KITTELSON & ASSOCIATES
610 SW ALDER STREET, SUITE 700
PORTLAND, OR 97205
P 503.228.5230 F 503.273.8169

MEMORANDUM

Date:	April 5, 2018	Project #: 22064.0
To:	Manuel Abarca, PE, City of Longview	
From:	Matt Bell and Nick Gross, Kittelson & Associates, Inc.	
Project:	3rd Avenue Pedestrian Crossing	
Subject:	Final Pedestrian Crossing Assessment	

EXECUTIVE SUMMARY

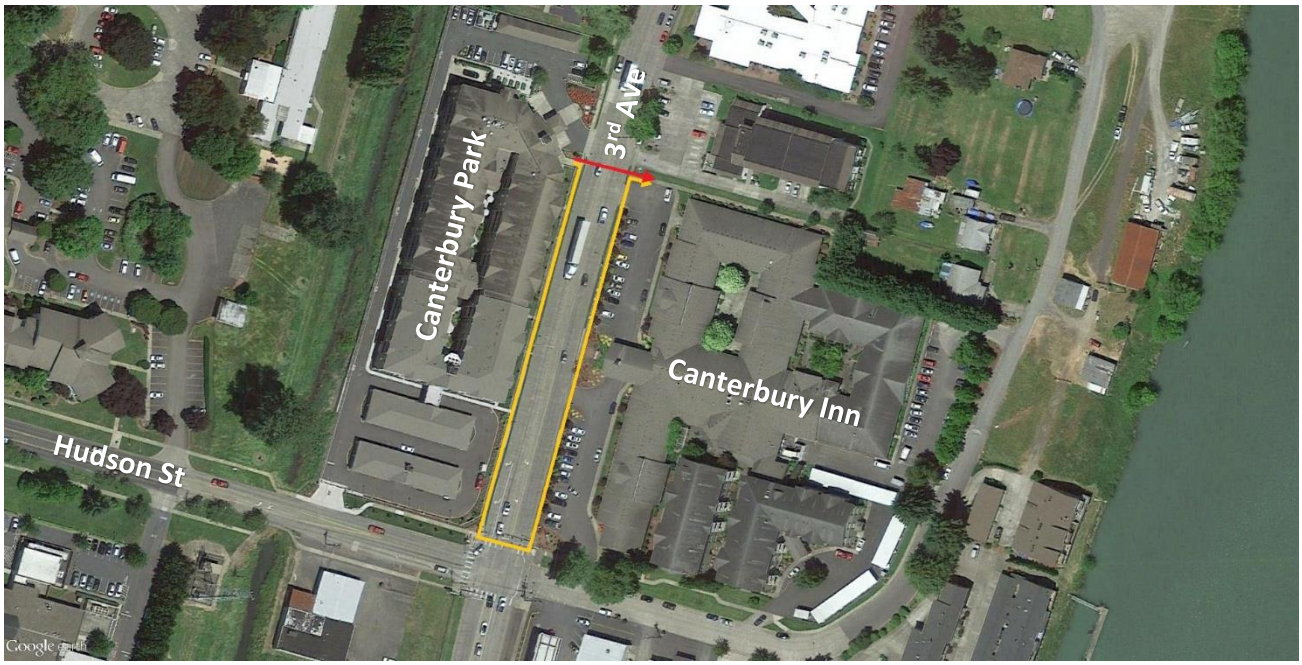
This memorandum summarizes the results of a pedestrian crossing assessment prepared on behalf of the City of Longview. The purpose of the assessment is to determine if an enhanced mid-block crossing adjacent to the Canterbury Park and Canterbury Inn residential facilities is supported by the study methodology. The assessment is based on field observations as well as conversations with Canterbury Park and City of Longview staff. Key findings are summarized below.

- A signalized pedestrian crossing is currently provided along 3rd Avenue at the 3rd Avenue/Hudson Street intersection, approximately 480-feet south of the proposed mid-block crossing.
- A total of 42 pedestrians crossed 3rd Avenue at the proposed mid-block crossing location over a 12-hour period (7:00 a.m. to 7:00 p.m.) in February 2018, including five during the morning, 14 during the mid-day, and five during the evening peak hours.
- A total of 15,320 vehicles traveled along 3rd Avenue over a 24-hour period in February 2018, including 989 during the morning, 1,177 during the mid-day, and 1,308 during the evening peak hours.
- The 85th percentile speeds along 3rd Avenue are 32 miles per hour (mph) in the northbound direction and 35 mph in the southbound direction. The posted speed limit is 35 mph.

The results of the assessment indicate that an enhanced mid-block crossing along 3rd Avenue adjacent to the Canterbury Park and Canterbury Inn residential facilities is NOT supported by the study methodology due to a lack of pedestrian activity. However, given the potential for increases in pedestrian activity at the proposed mid-block crossing, the City should continue to monitor the crossing and if/when pedestrian activity reaches the minimum requirement (20 crossings during the peak hour), consideration should be given to installing an enhanced mid-block crossing with a high level of crosswalk protection (i.e. curb extensions, high visibility pavement markings and signs, and flashing beacons). Additional information on the study methodology and findings is provided below.

BACKGROUND

Residents of Canterbury Park and Canterbury Inn residential facilities have expressed the need for an enhanced mid-block crossing on 3rd Avenue to facilitate movement between the two facilities. Canterbury Park is an independent living facility located on the west side of 3rd Avenue and Canterbury Inn is an assisted living facility located on the east side of 3rd Avenue. Given the nature of the facilities, residents often make frequent trips across 3rd Avenue. Currently, residents cross at this location without the assistance of a marked crosswalk or travel approximately 960-feet out-of-direction to cross at a the 3rd Avenue/Hudson Street intersection.



STUDY AREA

The study area consists of the segment of 3rd Avenue adjacent to the Canterbury Park and Canterbury Inn residential facilities. An existing concrete pathway from Canterbury Park's main entrance leads southeast to 3rd Avenue and the location of the proposed mid-block crossing. A similar concrete pathway continues southeast from 3rd Avenue to Canterbury Inn's main entrance. The location and orientation of the existing concrete pathways create a natural pathway across 3rd Avenue at the proposed mid-block crossing location.

Land-Uses

Land uses along 3rd Avenue primarily consist of high density residential on both sides of the roadway. In addition to Canterbury Park and Canterbury Inn, other residential facilities include the Canterbury Gardens memory care facility, Frontier Rehabilitation and Extended Care Center, and the Fremont Village apartments; each of which are located within close proximity to the proposed mid-block crossing. The surrounding area is generally built out with minimal opportunities for new development.

TRANSPORTATION FACILITIES

Roadway Facilities

3rd Avenue (SR 411) is a principle arterial that travels north-south along the eastern boundary of the City of Longview, parallel to the Cowlitz River. North of the study area, 3rd Avenue transitions to 1st Avenue and connects to Interstate 5 (I-5) via Allen Street. South of the study area, 3rd Avenue connects to downtown Longview via Hudson Street and Tennant Way (SR 432), which also provides access to I-5. 3rd Avenue also continues south to Industrial Way (SR 432), which connects to the Lewis and Clark Bridge.

Jurisdiction

The City of Longview has jurisdiction over 3rd Avenue and the adjacent roadways, including Hudson Street.

Functional Classification

3rd Avenue (SR 411) is classified as a principle arterial by the City of Longview Comprehensive Plan (Reference 1). As a principle arterial, 3rd Avenue is intended to provide a direct connection to the State highways and other limited access facilities. Arterials provide circulation and access as well as a link with State and federal highways. Arterials are the widest streets and are designed to carry heavy volumes of traffic.

Cross Section

3rd Avenue currently has a three-lane cross section within the vicinity of the proposed mid-block crossing, including two 11-foot travel lanes (one in each direction) and one 12-foot center two-way left-turn (TWLT) lane. There are also two 8-foot parking lanes (one in each direction) north of Canterbury Park. South of Canterbury Park, on-street parking is prohibited on the west side of the roadway. The overall paved width of 3rd Avenue is approximately 50 feet.

Traffic Control and Signage

The closest traffic signal is located at the 3rd Avenue/Hudson Street intersection approximately 480-feet south of the proposed mid-block crossing location. Marked crosswalks are provided across all four legs of the signalized intersection. The crosswalks are pedestrian actuated with pedestrian pushbuttons and pedestrian signal heads. Per discussions with Canterbury Park staff, there are several challenges associated with using the signal. The challenges identified by Canterbury Park staff include:

- *The location of the traffic signal results in out-of-direction travel for Canterbury residents who are elderly and tend to have reduced mobility.*
- *The traffic signal does not provide sufficient time for pedestrians to cross the street.*
    - Per signal timing data provided by the City, the traffic signal provides 5 seconds of walk time followed by 15 seconds of flash don't walk time across the north leg of the intersection.

- The pedestrian heads are not countdown pedestrian heads, which means pedestrians that approach the intersection after it has been actuated do not know how much time they have to cross.

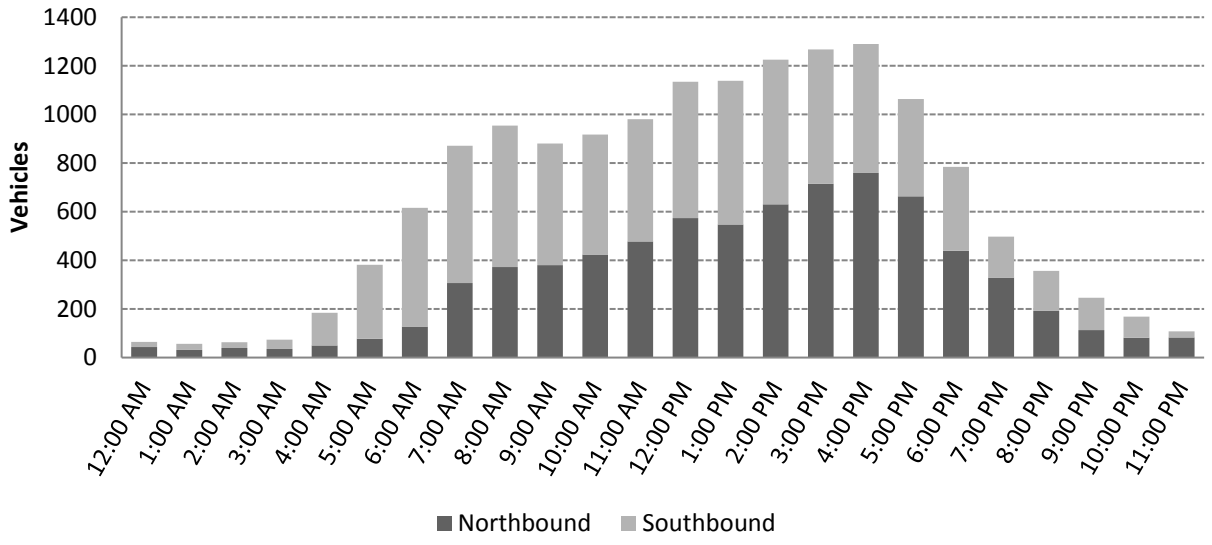
- *Motorists do not yield to pedestrians crossing the north leg of the intersection.*
  - Per the signal timing data, the eastbound and westbound approaches have permitted left-turn phasing. With permitted left-turn phasing, vehicle and pedestrian movements can occur at the same time.
- *The pedestrian ramps do not align with the crosswalks, particularly in the northwest corner of the intersection.*

Manual turning movement counts conducted at the intersection show that the eastbound left- and southbound right-turn movements are relatively high during the weekday AM and PM peak hours. An evaluation of the intersection using Synchro 9 modeling software indicates that the intersection is currently operating acceptably per the City's applicable mobility standards during the peak time periods. Further evaluation of the intersection indicates that it would continue to operate acceptable with protected left-turn phasing at the eastbound approach, particularly if the left-turn lags like the northbound and southbound approaches. With the provision of protected left-turn phasing, pedestrians would cross the north leg of the intersection during a separate phase from the left-turn movement. *Attachment "A" contains the turning movement counts conducted at the intersection. Attachment "B" contains the worksheets used to evaluation traffic operations as well as potential mitigation measures.*

Traffic Volumes

Traffic volume data was collected along 3rd Avenue north of Hudson Street in February 2018. The data includes the total number of vehicles that traveled along 3rd Avenue over a 24-hour period. Chart 1 displays the hourly traffic volume data by direction.

Chart 1: Daily Traffic Volumes along 3rd Avenue



As shown in Chart 1, traffic volumes along 3rd Avenue increase steadily throughout the day with morning, mid-day, and evening peak hours occurring at 7:45 a.m., 12:45 p.m., and 3:45 p.m., respectively. Based on the data, a total of 15,320 vehicles were counted over the 24-hour period, including 989 during the morning, 1,177 during the mid-day, and 1,308 during the evening peak hours. *The traffic volume data is provided in Attachment "C".*

Travel Speeds

Travel speed data was collected along 3rd Avenue north of Hudson Street over a 24-hour period in February 2018. Based on the data, the 85th percentile speeds are 32 miles per hour (mph) in the northbound direction and 35 mph in the southbound direction. The posted speed limit is 35 mph. *The travel speed data is provided in Attachment "D".*

Heavy Vehicle (Truck) Percentages

Heavy vehicle data was collected along 3rd Avenue north of Hudson Street over a 24-hour period in February 2018. Based on the data, approximately 3.6 percent of all northbound traffic and 4.2 percent of all southbound traffic consists of heavy vehicles. *The heavy vehicle percentage data is included in Attachment "E".*

Other Roadway Considerations

Illumination

Illumination is currently provided by street lights installed at approximate 230-foot intervals along the both side of 3rd Avenue. An existing street light is provided on the west side of the roadway, south of the Canterbury Park entrance and just north of the proposed mid-block crossing.

Topography

3rd Avenue is relatively flat and straight within the vicinity of the proposed mid-block crossing. As indicated below, the horizontal curve to the north does not limit sight-distance at the southbound approach to the proposed mid-block crossing.

Vegetation

At the time of the field investigation, vegetation along both sides of 3rd Avenue was maintained and did not limit sight distance along the roadway or at the proposed mid-block crossing.

Sight Distance

The posted speed limit of 35 mph was used to calculate stopping sight distance requirements along 3rd Avenue in accordance with the methodology identified in the standard reference manual, *A Policy on Geometric Design of Highway and Streets,* published by the American Association of State Highway and Transportation Officials (AASHTO – Reference 2). Accordingly, the stopping sight distance requirement is 246-feet. Given this requirement, there is currently sufficient stopping sight distance along 3rd Avenue to safely stop a moving vehicle in advance of the proposed mid-block crossing.

PEDESTRIAN FACILITIES

Sidewalks

Continuous sidewalks are provided along both sides of 3rd Avenue and appear to be in good condition. A 3-foot landscape strip is provided between the sidewalk and outside travel lane on both sides of the roadway. All sidewalks are free from any impediments such as utility poles, light poles, fire hydrants, etc. Concrete walking paths are also provided at the east and westbound approaches to the proposed mid-block crossing location. The concrete pathway on the west side of 3rd Avenue connects to the main entrance of Canterbury Park, while the concrete pathway on the east side of 3rd Avenue connects to the main entrance of Canterbury Inn.

Crosswalks

The closest marked crosswalk is located on the north leg of the 3rd Avenue/Hudson Street intersection approximately 480-feet south. The intersection includes a pedestrian actuated traffic signal with pedestrian push button and pedestrian signal heads.

Pedestrian Activity

Pedestrian activity data was collected along 3rd Avenue at the proposed mid-block crossing in February 2018. The data includes the total number of pedestrians that crossed 3rd Avenue over a 12-hour period from 7:00 a.m. to 7:00 p.m. The following provides a summary of the pedestrian data.

- Five pedestrians crossed 3rd Avenue during the morning peak hour for pedestrian activity (8:30 a.m.); two pedestrians crossed during the morning peak hour for vehicles (7:45 a.m.).
- 14 pedestrians crossed 3rd Avenue during the afternoon peak for pedestrian activity (1:00 p.m.); eight pedestrians crossed during the afternoon peak hour for vehicles (12:45 p.m.).
- Five pedestrians crossed 3rd Avenue during the evening peak hour for pedestrian activity (5:30 p.m.); two pedestrians crossed during the evening peak hour for vehicles (3:45 p.m.).

It should be noted that the pedestrian counts were conducted in February and while no inclement weather was present, anecdotal evidence suggests that pedestrian activity increases during the summer months. Also, while the pedestrian counts were collected at the proposed mid-block crossing location, additional crossings may have occurred further to the north and south of the crossing and could be consolidated by a potential crossing. *The pedestrian crossing data is provided in Attachment "F".*

TRANSIT FACILITIES AND SERVICES

Transit Service

Transit for Longview residents is provided by River Cities Transit (RCT). Information regarding local transit service within the study area was obtained from the current RCT system map and bus schedule. RCT Line 45 provides frequent service along 3rd Avenue on approximately 35-minute headways. Service is provided Monday through Friday from 6:34 a.m. to 6:34 p.m. and on Saturday's from 8:04 a.m. to 5:34 p.m. The

closest transit stop is located just north of Canterbury Inn on the east side of 3rd Avenue and is served by RCT Line 45.

PLANNED AND PENDING TRANSPORTATION FACILITIES

The Longview Comprehensive Plan identifies a number of potential projects that will improve traffic safety, increase traffic flow, increase circulation, improve freight mobility, and/or enhance the beatification of the City's roadways. No projects have been identified in the Comprehensive Plan as having the potential to impact conditions along 3rd.

CROSSWALK ASSESSMENT

A crosswalk assessment was conducted to determine if the proposed mid-block crossing would be supported by the study methodology under existing traffic conditions. The results of the assessment are described below.

Gap Analysis

The National Cooperative Highway Research Program (NCHRP) Report 562 *Improving Pedestrian Safety at Unsignalized Crossings* (Reference 3) provides a methodology for evaluating appropriate levels of crosswalk protection that considers traffic volumes, travel speeds, and pedestrian activity as well as a number of other factors. The methodology was applied to the proposed mid-block crossing under existing traffic conditions.

Existing Conditions

Table 1 summarizes the existing traffic volumes, travel speeds, and pedestrian activity at the proposed mid-block crossing during the morning, mid-day, and evening peak hours.

Table 1: Existing Conditions – 3rd Avenue at Canterbury Park Main Entrance

Peak Hour	Morning Peak Hour			Afternoon Peak Hour			Evening Peak Hour		
	Traffic Volume	Travel Speed	Ped Crossings	Traffic Volume	Travel Speed	Ped Crossings	Traffic Volume	Travel Speed	Ped Crossings
Vehicle Peak	989	35	2	1,177	35	8	1,308	35	2
Pedestrian Peak	913	35	5	1,138	35	14	919	35	5

An assessment of the traffic volumes shown in Table 1 led to the conclusion that an enhanced pedestrian crossing at the proposed mid-block crossing location is *NOT* supported by the study methodology under existing traffic conditions due to a lack of pedestrian activity. *The worksheets used in the existing conditions evaluation are included in Attachment "G".* The NCHRP 562 methodology requires a minimum of 20 pedestrian crossings during the peak hour to support minimal crossing treatments. As pedestrian crossing volumes increase, the level of crosswalk protection needed also increases.

Sensitivity Analysis

Given the potential for increases in pedestrian activity at the study location, a sensitivity analysis was conducted to determine the extent to which various crossing treatments could accommodate increases in pedestrian activity and/or traffic volumes. The sensitivity analysis includes the following scenarios:

- Scenario 1 (traffic increase & no pedestrian increase): An increase in traffic volumes of up to 20 percent with no increase in pedestrian crossings.
    - The results of this analysis indicate that an enhanced mid-block crossing is not supported.
- Scenario 2 (no traffic increase & pedestrian increase): No increase in traffic volumes with an increase of up to 20 pedestrian crossings – this represents an increase of up to 15 pedestrians during the morning and evening peak hours and six pedestrians during the mid-day peak hour.
    - The results of this analysis indicate that an enhanced mid-block crossing with a high level of crosswalk protection is supported.
- Scenario 3 (traffic increase & pedestrian increase): An increase in traffic volumes of up to 20 percent with an increase of up to 20 pedestrian crossings.
    - The results of this analysis indicate that an enhanced mid-block crossing with a high level of crosswalk protection is supported.

The results of the sensitivity analysis indicate that an increase in pedestrian activity has a more significant impact on the need for an enhanced mid-block crossing than an increase in vehicle activity. In addition, once the minimum number of pedestrians needed to support an enhanced mid-block crossing is reached, the type of crossing treatment necessary to support the minimum level of pedestrian activity can accommodate a significant increase in pedestrian activity. *The work sheets used in the sensitivity evaluations are included in Attachment "H".*

FINDINGS AND RECOMMENDATIONS

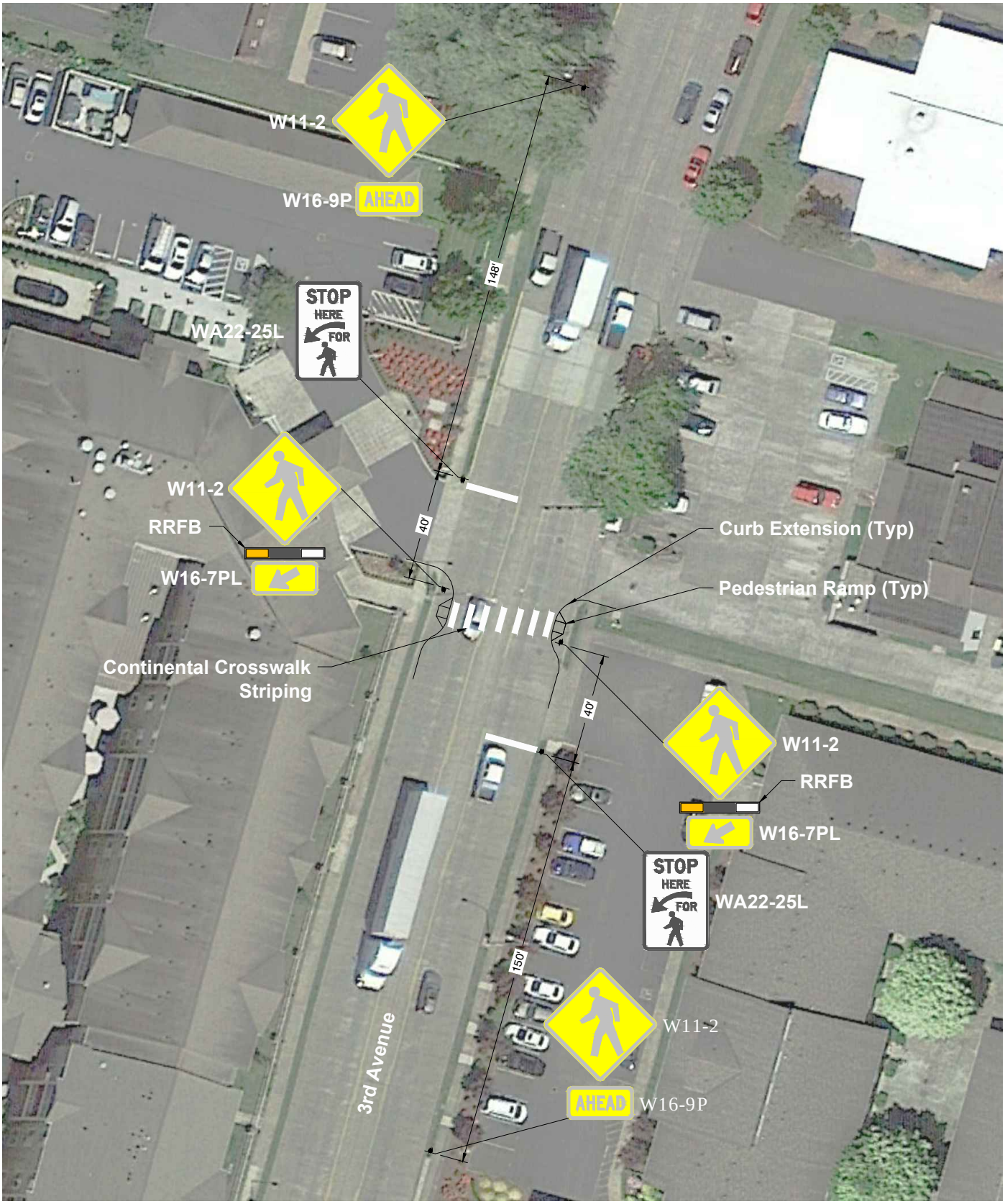
The results of the assessment indicate that an enhanced mid-block crossing along 3rd Avenue adjacent to the Canterbury Park and Canterbury Inn assisted living facilities is NOT supported by the study methodology. However, given the potential for increases in pedestrian activity at the proposed mid-block crossing, the City should continue to monitor the crossing and if/when pedestrian activity reaches the minimum requirement (20 crossings during the peak hour), consideration should be given to installing an enhanced mid-block crossing with a high level of crosswalk protection. The following summarizes the recommended crossing treatments needed to improve pedestrian and vehicle access and circulation.

Recommended Crossing Treatments

Recognizing that the implementation of enhanced crossing treatments will likely depend on policies, priorities and available funding, the following recommendations are presented according to their simplicity and anticipated time and cost constraints. All crosswalk treatments should be consistent with the guidelines found in the Manual on Uniform Traffic Control Devices (MUTCD – Reference 4).

- Modify the eastbound approach to the 3rd Avenue/Hudson Street intersection to provide a separate eastbound left-turn lane and a shared through/right-turn lane.
    - This may require modifications to the signing and striping at the eastbound and westbound approaches to the intersection.
- Modify the traffic signal at the 3rd Avenue/Hudson Street intersection to provide protected left-turn phasing at the eastbound approach – lag the left-turn movement and increase the walk time for the east-west movement.
- Upgrade the pedestrian signal heads with countdown modules at the 3rd Avenue/Hudson Street intersection.
    - This improvement may trigger the need to update the pedestrian ramps to current Americans with Disabilities Act (ADA) standards.
- Monitor the proposed mid-block crossing and if/when pedestrian activity reaches the minimum requirement, consideration should be given to installing an enhanced mid-block crossing with the following crossing treatments:
    - Curb extensions on both sides of the proposed mid-block crossing.
    - ADA compliant pedestrian ramps at both ends of the crossing per City standards.
    - High visibility crosswalk pavement markings and signs per the MUTCD.
    - Rectangular Rapid Flash Beacons (RRFB) on the crosswalk signs.
    - Advance stop bars at each approach with “Stop Here for Pedestrian” signs.
    - Advance warning signs at each approach.

Figure 1 illustrates the potential mid-block pedestrian crossing treatments.



Potential Mid-block Pedestrian Crossing Treatments
Longview, WA

Figure 1

H:\22\22064 - 3rd and 30th Ave Ped Crossing Assessment\report\figs\22064_Fig1.dwg Apr 05, 2018 - 11:55am - mbell Layout Tab: Fig01

REFERENCES:

1. City of Longview. *Comprehensive Plan*. *Adopted 2006*
2. American Association of State Highway and Transportation Officials. *A Policy on Geometric Design of Highway and Streets.* 2012.
3. The National Cooperative Highway Research Program (NCHRP). *Report 562 Improving Pedestrian Safety at Unsignalized Crossings*. 2006.
4. Federal Highway Administration (FHWA). *Manual on Uniform Traffic Control Devices for Streets and Highways*. 2009.

ATTACHMENTS

A. Turning Movement County
B. Existing Conditions Worksheets with Mitigation
C. Traffic Volumes
D. Travel Speeds
E. Vehicle Classifications
F. Pedestrian Volumes
G. NCHRP 562 Worksheets: Existing Conditions
H. NCHRP 562 Worksheets: Sensitivity Analysis

Attachment A Turning Movement Counts

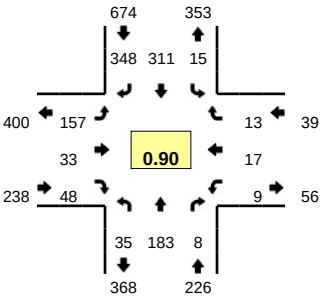
Type of peak hour being reported: Intersection Peak

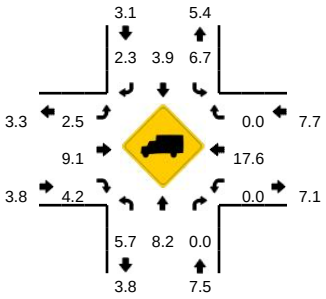
Method for determining peak hour: Total Entering Volume

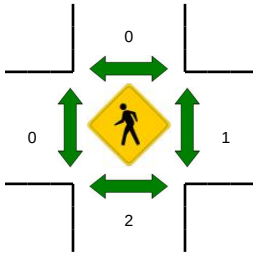
LOCATION: 3rd Ave -- Hudson St
CITY/STATE: Longview, WA

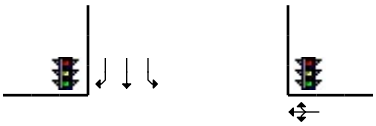
QC JOB #: 14551901
DATE: Wed, Feb 07 2018

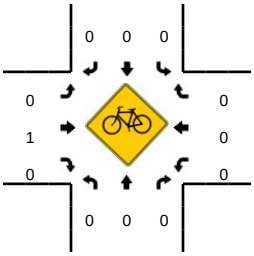
Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

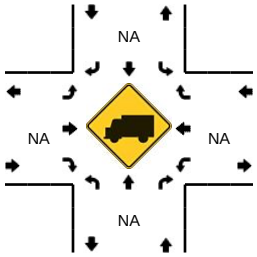


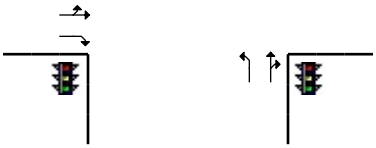


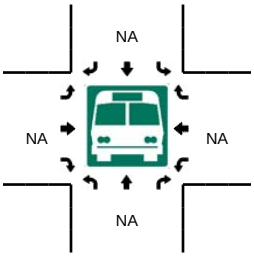












5-Min Count Period Beginning At	3rd Ave (Northbound)				3rd Ave (Southbound)				Hudson St (Eastbound)				Hudson St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	4	2	0	1	21	11	0	5	4	6	0	1	4	2	0	61	
7:05 AM	3	17	1	0	0	19	17	0	7	5	1	0	0	0	4	0	74	
7:10 AM	4	24	1	0	0	27	15	0	7	1	2	0	0	0	2	0	83	
7:15 AM	0	17	0	0	0	21	17	0	4	1	0	0	1	1	3	0	65	
7:20 AM	4	13	0	0	0	22	22	0	11	3	1	0	2	1	1	0	80	
7:25 AM	4	19	0	0	0	20	17	0	8	1	3	0	1	1	0	0	74	
7:30 AM	1	18	0	0	2	13	18	0	6	4	0	0	0	2	1	0	65	
7:35 AM	3	12	0	0	2	23	25	0	5	3	0	0	1	1	2	0	77	
7:40 AM	2	25	1	0	2	31	30	0	11	3	5	0	3	1	0	0	114	
7:45 AM	1	3	0	0	0	32	36	0	13	5	3	0	2	2	2	0	99	
7:50 AM	5	13	1	0	3	31	42	0	12	1	4	0	0	1	0	0	113	
7:55 AM	3	18	2	0	3	27	24	0	17	7	8	0	0	0	1	0	110	1015
8:00 AM	1	10	1	0	0	29	37	0	12	1	5	0	0	2	2	0	100	1054
8:05 AM	4	11	1	0	1	16	25	0	8	2	4	0	0	2	1	0	75	1055
8:10 AM	4	8	1	0	0	25	24	0	11	3	6	0	1	6	2	0	91	1063
8:15 AM	2	13	0	0	0	23	27	0	11	0	3	0	0	1	1	0	81	1079
8:20 AM	3	24	0	0	0	21	26	0	15	3	3	0	0	0	0	0	95	1094
8:25 AM	3	17	0	0	5	20	20	0	16	3	1	0	0	0	1	0	86	1106
8:30 AM	5	14	1	0	1	23	29	0	17	3	3	0	0	2	2	0	100	1141
8:35 AM	2	27	0	0	0	33	28	0	14	2	3	0	3	0	1	0	113	1177
8:40 AM	7	17	0	0	0	18	21	0	16	1	6	0	1	5	0	0	92	1155
8:45 AM	5	14	0	0	0	23	25	0	16	3	5	0	0	0	3	0	94	1150
8:50 AM	6	9	1	0	1	12	32	0	20	4	5	0	0	0	1	0	91	1128
8:55 AM	5	19	1	0	0	17	32	0	16	1	5	0	0	1	1	0	98	1116

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	32	164	8	0	20	376	432	0	144	36	48	0	20	16	8	0	1304
Heavy Trucks	0	12	0		0	24	12		0	0	4		0	4	0		56
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	1	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/14/2018 2:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

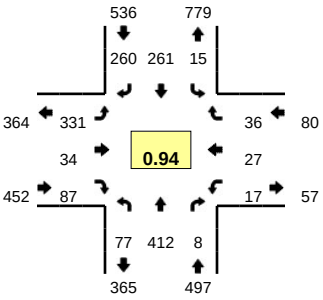
Type of peak hour being reported: Intersection Peak

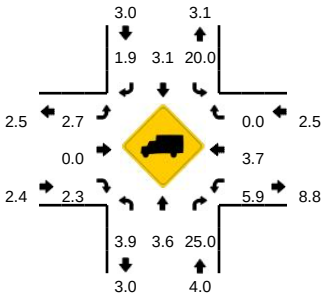
Method for determining peak hour: Total Entering Volume

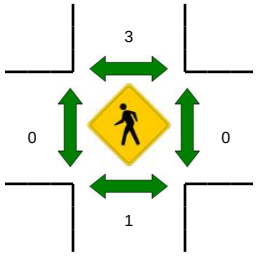
LOCATION: 3rd Ave -- Hudson St
CITY/STATE: Longview, WA

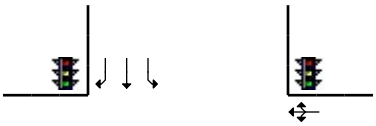
QC JOB #: 14551902
DATE: Wed, Feb 07 2018

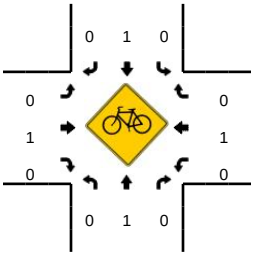
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

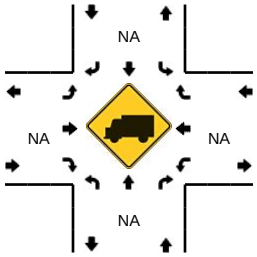


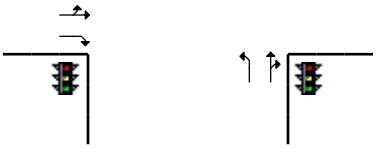


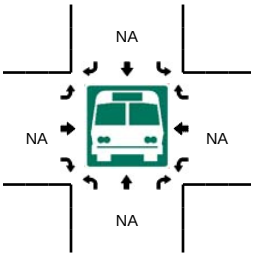












5-Min Count Period Beginning At	3rd Ave (Northbound)				3rd Ave (Southbound)				Hudson St (Eastbound)				Hudson St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	9	37	0	0	0	27	12	0	21	5	9	0	1	2	6	0	129	
4:05 PM	12	30	0	0	0	16	21	0	35	1	11	0	1	3	2	0	132	
4:10 PM	8	27	1	0	2	20	24	0	27	0	7	0	1	2	1	0	120	
4:15 PM	8	40	2	0	1	30	15	0	20	3	10	0	1	1	3	0	134	
4:20 PM	3	33	0	0	2	24	22	0	33	4	7	0	1	0	3	0	132	
4:25 PM	7	23	2	0	1	19	26	0	31	2	3	0	3	4	2	0	123	
4:30 PM	6	37	1	0	2	24	21	0	23	3	7	0	1	2	3	0	130	
4:35 PM	3	42	0	0	0	19	21	0	37	4	11	0	1	3	3	0	144	
4:40 PM	6	46	1	0	1	16	24	0	31	4	5	0	0	4	5	0	143	
4:45 PM	7	32	0	0	3	22	24	0	26	1	5	0	2	3	3	0	128	
4:50 PM	6	40	0	0	2	21	28	0	22	2	7	0	5	2	2	0	137	
4:55 PM	2	25	1	0	1	23	22	0	25	5	5	0	0	1	3	0	113	1565
5:00 PM	7	31	0	0	0	13	10	0	23	2	11	0	0	2	2	0	101	1537
5:05 PM	5	52	0	0	2	26	23	0	36	1	11	0	2	1	0	0	159	1564
5:10 PM	11	34	1	0	1	12	15	0	29	1	5	0	0	2	2	0	113	1557
5:15 PM	10	36	0	0	0	23	25	0	32	0	7	0	0	0	4	0	137	1560
5:20 PM	5	29	0	0	0	26	11	0	21	3	6	0	1	1	2	0	105	1533
5:25 PM	6	17	2	0	0	17	21	0	20	2	3	0	0	4	0	0	92	1502
5:30 PM	8	25	1	0	3	12	15	0	37	3	2	0	3	1	1	0	111	1483
5:35 PM	8	24	0	0	1	19	17	0	21	2	1	0	1	1	4	0	99	1438
5:40 PM	3	28	0	0	1	19	12	0	38	3	7	0	0	1	2	0	114	1409
5:45 PM	2	25	0	0	0	12	16	0	25	0	6	0	2	1	2	0	91	1372
5:50 PM	5	12	0	0	1	19	14	0	23	0	3	0	0	2	4	0	83	1318
5:55 PM	5	18	0	0	1	16	7	0	20	1	3	0	0	0	1	0	72	1277

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	60	500	8	0	12	236	264	0	364	44	92	0	8	36	44	0	1668
Heavy Trucks	0	16	0		8	4	0		12	0	4		0	0	0		44
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	1	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/14/2018 2:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Attachment B Existing Conditions Worksheets with Mitigations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	33	48	9	17	13	35	183	8	15	311	348
Future Volume (vph)	157	33	48	9	17	13	35	183	8	15	311	348
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1754	1529		1662		1703	1752		1687	1827	1583
Flt Permitted		0.73	1.00		0.91		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1340	1529		1533		1703	1752		1687	1827	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	174	37	53	10	19	14	39	203	9	17	346	387
RTOR Reduction (vph)	0	0	31	0	10	0	0	1	0	0	0	160
Lane Group Flow (vph)	0	211	22	0	33	0	39	211	0	17	346	227
Confl. Peds. (#/hr)			2	2					1			
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	3%	9%	4%	0%	18%	0%	6%	8%	0%	7%	4%	2%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8								6
Actuated Green, G (s)		16.1	25.2		16.1		9.1	25.4		2.4	18.7	18.7
Effective Green, g (s)		16.1	25.2		16.1		9.1	25.4		2.4	18.7	18.7
Actuated g/C Ratio		0.26	0.41		0.26		0.15	0.41		0.04	0.30	0.30
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)		3.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		348	770		398		250	718		65	551	478
v/s Ratio Prot			0.00				c0.02	c0.12		0.01	c0.19	
v/s Ratio Perm		c0.16	0.01		0.02							0.14
v/c Ratio		0.61	0.03		0.08		0.16	0.29		0.26	0.63	0.48
Uniform Delay, d1		20.1	11.0		17.3		23.0	12.2		28.9	18.6	17.6
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		3.0	0.0		0.0		0.1	0.1		0.8	1.6	0.3
Delay (s)		23.1	11.0		17.3		23.2	12.3		29.7	20.2	17.9
Level of Service		C	B		B		C	B		C	C	B
Approach Delay (s)		20.7			17.3			14.0			19.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	61.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	34	87	17	27	36	77	412	8	15	261	260
Future Volume (vph)	331	34	87	17	27	36	77	412	8	15	261	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.98		0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes		0.99	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1760	1558		1700		1736	1813		1504	1845	1549
Flt Permitted		0.69	1.00		0.89		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1261	1558		1537		1736	1813		1504	1845	1549
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	352	36	93	18	29	38	82	438	9	16	278	277
RTOR Reduction (vph)	0	0	24	0	18	0	0	1	0	0	0	158
Lane Group Flow (vph)	0	388	69	0	67	0	82	446	0	16	278	119
Confl. Peds. (#/hr)	3		1	1		3						
Confl. Bikes (#/hr)			1			1			1			1
Heavy Vehicles (%)	3%	0%	2%	6%	4%	0%	4%	4%	25%	20%	3%	2%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8								6
Actuated Green, G (s)		34.8	50.6		34.8		15.8	33.3		2.3	19.8	19.8
Effective Green, g (s)		34.8	50.6		34.8		15.8	33.3		2.3	19.8	19.8
Actuated g/C Ratio		0.39	0.57		0.39		0.18	0.38		0.03	0.22	0.22
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)		3.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		496	997		605		310	682		39	413	346
v/s Ratio Prot			0.01				c0.05	c0.25		0.01	0.15	
v/s Ratio Perm		c0.31	0.03		0.04							0.08
v/c Ratio		0.78	0.07		0.11		0.26	0.65		0.41	0.67	0.34
Uniform Delay, d1		23.5	8.4		17.0		31.3	22.8		42.4	31.3	28.8
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		7.9	0.0		0.0		0.2	1.7		2.5	3.4	0.2
Delay (s)		31.3	8.4		17.0		31.5	24.5		44.9	34.7	29.0
Level of Service		C	A		B		C	C		D	C	C
Approach Delay (s)		26.9			17.0			25.6			32.3	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	33	48	9	17	13	35	183	8	15	311	348
Future Volume (vph)	157	33	48	9	17	13	35	183	8	15	311	348
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91			0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	1610			1662		1703	1752		1687	1827	1583
Flt Permitted	0.95	1.00			0.89		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	1610			1502		1703	1752		1687	1827	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	174	37	53	10	19	14	39	203	9	17	346	387
RTOR Reduction (vph)	0	34	0	0	13	0	0	1	0	0	0	156
Lane Group Flow (vph)	174	56	0	0	30	0	39	211	0	17	346	231
Confl. Peds. (#/hr)			2	2					1			
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	3%	9%	4%	0%	18%	0%	6%	8%	0%	7%	4%	2%
Turn Type	Prot	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8								6
Actuated Green, G (s)	14.3	25.2			4.9		5.8	26.2		2.3	22.7	22.7
Effective Green, g (s)	14.3	25.2			4.9		5.8	26.2		2.3	22.7	22.7
Actuated g/C Ratio	0.20	0.35			0.07		0.08	0.37		0.03	0.32	0.32
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	349	565			102		137	640		54	578	501
v/s Ratio Prot	c0.10	0.03					c0.02	0.12		0.01	c0.19	
v/s Ratio Perm					c0.02							0.15
v/c Ratio	0.50	0.10			0.29		0.28	0.33		0.31	0.60	0.46
Uniform Delay, d1	25.5	15.6			31.8		31.0	16.4		33.9	20.7	19.6
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.1			0.6		0.4	0.1		1.2	1.1	0.2
Delay (s)	26.6	15.7			32.3		31.4	16.5		35.1	21.8	19.8
Level of Service	C	B			C		C	B		D	C	B
Approach Delay (s)		22.9			32.3			18.8			21.1	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	71.7	Sum of lost time (s)	24.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	34	87	17	27	36	77	412	8	15	261	260
Future Volume (vph)	331	34	87	17	27	36	77	412	8	15	261	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98			0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89			0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	1643			1697		1736	1813		1504	1845	1549
Flt Permitted	0.95	1.00			0.89		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	1643			1528		1736	1813		1504	1845	1549
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	352	36	93	18	29	38	82	438	9	16	278	277
RTOR Reduction (vph)	0	52	0	0	21	0	0	1	0	0	0	158
Lane Group Flow (vph)	352	77	0	0	64	0	82	446	0	16	278	119
Confl. Peds. (#/hr)	3		1	1		3						
Confl. Bikes (#/hr)			1			1			1			1
Heavy Vehicles (%)	3%	0%	2%	6%	4%	0%	4%	4%	25%	20%	3%	2%
Turn Type	Prot	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8								6
Actuated Green, G (s)	25.9	39.8			7.9		11.2	29.1		2.3	20.2	20.2
Effective Green, g (s)	25.9	39.8			7.9		11.2	29.1		2.3	20.2	20.2
Actuated g/C Ratio	0.29	0.45			0.09		0.13	0.33		0.03	0.23	0.23
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	508	733			135		217	591		38	417	350
v/s Ratio Prot	c0.20	0.05					c0.05	c0.25		0.01	0.15	
v/s Ratio Perm					c0.04							0.08
v/c Ratio	0.69	0.11			0.47		0.38	0.76		0.42	0.67	0.34
Uniform Delay, d1	28.1	14.4			38.7		35.8	26.9		42.8	31.4	28.9
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	0.1			1.0		0.4	4.9		2.7	3.1	0.2
Delay (s)	32.2	14.4			39.6		36.2	31.7		45.5	34.5	29.1
Level of Service	C	B			D		D	C		D	C	C
Approach Delay (s)		27.4			39.6			32.4			32.2	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	24.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Attachment C Traffic Volumes

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: NB
DATE: Feb 07 2018 - Feb 07 2018

Start Time	Mon	Tue	Wed 07-Feb-18	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM			43			43			43	
1:00 AM			32			32			32	
2:00 AM			39			39			39	
3:00 AM			35			35			35	
4:00 AM			50			50			50	
5:00 AM			78			78			78	
6:00 AM			127			127			127	
7:00 AM			306			306			306	
8:00 AM			372			372			372	
9:00 AM			380			380			380	
10:00 AM			424			424			424	
11:00 AM			**478**			**478**			**478**	
12:00 PM			574			574			574	
1:00 PM			548			548			548	
2:00 PM			630			630			630	
3:00 PM			715			715			715	
4:00 PM			**760**			**760**			**760**	
5:00 PM			664			664			664	
6:00 PM			439			439			439	
7:00 PM			329			329			329	
8:00 PM			192			192			192	
9:00 PM			113			113			113	
10:00 PM			81			81			81	
11:00 PM			83			83			83	
Day Total			7492			7492			7492	
% Weekday Average			100.0%							
% Week Average			100.0%			100.0%				
AM Peak Volume			11:00 AM 478			11:00 AM 478			11:00 AM 478	
PM Peak Volume			4:00 PM 760			4:00 PM 760			4:00 PM 760	

Comments:

Quality Counts
TRANSPORTATION DATA COLLECTION

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: SB
DATE: Feb 07 2018 - Feb 07 2018

Start Time	Mon	Tue	Wed 07-Feb-18	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM			22			22			22	
1:00 AM			24			24			24	
2:00 AM			24			24			24	
3:00 AM			38			38			38	
4:00 AM			134			134			134	
5:00 AM			303			303			303	
6:00 AM			489			489			489	
7:00 AM			565			565			565	
8:00 AM			**582**			**582**			**582**	
9:00 AM			500			500			500	
10:00 AM			493			493			493	
11:00 AM			502			502			502	
12:00 PM			561			561			561	
1:00 PM			590			590			590	
2:00 PM			**596**			**596**			**596**	
3:00 PM			552			552			552	
4:00 PM			530			530			530	
5:00 PM			400			400			400	
6:00 PM			345			345			345	
7:00 PM			168			168			168	
8:00 PM			164			164			164	
9:00 PM			133			133			133	
10:00 PM			88			88			88	
11:00 PM			25			25			25	
Day Total			7828			7828			7828	
% Weekday Average			100.0%							
% Week Average			100.0%			100.0%				
AM Peak Volume			8:00 AM 582			8:00 AM 582			8:00 AM 582	
PM Peak Volume			2:00 PM 596			2:00 PM 596			2:00 PM 596	

Comments:

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: NB/SB
DATE: Feb 07 2018 - Feb 07 2018

Start Time	Mon	Tue	Wed 07-Feb-18	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM			65			65			65	
1:00 AM			56			56			56	
2:00 AM			63			63			63	
3:00 AM			73			73			73	
4:00 AM			184			184			184	
5:00 AM			381			381			381	
6:00 AM			616			616			616	
7:00 AM			871			871			871	
8:00 AM			954			954			954	
9:00 AM			880			880			880	
10:00 AM			917			917			917	
11:00 AM			**980**			**980**			**980**	
12:00 PM			1135			1135			1135	
1:00 PM			1138			1138			1138	
2:00 PM			1226			1226			1226	
3:00 PM			1267			1267			1267	
4:00 PM			**1290**			**1290**			**1290**	
5:00 PM			1064			1064			1064	
6:00 PM			784			784			784	
7:00 PM			497			497			497	
8:00 PM			356			356			356	
9:00 PM			246			246			246	
10:00 PM			169			169			169	
11:00 PM			108			108			108	
Day Total			15320			15320			15320	
% Weekday Average			100.0%							
% Week Average			100.0%			100.0%				
AM Peak Volume			11:00 AM 980			11:00 AM 980			11:00 AM 980	
PM Peak Volume			4:00 PM 1290			4:00 PM 1290			4:00 PM 1290	

Comments:

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Attachment D Travel Speeds

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: NB
DATE: Feb 07 2018

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	0	1	8	24	8	2	0	0	0	0	0	0	0	43	26-35	32
1:00 AM	1	0	0	5	17	5	**4**	0	0	0	0	0	0	0	32	27-36	22
2:00 AM	0	0	0	9	25	5	0	0	0	0	0	0	0	0	39	26-35	34
3:00 AM	1	3	0	8	17	6	0	0	0	0	0	0	0	0	35	28-37	24
4:00 AM	0	0	3	15	17	14	1	0	0	0	0	0	0	0	50	30-39	31
5:00 AM	2	0	5	27	32	12	0	0	0	0	0	0	0	0	78	26-35	59
6:00 AM	7	0	8	38	54	18	2	0	0	0	0	0	0	0	127	26-35	92
7:00 AM	28	1	20	112	114	**29**	2	0	0	0	0	0	0	0	306	26-35	226
8:00 AM	26	5	30	165	**131**	15	0	0	0	0	0	0	0	0	372	26-35	296
9:00 AM	32	3	39	175	111	20	0	0	0	0	0	0	0	0	380	26-35	286
10:00 AM	**38**	7	**49**	212	105	12	1	0	0	0	0	0	0	0	424	26-35	317
11:00 AM	37	**12**	48	**246**	126	9	0	0	0	0	0	0	0	0	**478**	26-35	372
12:00 PM	39	10	102	264	**143**	15	0	0	0	0	0	0	0	**1**	574	26-35	407
1:00 PM	53	8	91	258	119	**19**	0	0	0	0	0	0	0	0	548	26-35	376
2:00 PM	49	13	148	294	117	8	1	0	0	0	0	0	0	0	630	21-30	441
3:00 PM	58	11	**172**	336	124	13	1	0	0	0	0	0	0	0	715	21-30	508
4:00 PM	**64**	4	171	**394**	114	13	0	0	0	0	0	0	0	0	**760**	21-30	565
5:00 PM	34	**15**	127	356	125	7	0	0	0	0	0	0	0	0	664	21-30	483
6:00 PM	16	2	78	234	96	12	1	0	0	0	0	0	0	0	439	26-35	330
7:00 PM	9	1	16	150	137	16	0	0	0	0	0	0	0	0	329	26-35	286
8:00 PM	1	1	10	98	70	10	1	**1**	0	0	0	0	0	0	192	26-35	168
9:00 PM	4	1	2	40	48	18	0	0	0	0	0	0	0	0	113	26-35	87
10:00 PM	0	0	2	29	40	8	**2**	0	0	0	0	0	0	0	81	26-35	69
11:00 PM	0	0	2	25	51	5	0	0	0	0	0	0	0	0	83	26-35	76
Day Total	499	97	1124	3498	1957	297	18	1	0	0	0	0	0	1	7492	26-35	5454
Percent	6.7%	1.3%	15.0%	46.7%	26.1%	4.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
ADT 7492																	
AM Peak	10:00 AM	11:00 AM	10:00 AM	11:00 AM	8:00 AM	7:00 AM	1:00 AM								11:00 AM		
Volume	38	12	49	246	131	29	4								478		
PM Peak	4:00 PM	5:00 PM	3:00 PM	4:00 PM	12:00 PM	1:00 PM	10:00 PM	8:00 PM						12:00 PM	4:00 PM		
Volume	64	15	172	394	143	19	2	1						1	760		

Comments:

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

SUMMARY - Tube Count - Speed Data

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: NB
DATE: Feb 07 2018 - Feb 07 2018

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
Grand Total	499	97	1124	3498	1957	297	18	1	0	0	0	0	0	1	7492	26-35	5454
Percent	6.7%	1.3%	15.0%	46.7%	26.1%	4.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
Cumulative Percent	6.7%	8.0%	23.0%	69.6%	95.8%	99.7%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%			

ADT 7492

85th Percentile 32 MPH

Mean Speed(Average) 27 MPH

Median 27 MPH
Mode: 28 MPH

Comments:

Report generated on 2/14/2018 2:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Quality Counts
TRANSPORTATION DATA COLLECTION

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: SB
DATE: Feb 07 2018

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	0	0	4	11	5	2	0	0	0	0	0	0	0	22	31-40	16
1:00 AM	0	0	1	1	11	10	1	0	0	0	0	0	0	0	24	31-40	21
2:00 AM	0	1	0	1	11	9	1	0	0	0	0	0	**1**	0	24	31-40	19
3:00 AM	0	0	0	3	15	16	3	1	0	0	0	0	0	0	38	31-40	31
4:00 AM	0	0	0	2	31	81	18	**2**	0	0	0	0	0	0	134	31-40	112
5:00 AM	4	0	3	33	114	126	22	1	0	0	0	0	0	0	303	31-40	239
6:00 AM	6	4	11	60	212	**171**	**24**	1	0	0	0	0	0	0	489	31-40	383
7:00 AM	31	1	11	102	277	128	15	0	0	0	0	0	0	0	565	31-40	405
8:00 AM	21	4	15	119	**335**	83	4	1	0	0	0	0	0	0	**582**	26-35	454
9:00 AM	23	3	26	106	255	82	5	0	0	0	0	0	0	0	500	26-35	361
10:00 AM	30	**8**	29	152	222	52	0	0	0	0	0	0	0	0	493	26-35	373
11:00 AM	**43**	6	**43**	**153**	203	48	5	1	0	0	0	0	0	0	502	26-35	356
12:00 PM	47	11	**57**	183	219	42	2	0	0	0	0	0	0	0	561	26-35	401
1:00 PM	51	9	50	**224**	222	31	3	0	0	0	0	0	0	0	590	26-35	445
2:00 PM	64	**12**	49	189	**240**	39	3	0	0	0	0	0	0	0	**596**	26-35	429
3:00 PM	**70**	5	34	157	233	50	3	0	0	0	0	0	0	0	552	26-35	390
4:00 PM	68	7	24	146	217	**62**	5	0	0	**1**	0	0	0	0	530	26-35	362
5:00 PM	41	2	28	113	164	48	4	0	0	0	0	0	0	0	400	26-35	277
6:00 PM	22	4	20	109	146	39	5	0	0	0	0	0	0	0	345	26-35	254
7:00 PM	5	1	4	21	97	37	2	**1**	0	0	0	0	0	0	168	31-40	134
8:00 PM	2	0	1	37	86	35	3	0	0	0	0	0	0	0	164	26-35	123
9:00 PM	1	1	3	22	64	37	5	0	0	0	0	0	0	0	133	31-40	101
10:00 PM	0	0	1	10	42	28	**6**	1	0	0	0	0	0	0	88	31-40	69
11:00 PM	0	0	1	2	11	10	1	0	0	0	0	0	0	0	25	31-40	21
Day Total	529	79	411	1949	3438	1269	142	9	0	1	0	0	1	0	7828	26-35	5387
Percent	6.8%	1.0%	5.3%	24.9%	43.9%	16.2%	1.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
ADT 7828																	
AM Peak	11:00 AM	10:00 AM	11:00 AM	11:00 AM	8:00 AM	6:00 AM	6:00 AM	4:00 AM					2:00 AM		8:00 AM		
Volume	43	8	43	153	335	171	24	2					1		582		
PM Peak	3:00 PM	2:00 PM	12:00 PM	1:00 PM	2:00 PM	4:00 PM	10:00 PM	7:00 PM		4:00 PM					2:00 PM		
Volume	70	12	57	224	240	62	6	1		1					596		

Comments:

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

SUMMARY - Tube Count - Speed Data

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: SB
DATE: Feb 07 2018 - Feb 07 2018

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
Grand Total	529	79	411	1949	3438	1269	142	9	0	1	0	0	1	0	7828	26-35	5387
Percent	6.8%	1.0%	5.3%	24.9%	43.9%	16.2%	1.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
Cumulative Percent	6.8%	7.8%	13.0%	37.9%	81.8%	98.0%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%			

ADT 7828

85th Percentile 35 MPH

Mean Speed(Average) 29 MPH

Median 31 MPH
Mode: 33 MPH

Comments:

Report generated on 2/14/2018 2:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Quality Counts
TRANSPORTATION DATA COLLECTION

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: NB/SB
DATE: Feb 07 2018

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	0	1	12	35	13	4	0	0	0	0	0	0	0	65	31-40	47
1:00 AM	1	0	1	6	28	15	5	0	0	0	0	0	0	0	56	31-40	43
2:00 AM	0	1	0	10	36	14	1	0	0	0	0	0	**1**	0	63	31-40	49
3:00 AM	1	3	0	11	32	22	3	1	0	0	0	0	0	0	73	31-40	54
4:00 AM	0	0	3	17	48	95	19	**2**	0	0	0	0	0	0	184	31-40	143
5:00 AM	6	0	8	60	146	138	22	1	0	0	0	0	0	0	381	31-40	284
6:00 AM	13	4	19	98	266	**189**	**26**	1	0	0	0	0	0	0	616	31-40	454
7:00 AM	59	2	31	214	391	157	17	0	0	0	0	0	0	0	871	26-35	605
8:00 AM	47	9	45	284	**466**	98	4	1	0	0	0	0	0	0	954	26-35	750
9:00 AM	55	6	65	281	366	102	5	0	0	0	0	0	0	0	880	26-35	647
10:00 AM	68	15	78	364	327	64	1	0	0	0	0	0	0	0	917	26-35	691
11:00 AM	**80**	**18**	**91**	**399**	329	57	5	1	0	0	0	0	0	0	**980**	26-35	727
12:00 PM	86	21	159	447	**362**	57	2	0	0	0	0	0	0	**1**	1135	26-35	809
1:00 PM	104	17	141	482	341	50	3	0	0	0	0	0	0	0	1138	26-35	823
2:00 PM	113	**25**	197	483	357	47	4	0	0	0	0	0	0	0	1226	26-35	840
3:00 PM	128	16	**206**	493	357	63	4	0	0	0	0	0	0	0	1267	26-35	850
4:00 PM	**132**	11	195	**540**	331	**75**	5	0	0	**1**	0	0	0	0	**1290**	26-35	871
5:00 PM	75	17	155	469	289	55	4	0	0	0	0	0	0	0	1064	26-35	757
6:00 PM	38	6	98	343	242	51	6	0	0	0	0	0	0	0	784	26-35	585
7:00 PM	14	2	20	171	234	53	2	**1**	0	0	0	0	0	0	497	26-35	404
8:00 PM	3	1	11	135	156	45	4	1	0	0	0	0	0	0	356	26-35	291
9:00 PM	5	2	5	62	112	55	5	0	0	0	0	0	0	0	246	26-35	173
10:00 PM	0	0	3	39	82	36	**8**	1	0	0	0	0	0	0	169	26-35	121
11:00 PM	0	0	3	27	62	15	1	0	0	0	0	0	0	0	108	26-35	89
Day Total	1028	176	1535	5447	5395	1566	160	10	0	1	0	0	1	1	15320	26-35	10842
Percent	6.7%	1.1%	10.0%	35.6%	35.2%	10.2%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
ADT 15320																	
AM Peak	11:00 AM	11:00 AM	11:00 AM	11:00 AM	8:00 AM	6:00 AM	6:00 AM	4:00 AM					2:00 AM		11:00 AM		
Volume	80	18	91	399	466	189	26	2					1		980		
PM Peak	4:00 PM	2:00 PM	3:00 PM	4:00 PM	12:00 PM	4:00 PM	10:00 PM	7:00 PM		4:00 PM				12:00 PM	4:00 PM		
Volume	132	25	206	540	362	75	8	1		1				1	1290		

Comments:

Quality Counts
TRANSPORTATION DATA COLLECTION

SUMMARY - Tube Count - Speed Data

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: NB/SB
DATE: Feb 07 2018 - Feb 07 2018

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
Grand Total	1028	176	1535	5447	5395	1566	160	10	0	1	0	0	1	1	15320	26-35	10842
Percent	6.7%	1.1%	10.0%	35.6%	35.2%	10.2%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
Cumulative Percent	6.7%	7.9%	17.9%	53.4%	88.6%	98.9%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%			

ADT 15320

85th Percentile 34 MPH

Mean Speed(Average) 28 MPH

Median 29 MPH
Mode: 28 MPH

Comments:

Report generated on 2/14/2018 2:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Quality Counts
TRANSPORTATION DATA COLLECTION

Attachment E Vehicle Classifications

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: NB
DATE: Feb 07 2018

Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
12:00 AM	0	30	9	0	4	0	0	0	0	0	0	0	0	0	43
1:00 AM	0	20	7	0	1	2	0	0	0	**1**	0	0	0	1	32
2:00 AM	0	26	7	0	6	0	0	0	0	0	0	0	0	0	39
3:00 AM	0	21	5	0	3	3	0	1	1	0	0	0	0	1	35
4:00 AM	6	23	13	0	6	1	0	0	1	0	0	0	0	0	50
5:00 AM	4	42	18	0	6	4	**2**	0	1	0	0	0	0	1	78
6:00 AM	6	68	31	0	10	4	0	0	0	0	0	0	**1**	7	127
7:00 AM	7	179	64	0	20	**5**	0	1	2	0	0	0	0	28	306
8:00 AM	8	211	79	0	**42**	1	1	**3**	1	0	0	0	0	26	372
9:00 AM	8	219	86	**2**	32	2	0	1	0	0	0	0	0	30	380
10:00 AM	5	246	95	2	27	5	1	1	2	1	0	0	1	**38**	424
11:00 AM	**10**	**277**	**106**	1	36	5	2	2	**3**	0	0	0	0	36	**478**
12:00 PM	**14**	357	122	0	38	2	0	2	0	0	0	0	0	39	574
1:00 PM	5	329	111	1	40	**12**	0	4	0	0	0	0	0	46	548
2:00 PM	13	379	132	1	46	6	**2**	3	0	0	0	0	0	48	630
3:00 PM	8	432	**170**	0	38	3	0	**5**	2	0	0	0	0	57	715
4:00 PM	7	**481**	146	**2**	**55**	3	0	4	0	0	0	0	0	**62**	**760**
5:00 PM	4	463	113	0	45	2	1	2	0	0	0	0	0	34	664
6:00 PM	6	292	93	1	24	2	0	2	**3**	0	0	0	0	16	439
7:00 PM	4	230	69	0	16	0	0	1	0	0	0	0	0	9	329
8:00 PM	2	143	40	0	7	0	0	0	0	0	0	0	0	0	192
9:00 PM	1	94	11	0	3	0	0	0	0	0	0	0	0	4	113
10:00 PM	0	58	19	0	3	0	0	1	0	0	0	0	0	0	81
11:00 PM	0	68	14	0	1	0	0	0	0	0	0	0	0	0	83
Day Total	118	4688	1560	10	509	62	9	33	16	2	0	0	2	483	7492
Percent	1.6%	62.6%	20.8%	0.1%	6.8%	0.8%	0.1%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	6.4%	
ADT 7492															
AM Peak	11:00 AM	11:00 AM	11:00 AM	9:00 AM	8:00 AM	7:00 AM	5:00 AM	8:00 AM	11:00 AM	1:00 AM			6:00 AM	10:00 AM	11:00 AM
Volume	10	277	106	2	42	5	2	3	3	1			1	38	478
PM Peak	12:00 PM	4:00 PM	3:00 PM	4:00 PM	4:00 PM	1:00 PM	2:00 PM	3:00 PM	6:00 PM					4:00 PM	4:00 PM
Volume	14	481	170	2	55	12	2	5	3					62	760

Comments:

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

SUMMARY - Tube Count - Vehicle Classification Data

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: NB
DATE: Feb 07 2018 - Feb 07 2018

Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
Grand Total	118	4688	1560	10	509	62	9	33	16	2	0	0	2	483	7492
Percent	1.6%	62.6%	20.8%	0.1%	6.8%	0.8%	0.1%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	6.4%	
ADT 7492															

Comments:

Report generated on 2/14/2018 2:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Quality Counts
TRANSPORTATION DATA COLLECTION

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: SB
DATE: Feb 07 2018

Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
12:00 AM	0	14	4	0	3	0	0	1	0	0	0	0	0	0	22
1:00 AM	0	19	4	0	0	0	0	0	1	0	0	0	0	0	24
2:00 AM	0	17	3	0	4	0	0	0	0	0	0	0	0	0	24
3:00 AM	0	22	4	1	11	0	0	0	0	0	0	0	0	0	38
4:00 AM	0	64	34	0	32	2	0	0	2	0	0	0	0	0	134
5:00 AM	3	155	60	0	77	1	0	1	1	1	0	0	0	4	303
6:00 AM	3	228	**137**	1	**108**	2	0	1	1	**2**	0	0	**1**	5	489
7:00 AM	**6**	329	117	0	73	4	0	4	2	1	0	0	0	29	565
8:00 AM	2	**344**	134	1	76	2	0	1	1	0	0	0	0	21	**582**
9:00 AM	2	292	109	0	54	4	**1**	4	**8**	2	0	0	1	23	500
10:00 AM	3	274	116	**2**	52	**8**	0	3	3	1	0	0	1	30	493
11:00 AM	2	297	100	0	45	6	0	**7**	1	1	0	0	0	**43**	502
12:00 PM	2	322	**130**	1	52	**7**	0	5	**3**	1	0	0	**1**	37	561
1:00 PM	3	347	118	**3**	**55**	6	0	3	2	1	0	0	1	51	590
2:00 PM	6	**353**	117	2	49	2	0	4	0	0	0	0	1	62	**596**
3:00 PM	5	305	119	2	40	1	**1**	**6**	1	**3**	0	0	1	**68**	552
4:00 PM	**9**	306	98	0	43	5	0	3	0	0	0	0	0	66	530
5:00 PM	6	234	81	1	34	1	0	2	0	0	0	0	0	41	400
6:00 PM	2	205	89	0	25	0	0	2	0	0	0	0	0	22	345
7:00 PM	0	110	33	0	20	0	0	0	0	0	0	0	0	5	168
8:00 PM	0	114	42	0	6	0	0	0	0	0	0	0	0	2	164
9:00 PM	1	91	31	0	9	0	0	0	0	0	0	0	0	1	133
10:00 PM	0	63	18	0	6	0	0	0	1	0	0	0	0	0	88
11:00 PM	0	19	3	1	1	0	0	0	1	0	0	0	0	0	25
Day Total	55	4524	1701	15	875	51	2	47	28	13	0	0	7	510	7828
Percent	0.7%	57.8%	21.7%	0.2%	11.2%	0.7%	0.0%	0.6%	0.4%	0.2%	0.0%	0.0%	0.1%	6.5%	
ADT 7828															
AM Peak	7:00 AM	8:00 AM	6:00 AM	10:00 AM	6:00 AM	10:00 AM	9:00 AM	11:00 AM	9:00 AM	6:00 AM			6:00 AM	11:00 AM	8:00 AM
Volume	6	344	137	2	108	8	1	7	8	2			1	43	582
PM Peak	4:00 PM	2:00 PM	12:00 PM	1:00 PM	1:00 PM	12:00 PM	3:00 PM	3:00 PM	12:00 PM	3:00 PM			12:00 PM	3:00 PM	2:00 PM
Volume	9	353	130	3	55	7	1	6	3	3			1	68	596

Comments:

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

SUMMARY - Tube Count - Vehicle Classification Data

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: SB
DATE: Feb 07 2018 - Feb 07 2018

Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
Grand Total	55	4524	1701	15	875	51	2	47	28	13	0	0	7	510	7828
Percent	0.7%	57.8%	21.7%	0.2%	11.2%	0.7%	0.0%	0.6%	0.4%	0.2%	0.0%	0.0%	0.1%	6.5%	
ADT 7828															

Comments:

Report generated on 2/14/2018 2:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Quality Counts
TRANSPORTATION DATA COLLECTION

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: NB/SB
DATE: Feb 07 2018

Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
12:00 AM	0	44	13	0	7	0	0	1	0	0	0	0	0	0	65
1:00 AM	0	39	11	0	1	2	0	0	1	1	0	0	0	1	56
2:00 AM	0	43	10	0	10	0	0	0	0	0	0	0	0	0	63
3:00 AM	0	43	9	1	14	3	0	1	1	0	0	0	0	1	73
4:00 AM	6	87	47	0	38	3	0	0	3	0	0	0	0	0	184
5:00 AM	7	197	78	0	83	5	**2**	1	2	1	0	0	0	5	381
6:00 AM	9	296	168	1	**118**	6	0	1	1	**2**	0	0	**2**	12	616
7:00 AM	**13**	508	181	0	93	9	0	5	4	1	0	0	0	57	871
8:00 AM	10	555	**213**	1	118	3	1	4	2	0	0	0	0	47	954
9:00 AM	10	511	195	2	86	6	1	5	**8**	2	0	0	1	53	880
10:00 AM	8	520	211	**4**	79	**13**	1	4	5	2	0	0	2	68	917
11:00 AM	12	**574**	206	1	81	11	2	**9**	4	1	0	0	0	**79**	**980**
12:00 PM	16	679	252	1	90	9	0	7	**3**	1	0	0	**1**	76	1135
1:00 PM	8	676	229	**4**	95	**18**	0	7	2	1	0	0	1	97	1138
2:00 PM	**19**	732	249	3	95	8	**2**	7	0	0	0	0	1	110	1226
3:00 PM	13	737	**289**	2	78	4	1	**11**	3	**3**	0	0	1	125	1267
4:00 PM	16	**787**	244	2	**98**	8	0	7	0	0	0	0	0	**128**	**1290**
5:00 PM	10	697	194	1	79	3	1	4	0	0	0	0	0	75	1064
6:00 PM	8	497	182	1	49	2	0	4	3	0	0	0	0	38	784
7:00 PM	4	340	102	0	36	0	0	1	0	0	0	0	0	14	497
8:00 PM	2	257	82	0	13	0	0	0	0	0	0	0	0	2	356
9:00 PM	2	185	42	0	12	0	0	0	0	0	0	0	0	5	246
10:00 PM	0	121	37	0	9	0	0	1	1	0	0	0	0	0	169
11:00 PM	0	87	17	1	2	0	0	0	1	0	0	0	0	0	108
Day Total	173	9212	3261	25	1384	113	11	80	44	15	0	0	9	993	15320
Percent	1.1%	60.1%	21.3%	0.2%	9.0%	0.7%	0.1%	0.5%	0.3%	0.1%	0.0%	0.0%	0.1%	6.5%	
ADT 15320															
AM Peak	7:00 AM	11:00 AM	8:00 AM	10:00 AM	6:00 AM	10:00 AM	5:00 AM	11:00 AM	9:00 AM	6:00 AM			6:00 AM	11:00 AM	11:00 AM
Volume	13	574	213	4	118	13	2	9	8	2			2	79	980
PM Peak	2:00 PM	4:00 PM	3:00 PM	1:00 PM	4:00 PM	1:00 PM	2:00 PM	3:00 PM	12:00 PM	3:00 PM			12:00 PM	4:00 PM	4:00 PM
Volume	19	787	289	4	98	18	2	11	3	3			1	128	1290

Comments:

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

SUMMARY - Tube Count - Vehicle Classification Data

LOCATION: 3rd Ave north of Hudson St
SPECIFIC LOCATION: 3rd Ave north of Hudson St
CITY/STATE: Longview, WA

QC JOB #: 14551906
DIRECTION: NB/SB
DATE: Feb 07 2018 - Feb 07 2018

Start Time	Motor-cycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
Grand Total	173	9212	3261	25	1384	113	11	80	44	15	0	0	9	993	15320
Percent	1.1%	60.1%	21.3%	0.2%	9.0%	0.7%	0.1%	0.5%	0.3%	0.1%	0.0%	0.0%	0.1%	6.5%	
ADT 15320															

Comments:

Report generated on 2/14/2018 2:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Quality Counts
TRANSPORTATION DATA COLLECTION

Attachment F Pedestrian Volumes

Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

Location: 3rd Ave & Hudson Jaywalkers
Date: 2/7/2018
Order Number: 145519

Time:	Jaywalkers
7:00 AM	0
7:05 AM	0
7:10 AM	0
7:15 AM	0
7:20 AM	1
7:25 AM	0
7:30 AM	0
7:35 AM	0
7:40 AM	0
7:45 AM	0
7:50 AM	0
7:55 AM	0
8:00 AM	0
8:05 AM	0
8:10 AM	0
8:15 AM	0
8:20 AM	0
8:25 AM	0
8:30 AM	2
8:35 AM	0
8:40 AM	0
8:45 AM	0
8:50 AM	0
8:55 AM	0
9:00 AM	0
9:05 AM	0
9:10 AM	0
9:15 AM	0
9:20 AM	1
9:25 AM	2
9:30 AM	1
9:35 AM	0
9:40 AM	0
9:45 AM	0
9:50 AM	0
9:55 AM	0
10:00 AM	0
10:05 AM	0
10:10 AM	0
10:15 AM	0
10:20 AM	0
10:25 AM	1
10:30 AM	0
10:35 AM	4

10:40 AM	0
10:45 AM	0
10:50 AM	0
10:55 AM	0
11:00 AM	0
11:05 AM	0
11:10 AM	0
11:15 AM	0
11:20 AM	0
11:25 AM	0
11:30 AM	0
11:35 AM	0
11:40 AM	0
11:45 AM	0
11:50 AM	0
11:55 AM	0
12:00 PM	0
12:05 PM	0
12:10 PM	0
12:15 PM	0
12:20 PM	0
12:25 PM	1
12:30 PM	0
12:35 PM	0
12:40 PM	0
12:45 PM	0
12:50 PM	0
12:55 PM	0
1:00 PM	0
1:05 PM	0
1:10 PM	4
1:15 PM	0
1:20 PM	2
1:25 PM	2
1:30 PM	0
1:35 PM	0
1:40 PM	0
1:45 PM	0
1:50 PM	0
1:55 PM	6
2:00 PM	0
2:05 PM	0
2:10 PM	0
2:15 PM	0
2:20 PM	0
2:25 PM	2
2:30 PM	2
2:35 PM	0
2:40 PM	0
2:45 PM	0
2:50 PM	0
2:55 PM	0
3:00 PM	0
3:05 PM	0
3:10 PM	2
3:15 PM	2
3:20 PM	0
3:25 PM	0

3:30 PM	0
3:35 PM	0
3:40 PM	0
3:45 PM	0
3:50 PM	0
3:55 PM	0
4:00 PM	0
4:05 PM	0
4:10 PM	0
4:15 PM	0
4:20 PM	0
4:25 PM	0
4:30 PM	1
4:35 PM	1
4:40 PM	0
4:45 PM	0
4:50 PM	0
4:55 PM	0
5:00 PM	0
5:05 PM	0
5:10 PM	0
5:15 PM	0
5:20 PM	0
5:25 PM	0
5:30 PM	0
5:35 PM	2
5:40 PM	0
5:45 PM	0
5:50 PM	1
5:55 PM	0
6:00 PM	1
6:05 PM	0
6:10 PM	0
6:15 PM	0
6:20 PM	0
6:25 PM	1
6:30 PM	0
6:35 PM	0
6:40 PM	0
6:45 PM	0
6:50 PM	0
6:55 PM	0
Total:	**42**

Attachment G NCHRP 562 Worksheets: Existing Conditions

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.

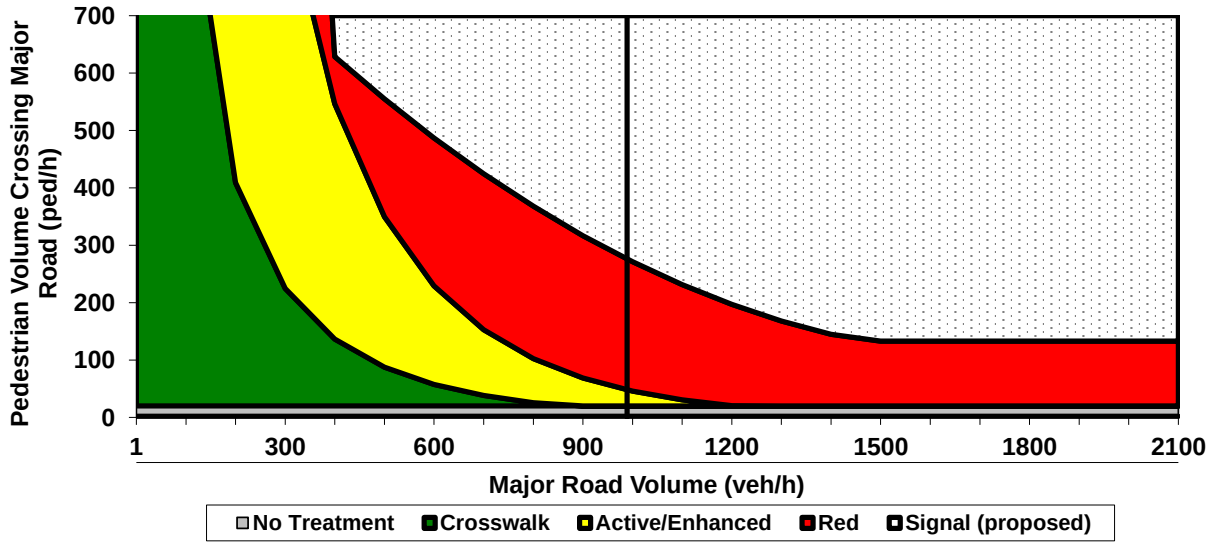
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	7:45 AM (Veh Peak)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	2
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-s}		*3a*	989
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	276
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	276
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	138
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		*4a*	50
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*	17
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*	989
Major road flow rate (veh/s), v		*4f*	0.27
Average pedestrian delay (s/person), d_p		*4g*	373
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*	0.2
		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.

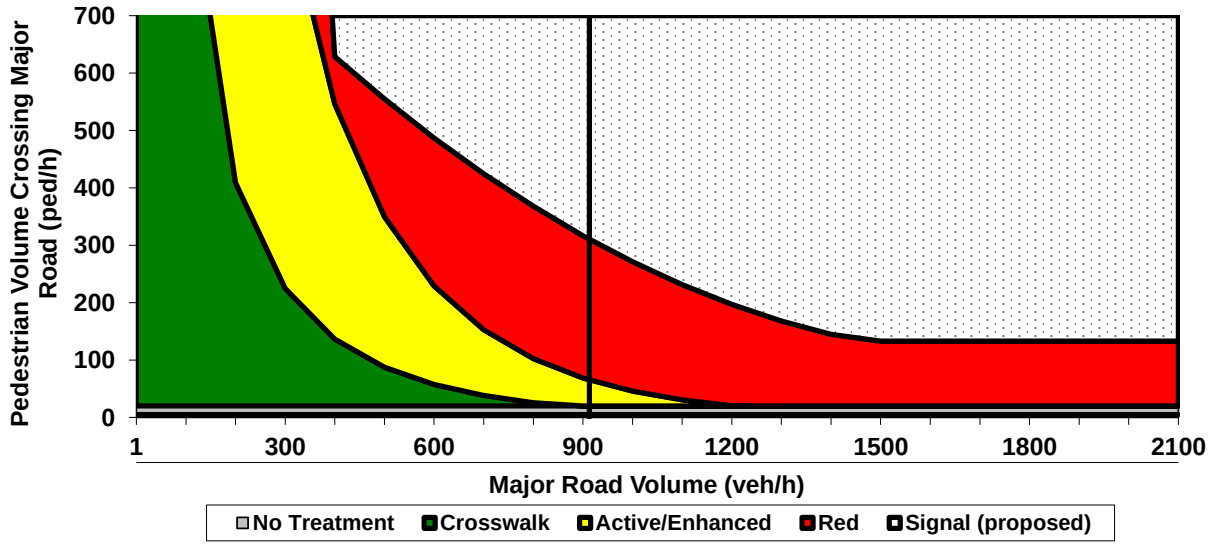
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	8:30 AM (Ped Peak)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	5
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-s}		*3a*	913
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	311
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	311
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	155
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		*4a*	50
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*	17
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*	913
Major road flow rate (veh/s), v		*4f*	0.25
Average pedestrian delay (s/person), d_p		*4g*	280
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*	0.4
		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.

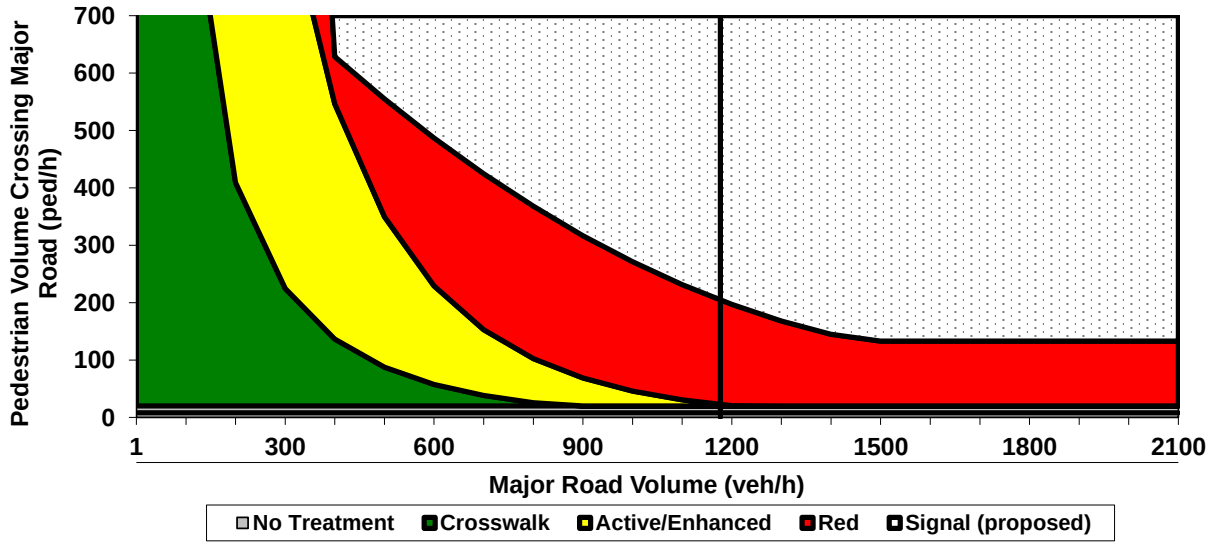
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	12:45 PM (Veh Peak)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	8
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-s}		*3a*	1177
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	204
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	204
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	102
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		*4a*	50
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*	17
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*	1177
Major road flow rate (veh/s), v		*4f*	0.33
Average pedestrian delay (s/person), d_p		*4g*	889
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*	2.0
		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.

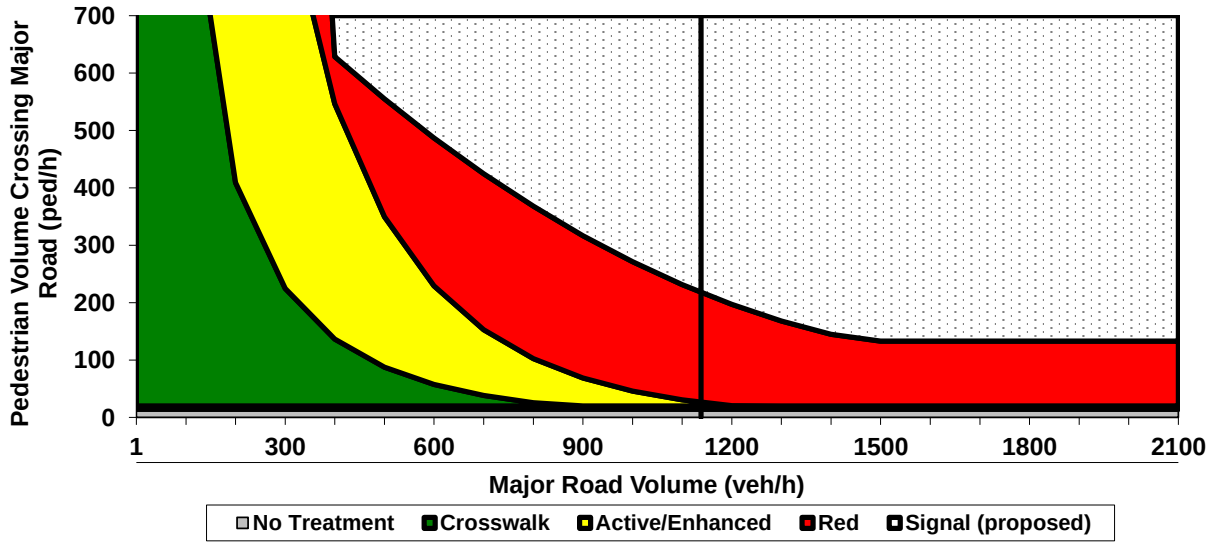
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	1:00 PM (Ped Peak)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	14
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-s}		*3a*	1138
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	218
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	218
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	109
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*	50
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*	17
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*	1138
Major road flow rate (veh/s), v		*4f*	0.32
Average pedestrian delay (s/person), d_p		*4g*	769
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*	3.0
		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.

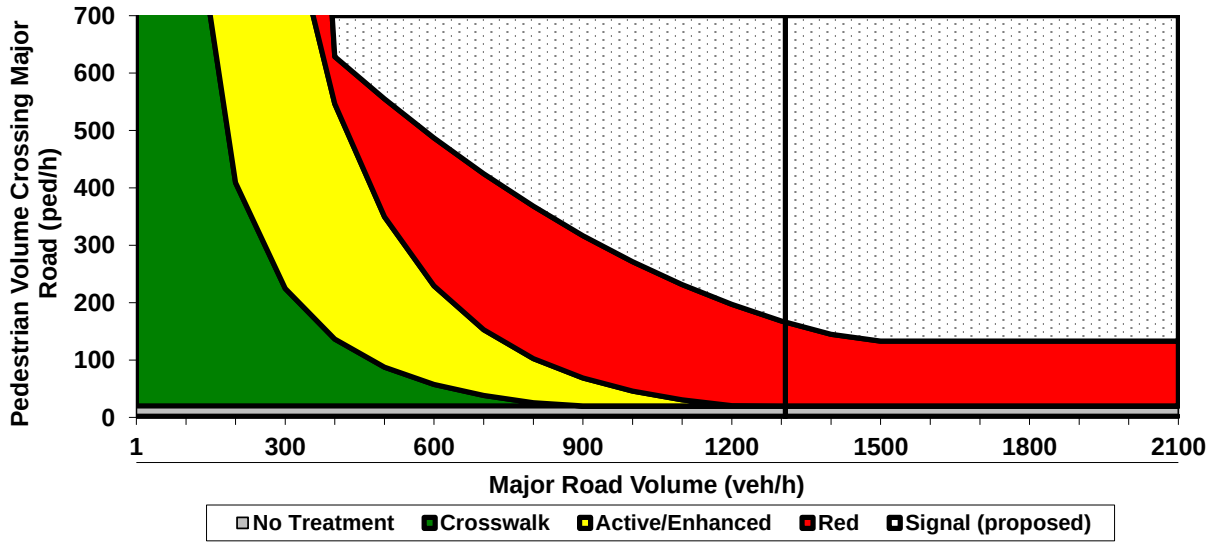
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	3:45 PM (Veh Peak)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	2
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-s}		*3a*	1308
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	166
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	166
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	83
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		*4a*	50
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*	17
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*	1308
Major road flow rate (veh/s), v		*4f*	0.36
Average pedestrian delay (s/person), d_p		*4g*	1380
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*	0.8
		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.

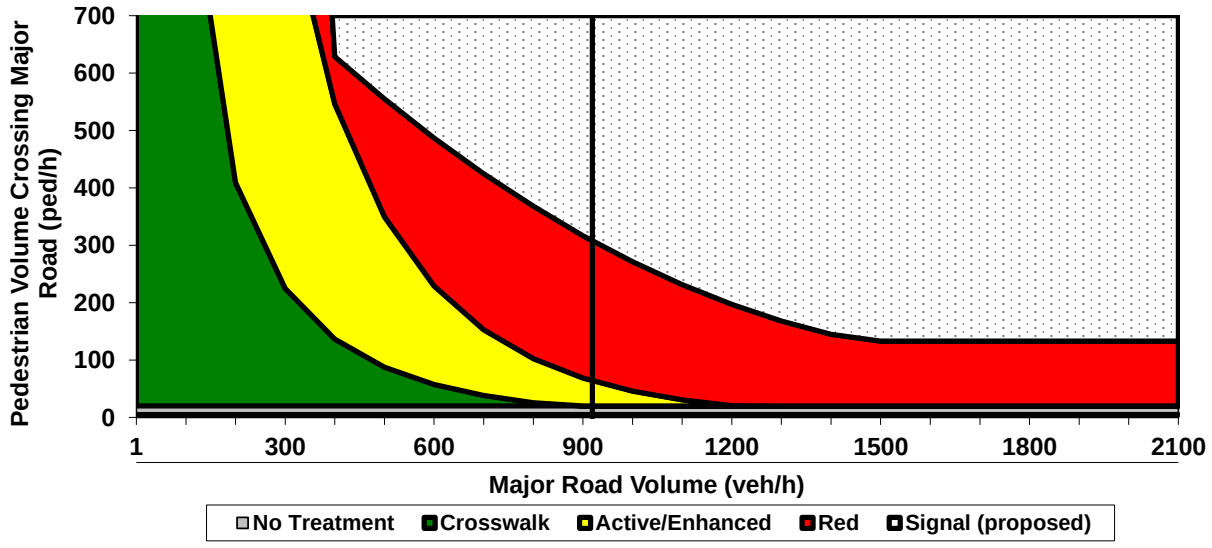
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	5:30 PM (Ped Peak)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	5
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-s}		*3a*	919
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	308
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	308
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	154
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		*4a*	50
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*	17
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*	919
Major road flow rate (veh/s), v		*4f*	0.26
Average pedestrian delay (s/person), d_p		*4g*	323
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*	0.4
		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.

Attachment H NCHRP 562 Worksheets: Sensitivity Analysis

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.

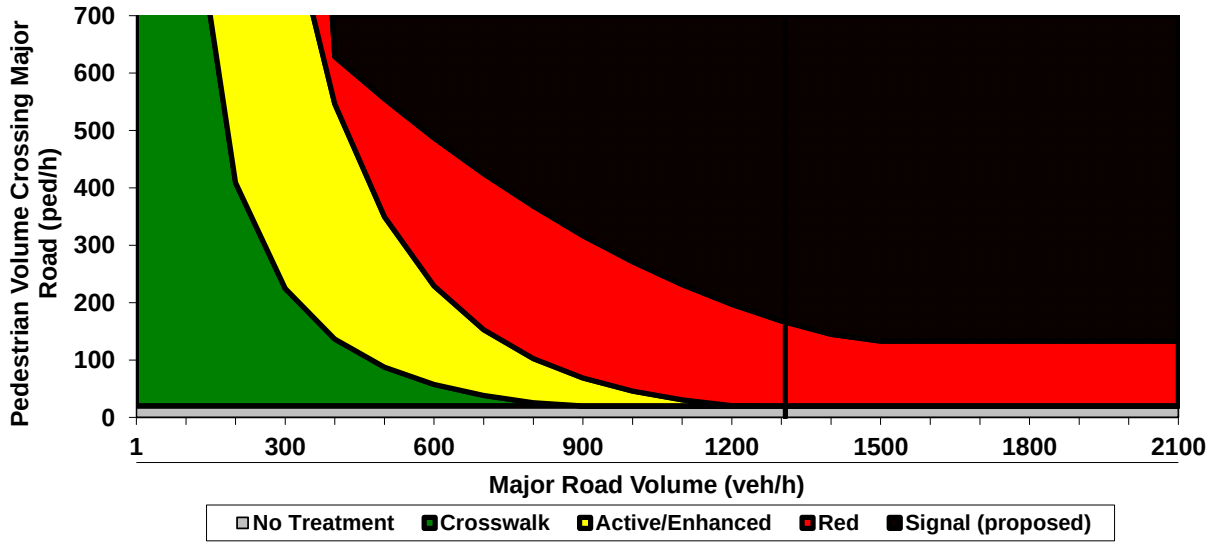
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	3:45 PM (Veh Peak - Sensitivity 2)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	20
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*	1308
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	166
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	166
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	83
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*	50
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*	17
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*	1308
Major road flow rate (veh/s), v		*4f*	0.36
Average pedestrian delay (s/person), d_p		*4g*	1380
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*	7.7
		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:	**RED**		



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.

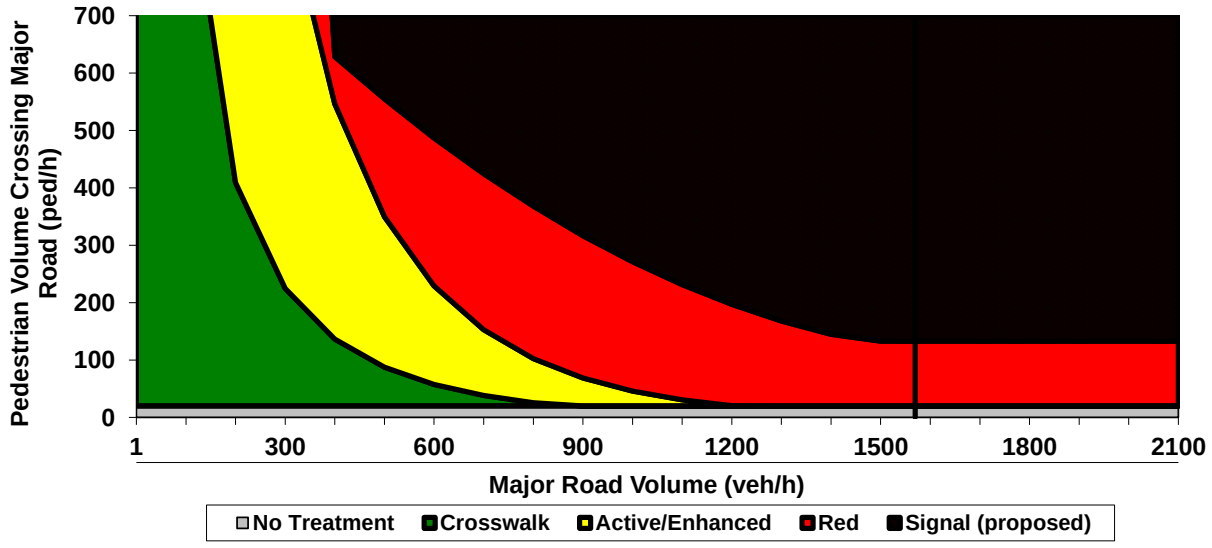
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	3:45 PM (Veh Peak - Sensitivity 3)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	20
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*	1569.6
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	133
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	133
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	67
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*	50
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*	17
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*	1569.6
Major road flow rate (veh/s), v		*4f*	0.44
Average pedestrian delay (s/person), d_p		*4g*	4548
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*	25.3
		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:	**RED**		



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.

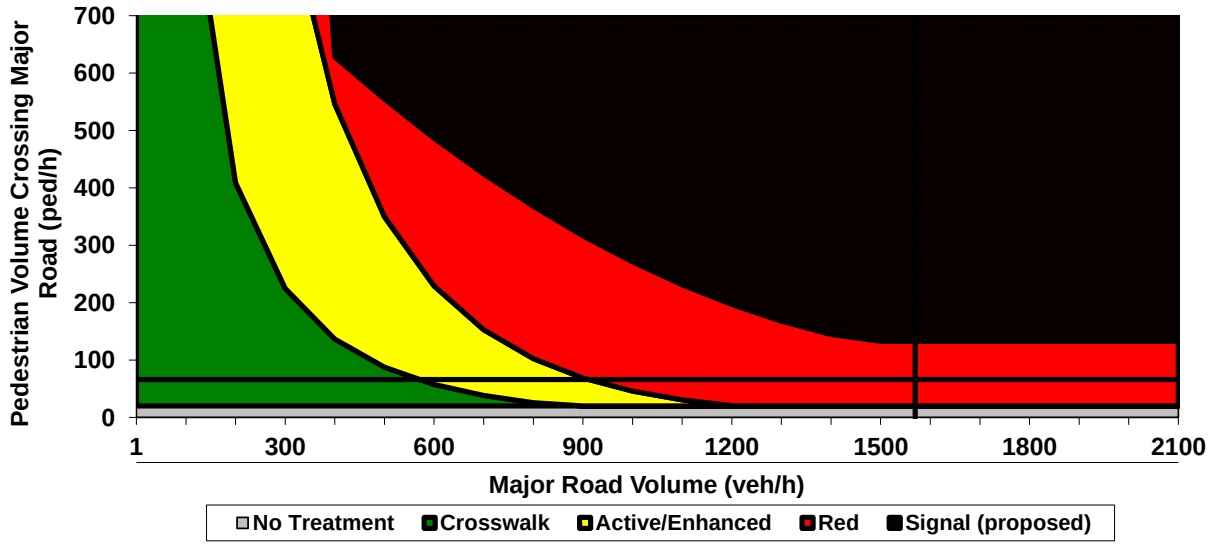
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	3:45 PM (Veh Peak)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	66
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*	1569.6
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	133
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	133
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	67
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*	50
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*	17
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*	1569.6
Major road flow rate (veh/s), v		*4f*	0.44
Average pedestrian delay (s/person), d_p		*4g*	4548
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*	83.4
		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:	**RED**		



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.

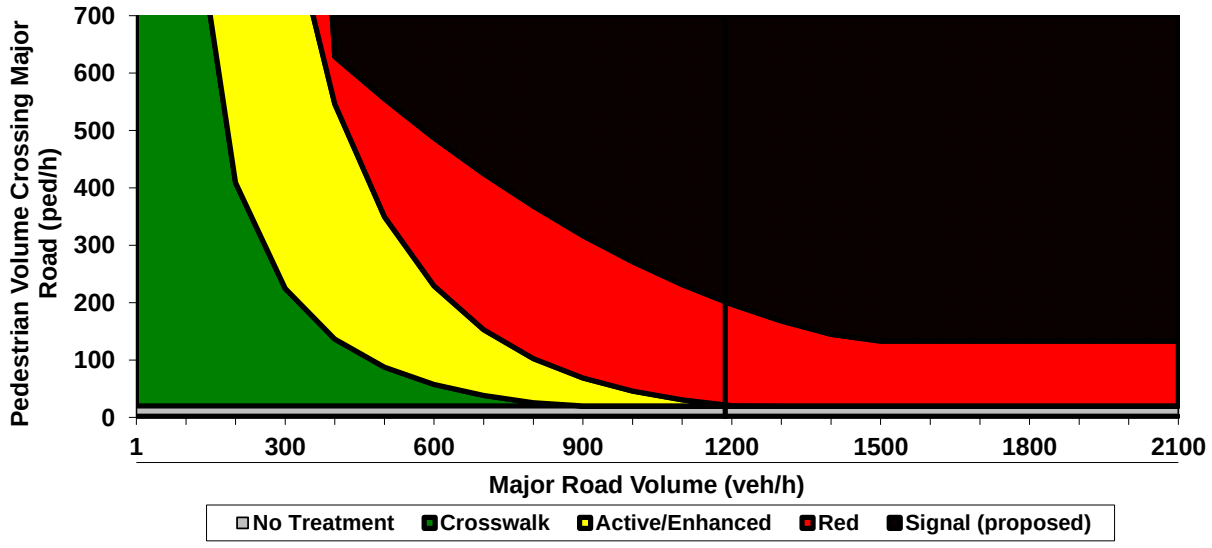
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	7:45 AM (Veh Peak - Sensitivity 1)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	2
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-s}		*3a*	1186.8
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	201
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	201
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	101
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		*4a*	50
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*	17
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*	1186.8
Major road flow rate (veh/s), v		*4f*	0.33
Average pedestrian delay (s/person), d_p		*4g*	889
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*	0.5
		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:	**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.

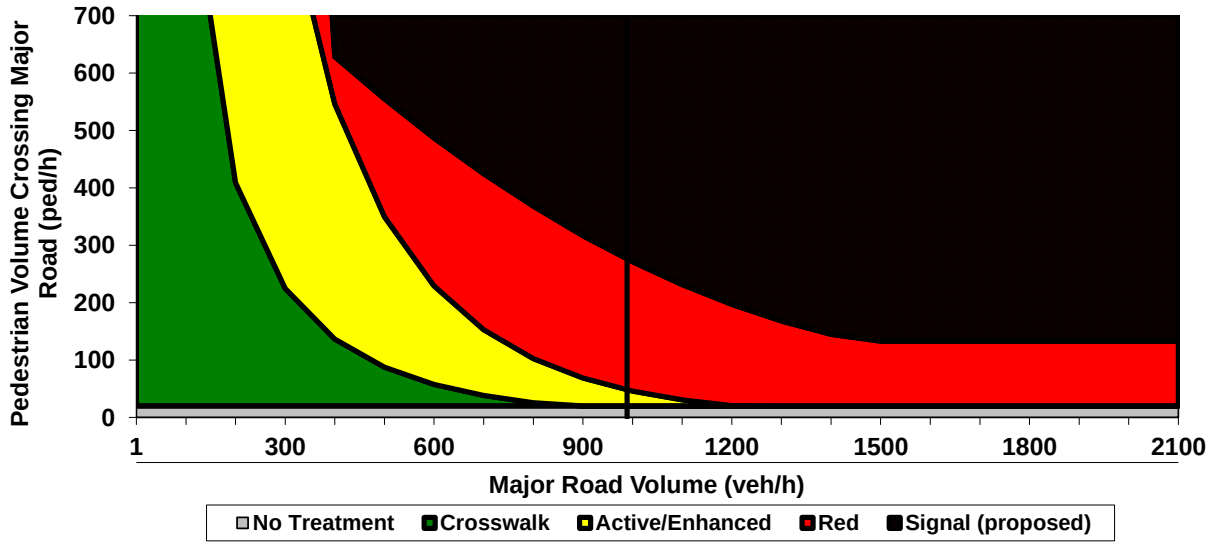
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	7:45 AM (Veh Peak - Sensitivity 2)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	20
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*	989
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	276
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	276
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	138
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*	50
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*	17
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*	989
Major road flow rate (veh/s), v		*4f*	0.27
Average pedestrian delay (s/person), d_p		*4g*	373
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*	2.1
		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:	**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.

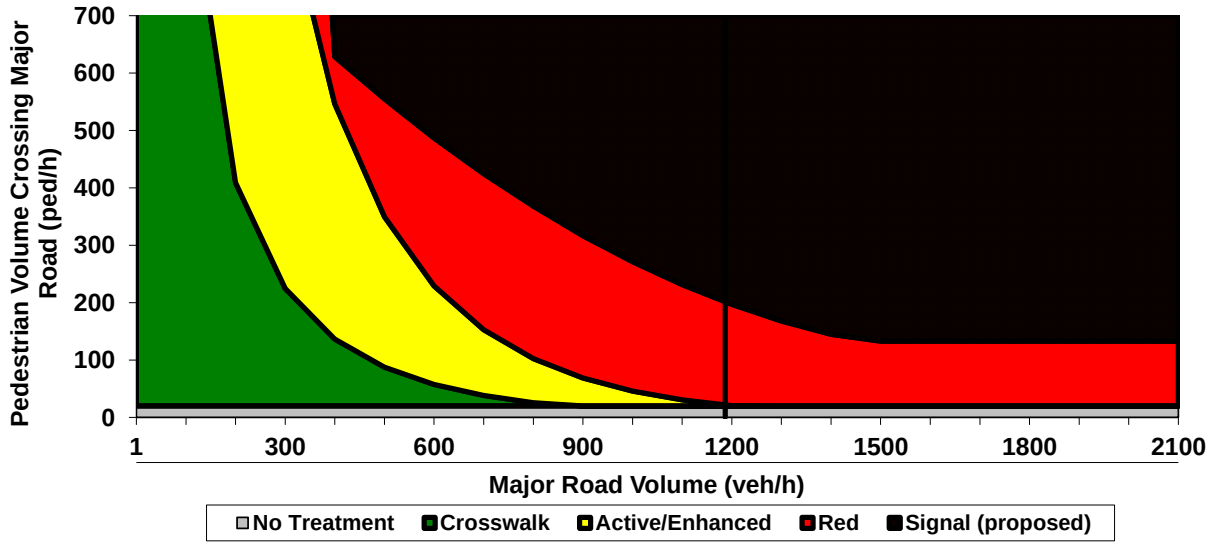
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	7:45 AM (Veh Peak - Sensitivity 3)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	20
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*	1186.8
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	201
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	201
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	101
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*	50
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*	17
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*	1186.8
Major road flow rate (veh/s), v		*4f*	0.33
Average pedestrian delay (s/person), d_p		*4g*	889
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*	4.9
		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.

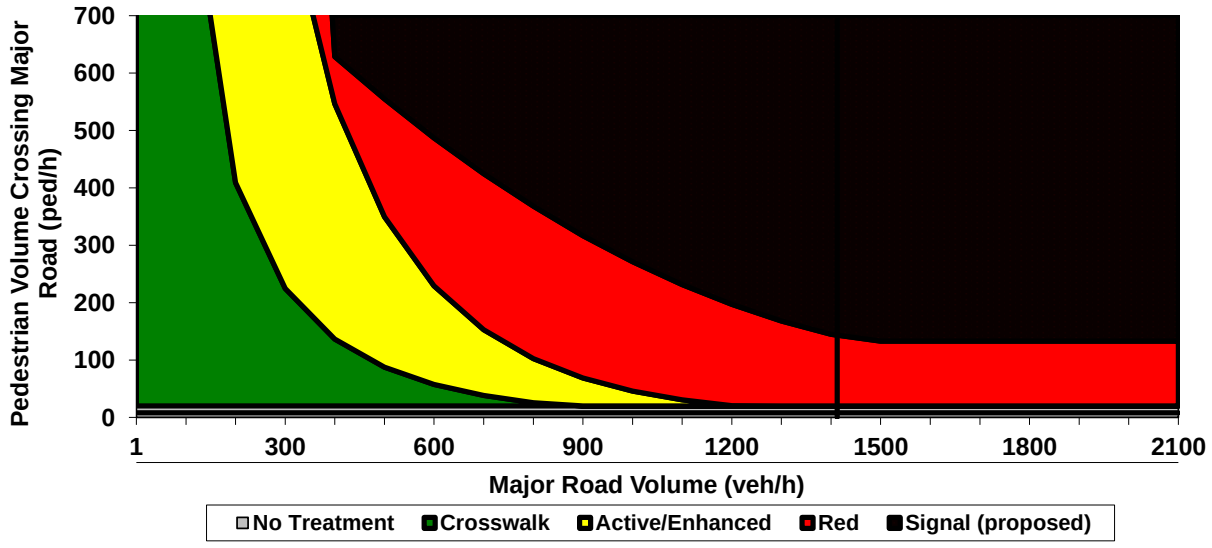
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	12:45 PM (Veh Peak - Sensitivity 1)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	8
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-s}		*3a*	1412.4
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	142
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	142
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	71
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		*4a*	50
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*	17
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*	1412.4
Major road flow rate (veh/s), v		*4f*	0.39
Average pedestrian delay (s/person), d_p		*4g*	2151
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*	4.8
		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.

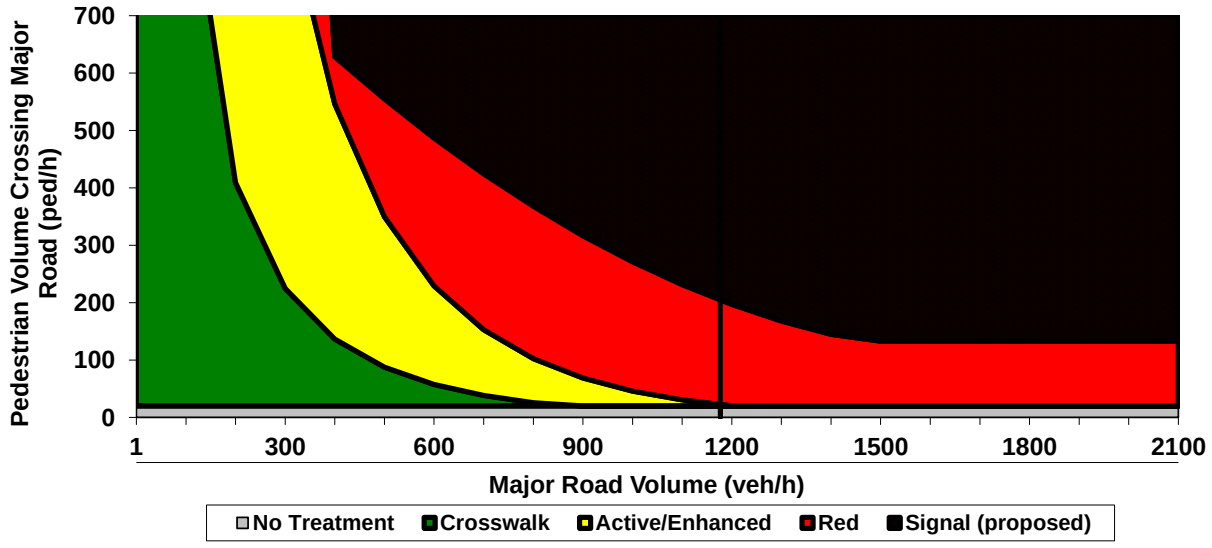
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	12:45 PM (Veh Peak - Sensitivity 2)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	20
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*	1177
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	204
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	204
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	102
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*	50
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*	17
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*	1177
Major road flow rate (veh/s), v		*4f*	0.33
Average pedestrian delay (s/person), d_p		*4g*	889
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*	4.9
		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.

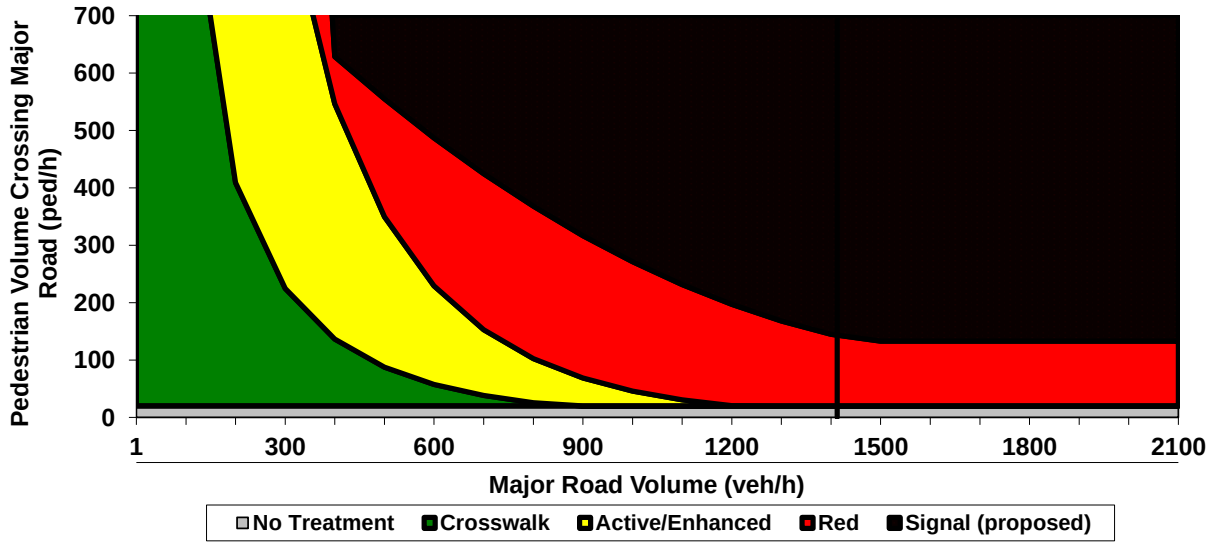
This spreadsheet is still under development, please inform TTI if errors are identified.

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	12:45 PM (Veh Peak - Sensitivity 3)

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	35
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*	20
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*	1412.4
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	142
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	142
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	Yes
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*	50%
	Reduced value or *3c*	*3f*	71
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*	50
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*	17
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*	1412.4
Major road flow rate (veh/s), v		*4f*	0.39
Average pedestrian delay (s/person), d_p		*4g*	2151
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*	12.0
		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:	**RED**		



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.

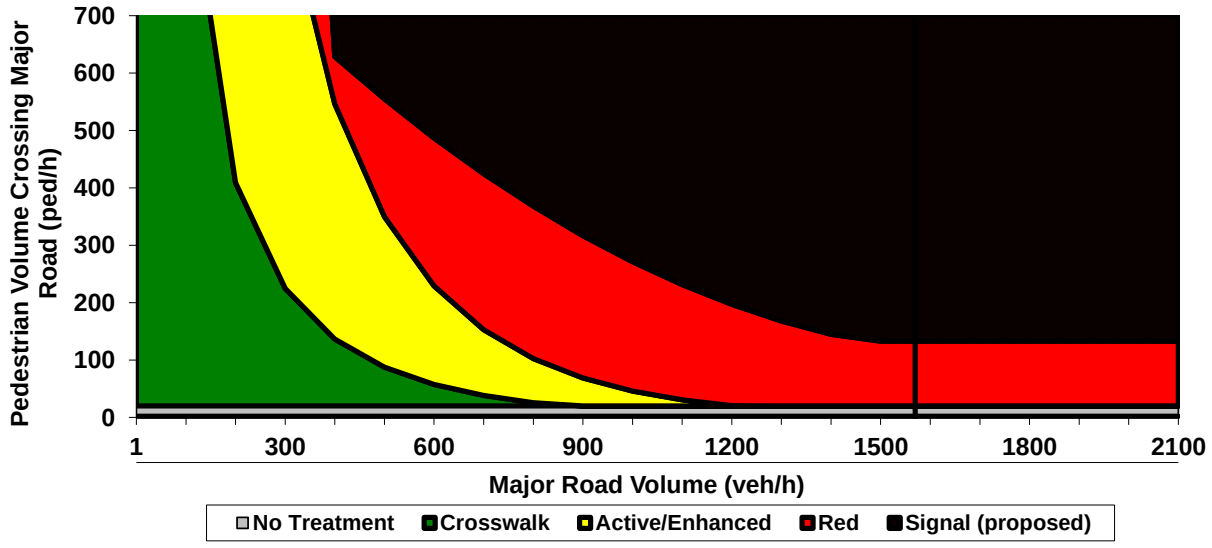
Key

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	KAI	Major Street	3rd Avenue
Analysis Date	March 16, 2018	Minor Street or Location	N/A
Data Collection Date	February 7, 2018	Peak Hour	3:45 PM (Veh Peak - Sensitivity 1)

Step 1: Select worksheet:		
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)	*1a*	35
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*	2
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-s}	*3a*	1569.6
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant	*3b*	133
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant	*3c*	133
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)	*3d*	Yes
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*	50%
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*	67
Result:		
Step 4: Estimate pedestrian delay.		
Pedestrian crossing distance, curb to curb (ft), L	*4a*	50
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*	17
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*	1569.6
Major road flow rate (veh/s), v	*4f*	0.44
Average pedestrian delay (s/person), d_p	*4g*	4548
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*	2.5
	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:	**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.