



# LOR – SR 611 Signals

City of Lorain  
Central Office Presentation

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



# LOR – SR 611 Signals

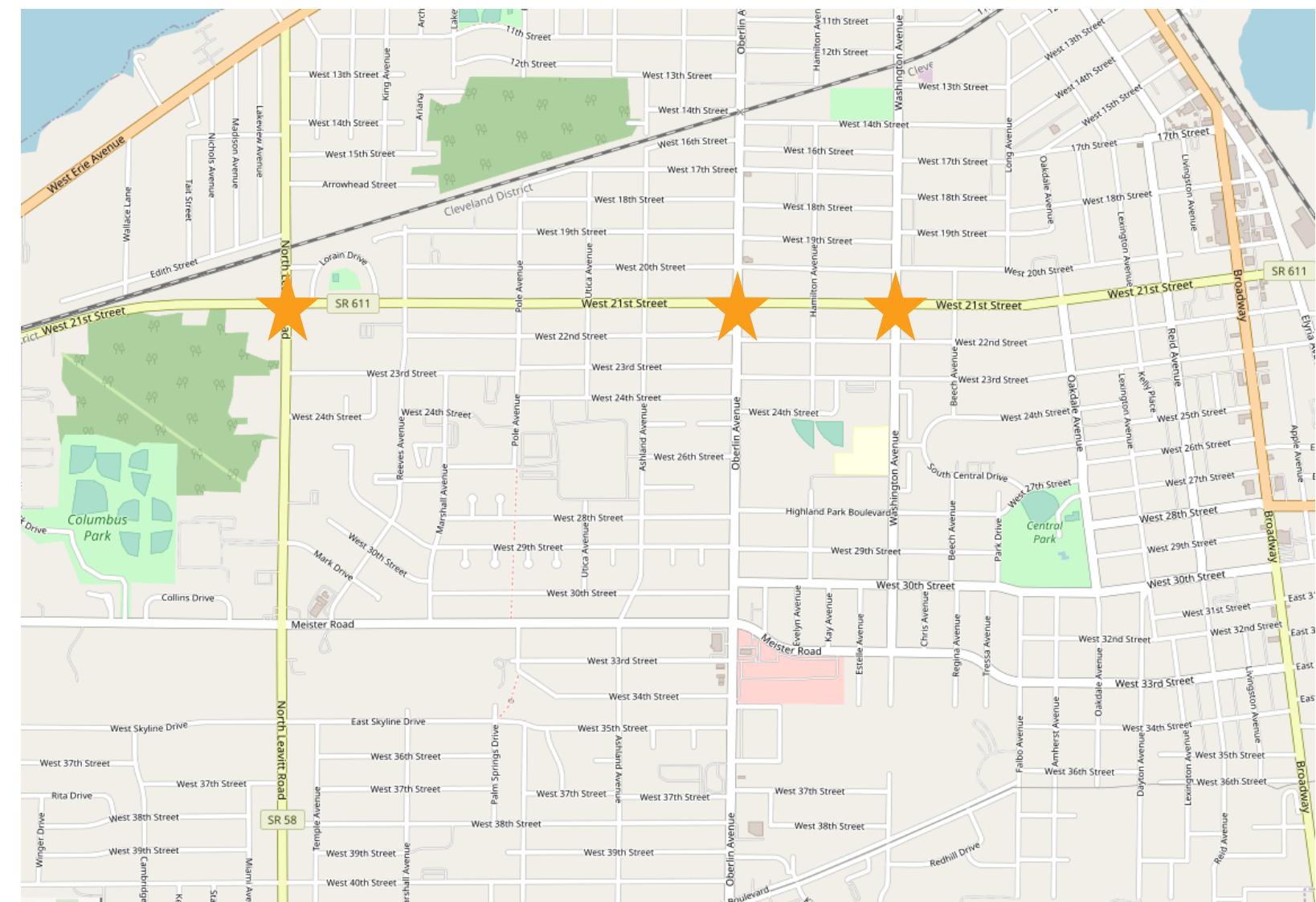
## Study Intersections

## **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

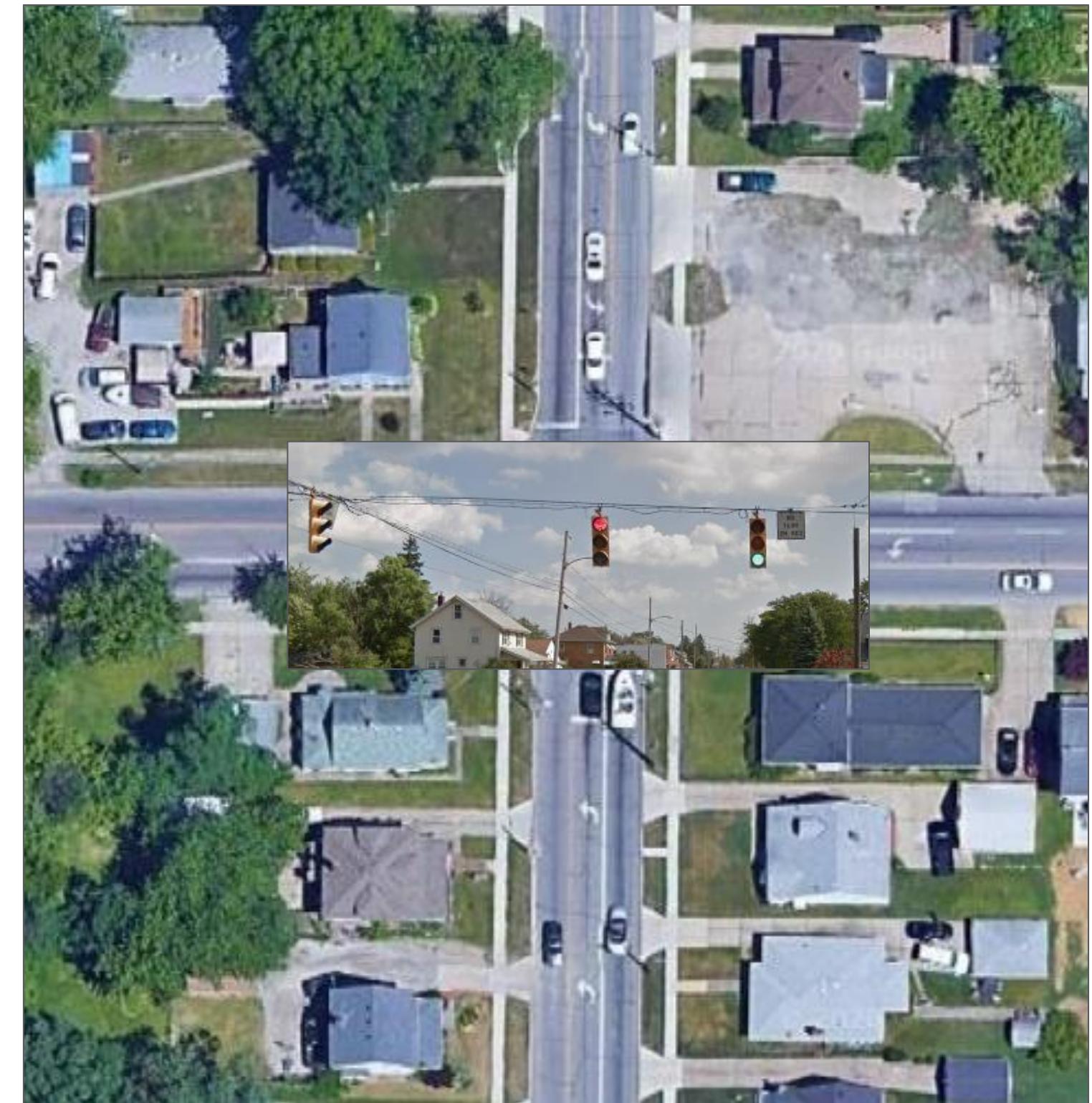
## SR 611 & Oberlin Avenue Intersection

### 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

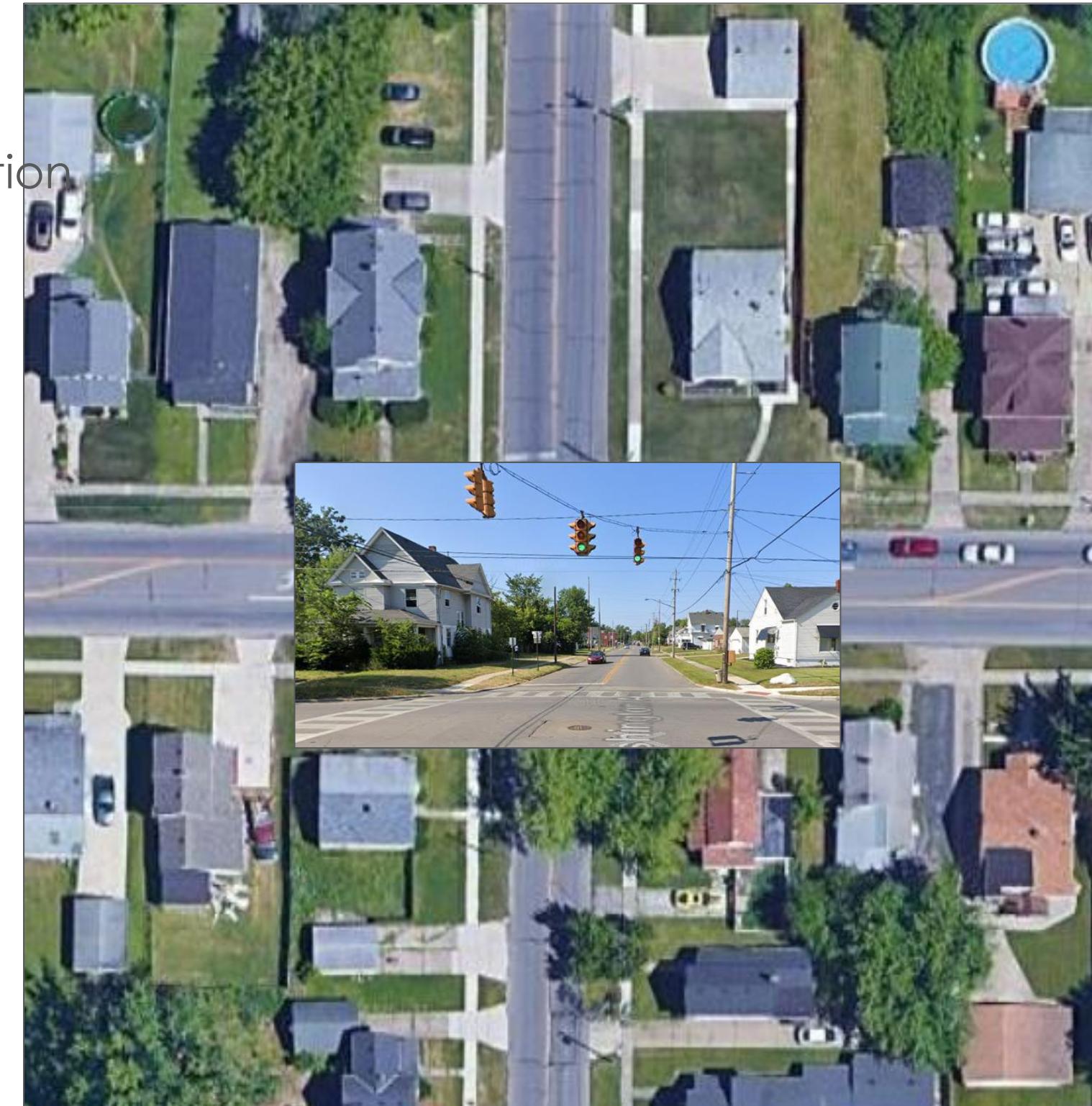
## SR 611 & Washington Avenue Intersection

### 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

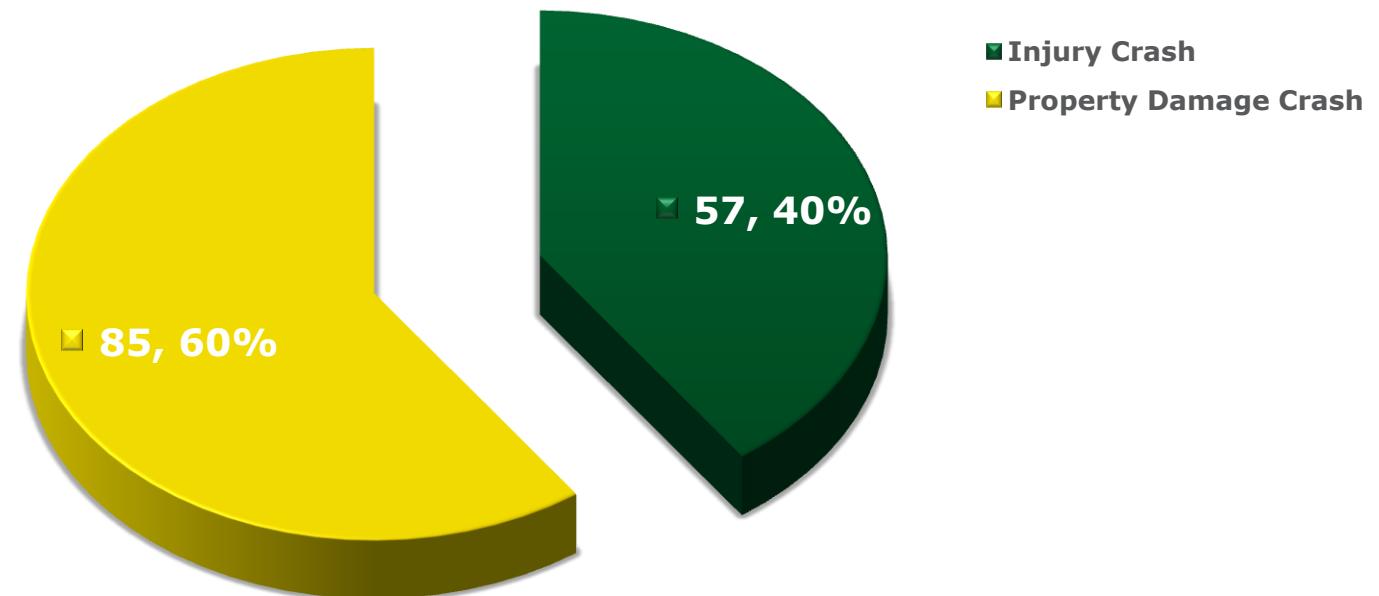
## Current Crash Analysis Summary

**142 Crashes Reported from 2015 to 2019**

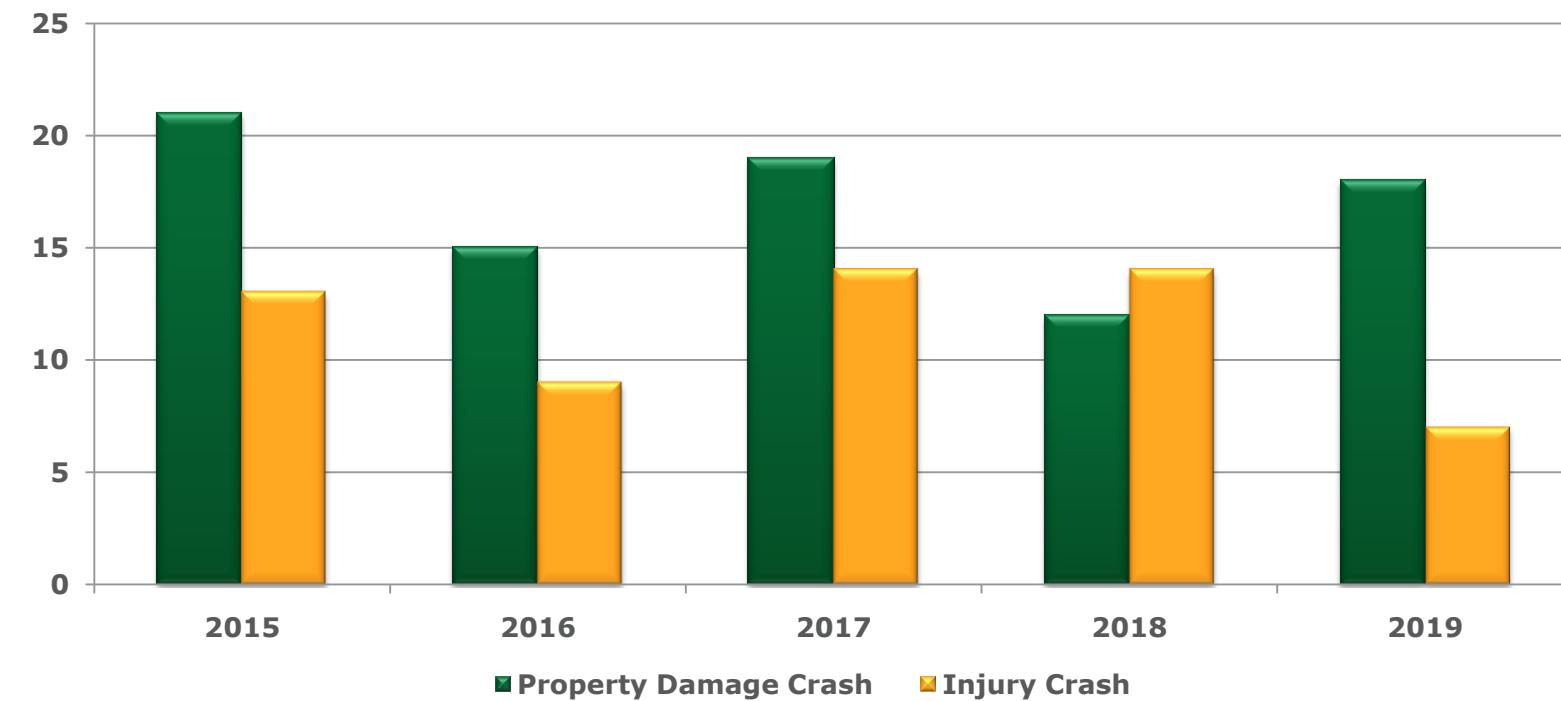
- 81 Rear End
- 29 Angle
- 8 Left Turn
- 8 Backing
- 8 Sideswipe - Passing
- 3 Head On
- 2 Right Turn
- 1 Pedestrian
- 1 Fixed Object
- 1 Backing



**Frequency of Crashes by Severity**



**Frequency of Crashes by Year and Severity**



# LOR – SR 611 Signals

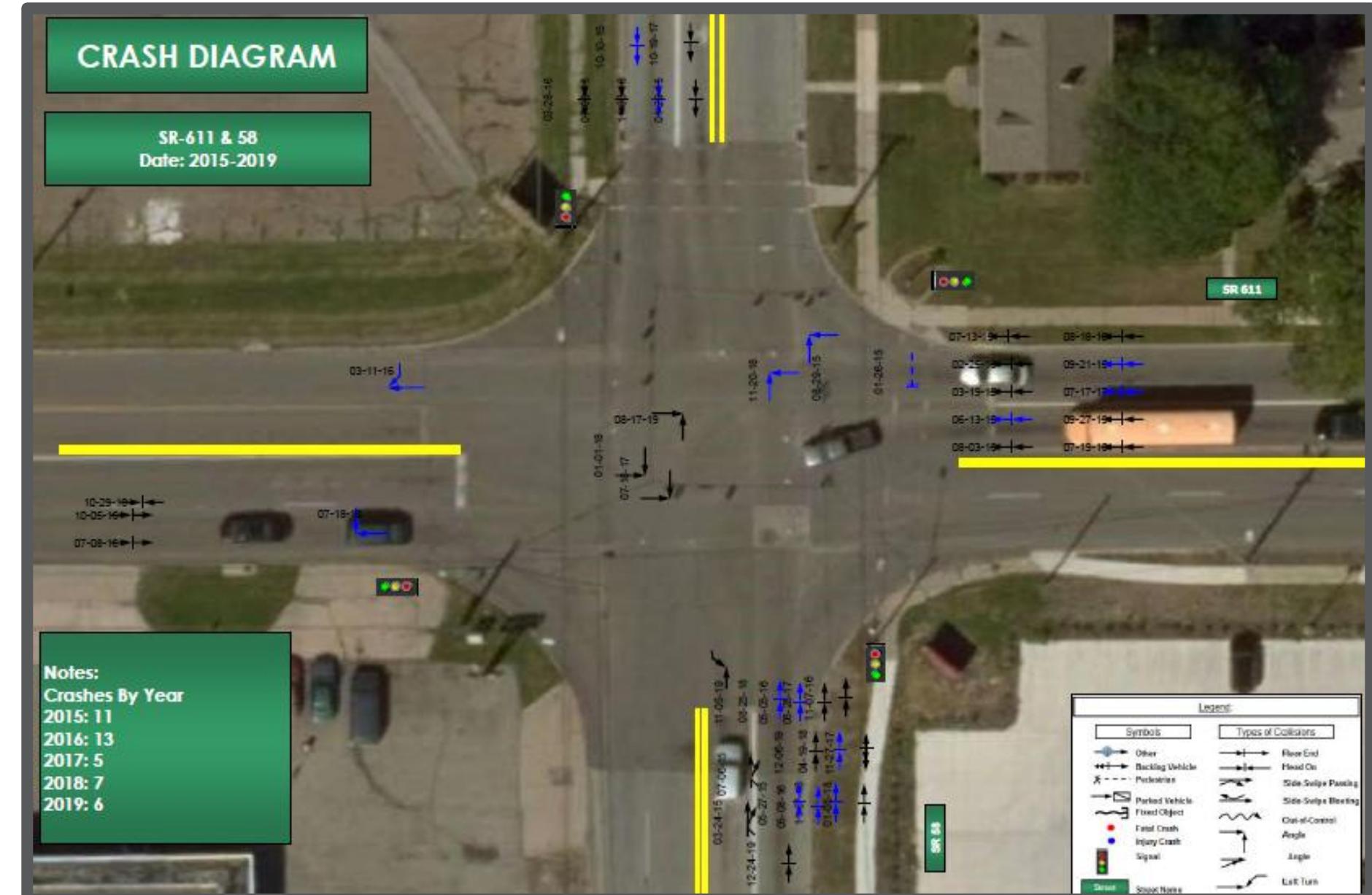
## SR 611 at SR 58 Crash Diagram

### 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

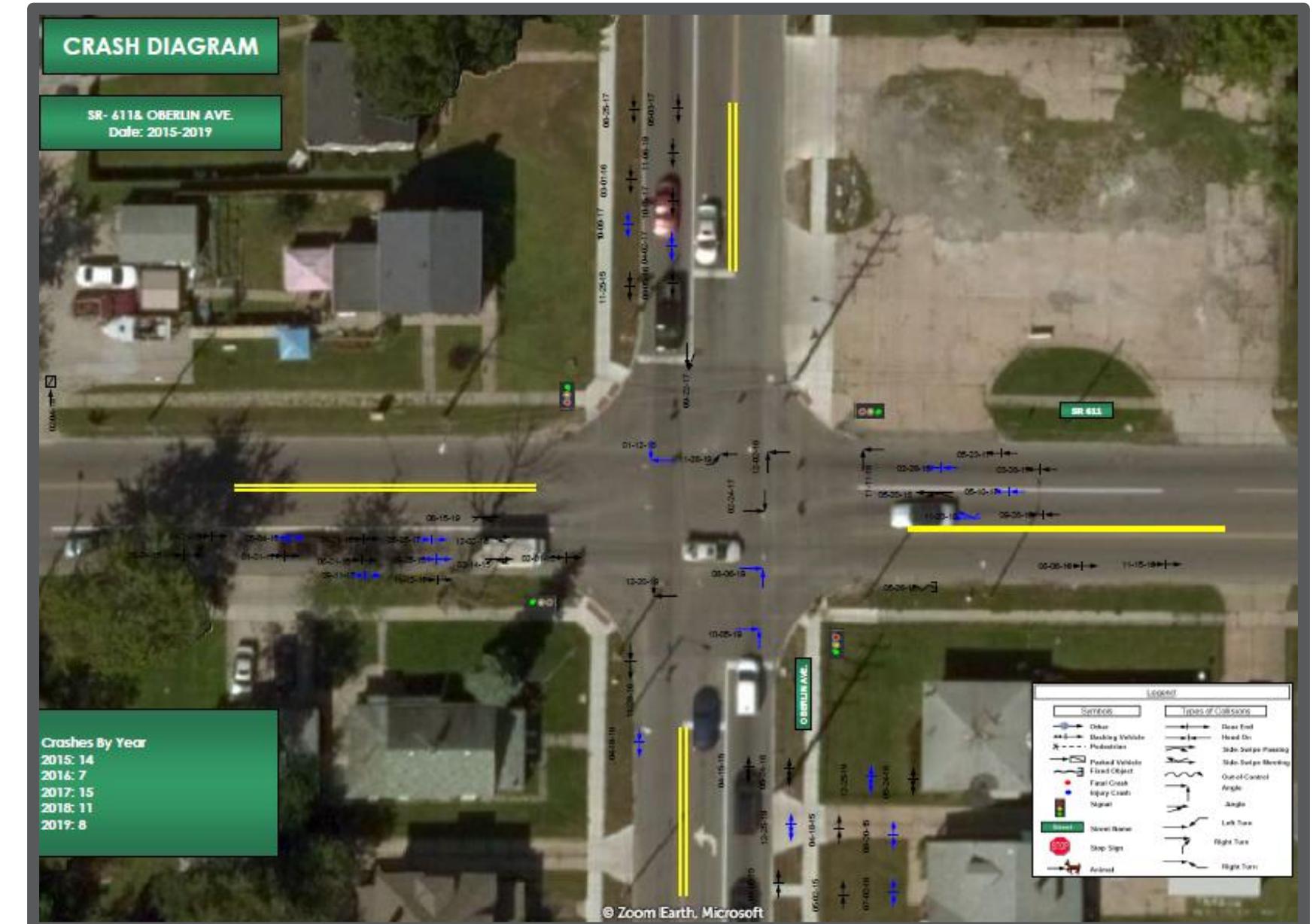
## SR 611 at Oberlin Avenue Crash Diagram

### Crash Analysis

- 55 crashes from 2015 – 2019
- 33% of crashes resulted in an injury
- 35 Rear-End
- 8 Angle
- 42% Young drive 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

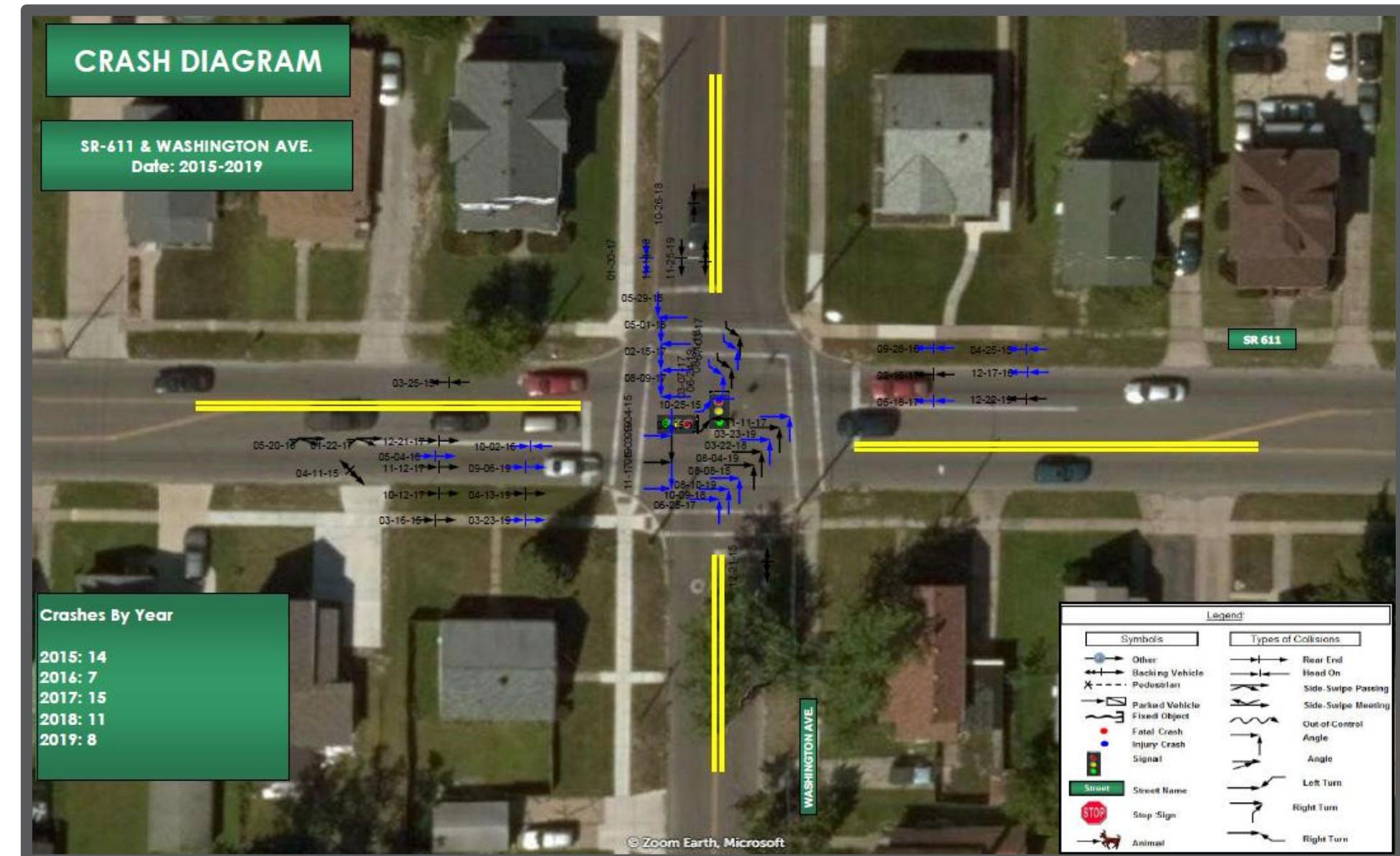
## SR 611 at Washington Avenue Crash Diagram

### Crash Analysis

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

### Probable Causes

- Driver inexperience
- Distraction
- Signal visibility
- Signal Timings



# LOR – SR 611 Signals

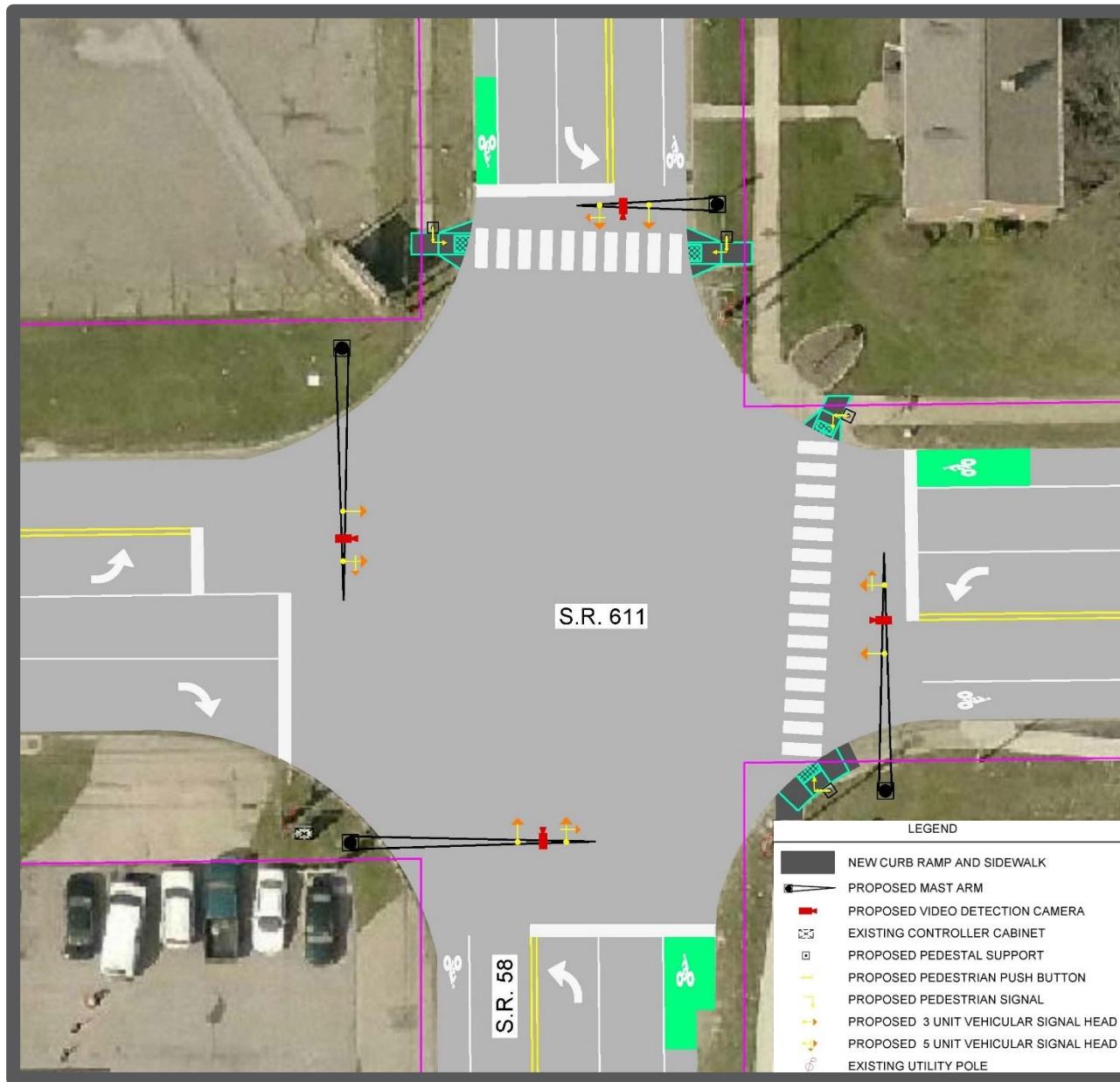
## Proposed Countermeasures

- 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

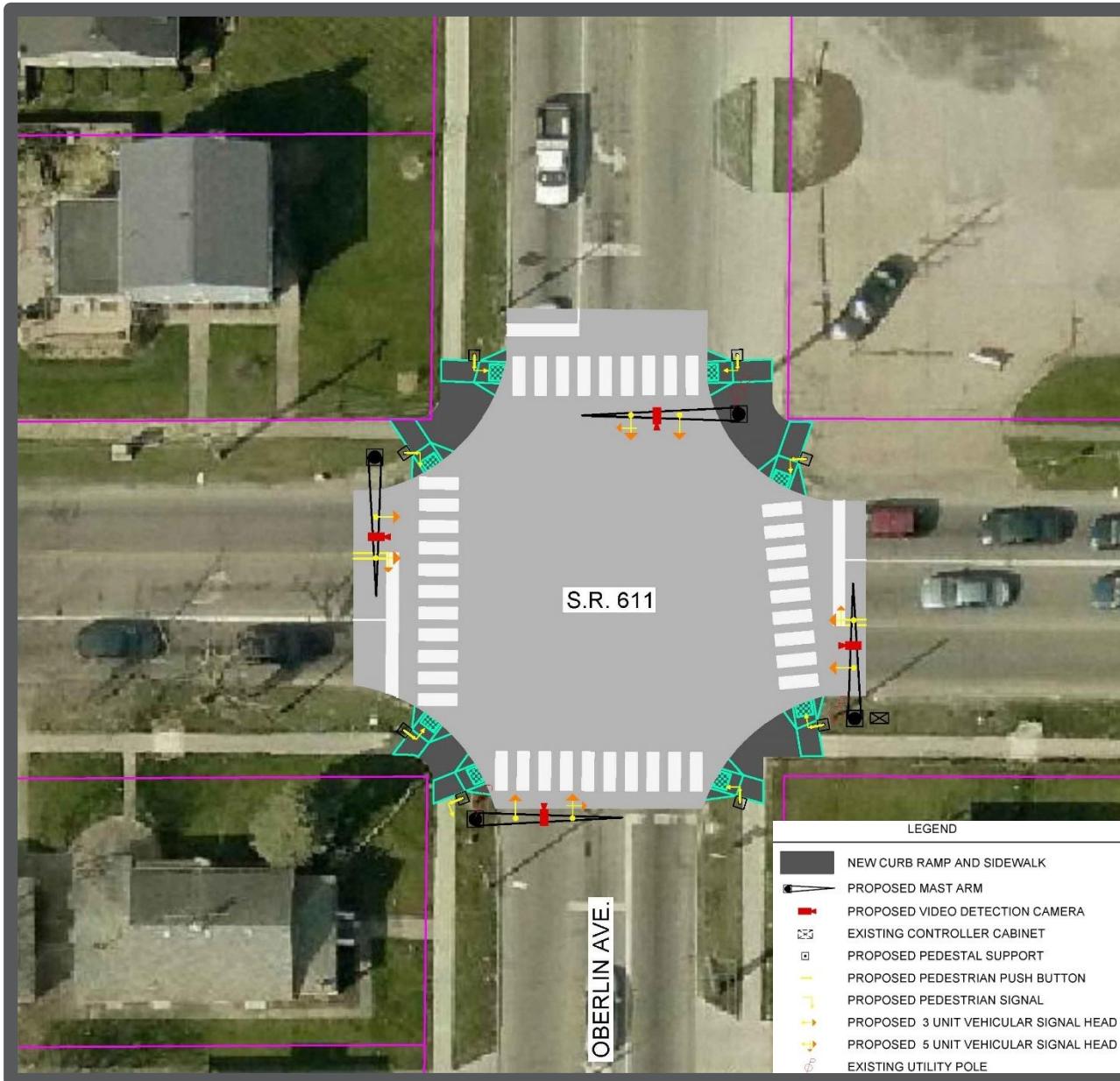


### Intersection Improvements

- 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

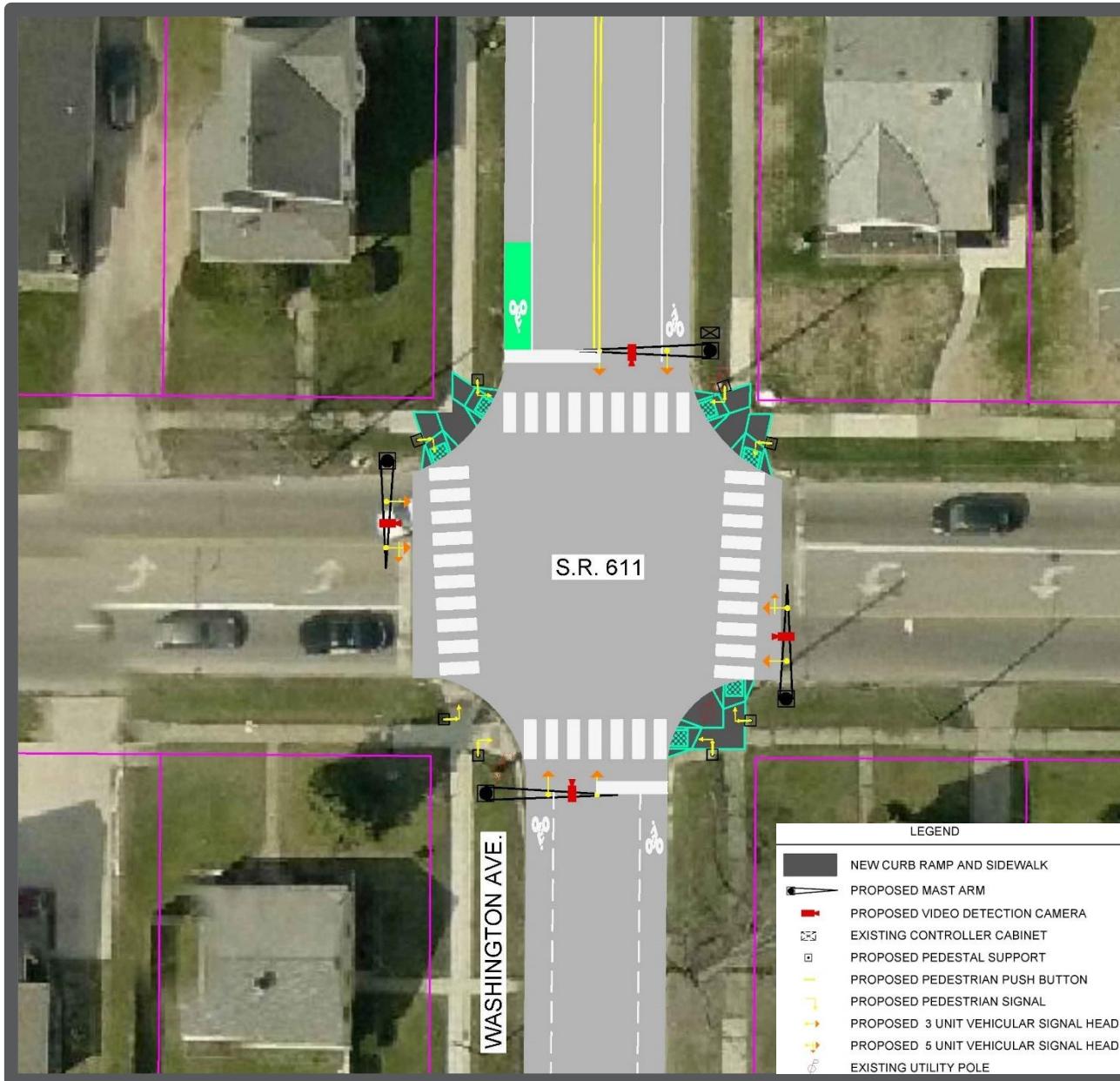


### Intersection Improvements

- 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.

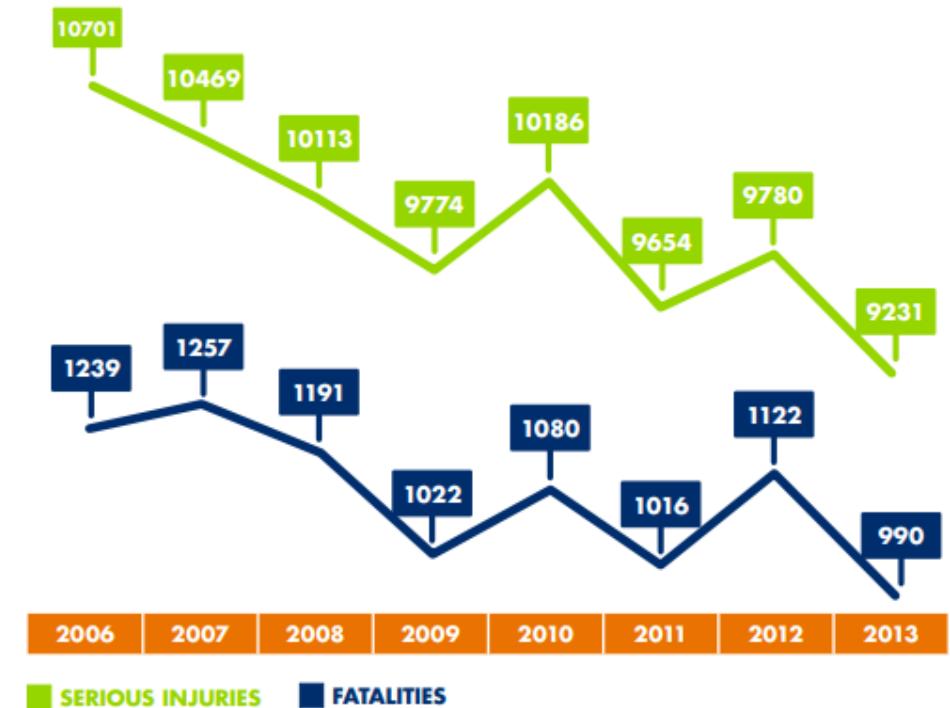


### GOALS

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

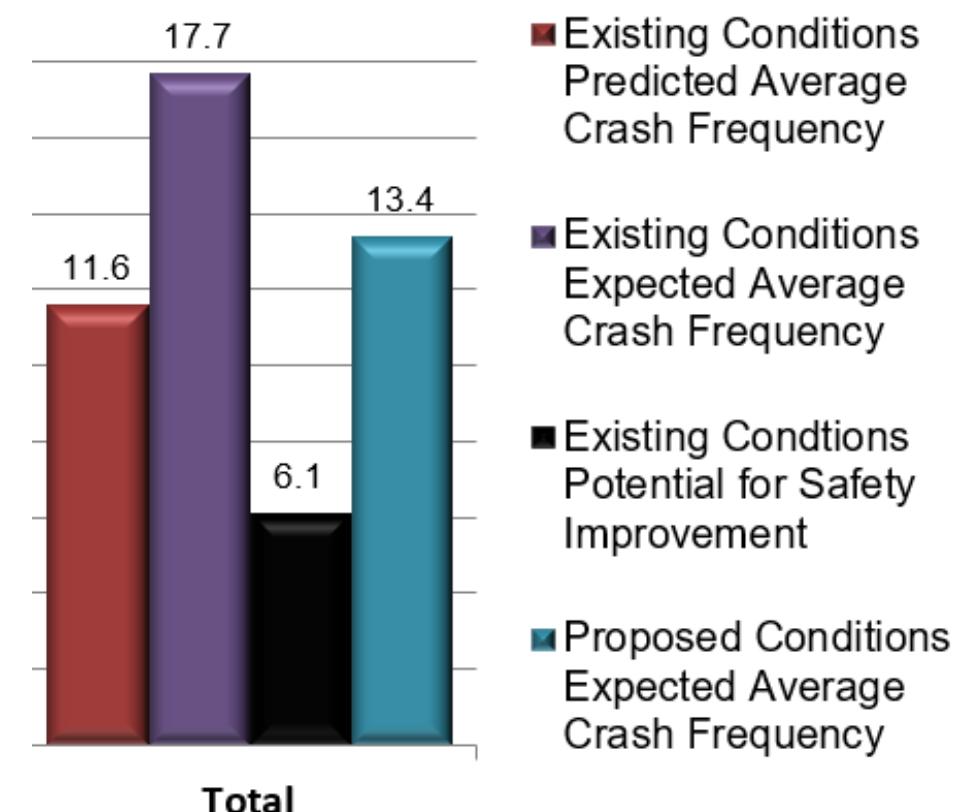
**A Comprehensive Plan to Reduce Fatalities and Serious Injuries | 2014-2019**

# 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	
<b>Number of Fatal &amp; Incapacitating Injury Crashes</b>	<b>-0.117</b>
<b>Number of Injury Crashes</b>	<b>-1.467</b>
<b>Number of Total Crashes</b>	<b>-4.295</b>



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## Benefit to Cost Analysis

- Estimated Cost of Project:  
(Not Including Inspection & Inflation) \$1,041,500.00
- 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

Funding Type	Dollar Amount	% of Total
Safety Funding Request:	\$1,122,750.00	89.3%
Local Funding:	\$ 134,750.00	10.7%
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 Westbrooks, P.E., PTOE  
GPD Project Manager

