or *3c*		*3f*	240
Result: The signal warrant is not met. Go to step 4.					
Step 4: Estimate pedestrian delay.					
Pedestrian crossing distance, curb to curb (ft), L				*4a*	38
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)				*4b*	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)				*4c*	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c				*4d*	14
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}				*4e*	1076
Major road flow rate (veh/s), v				*4f*	0.30
Average pedestrian delay (s/person), d_p				*4g*	196
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.				*4h*	1.5
				4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.					
Expected motorist compliance at pedestrian crossings in region: enter ***HIGH for High Compliance*** or ***LOW for Low Compliance***				*5a*	low
Treatment Category:	**ACTIVE OR ENHANCED**				



This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

Appendix F
Pedestrian Gap Analyses Results

INTERSECTION GAP ANALYSIS

MAIN STREET: Aurora Street
SIDE STREET(S): E. Main Street
CITY: Hudson
COUNTY: Summit
STATE: Ohio

DATE: 11/8/2024
ENGINEER: AJP
PROJECT # 024-029

TMS Engineers, Inc.
2112 Case Parkway South #7
TWINSBURG, OHIO 44224
PHONE (330) 686-6402
FAX (330) 686-6417

DATA INPUT

1.) ROADWAY (PAVEMENT) WIDTH, CURB TO CURB, (FEET): **W=** 34 FT

2.) DESIRED CROSSING RATE ACROSS WIDTH OF STREET, (FT/SEC): **CR=** 3.5 FT/SEC
USE 4.0 FT/SEC FOR HANDICAP

3.) DESIRED GAP TIME (G), (SECONDS): CALCULATED FROM EQUATION A

(A) $G = R + (W/CR) + 2(N-1)$

WHERE,

G = DESIRED GAP TIME, SECONDS
R = PEDESTRIAN REACTION TIME, SECONDS **R=** 3.0 SEC
N = NUMBER OF ROWS OF PEDESTRIANS CROSSING IN THE 85TH PERCENTILE GROUP **N=** 1 ROWS

THERFORE DESIRED GAP TIME **G=** 12.71 SEC

4.) TRAFFIC COUNT TIME PERIOD:
FROM: 17:00 TO: 17:30 **T1=** 30 MINUTES

5.) TOTAL NUMBER OF PEDESTRIANS CROSSING STREET IN ABOVE TIME PERIOD **PED=** 9 PEDS

6.) VEHICULAR VOLUME (V) IN ABOVE TIME PERIOD(BOTH DIRECTIONS) **V=** 242 VEHICLES

7.) NUMBER OF AVAILABLE GAPS GREATER THAN **G=** 13 SECONDS

(B) $N = Ve^{-(V)(G/T)}$ (POISSON DISTRIBUTION)

WHERE: N = NUMBER OF AVAILABLE GAPS GREATER THAN THE DESIRED GAP TIME
T = TIME PERIOD IN SECONDS **T=** 1800 SECONDS
G = DESIRED GAP TIME **G=** 13 SECONDS
e = BASE OF NATURAL (NAPERIEN) LOGS **e=** 2.718281828
V = VEHICULAR VOLUME IN TIME PERIOD **V=** 242 VEHICLES

THEREFORE AVAILABLE GAPS (N) = **43.80** GAPS

THERE MUST BE ONE GAP (N) PER MINUTE OF TRAFFIC COUNT TIME (T) IN ORDER TO MEET ACCEPTABLE CONDITIONS.

INTERSECTION GAP ANALYSIS

MAIN STREET: SR 91
SIDE STREET(S): Mid-Block Crosswalk
CITY: Hudson
COUNTY: Summit
STATE: Ohio
DATE: 11/8/2024
ENGINEER: AJP
PROJECT # 024-029

TMS Engineers, Inc.
2112 Case Parkway South #7
TWINSBURG, OHIO 44224
PHONE (330) 686-6402
FAX (330) 686-6417

DATA INPUT

1.) ROADWAY (PAVEMENT) WIDTH, CURB TO CURB, (FEET): **W=** 28 FT

2.) DESIRED CROSSING RATE ACROSS WIDTH OF STREET, (FT/SEC): **CR=** 3.5 FT/SEC
USE 4.0 FT/SEC FOR HANDICAP

3.) DESIRED GAP TIME (G), (SECONDS): CALCULATED FROM EQUATION A

(A) $G = R + (W/CR) + 2(N-1)$

WHERE,

G = DESIRED GAP TIME, SECONDS
R = PEDESTRIAN REACTION TIME, SECONDS **R=** 3.0 SEC
N = NUMBER OF ROWS OF PEDESTRIANS CROSSING IN THE 85TH PERCENTILE GROUP **N=** 1 ROWS

THERFORE DESIRED GAP TIME **G=** 11 SEC

4.) TRAFFIC COUNT TIME PERIOD:
FROM: 17:30 TO: 18:00 **T1=** 30 MINUTES

5.) TOTAL NUMBER OF PEDESTRIANS CROSSING STREET IN ABOVE TIME PERIOD **PED=** 24 PEDS

6.) VEHICULAR VOLUME (V) IN ABOVE TIME PERIOD(BOTH DIRECTIONS) **V=** 663 VEHICLES

7.) NUMBER OF AVAILABLE GAPS GREATER THAN **G=** 11 SECONDS

(B) $N = Ve^{-(V)(G/T)}$ (POISSON DISTRIBUTION)

WHERE: N = NUMBER OF AVAILABLE GAPS GREATER THAN THE DESIRED GAP TIME
T = TIME PERIOD IN SECONDS **T=** 1800 SECONDS
G = DESIRED GAP TIME **G=** 11 SECONDS
e = BASE OF NATURAL (NAPERIEN) LOGS **e=** 2.718281828
V = VEHICULAR VOLUME IN TIME PERIOD **V=** 663 VEHICLES

THEREFORE AVAILABLE GAPS (N) = **11.53** GAPS

THERE MUST BE ONE GAP (N) PER MINUTE OF TRAFFIC COUNT TIME (T) IN ORDER TO MEET ACCEPTABLE CONDITIONS.

INTERSECTION GAP ANALYSIS

MAIN STREET: SR 91
SIDE STREET(S): Chucrh Crosswalk
CITY: Hudson
COUNTY: Summit
STATE: Ohio
DATE: 11/8/2024
ENGINEER: AJP
PROJECT # 024-029

TMS Engineers, Inc.
2112 Case Parkway South #7
TWINSBURG, OHIO 44224
PHONE (330) 686-6402
FAX (330) 686-6417

DATA INPUT

1.) ROADWAY (PAVEMENT) WIDTH, CURB TO CURB, (FEET): **W=** 38 FT

2.) DESIRED CROSSING RATE ACROSS WIDTH OF STREET, (FT/SEC): **CR=** 3.5 FT/SEC
USE 4.0 FT/SEC FOR HANDICAP

3.) DESIRED GAP TIME (G), (SECONDS): CALCULATED FROM EQUATION A

(A) $G = R + (W/CR) + 2(N-1)$

WHERE,

G = DESIRED GAP TIME, SECONDS
R = PEDESTRIAN REACTION TIME, SECONDS **R=** 3.0 SEC
N = NUMBER OF ROWS OF PEDESTRIANS CROSSING IN THE 85TH PERCENTILE GROUP **N=** 1 ROWS

THERFORE DESIRED GAP TIME **G=** 13.86 SEC

4.) TRAFFIC COUNT TIME PERIOD:
FROM: 17:30 TO: 18:00 **T1=** 30 MINUTES

5.) TOTAL NUMBER OF PEDESTRIANS CROSSING STREET IN ABOVE TIME PERIOD **PED=** 11 PEDS

6.) VEHICULAR VOLUME (V) IN ABOVE TIME PERIOD(BOTH DIRECTIONS) **V=** 521 VEHICLES

7.) NUMBER OF AVAILABLE GAPS GREATER THAN **G=** 14 SECONDS

(B) $N = Ve^{-(V)(G/T)}$ (POISSON DISTRIBUTION)

WHERE: N = NUMBER OF AVAILABLE GAPS GREATER THAN THE DESIRED GAP TIME
T = TIME PERIOD IN SECONDS **T=** 1800 SECONDS
G = DESIRED GAP TIME **G=** 14 SECONDS
e = BASE OF NATURAL (NAPERIEN) LOGS **e=** 2.718281828
V = VEHICULAR VOLUME IN TIME PERIOD **V=** 521 VEHICLES

THEREFORE AVAILABLE GAPS (N) = **9.44** GAPS

THERE MUST BE ONE GAP (N) PER MINUTE OF TRAFFIC COUNT TIME (T) IN ORDER TO MEET ACCEPTABLE CONDITIONS.