



TRAFFIC SIGNAL TIMING FOR LOCAL MUNICIPALITIES

TRANSPORTATION ENGINEERING WORKSHOP
JUNE 5, 2019



EDWARD WILLIAMS, PE, PTOE, RSP
TEC VICE PRESIDENT



ENGINEERS



PLANNERS

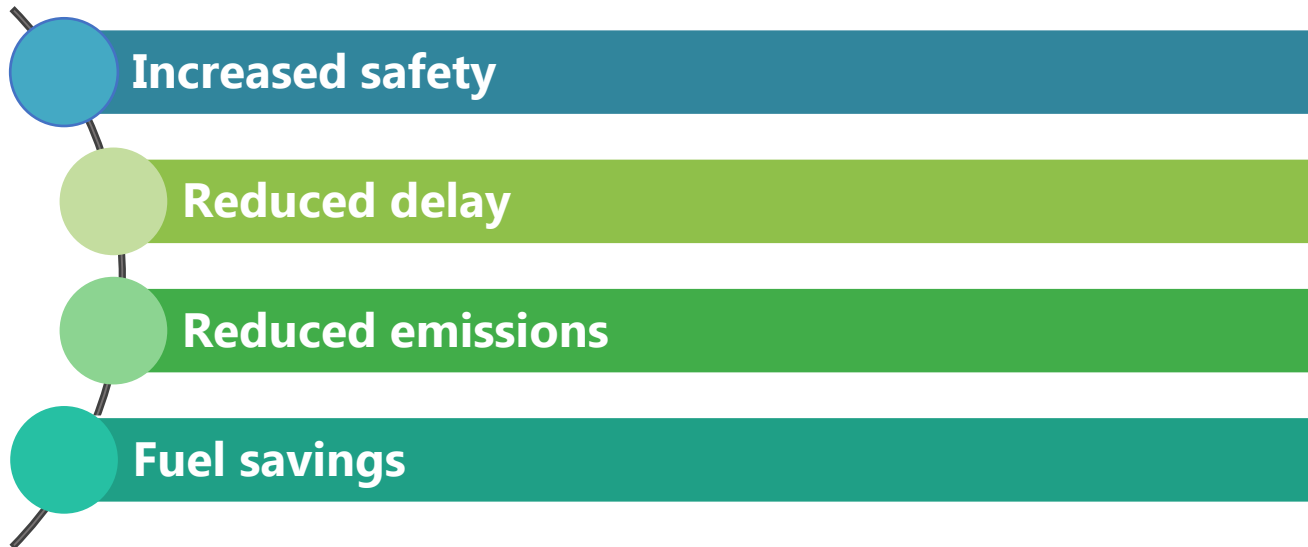


SURVEYORS

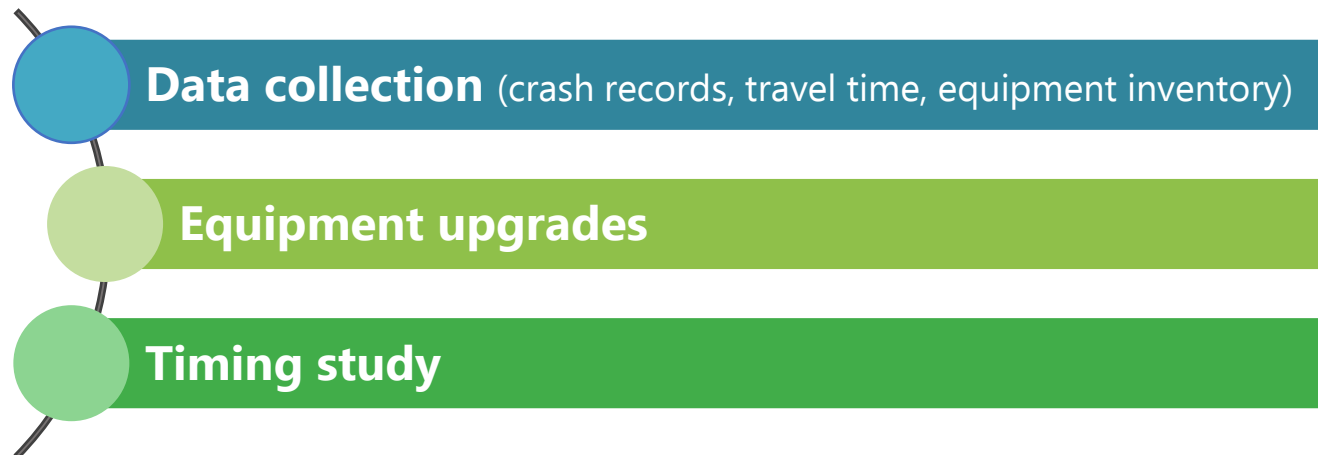
SIGNAL TIMING PROJECTS:

BENEFITS VS. COSTS

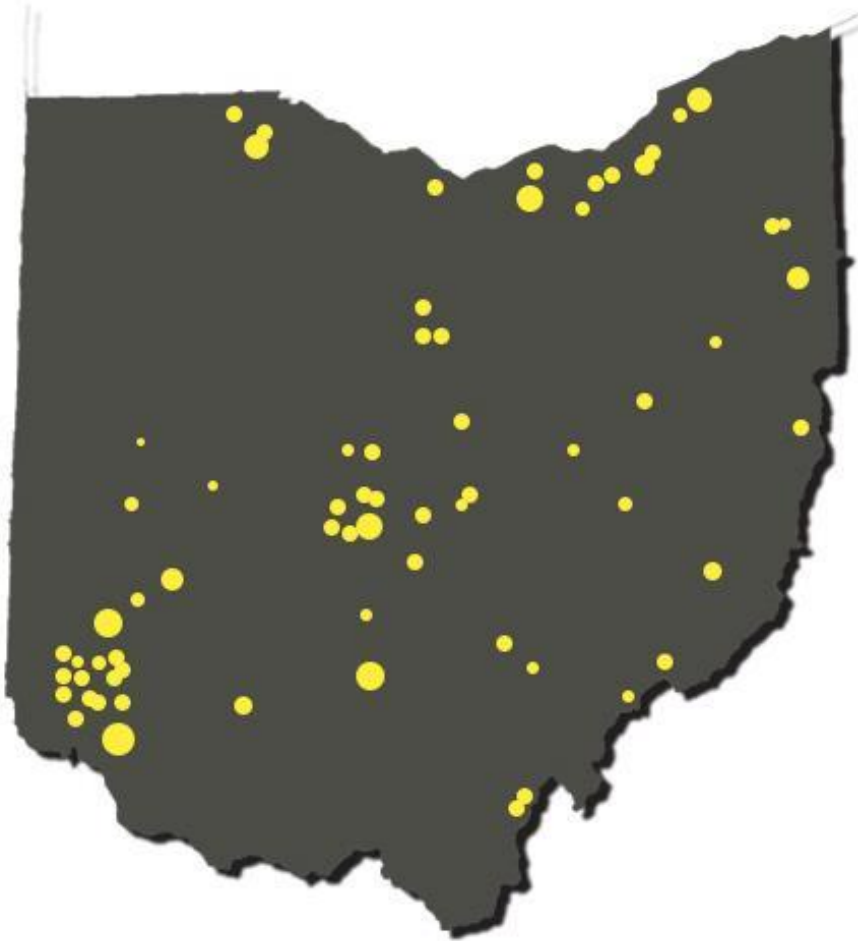
BENEFITS



COSTS



TEC TIMING STUDY LOCATIONS



**MORE THAN 1,000 SIGNALS
RETIMED**

20 TO 1 COST-BENEFIT RATIO

**CORRIDORS SHOW REDUCTIONS
IN DELAY OF 10-40%**

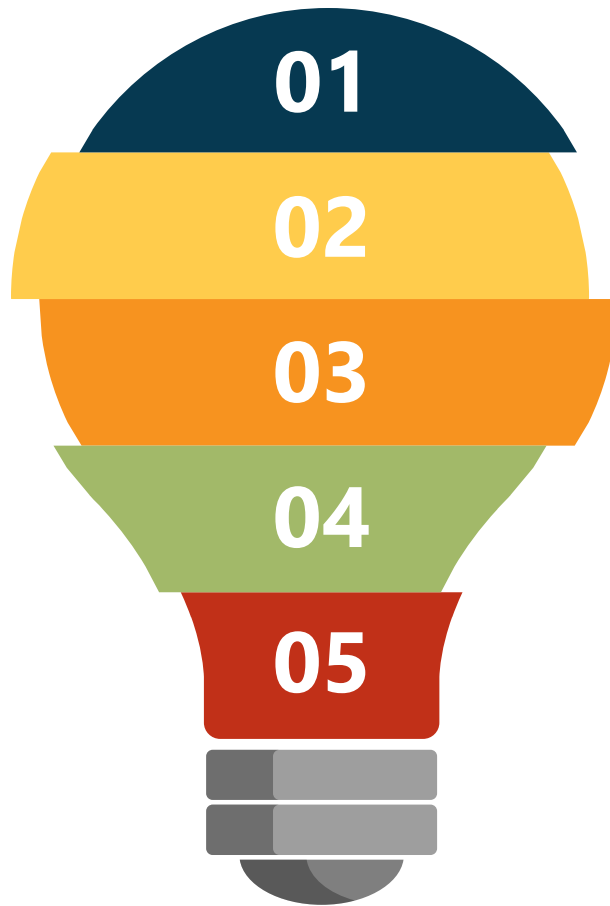
VARIETY OF MUNICIPAL RESPONSIBILITIES

WHO'S IN CHARGE?



- 1 SMALL COMMUNITY**
Administrator or Public Works
- 2 MEDIUM COMMUNITY**
May have Signal Inspector
- 3 LARGE COMMUNITY**
Engineering Department

EDUCATION



1 Cycle Length

2 Progression

3 Pedestrians

4 Clearances

5 Splits

CONTROLLER SETTINGS:

STANDARD ELEMENTS/COMMONLY USED



Command box

Phase settings

**Number of settings in a
controller**

CONTROLLER SETTINGS:

RARELY USED/"HIDDEN GEMS"



Advanced pedestrian settings

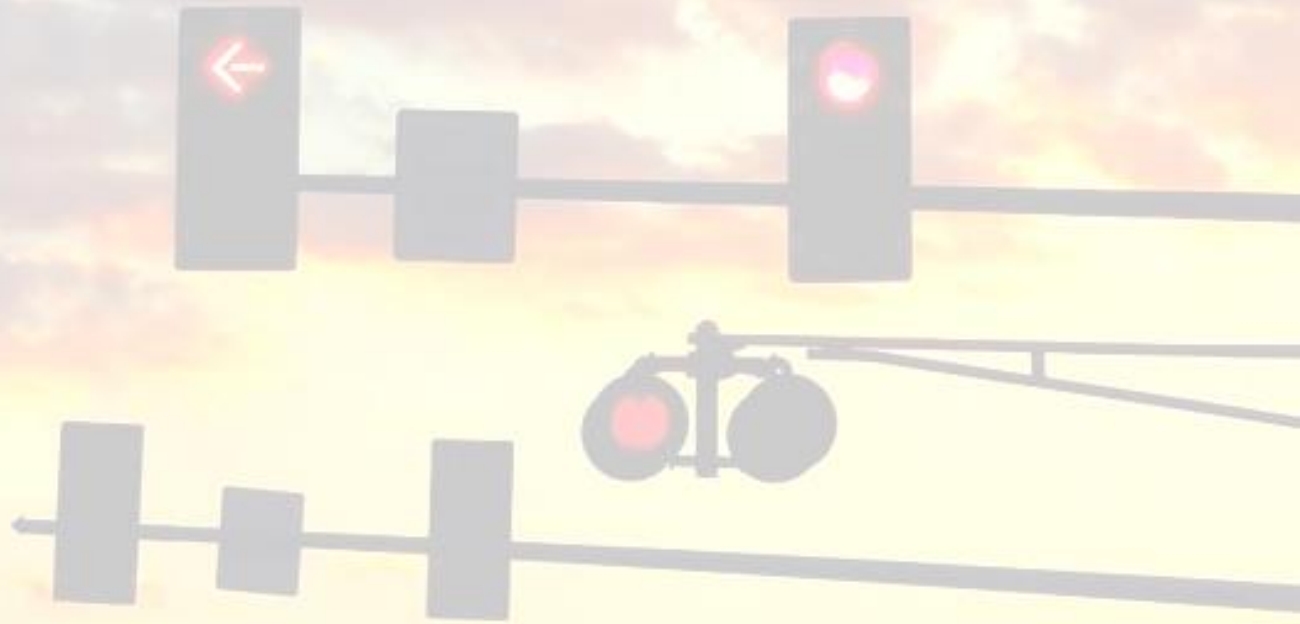
Step max

Traffic responsive settings

Coordination phase

TBR vs. TTR

CASE STUDIES



CASE STUDIES:

CITY OF WICKLIFFE, OHIO

East 305th Street and LAK-2

Multiple intersections controlled by one controller



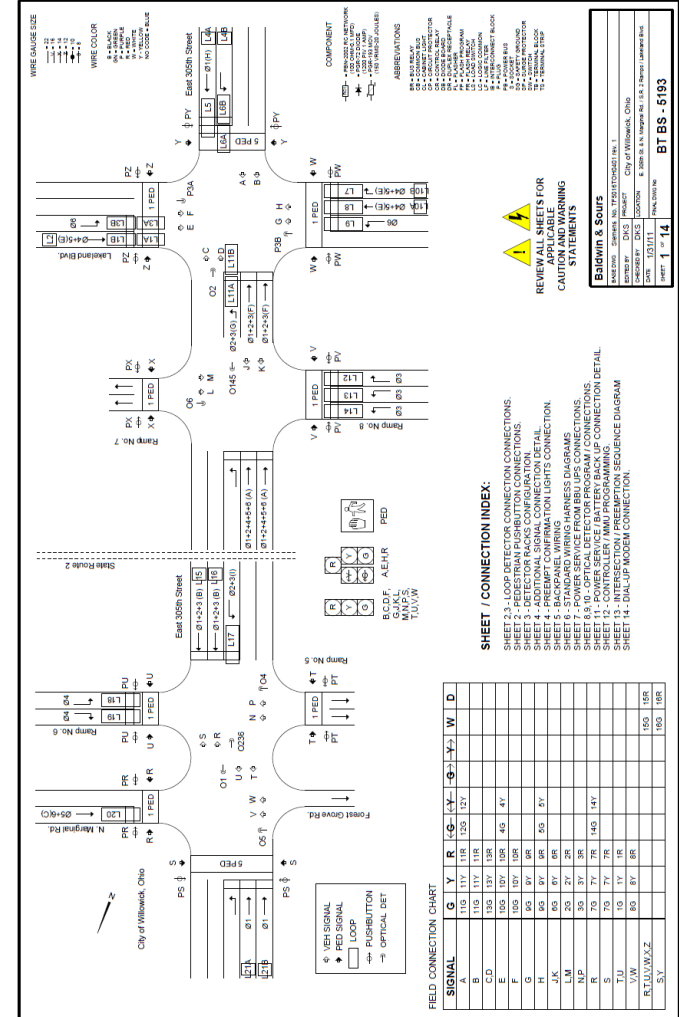
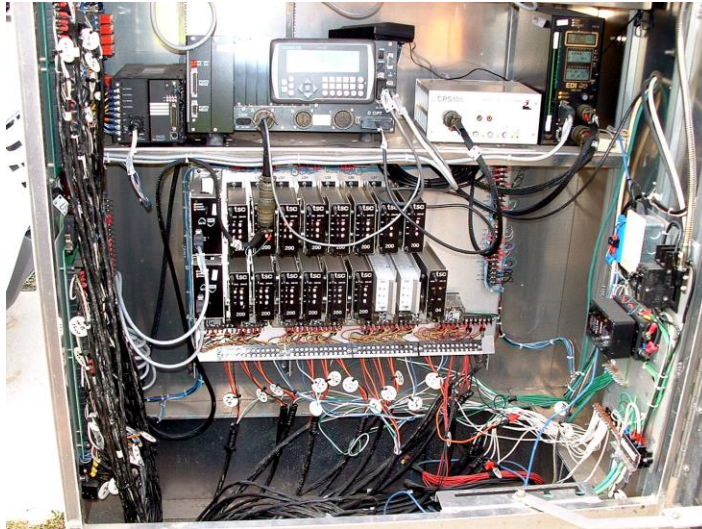
Multiple overlapping movements



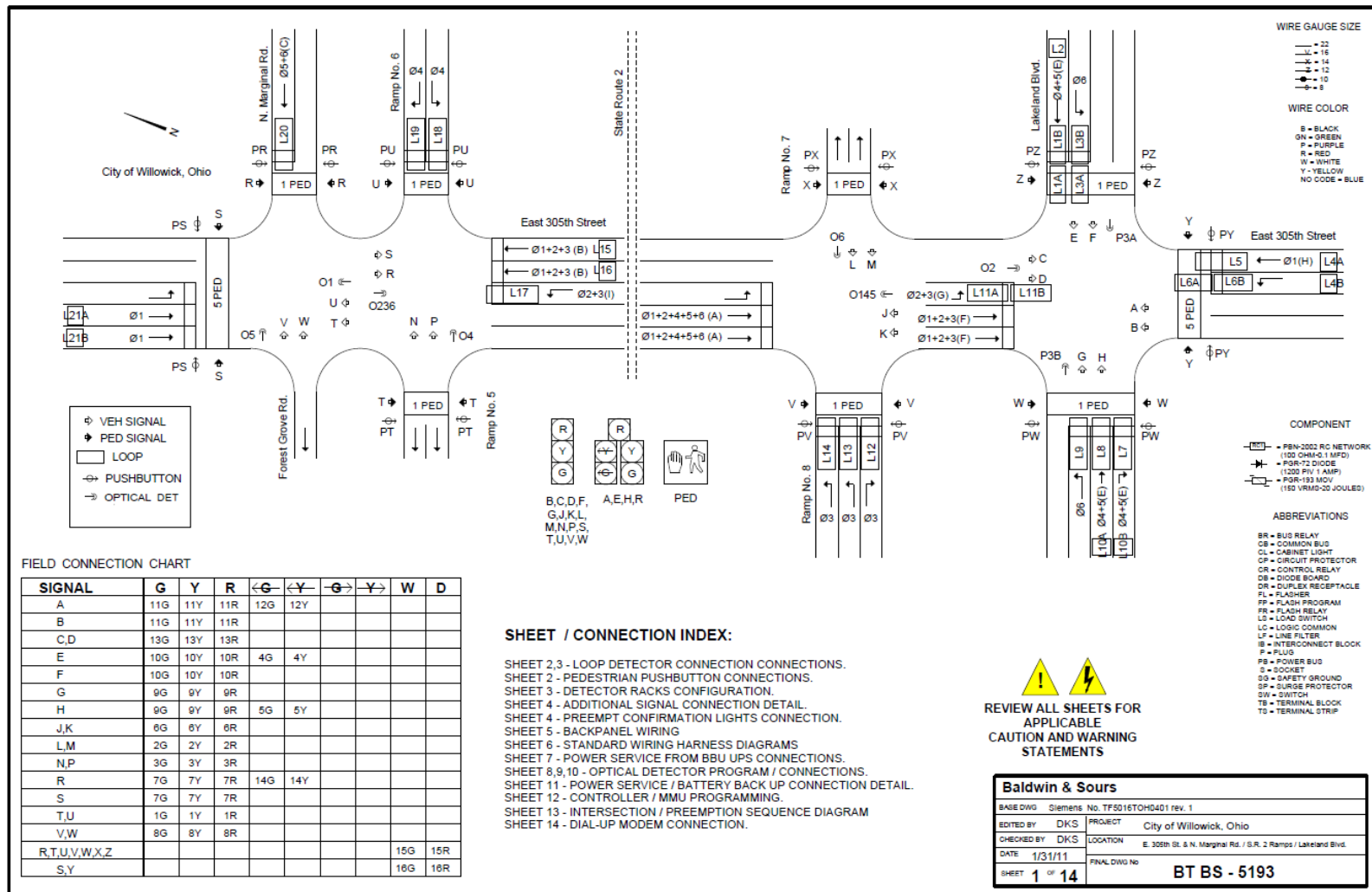
Dynamic maximums



East 305th Street and LAK-2



East 305th Street and LAK-2



CASE STUDIES:

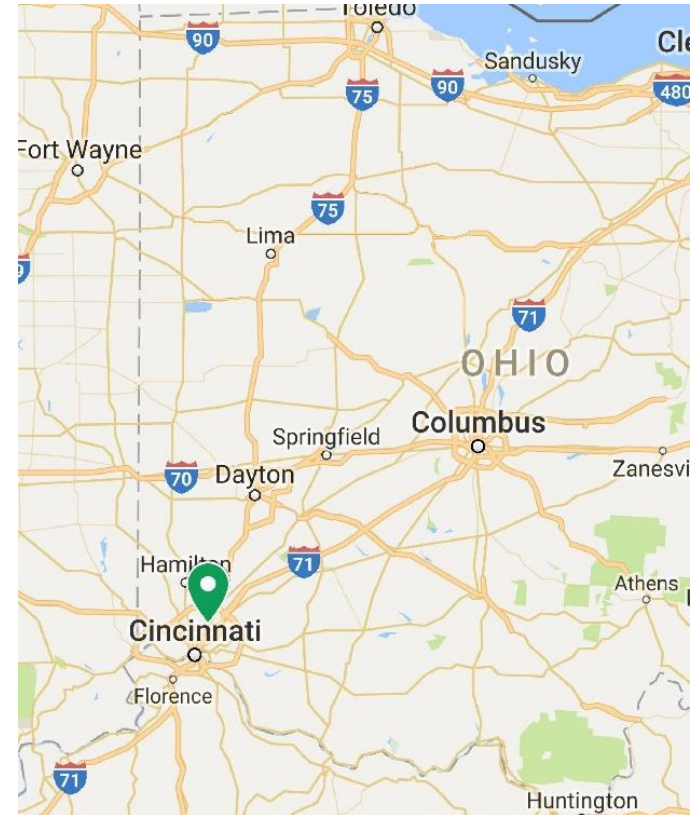
CITY OF READING, OHIO

Ridge Road, Maple Drive, SR 126

**Three intersections running
off one controller**



Complicated phasing

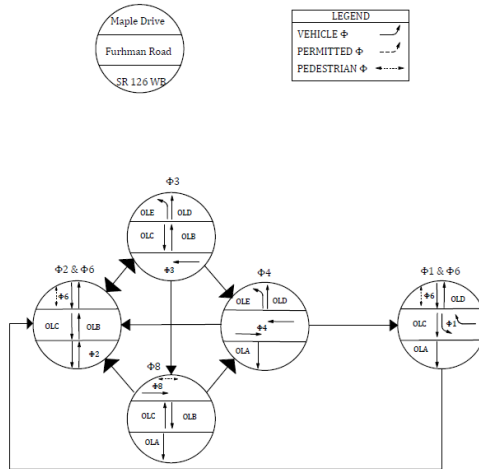


CASE STUDIES:

CITY OF READING, OHIO

Ridge Road, Maple Drive, SR 126

Ridge Road/Columbia Avenue & SR 126 WB & Furhman & Maple
Phase Diagram



NOTE:

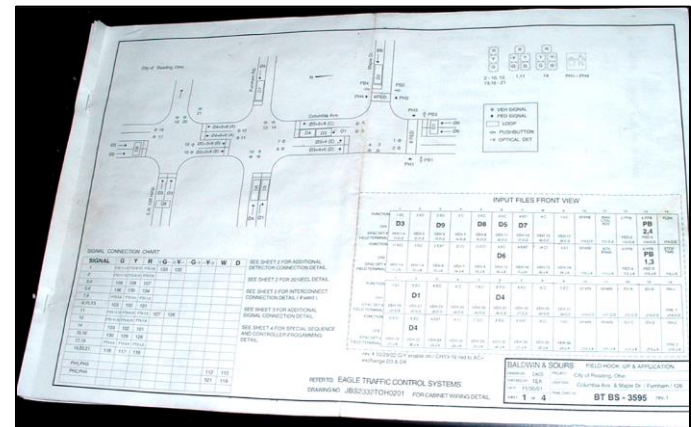
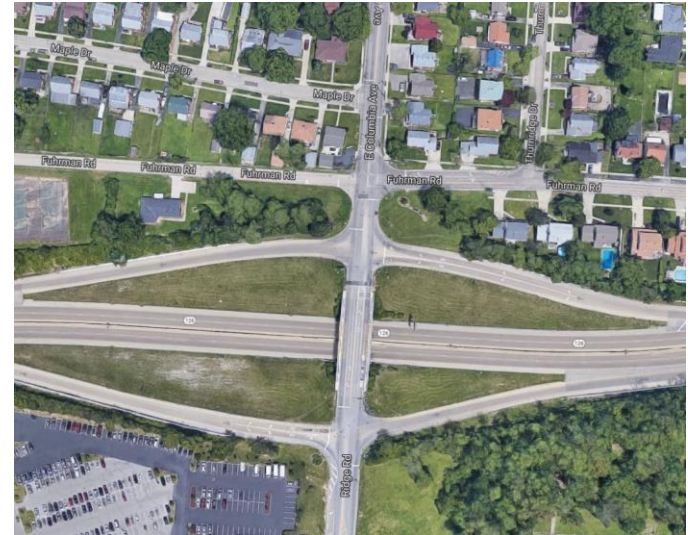
OLA: 4+6+8 - SB @ 126 WB Ramp
OLB: 2+3+8 - NB @ Furhman
OLC: 3+6+8 - SB @ Furhman
OLD: 3+4+6 - NB @ Maple
OLE: 2+4 - NBLT @ Maple

-Demand for SBLT at Furhman Phase 1 will create demand for WB Furhman Phase 4. D4 in the southbound lane is a call only stop bar detector that places a call to Phase 4. This detector stops extending Phase 4 after .01 seconds of green time.

-Controller must service Phase 4 before servicing Phase 1.

-Controller must go to Phase 3 to service Phases 8, 4, and 1.

-During Phase 2, demand for Phases 1, 4, and 8 is switched to Phase 3.



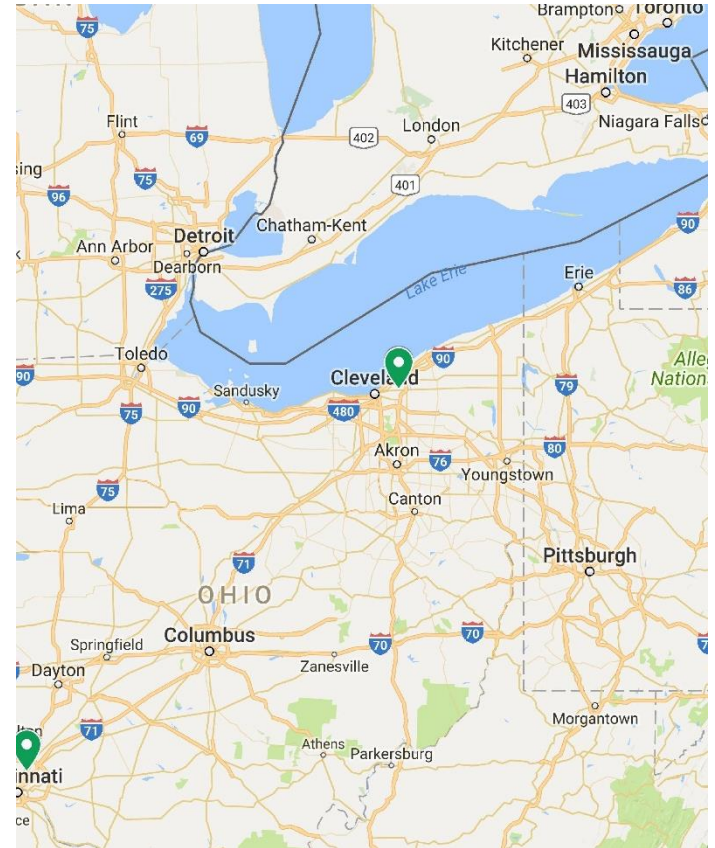
CASE STUDIES:

CUYAHOGA COUNTY, OHIO

SR 322

**Loop detector added to
unsignalized side street**

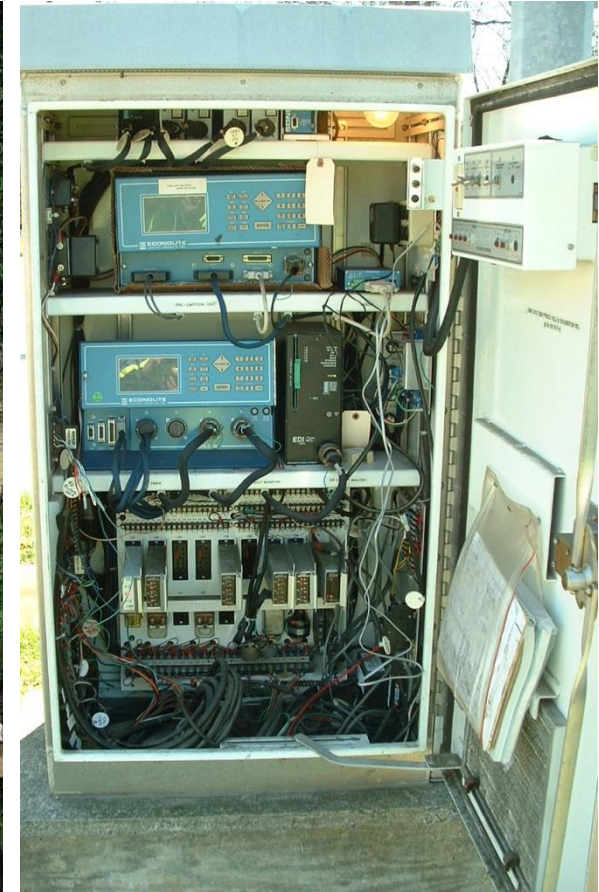
**Created gaps in Main
Street traffic**



CASE STUDIES:

CUYAHOGA COUNTY, OHIO

SR 322



CASE STUDIES:

VILLAGE OF CLEVES, OHIO

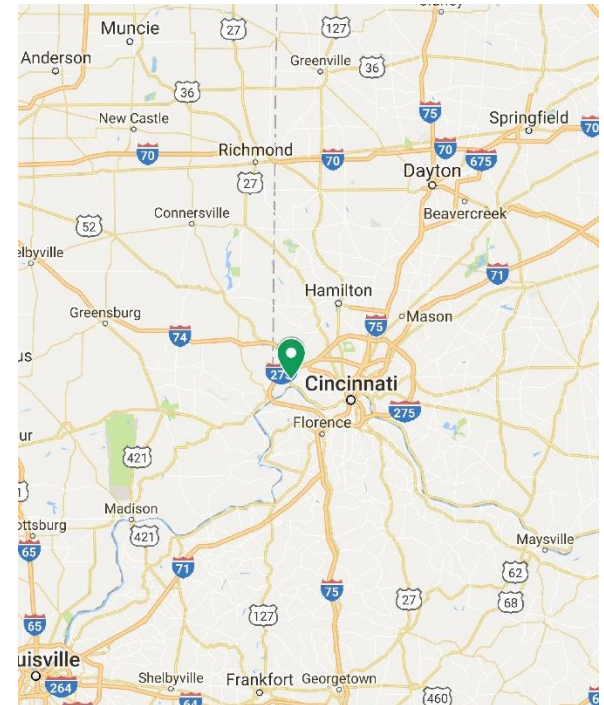
US 50 and Mt. Nebo Road

5-section signal heads needed

Existing poles/spans cannot provide minimum clearance

Railroad preemption needed at track crossing

Existing cabinet too small



CASE STUDIES:

VILLAGE OF CLEVES, OHIO

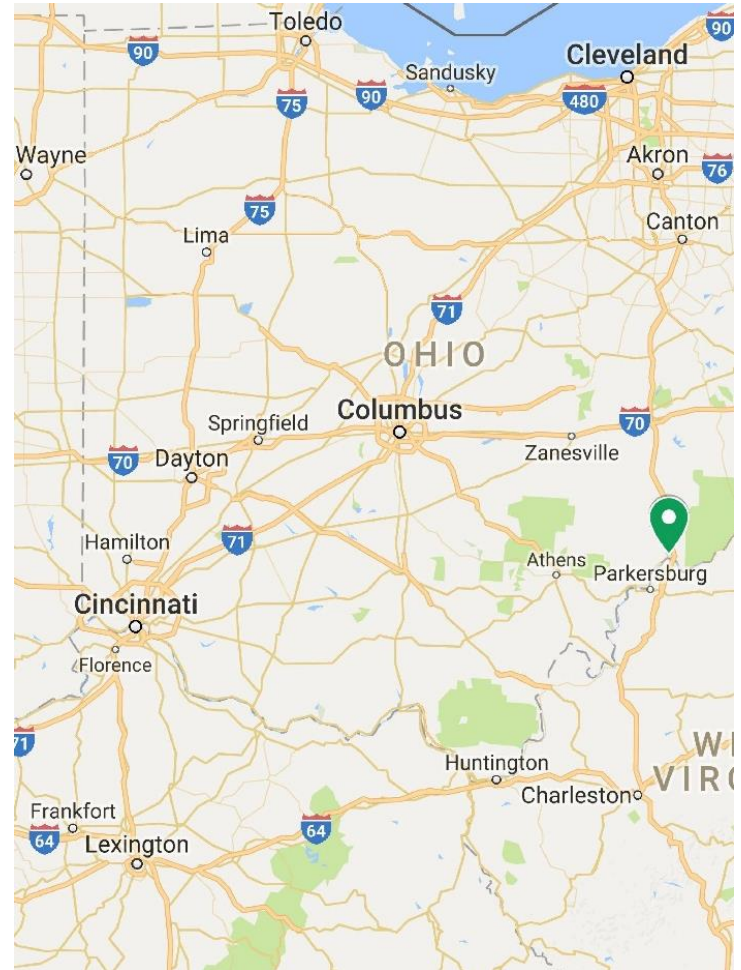
US 50 and Mt. Nebo Road



CASE STUDIES:

CITY OF MARIETTA, OHIO

Washington Street



CASE STUDIES:

CITY OF MARIETTA, OHIO

Fifth and Washington Street

No **all-red** interval

Mechanical Controller



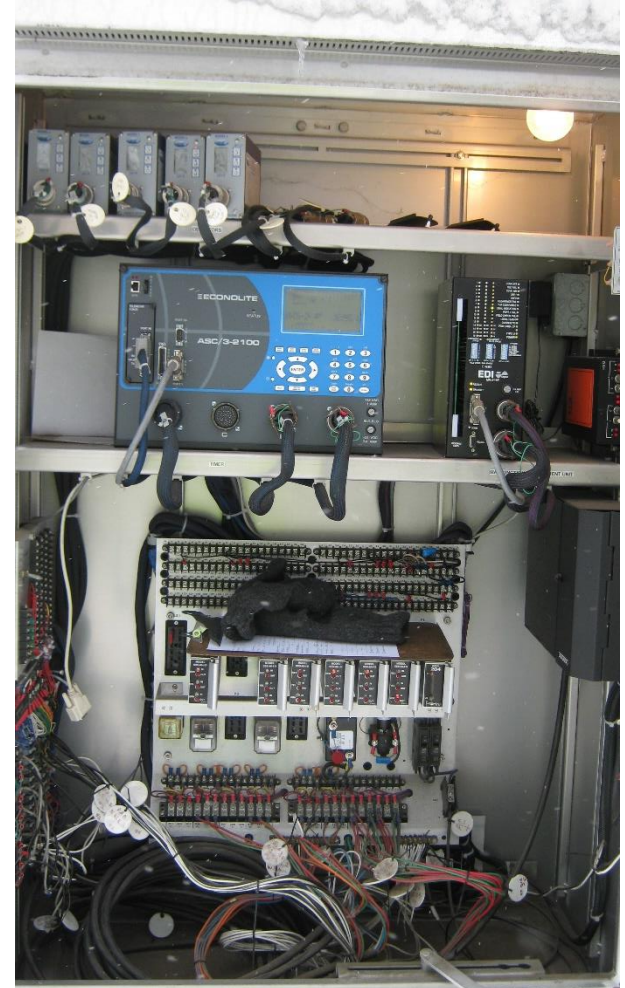
CASE STUDIES:

CITY OF MARIETTA, OHIO

Fourth and Washington Street

Advance **WALK** desired

Existing **ASC2** cannot provide without
major re-wiring



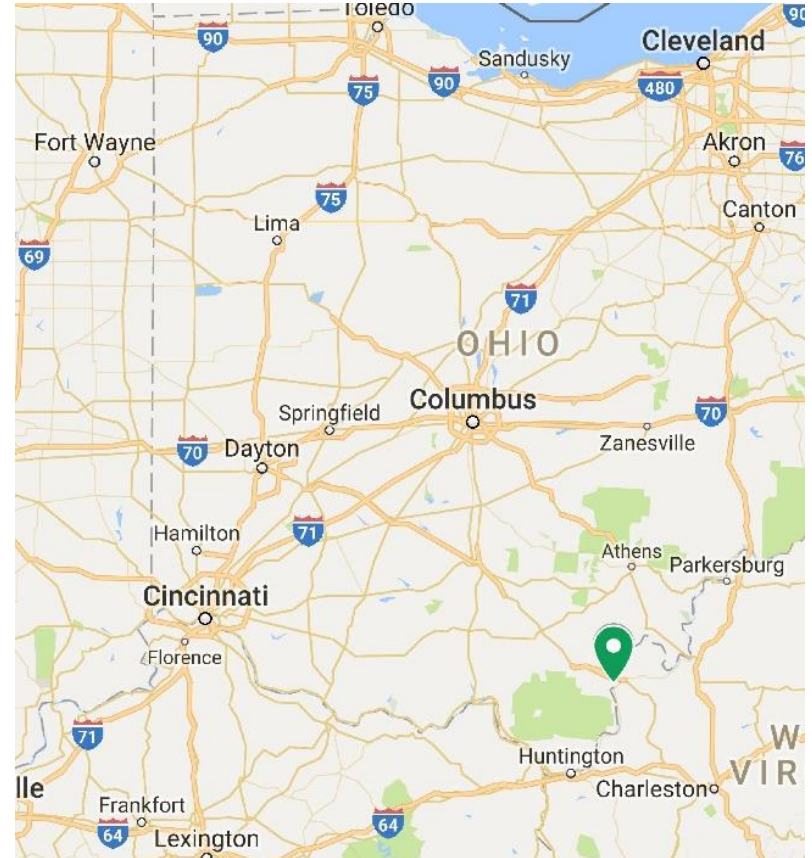
CASE STUDIES:

CITY OF GALLIPOLIS, OHIO

SR 7 & Smithers

Coordination not possible
with existing Transyt1800EL
controller

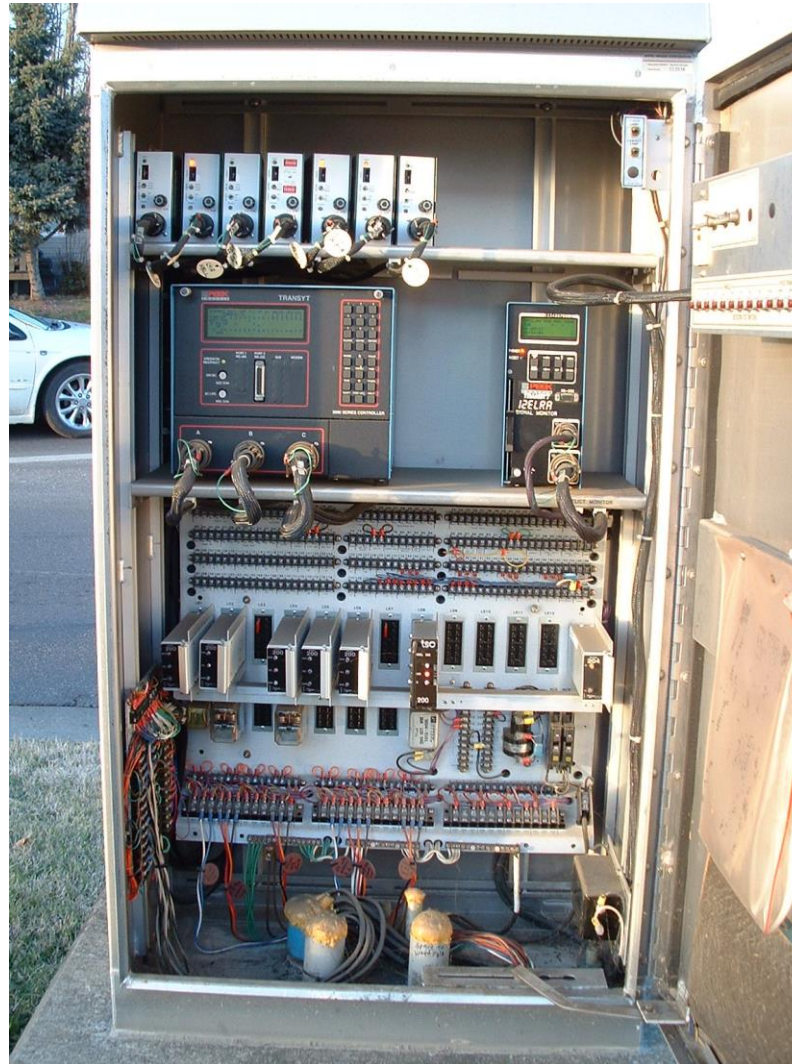
Controller changed out to
ASC3



CASE STUDIES:

CITY OF GALLIPOLIS, OHIO

SR 7 & Smithers



CASE STUDIES:

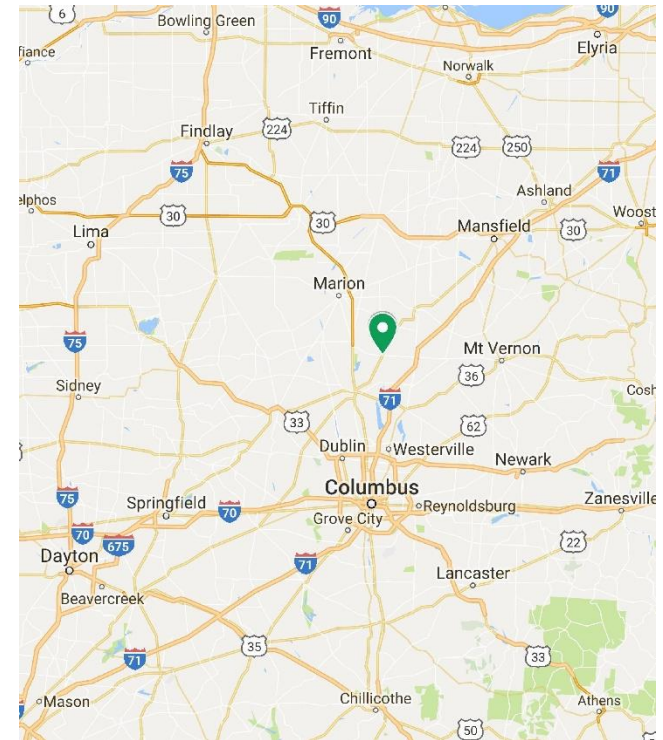
VILLAGE OF ASHLEY, OHIO

E. High St. & US 42

Desire to add left-turn phase and
blankout signs

Span wire on wood poles

ORDC project



CASE STUDIES:

VILLAGE OF ASHLEY, OHIO

E. High St. & US 42



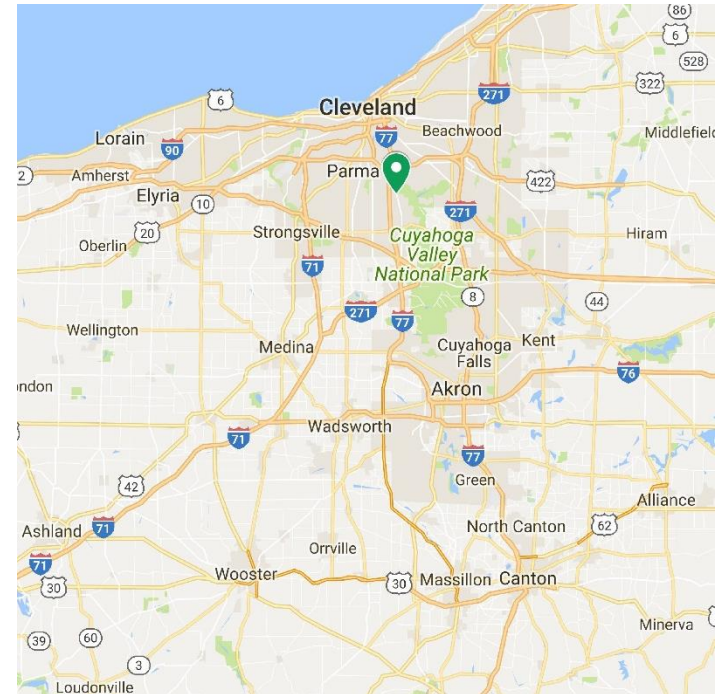
CASE STUDIES:

CITY OF INDEPENDENCE, OHIO

Rockside Road and West Creek Road

5-section signal for left-turn phase

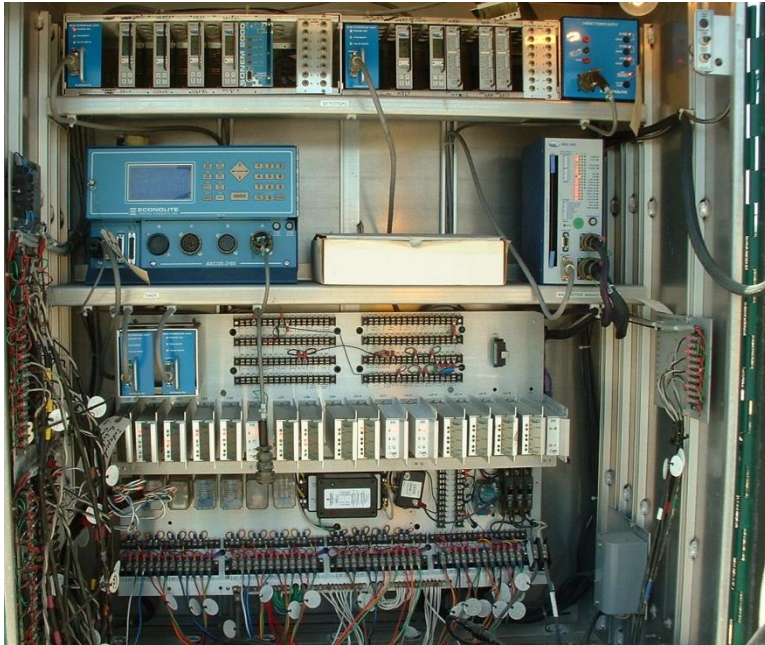
Permitted/protected by time of day



CASE STUDIES:

CITY OF INDEPENDENCE, OHIO

Westbound Rockside Road at West Creek Road



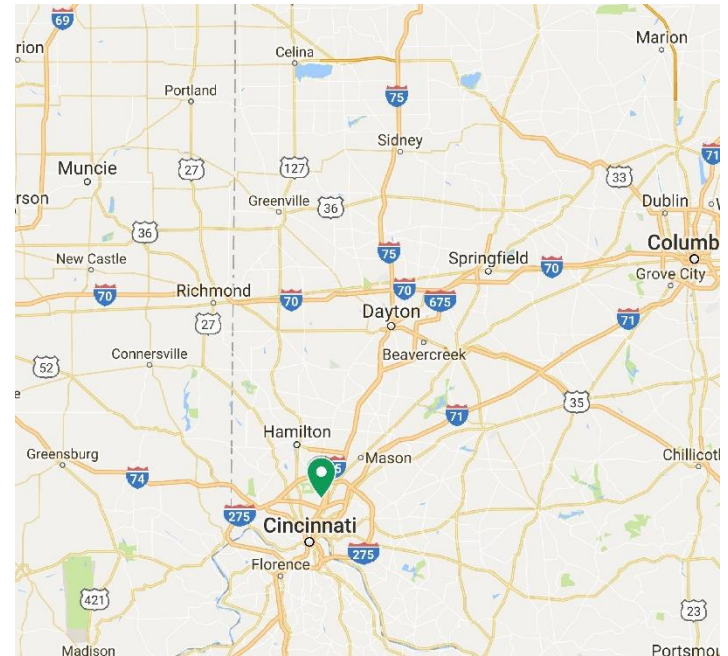
CASE STUDIES:

CITY OF WYOMING, OHIO

Springfield Pike and Charlotte Avenue

Coordination not possible with
existing controller

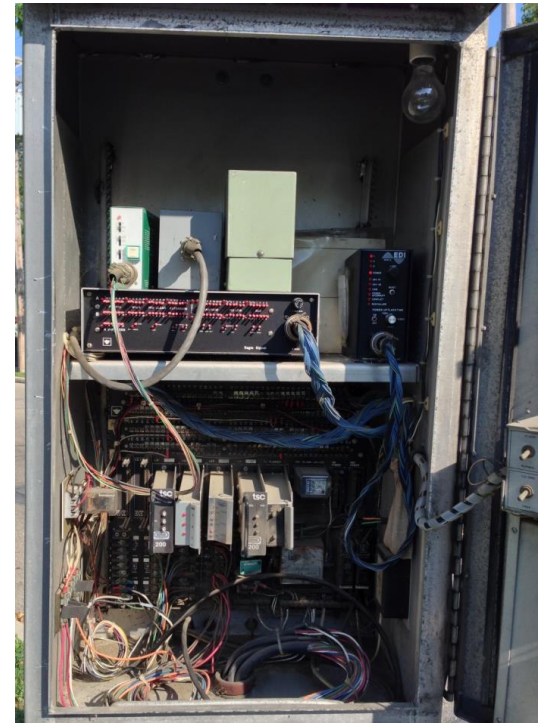
Intersection rebuilt and
controller changed

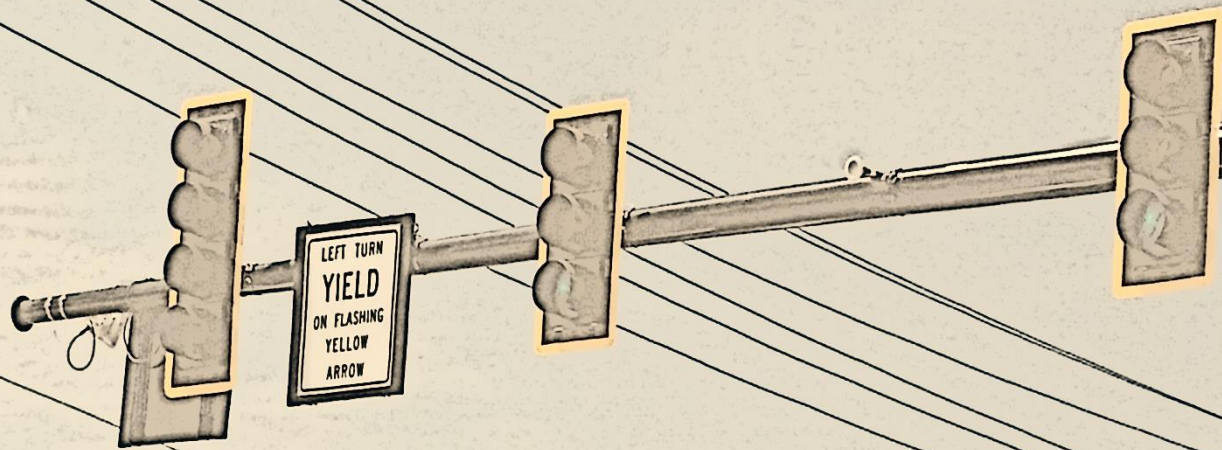


CASE STUDIES:

CITY OF WYOMING, OHIO

Springfield Pike and Charlotte Avenue





FLASHING YELLOW ARROWS



FLASHING YELLOW ARROW

THE PROBLEM

01

Heavy peak requires protected left

02

Lead lag lefts for directional flow

03

Railroad preemption

04

Yellow ball trap



FLASHING YELLOW ARROW

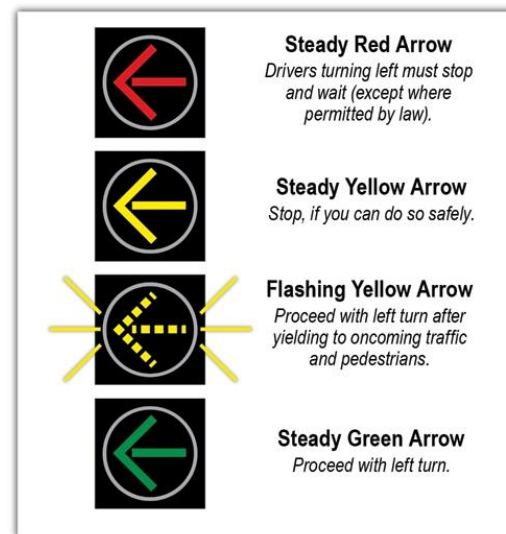
THE SOLUTION

01

Permissive protected (by time of day)

02

Yellow ball trap



FLASHING YELLOW ARROW

BENEFITS

SAFETY

- Clearer message
- Yellow ball trap

CAPACITY

- Lead lag
- Protected permissive

REDUCTION IN HARDWARE

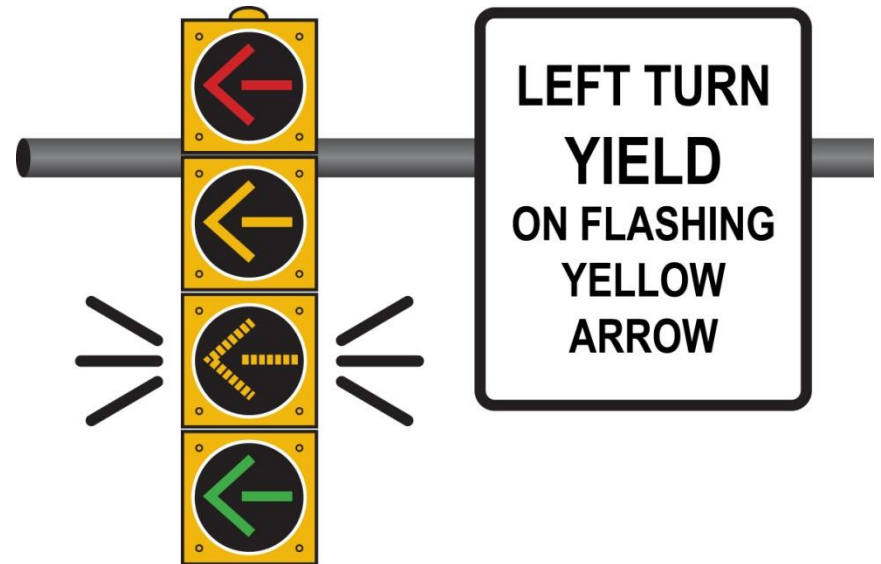
- Blank out signs

FLASHING YELLOW ARROW

(FYA)

DOWNSIDES:

- ❑ **Recognition**
 - ❑ It's new (driver understanding)
- ❑ **Additional Signal Lens**
 - ❑ Pole loading
 - ❑ Attachment height



FLASHING YELLOW ARROW

(FYA)

CURRENT EXAMPLES:



Tylersville & Kingsgate Road



Bethany Road & SR 741



Tylersville Road & US 42

THANK YOU!

CONTACT INFORMATION

Edward Williams, PE, PTOE, RSP

Vice President
TEC Engineering, Inc.

Email: ewilliams@teceng.com

Ph: (513) 771-8828