APPENDIX G: Signal Clearance Time Calculations

CLEARANCE TIME CALCULATIONS
Publication 46 (1/13)

COUNTY: **Union**
MUNICIPALITY: **Lewisburg Borough**
INTERSECTION: **Market Street (S.R. 0045) & 2nd Street)**

VEHICLE CHANGE AND CLEARANCE INTERVALS				(§4.3)

$$Y = t + \frac{1.47V}{2a \pm 64.4g}$$

$$AR = \frac{W + L}{1.47V}$$

Where: Y = Yellow change interval; s (typically 3 to 6 seconds)
AR = All-red clearance interval; s
t = Perception-reaction time; s (typically 1 second)
V = Approach speed of roadway; mph
a = Deceleration rate; ft/s² (typically 10 ft/s²)
g = Grade of approach; %/100
W = Width of intersection (from the stop bar to the end of the farthest traveled lane); ft
L = Length of vehicle; ft (typically 20 ft)
Sum = Y + AR rounded up to nearest whole number

MAJOR STREET: **Market Street**

Approach: **EB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.3	3	
W (feet) = **65**	Sum (sec) =	6		

Approach: **WB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.5	3	
W (feet) = **73**	Sum (sec) =	6		

MINOR STREET: **2nd Street**

Approach: **NB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.7	3	
W (feet) = **81**	Sum (sec) =	6		

Approach: **SB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.7	3	
W (feet) = **81**	Sum (sec) =	6		

PEDESTRIAN INTERVALS	(§4.3)

Pedestrian indications are: **Provided**

$$T_w = \frac{L}{3} - T_{pc} \text{ or 7 seconds, whichever is greater}$$

$$T_{pc} = \frac{L}{S_w}$$

$$T_p = \frac{L}{S_w} + 3$$

Where: T_w = WALK intervals (at least 7 seconds)
T_{pc} = Pedestrian change (flashing DON'T WALK) interval; s
T_p = Minimum green interval without pedestrian signals; s
L = Pedestrian walking distance from curb to curb; ft
   (per District 6 guidance)
S_w = Walking speed; ft/s (typically 3.5 ft/s)

TO CROSS MAJOR STREET: Market Street

Leg: **East**
L (feet) = **42**
Sw (fps) = **3.5**

T_w (sec) =	7
T_{pc} (sec) =	12
T_p (sec) =	N/A

Leg: **West**
L (feet) = **28**
Sw (fps) = **3.5**

T_w (sec) =	7
T_{pc} (sec) =	8
T_p (sec) =	N/A

TO CROSS MINOR STREET: 2nd Street

Leg: **North**
L (feet) = **28**
Sw (fps) = **3.5**

T_w (sec) =	7
T_{pc} (sec) =	8
T_p (sec) =	N/A

Leg: **South**
L (feet) = **32**
Sw (fps) = **3.5**

T_w (sec) =	7
T_{pc} (sec) =	10
T_p (sec) =	N/A

Compiled by: **PG**
Date: **6/13/2019**
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CLEARANCE TIME CALCULATIONS

Publication 46 (1/13)

COUNTY: **Union**
MUNICIPALITY: **Lewisburg Borough**
INTERSECTION: **Market Street (S.R. 0045) & 3rd Street)**

VEHICLE CHANGE AND CLEARANCE INTERVALS					(§4.3)

$$Y = t + \frac{1.47V}{2a \pm 64.4g}$$

$$AR = \frac{W + L}{1.47V}$$

Where: Y = Yellow change interval; s (typically 3 to 6 seconds)
AR = All-red clearance interval; s
t = Perception-reaction time; s (typically 1 second)
V = Approach speed of roadway; mph
a = Deceleration rate; ft/s² (typically 10 ft/s²)
g = Grade of approach; %/100
W = Width of intersection (from the stop bar to the end of the farthest traveled lane); ft
L = Length of vehicle; ft (typically 20 ft)
Sum = Y + AR rounded up to nearest whole number

MAJOR STREET: **Market Street**

Approach: **EB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.6	3	
W (feet) = **75**	Sum (sec) =	6		

Approach: **WB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.6	3	
W (feet) = **76**	Sum (sec) =	6		

MINOR STREET: **3rd Street**

Approach: **NB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.5	3	
W (feet) = **72**	Sum (sec) =	6		

Approach: **SB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.4	3	
W (feet) = **68**	Sum (sec) =	6		

PEDESTRIAN INTERVALS	(§4.3)

Pedestrian indications are: **Provided**

$$T_w = \frac{L}{3} - T_{pc} \text{ or 7 seconds, whichever is greater}$$

$$T_{pc} = \frac{L}{S_w}$$

$$T_p = \frac{L}{S_w} + 3$$

Where: T_w = WALK intervals (at least 7 seconds)
T_{pc} = Pedestrian change (flashing DON'T WALK) interval; s
T_p = Minimum green interval without pedestrian signals; s
L = Pedestrian walking distance from curb to curb; ft
 (per District 6 guidance)
S_w = Walking speed; ft/s (typically 3.5 ft/s)

TO CROSS MAJOR STREET: Market Street

Leg: **East**		
L (feet) = **28**	T_w (sec) =	7
Sw (fps) = **3.5**	T_{pc} (sec) =	8
	T_p (sec) =	N/A

Leg: **West**		
L (feet) = **28**	T_w (sec) =	7
Sw (fps) = **3.5**	T_{pc} (sec) =	8
	T_p (sec) =	N/A

TO CROSS MINOR STREET: 3rd Street

Leg: **North**		
L (feet) = **37**	T_w (sec) =	7
Sw (fps) = **3.5**	T_{pc} (sec) =	11
	T_p (sec) =	N/A

Leg: **South**		
L (feet) = **35**	T_w (sec) =	7
Sw (fps) = **3.5**	T_{pc} (sec) =	10
	T_p (sec) =	N/A

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CLEARANCE TIME CALCULATIONS
Publication 46 (1/13)

COUNTY: **Union**
MUNICIPALITY: **Lewisburg Borough**
INTERSECTION: **Market Street (S.R. 0045) & 4th Street)**

VEHICLE CHANGE AND CLEARANCE INTERVALS (§4.3)

$$Y = t + \frac{1.47V}{2a \pm 64.4g}$$

$$AR = \frac{W + L}{1.47V}$$

Where: Y = Yellow change interval; s (typically 3 to 6 seconds)
AR = All-red clearance interval; s
t = Perception-reaction time; s (typically 1 second)
V = Approach speed of roadway; mph
a = Deceleration rate; ft/s² (typically 10 ft/s²)
g = Grade of approach; %/100
W = Width of intersection (from the stop bar to the end of the farthest traveled lane); ft
L = Length of vehicle; ft (typically 20 ft)
Sum = Y + AR rounded up to nearest whole number

MAJOR STREET: **Market Street**			USE	COMMENTS
Approach: **EB**				
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.0	3	
W (feet) = **55**	Sum (sec) =	5		
Approach: **WB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.3	3	
W (feet) = **63**	Sum (sec) =	6		
MINOR STREET: **4th Street**				
Approach: **NB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	3.0	3	
W (feet) = **90**	Sum (sec) =	6		
Approach: **SB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.3	3	
W (feet) = **64**	Sum (sec) =	6		

PEDESTRIAN INTERVALS (§4.3)

Pedestrian indications are: **Provided**

$$T_w = \frac{L}{3} - T_{pc} \text{ or 7 seconds, whichever is greater}$$

$$T_{pc} = \frac{L}{S_w}$$

$$T_p = \frac{L}{S_w} + 3$$

Where: T_w = WALK intervals (at least 7 seconds)
T_{pc} = Pedestrian change (flashing DON'T WALK) interval; s
T_p = Minimum green interval without pedestrian signals; s
L = Pedestrian walking distance from curb to curb; ft
(per District 6 guidance)
S_w = Walking speed; ft/s (typically 3.5 ft/s)

TO CROSS MAJOR STREET: Market Street

Leg: **East**
L (feet) = **29**	T_w (sec) =	7
Sw (fps) = **3.5**	T_{pc} (sec) =	9
	T_p (sec) =	N/A

Leg: **West**
L (feet) = **37**	T_w (sec) =	7
Sw (fps) = **3.5**	T_{pc} (sec) =	11
	T_p (sec) =	N/A

TO CROSS MINOR STREET: 4th Street

Leg: **North**
L (feet) = **32**	T_w (sec) =	7
Sw (fps) = **3.5**	T_{pc} (sec) =	10
	T_p (sec) =	N/A

Leg: **South**
L (feet) = **30**	T_w (sec) =	7
Sw (fps) = **3.5**	T_{pc} (sec) =	9
	T_p (sec) =	N/A

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CLEARANCE TIME CALCULATIONS

Publication 46 (1/13)

COUNTY: **Union**
MUNICIPALITY: **Lewisburg Borough**
INTERSECTION: **Market Street (S.R. 0045) & 7th Street)**

VEHICLE CHANGE AND CLEARANCE INTERVALS (§4.3)

$$Y = t + \frac{1.47V}{2a \pm 64.4g}$$

$$AR = \frac{W + L}{1.47V}$$

Where: Y = Yellow change interval; s (typically 3 to 6 seconds)
AR = All-red clearance interval; s
t = Perception-reaction time; s (typically 1 second)
V = Approach speed of roadway; mph
a = Deceleration rate; ft/s² (typically 10 ft/s²)
g = Grade of approach; %/100
W = Width of intersection (from the stop bar to the end of the farthest traveled lane); ft
L = Length of vehicle; ft (typically 20 ft)
Sum = Y + AR rounded up to nearest whole number

MAJOR STREET: **Market Street**			USE	COMMENTS
Approach: **EB**				
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	1.7	3	
W (feet) = **43**	Sum (sec) =	5		
Approach: **WB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	1.7	3	
W (feet) = **43**	Sum (sec) =	5		
MINOR STREET: **7th Street**				
Approach: **NB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.3	3	
W (feet) = **63**	Sum (sec) =	6		
Approach: **SB**			USE	COMMENTS
V (mph) = **25**	Yellow (sec) =	2.8	3	
g (%/100) = **0**	Red (sec) =	2.3	3	
W (feet) = **63**	Sum (sec) =	6		

PEDESTRIAN INTERVALS (§4.3)

Pedestrian indications are: **Provided**

$$T_w = \frac{L}{3} - T_{pc} \text{ or 7 seconds, whichever is greater}$$

$$T_{pc} = \frac{L}{S_w}$$

$$T_p = \frac{L}{S_w} + 3$$

Where: T_w = WALK intervals (at least 7 seconds)
T_{pc} = Pedestrian change (flashing DON'T WALK) interval; s
T_p = Minimum green interval without pedestrian signals; s
L = Pedestrian walking distance from curb to curb; ft
(per District 6 guidance)
S_w = Walking speed; ft/s (typically 3.5 ft/s)

TO CROSS MAJOR STREET: Market Street

Leg: **East**
L (feet) = **34**
Sw (fps) = **3.5**

T_w (sec) =	7
T_{pc} (sec) =	10
T_p (sec) =	N/A

Leg: **West**
L (feet) = **34**
Sw (fps) = **3.5**

T_w (sec) =	7
T_{pc} (sec) =	10
T_p (sec) =	N/A

TO CROSS MINOR STREET: 7th Street

Leg: **North**
L (feet) = **26**
Sw (fps) = **3.5**

T_w (sec) =	7
T_{pc} (sec) =	8
T_p (sec) =	N/A

Leg: **South**
L (feet) = **27**
Sw (fps) = **3.5**

T_w (sec) =	7
T_{pc} (sec) =	8
T_p (sec) =	N/A

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