



# LOR – SR 611 Signals

City of Lorain  
Central Office Presentation

October 22<sup>nd</sup>, 2020



# LOR – SR 611 Signals

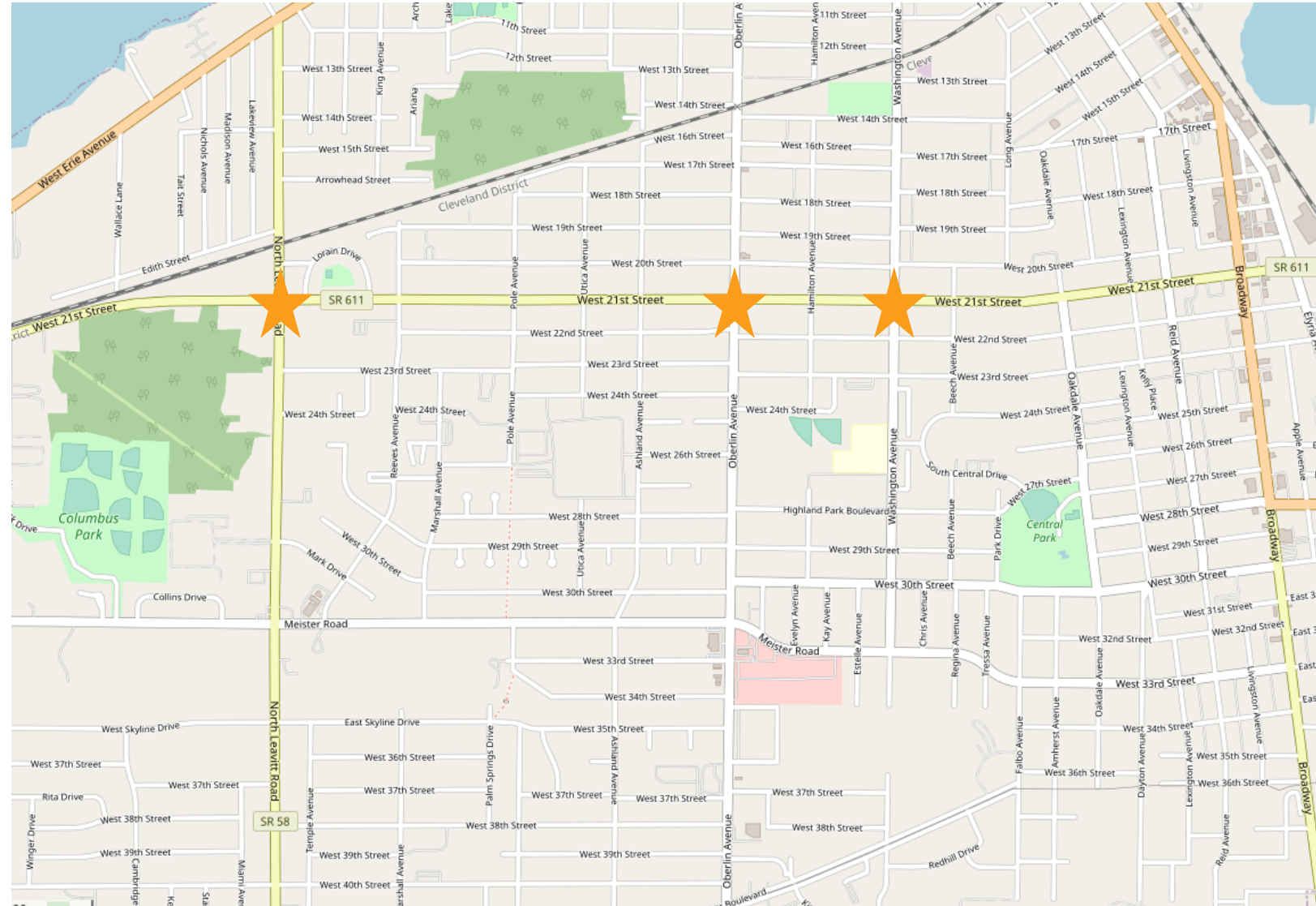
## Study Intersections

# State Route 611 Corridor

- Signalized intersections of SR 58, Oberlin Avenue and Washington Avenue
- Current Year 2020 ADT – 12,000

## Existing Traffic Volumes

- Traffic counts performed in March of 2020 before the beginning of the statewide shutdown due to COVID-19.
- 0.00% per year growth rate was found
  - ODOT District 3 agrees with methodology



# LOR – SR 611 Signals

## 2018 HSIP Safety Priority List

### Suburban Intersection Priority List

- Intersection list is created considering the crash frequency and severity at intersections.



City Priority	Roadway1	Roadway2	Total Crashes (2014-2018)	FSI Crashes	
1	SR611 (W. 21st St)	Kansas Ave	71	2	
2	SR58 (Leavitt Rd)	Tower Blvd	64	5	
3	SR611 (W. 21st St)	Broadway Ave	60	2	
4	SR58 (Leavitt Rd)	SR611 (W. 21st St)	57	1	270
5	SR611 (W. 21st St)	Oberlin Ave	56	0	478
6	SR57 (Grove Ave)	Fairless Dr	53	3	
7	SR611 (W. 21st St)	Washington Ave	46	0	223
8	SR57 (Grove Ave)	East 31st St	42	3	
9	Oberlin Ave	Meister Rd	42	1	
10	SR57 (Grove Ave)	Broadway Ave	40	1	



# LOR – SR 611 Signals

## SR 611 & SR 58 Intersection

### Existing Conditions

- Signalized with protected-only left turn phasing on all four approaches
  - Span wire installation without traffic signal backplates. Stop bar detection present on all approach lanes.
- SR 611 ADT = 7,000
- SR 58 ADT = 8,000

### Future Projects

- PID 110315
  - Road Diet on SR 611 from SR 58 to Oberlin Avenue (Under Construction)
- PID 101446
  - SR 58 resurfacing project (2021)





# LOR – SR 611 Signals

## SR 611 & Oberlin Avenue Intersection

### Existing Conditions

- Signalized with protected-only left turn phasing on all four approaches
  - Span wire installation without traffic signal backplates. Stop bar detection present on all approach lanes.
- SR 611 ADT = 11,000
- Oberlin Avenue ADT = 7,500

### Future Projects

- PID 110315
  - Road Diet on SR 611 from SR 58 to Oberlin Avenue (Under Construction)





# LOR – SR 611 Signals

## SR 611 & Washington Avenue Intersection

### Existing Conditions

- Signalized with permissive left turn phasing on all four approaches
  - Span wire installation with 8" signal heads, incandescent bulbs and no traffic signal backplates.
  - Electromechanical controller with no detection at the intersection.
- SR 611 ADT = 12,000
- Washington Avenue ADT = 3,000

### Future Projects

- PID 108528
  - Washington Avenue bike lanes (2021)



# LOR – SR 611 Signals

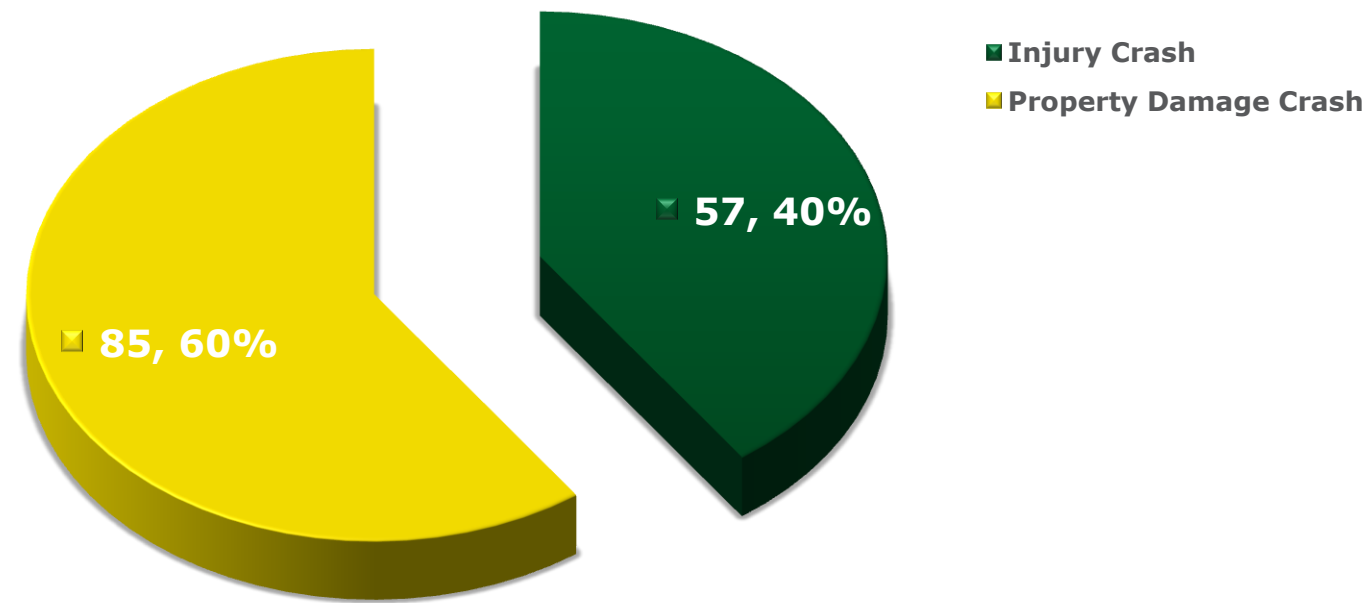
## Current Crash Analysis Summary

### 142 Crashes Reported from 2015 to 2019

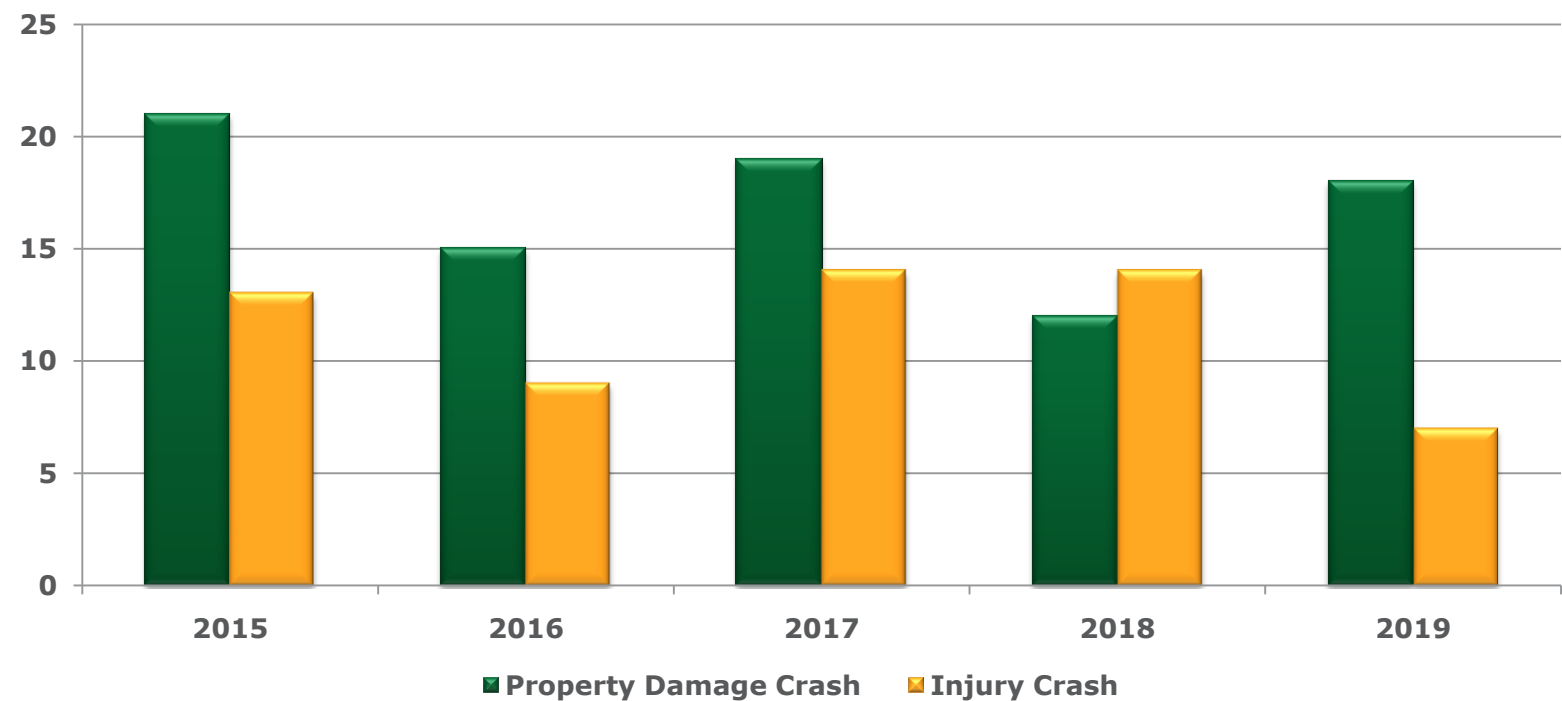
- 81 Rear End
- 29 Angle
- 8 Left Turn
- 8 Backing
- 8 Sideswipe - Passing
- 3 Head On
- 2 Right Turn
- 1 Pedestrian
- 1 Fixed Object
- 1 Backing



Frequency of Crashes by Severity



Frequency of Crashes by Year and Severity





# LOR – SR 611 Signals

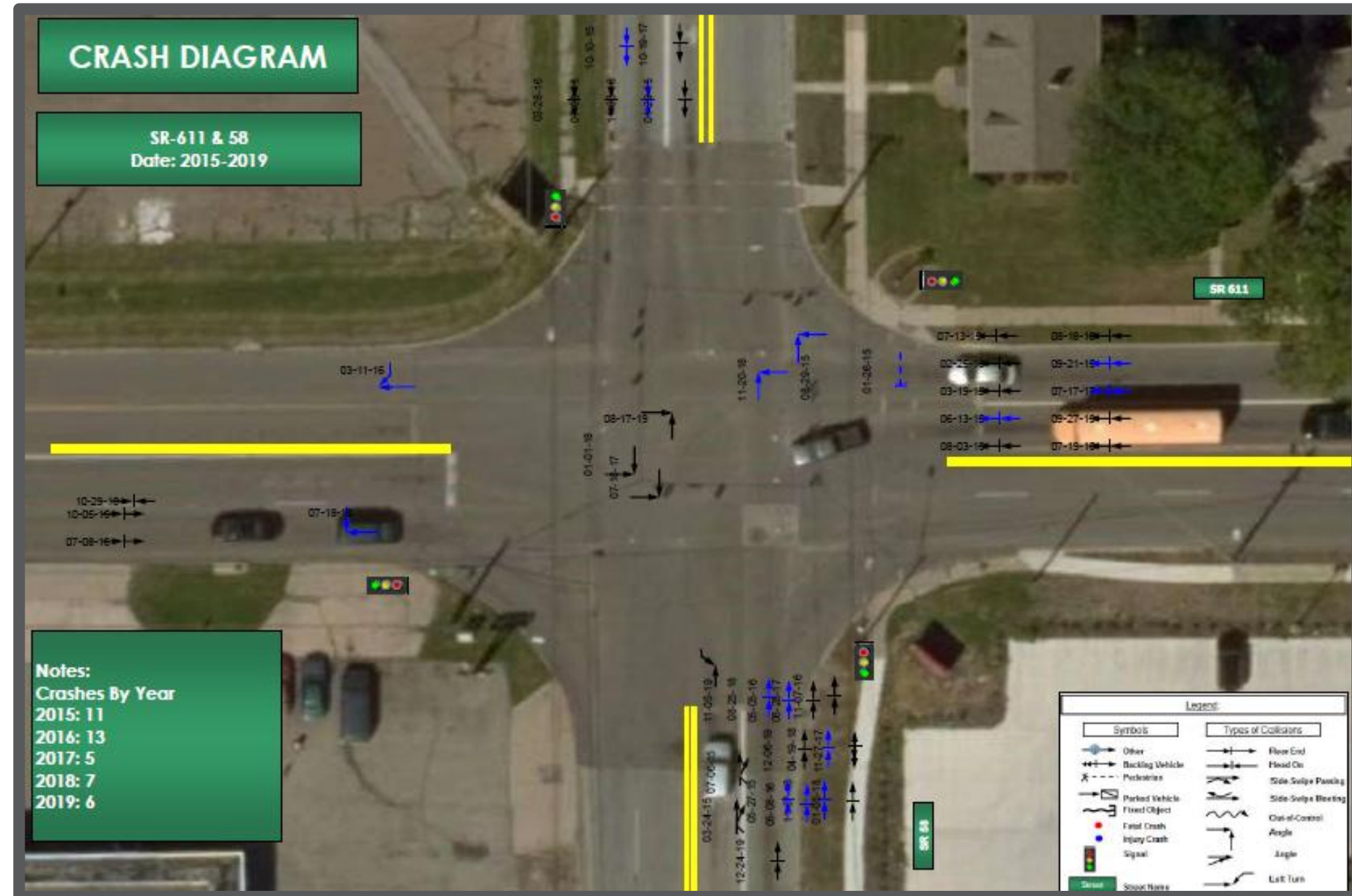
## SR 611 at SR 58 Crash Diagram

### Crash Analysis

- 42 crashes from 2015 – 2019
- 38% of crashes resulted in an injury
- 29 Rear-End
- 6 Angle
- 45% Young driver at-fault
- 19% older driver at fault

### Probable Causes

- Driver inexperience
- Distraction
- Signal visibility
- Excessive delay due to signal phasing
- Signal Timings





# LOR – SR 611 Signals

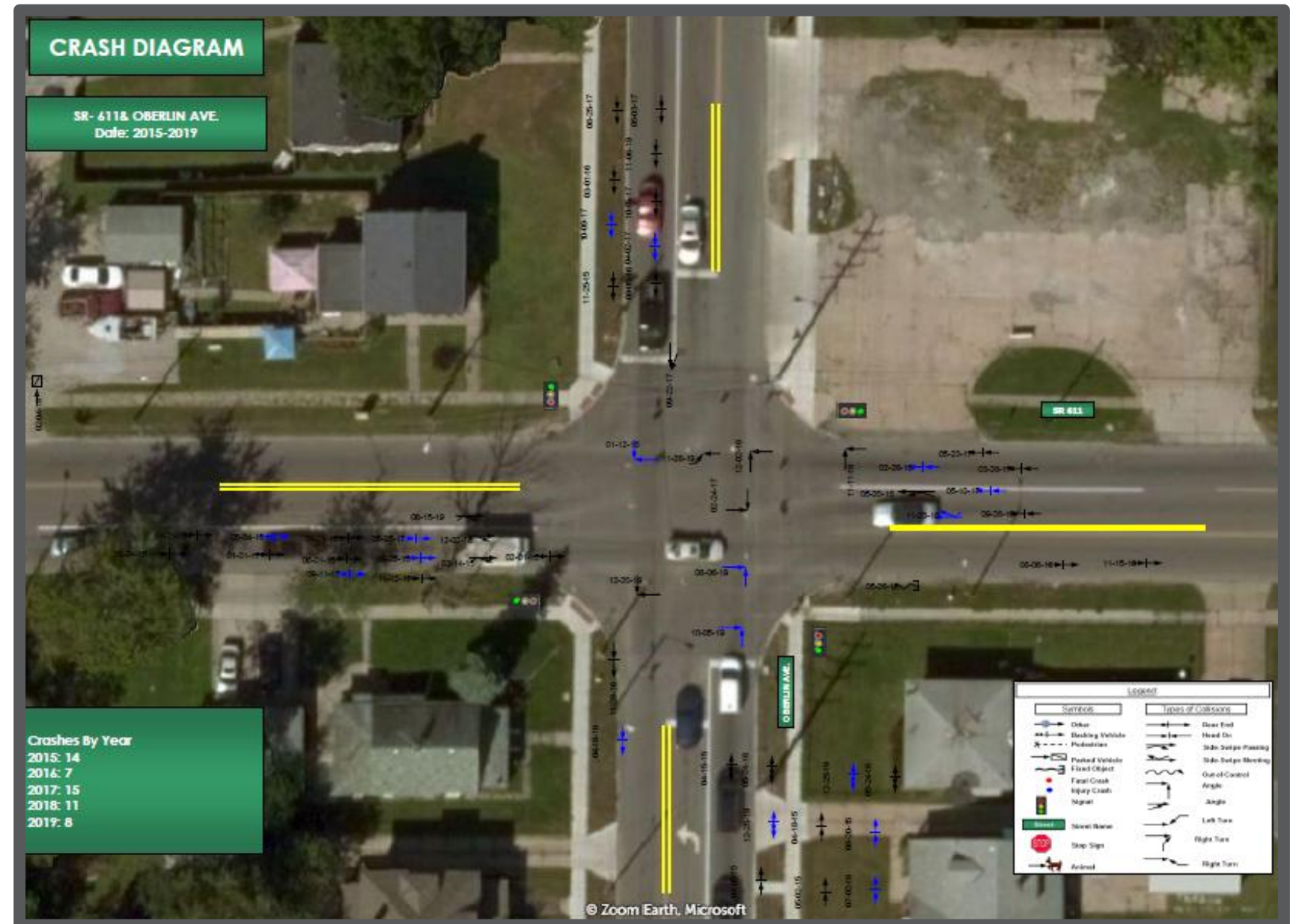
## SR 611 at Oberlin Avenue Crash Diagram

### Crash Analysis

- 55 crashes from 2015 – 2019
- 33% of crashes resulted in an injury
- 35 Rear-End
- 8 Angle
- 42% Young driver at-fault
- 20% older driver at fault

### Probable Causes

- Driver inexperience
- Distraction
- Signal visibility
- Excessive delay due to signal phasing
- Signal Timings



# LOR – SR 611 Signals

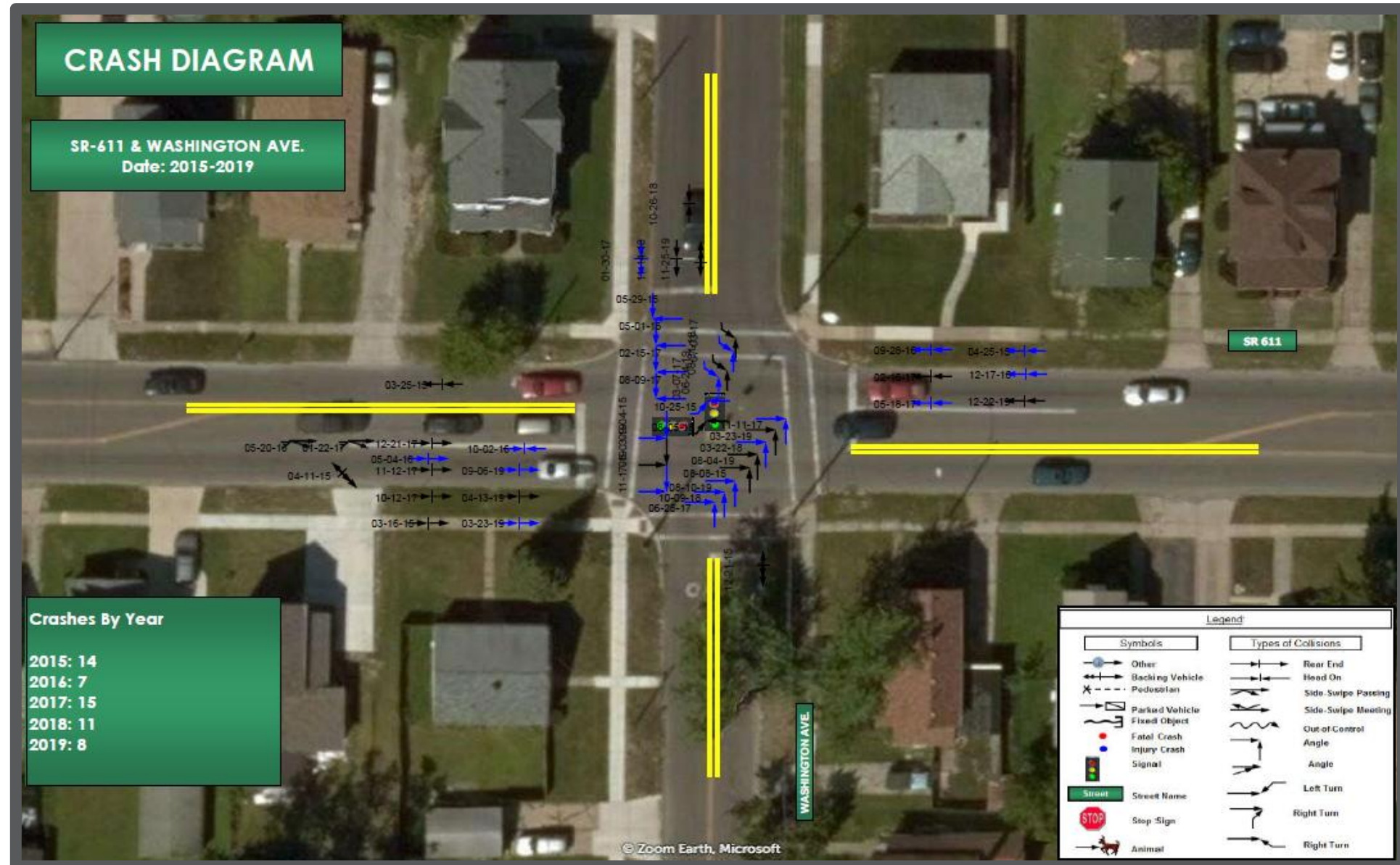
## SR 611 at Washington Avenue Crash Diagram

### Crash Analysis

- 45 crashes from 2015 – 2019
- 51% of crashes resulted in an injury
- 17 Rear-End
- 15 Angle
- 40% Young driver at-fault
- 18% older driver at fault

### Probable Causes

- Driver inexperience
- Distraction
- Signal visibility
- Signal Timings





# LOR – SR 611 Signals

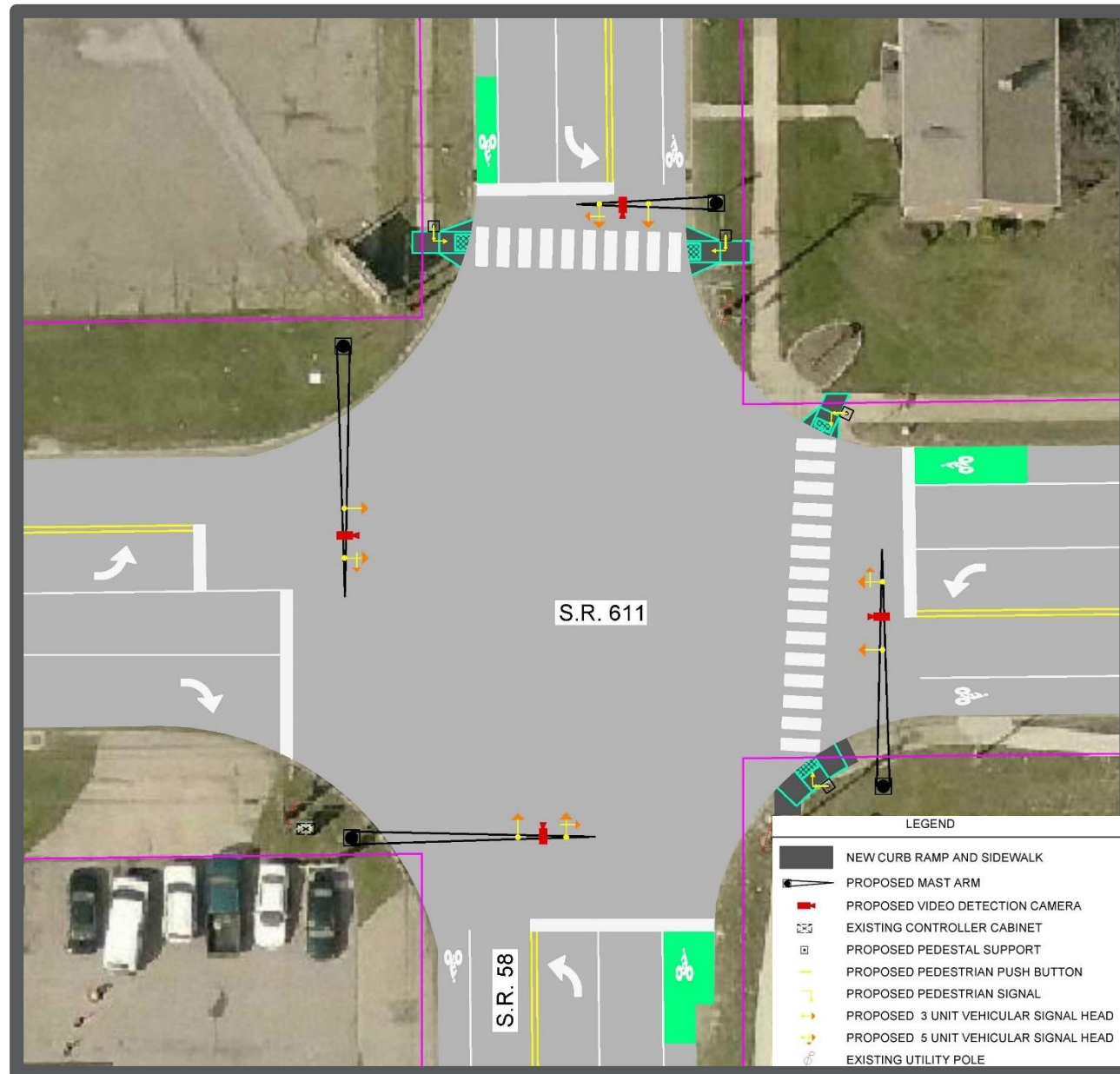
## Proposed Countermeasures

- Update the existing signal timings and clearance interval at all three study intersections
- Convert the left turn phasing to protected/permissive at the SR 611 intersections with SR 58 and Oberlin Avenue.
- Reconstruct the three traffic signals to fully accommodate pedestrians, including pedestrian countdown timers and pushbuttons.
  - All 3 traffic signals were determined to be warranted using 2020 traffic counts
- Reconstructed traffic signals would have new mast arms with backplates and LED signal heads in improve the target value.
- The City of Lorain intends to continue the communitywide promotion of driver safety to students and parents.



# LOR – SR 611 Signals

## SR 611 at SR 58 Signal Layout



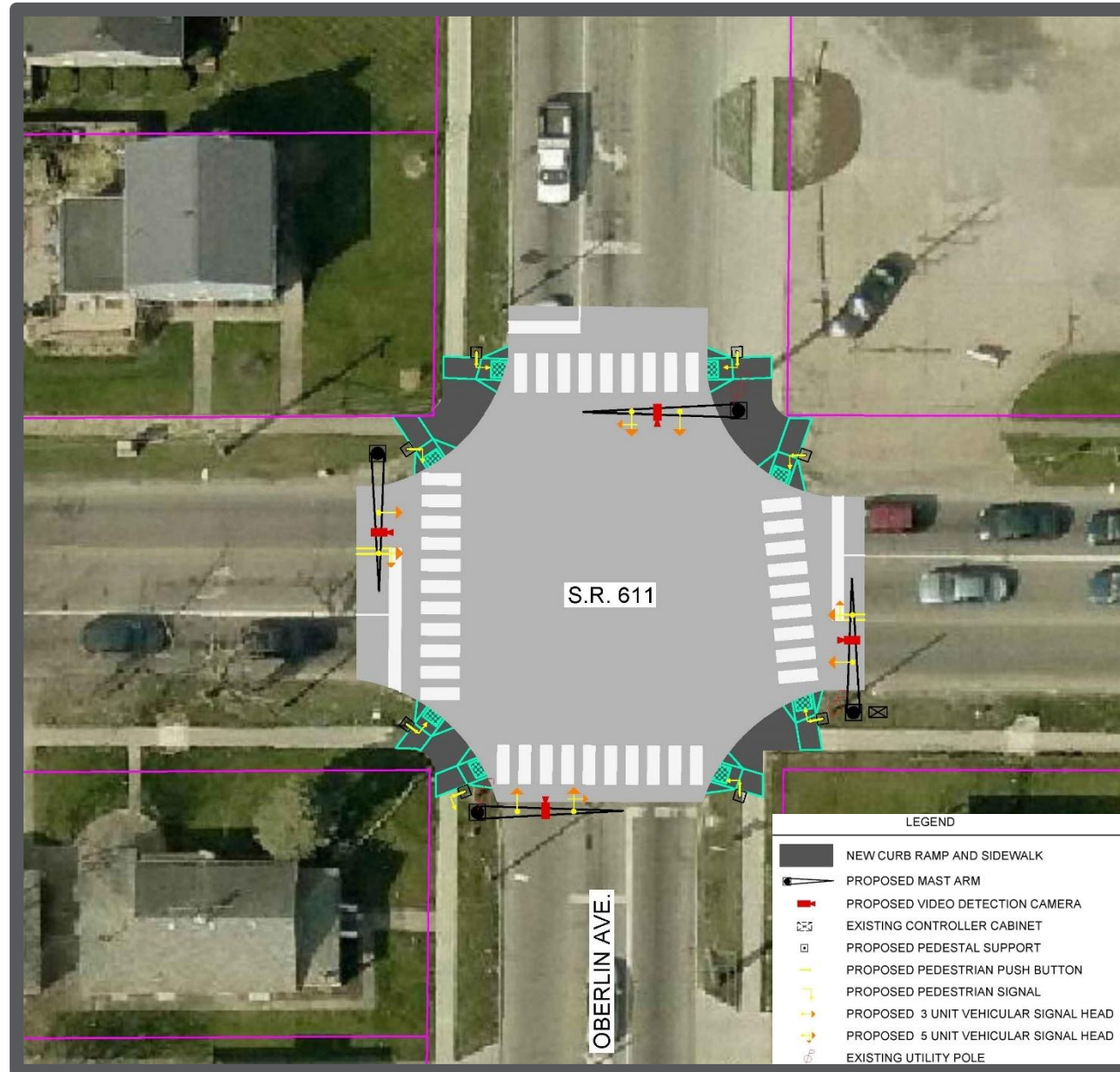
### Intersection Improvements

- All programmed projects on SR 611 and SR 58 shown on conceptual layout
- Resurfacing on SR 58 to include bike lanes
- Road diet on SR 611 to include bike lanes
- ADA compliant curb ramps to be constructed with other projects
- New signal with protected/permissive phasing on all approaches constructed as part of the signal project



# LOR – SR 611 Signals

## SR 611 at Oberlin Avenue Signal Layout

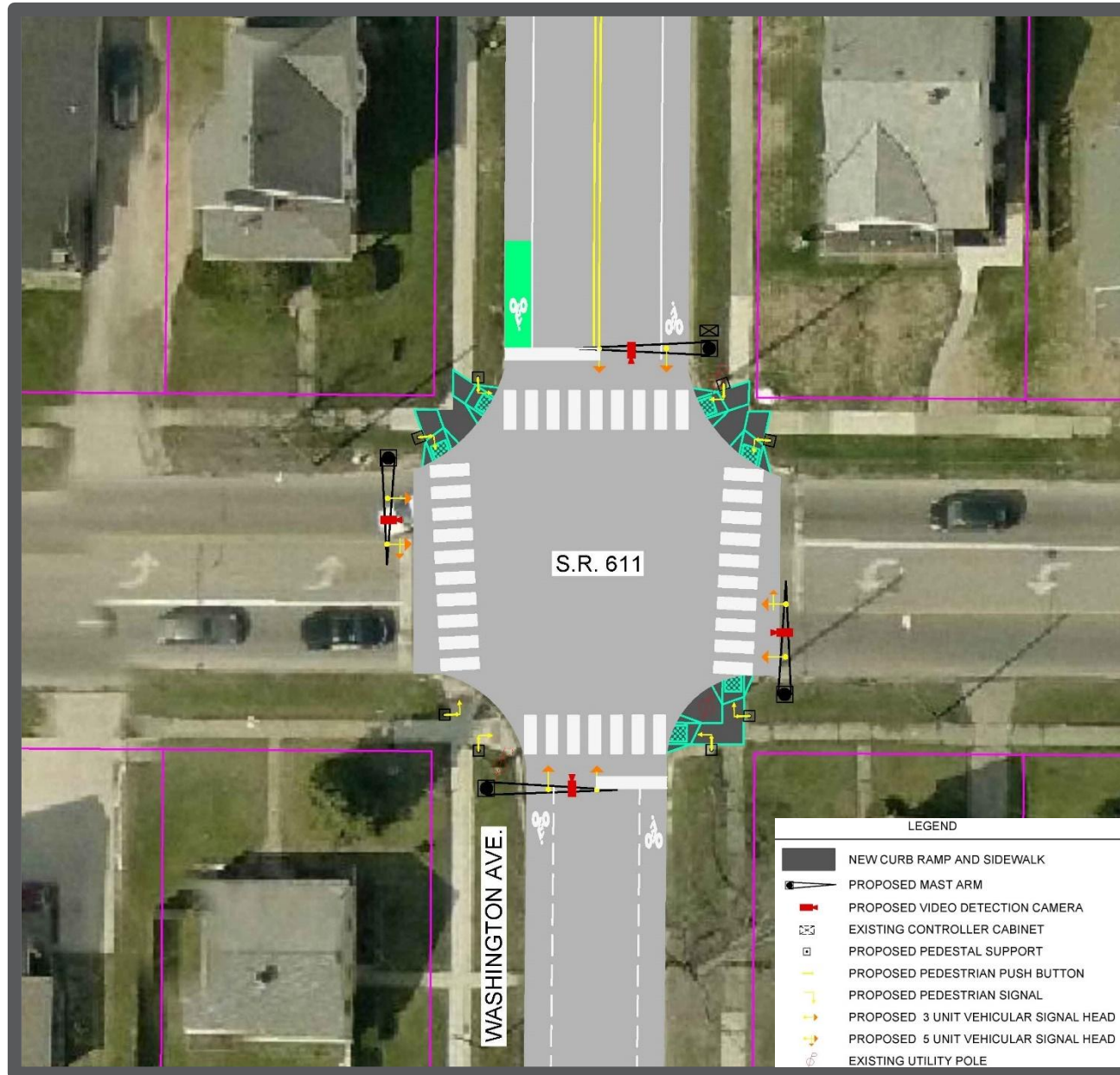


### Intersection Improvements

- New signal with protected/permissive phasing on all approaches constructed as part of the signal project

# LOR – SR 611 Signals

## SR 611 at Washington Avenue Signal Layout



### Intersection Improvements

- All programmed projects on SR 611 and Washington Avenue shown on conceptual layout
- Addition of bike lanes on Washington Avenue
- New signal with protected/permissive phasing on all approaches constructed as part of the signal project



# LOR – SR 611 Signals

## Strategic Highway Safety Plan

### 13 | Emphasis Areas

#### 14 | Serious Crash Types

##### 14 | Roadway Departure

##### 16 | Intersections

##### 18 | Rear End Crashes

##### 20 | Highway Railroad Crossings

#### 22 | High Risk Drivers and Behaviors

##### 22 | Impaired Drivers

##### 24 | Seat Belt

##### 26 | Speed

##### 28 | Young Drivers

##### 30 | Older Drivers

##### 32 | Distracted Drivers

#### 34 | Special Vehicles and Roadway Users

##### 34 | Bicycle Riders

##### 36 | Pedestrians

##### 38 | Commercial Vehicles

##### 40 | Motorcycles



#### GOALS

Reduce the number of Intersection fatalities from 266 to 245 between 2013-2017.  
Reduce the number of serious injuries related to intersection crashes from 3687 to 3401 between 2013-2017.



#### GOALS

Reduce the number of fatalities related to rear end crashes from 47 to 43 between 2013-2017.  
Reduce the number of serious injuries related to rear end crashes from 1248 to 1151 between 2013-2017.



#### GOALS

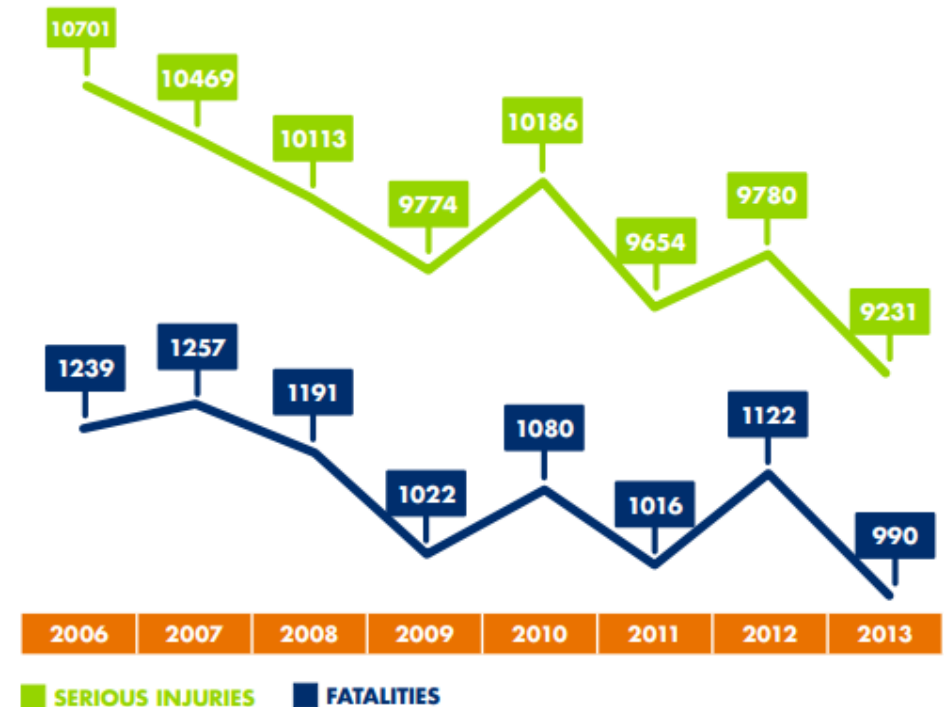
Reduce the number of bicycle fatalities from 17 to 16 between 2013-2017.  
Reduce the number of bicycle serious injuries from 221 to 204 between 2013-2017.



#### GOALS

Reduce the number of pedestrian fatalities from 100 to 92 between 2013-2017.  
Reduce the number of pedestrian serious injuries from 531 to 490 between 2013-2017.

OHIO FATALITIES AND SERIOUS INJURIES 2006-2012



## OHIO STRATEGIC HIGHWAY SAFETY PLAN

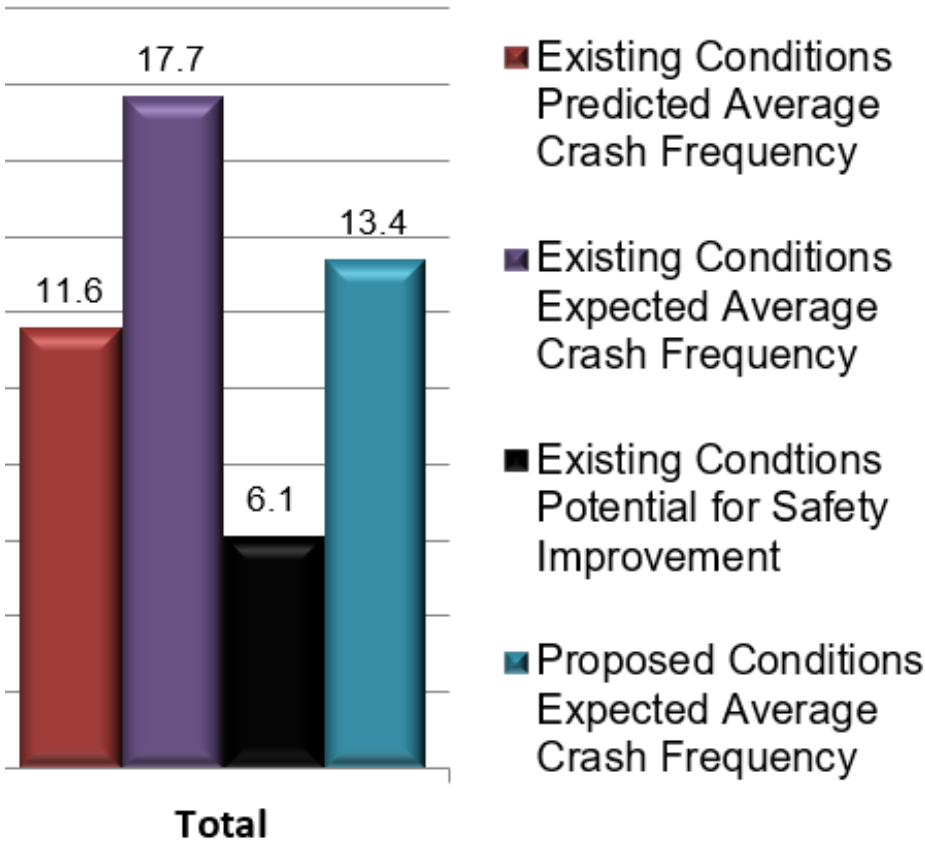
A Comprehensive Plan to Reduce Fatalities  
and Serious Injuries | 2014-2019

# LOR – SR 611 Signals

## Economic Crash Analyst Tool

- Predicted Crash Frequency: 11.57 crashes / year
- Expected Crash Frequency: 17.71 crashes / year
- Potential for Safety Improvement: 6.14 crashes / year
- Project Crash Reduction: 4.295 crashes / year

Expected Annual Crash Adjustment	
Number of Fatal & Incapacitating Injury Crashes	-0.117
Number of Injury Crashes	-1.467
Number of Total Crashes	-4.295





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## Benefit to Cost Analysis

- Estimated Cost of Project: \$1,041,500.00  
(Not Including Inspection & Inflation)
- Present Value of Safety Benefits: \$2,004,401.97
- Benefit to Cost Ratio on Project: 1.92

Benefit - Cost Calculator							
Net Present Value of Project						\$1,041,500.00	
Net Present Value of Safety Benefits						\$2,004,401.97	
Net Benefit						\$962,901.97	
Benefit / Cost Ratio						1.92	



# LOR – SR 611 Signals

## Current Project Funding Plan

<u>Funding Type</u>	<u>Dollar Amount</u>	<u>% of Total</u>
Safety Funding Request:	\$1,122,750.00	89.3%
<u>Local Funding:</u>	<u>\$ 134,750.00</u>	<u>10.7%</u>
Total Project Funding:	\$1,257,500.00	

- Local funds will be allocated from the City of Lorain funds.





# Q&A

- Dale Vandersommen, P.E.  
Lorain City Engineer
- Veronica A. Newsome, P.E.  
City of Lorain Civil Engineer
- Curtis J. Deibel, P.E., RSP  
GPD Traffic Engineer
- Kevin Westbrook, P.E., PTOE  
GPD Project Manager

