



# Midland Farmer's Market

Open House  
9/16/2015

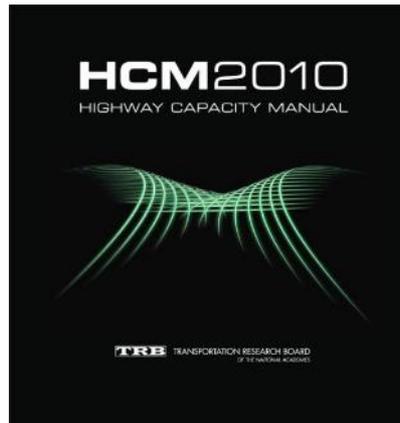
# Introduction

- ✓ LSL Planning – Brad Strader, PTP, AICP
- ✓ DLZ Michigan – Jason Whitten and Wes Butch – Traffic Engineers
- ✓ Selected by City and MML to evaluate traffic impacts that can be expected with new farmers market location, potential reconfiguration of the Poseyville Bridge Ramps and conversion of George to Two Way
- ✓ Process was to evaluate: (1) traffic volumes generated by background growth & relocated Farmer's Market (2) roadway improvements needed to accommodate future traffic volumes
- ✓ Criteria

# How Traffic Operations are Measured

- Level of Service (LOS) is the accepted procedure to evaluate traffic operations at signalized intersections
- It is a measurement of the delay of a typical vehicle
- Usually measured for a typical weekday during the AM and PM rush hours (“peak hours”)

Source: TRB Highway Capacity Manual 2010



Level of Service Criteria			
LOS	Description	Control Delay per Vehicle (secs)	
		Signalized Intersections	Unsignalized Intersections
A	Operations with very low control delay occurring with favorable progression and short cycle lengths.	10.0	10.0
B	Operations with low control delay occurring with good progression and short cycle lengths.	> 10 - 20	> 10 - 15
C	Operations with average control delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20 - 35	> 15 - 25
D	Operations with longer control delays due to a combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop and individual cycle failures are noticeable	> 35 - 55	> 25 - 35
E	Operations with high control delay values indicating poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	> 55 - 80	> 35 - 50
F	Operation with control delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80	> 50

Source: Highway Capacity Manual 2010 for Signalized and Unsignalized Intersections

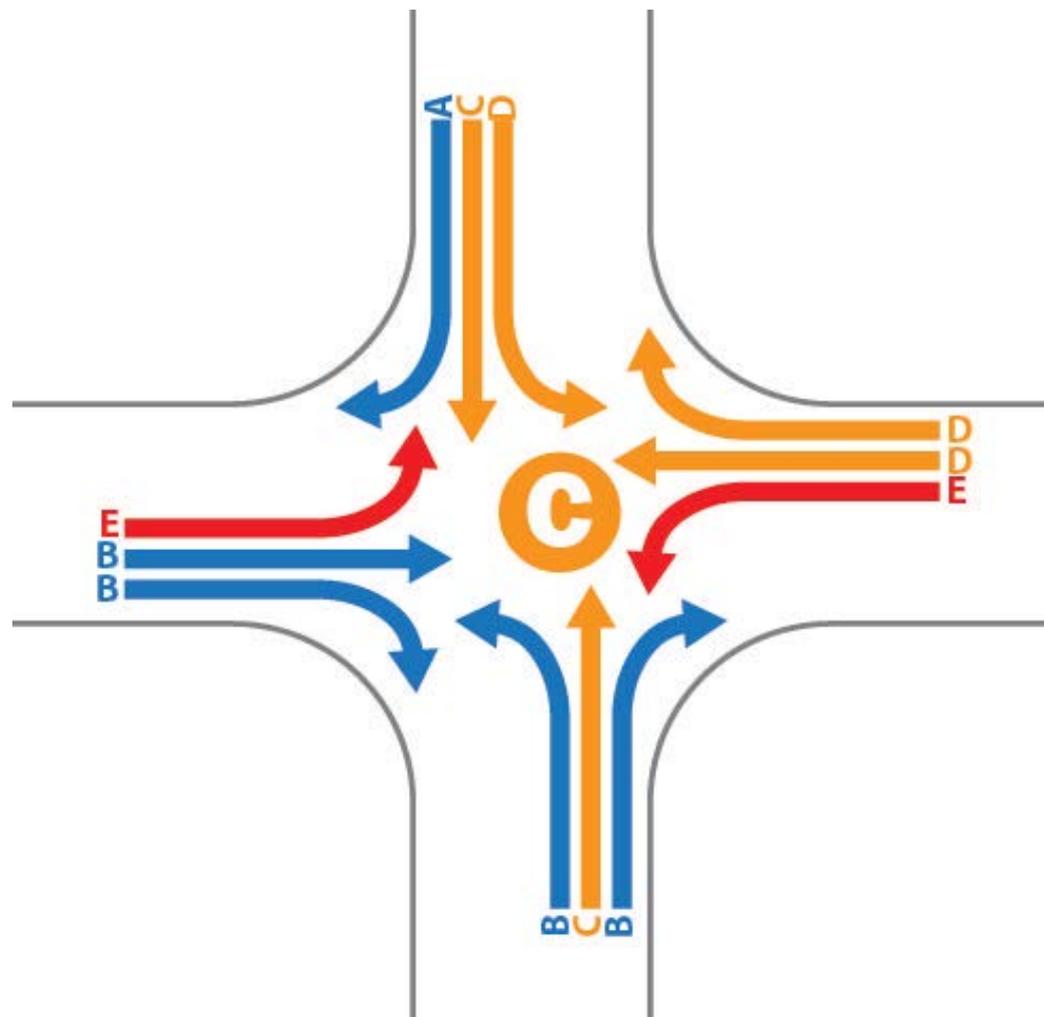
# Level of Service - Explained

LOS for each particular movement is based on the **average delay of all drivers** making the same movement at a given intersection. The table below illustrates how LOS could be determined for a single movement.

DRIVER	SIGNAL UPON APPROACH	DELAY	LEVEL OF SERVICE (LOS) FOR THAT DRIVER
DRIVER #1	Beginning of <b>GREEN</b> phase	0 seconds	<b>A</b>
DRIVER #2	Middle of <b>GREEN</b> phase	0 seconds	<b>A</b>
DRIVER #3	Beginning of <b>RED</b> phase	60 seconds	<b>E</b>
DRIVER #4	Middle of <b>RED</b> phase	30 seconds	<b>C</b>
DRIVER #5	3/4 through <b>RED</b> phase	15 seconds	<b>B</b>
<b>AVERAGE DELAY</b>		20 seconds	<b>B/C</b>

# Level of Service - Explained

Overall LOS for each intersection is based on the average LOS of all movements. The example to the right would result in a LOS of “C” for the intersection, even though some movements operate above and some below.



# Farmers Market Relocation - Traffic Impacts



# Study Methodology

- ✓ Used MDOT 2013 counts, adjusted to 2015
- ✓ City provided new counts at certain intersections (St. Charles, Ellsworth/Cronkright, Ellsworth/George)
- ✓ Projected farmers market traffic based on traffic and pedestrian counts at the current location plus 20% increase due to new location/size
- ✓ Forecasted future traffic conditions for 2040
  - Current traffic
    - + additional farmers market traffic
    - + background traffic
    - + background growth rate
- ✓ Identified improvements needed to retain current traffic operations (level of service)

# Existing (2015) Delays and Level of Service

Intersection	AM Peak Hour		PM Peak Hour	
	Overall LOS	Delay (sec/veh)	Overall LOS	Delay (sec/veh)
Poseyville at St. Charles (Unsignalized)*	<b>C</b>	<b>15.2</b>	<b>D</b>	<b>26.7</b>
Ellsworth at Cronkright (Signalized)	<b>A</b>	<b>6.8</b>	<b>A</b>	<b>7.0</b>
Ellsworth at George (Signalized)	<b>B</b>	<b>10.4</b>	<b>B</b>	<b>11.5</b>
Cronkright at Buttles (Signalized)	<b>B</b>	<b>12.1</b>	<b>B</b>	<b>13.6</b>
Cronkright at Indian (Unsignalized)*	<b>B</b>	<b>16.9</b>	<b>F</b>	<b>55.9</b>
George at Buttles (Signalized)	<b>A</b>	<b>5.6</b>	<b>A</b>	<b>4.3</b>
George at Indian (Signalized)	<b>C</b>	<b>17.3</b>	<b>B</b>	<b>16.6</b>
*Unsignalized LOS and delay is the maximum control delay from the STOP-controlled approaches only, not overall intersection LOS/delay				

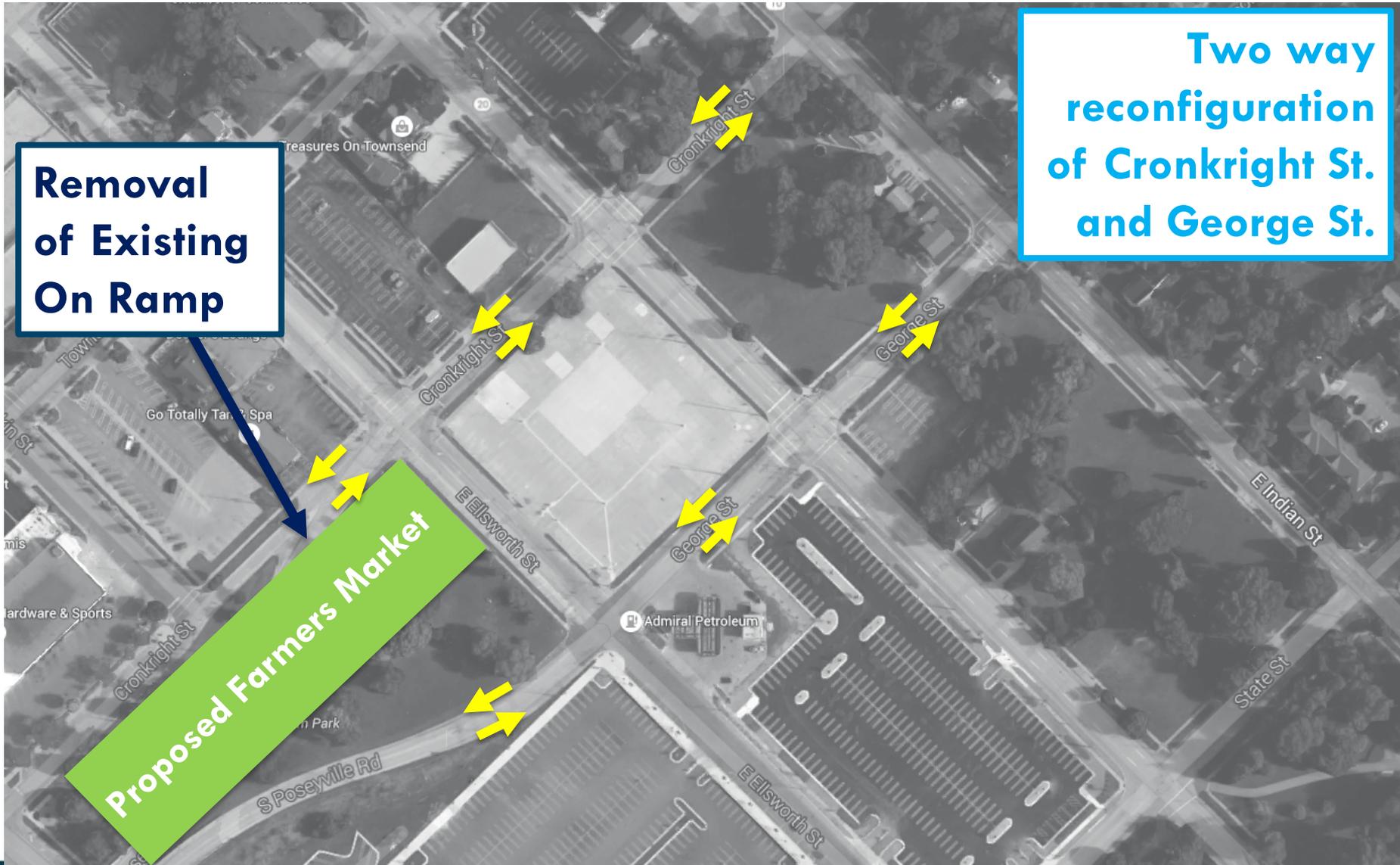
# Proposed Street Changes



**Removal  
of Existing  
On Ramp**

**Two way  
reconfiguration  
of Cronkright St.  
and George St.**

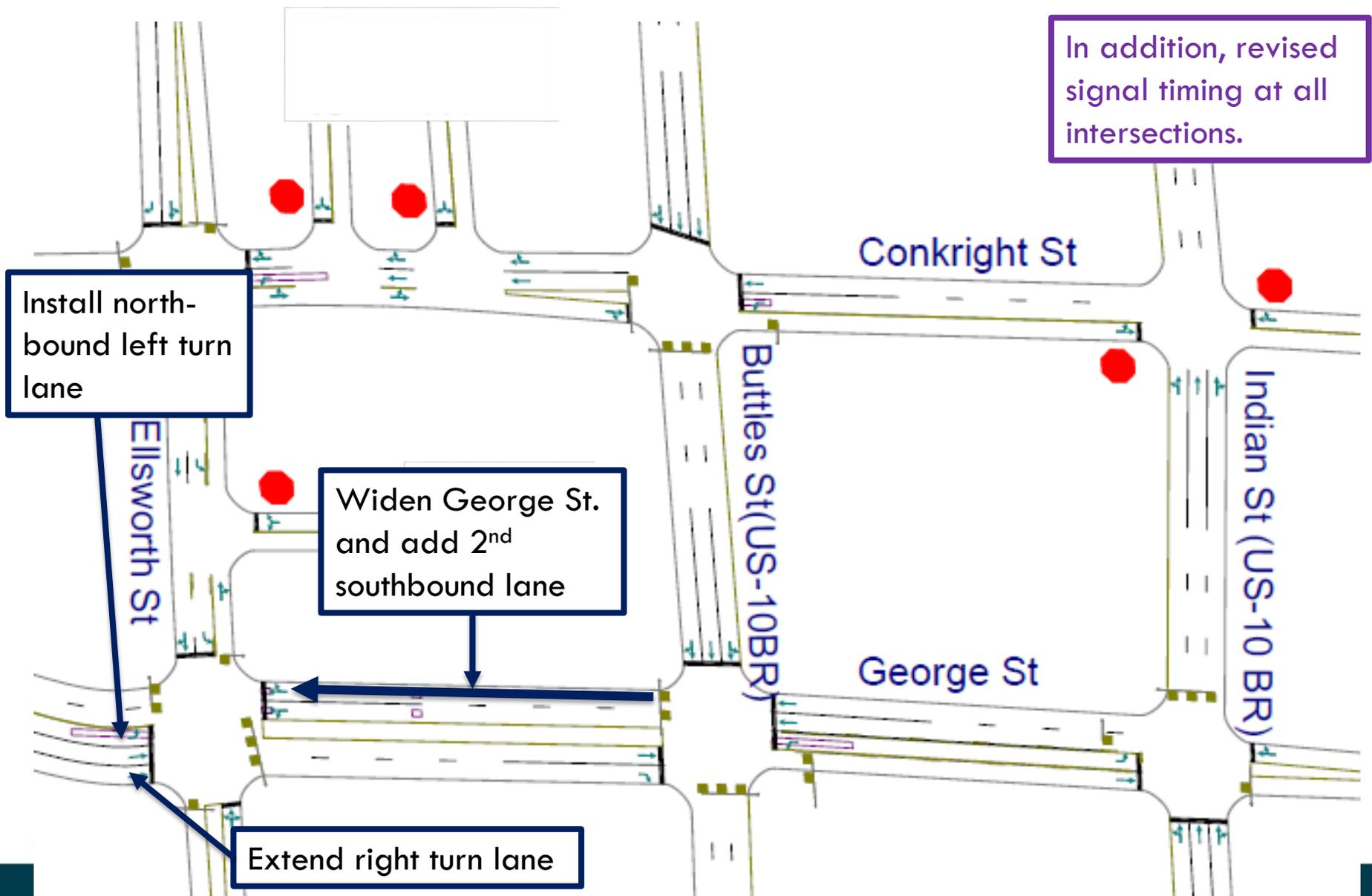
**Proposed Farmers Market**



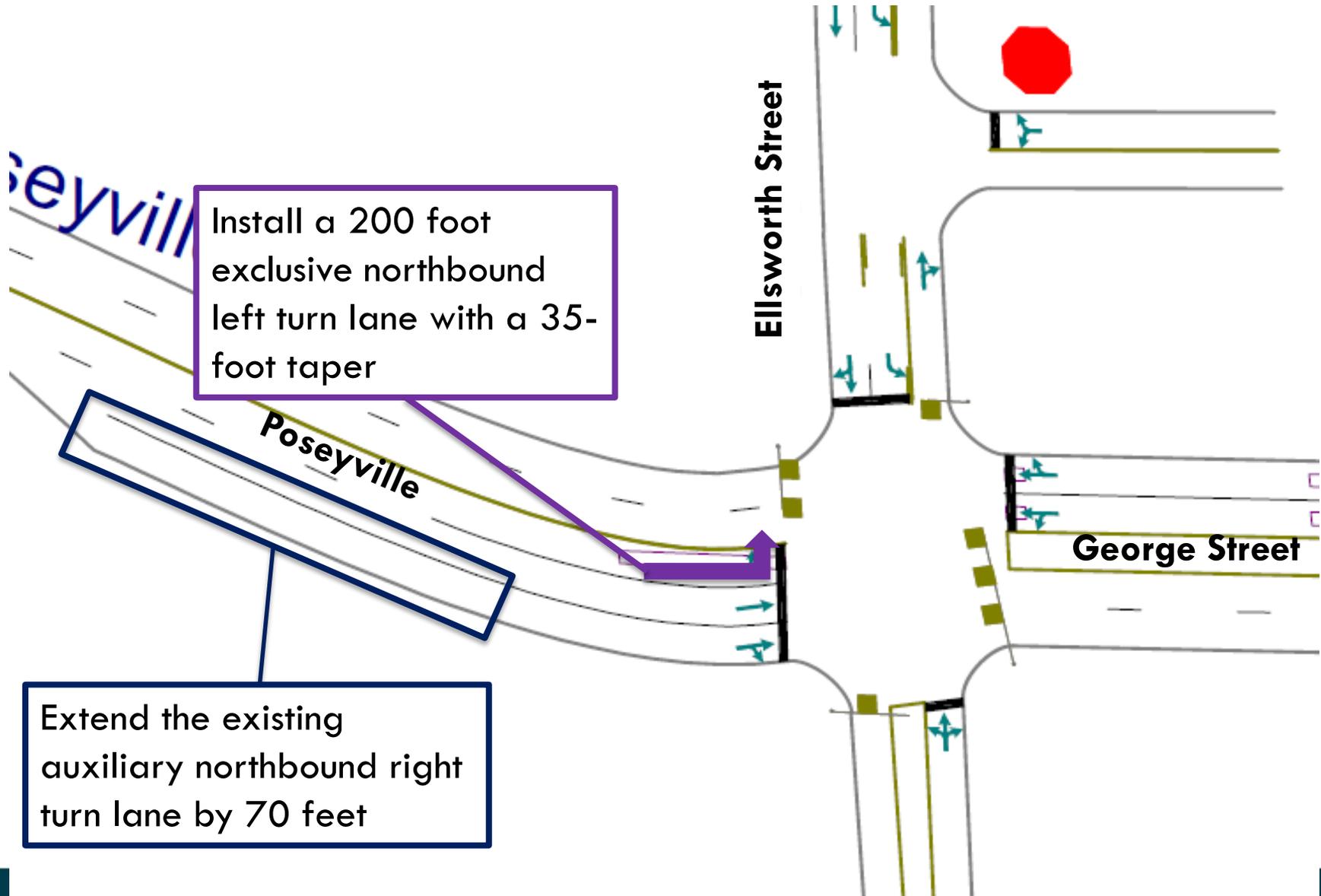
# Predicted Traffic Operations

- ✓ Traffic operations at several intersections would be worse
- ✓ Back ups would be expected along George St at Ellsworth, Buttles and Indian
- ✓ Improvements necessary to restore a current level of operation were identified

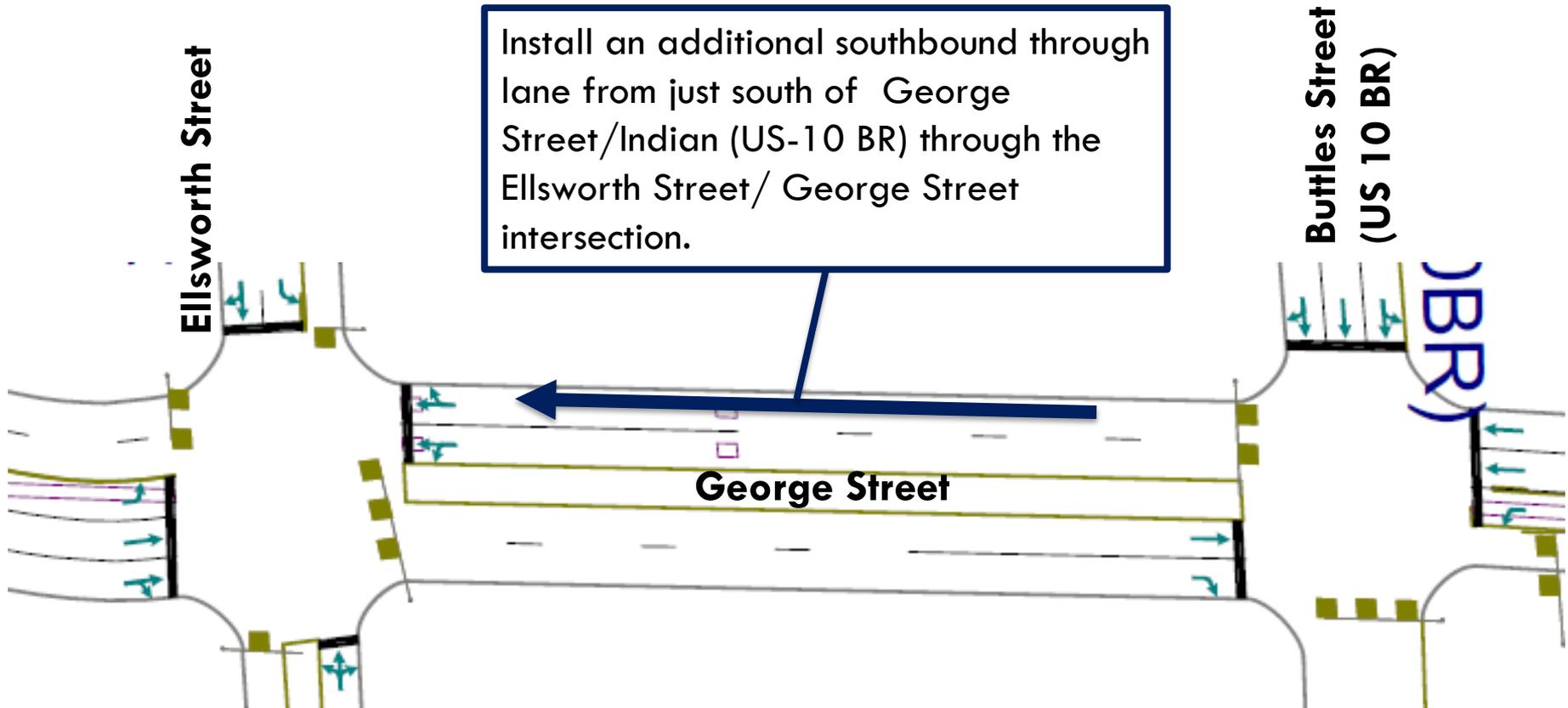
# Required Improvements



# Improvements at Poseyville/Ellsworth



# Widen George Street

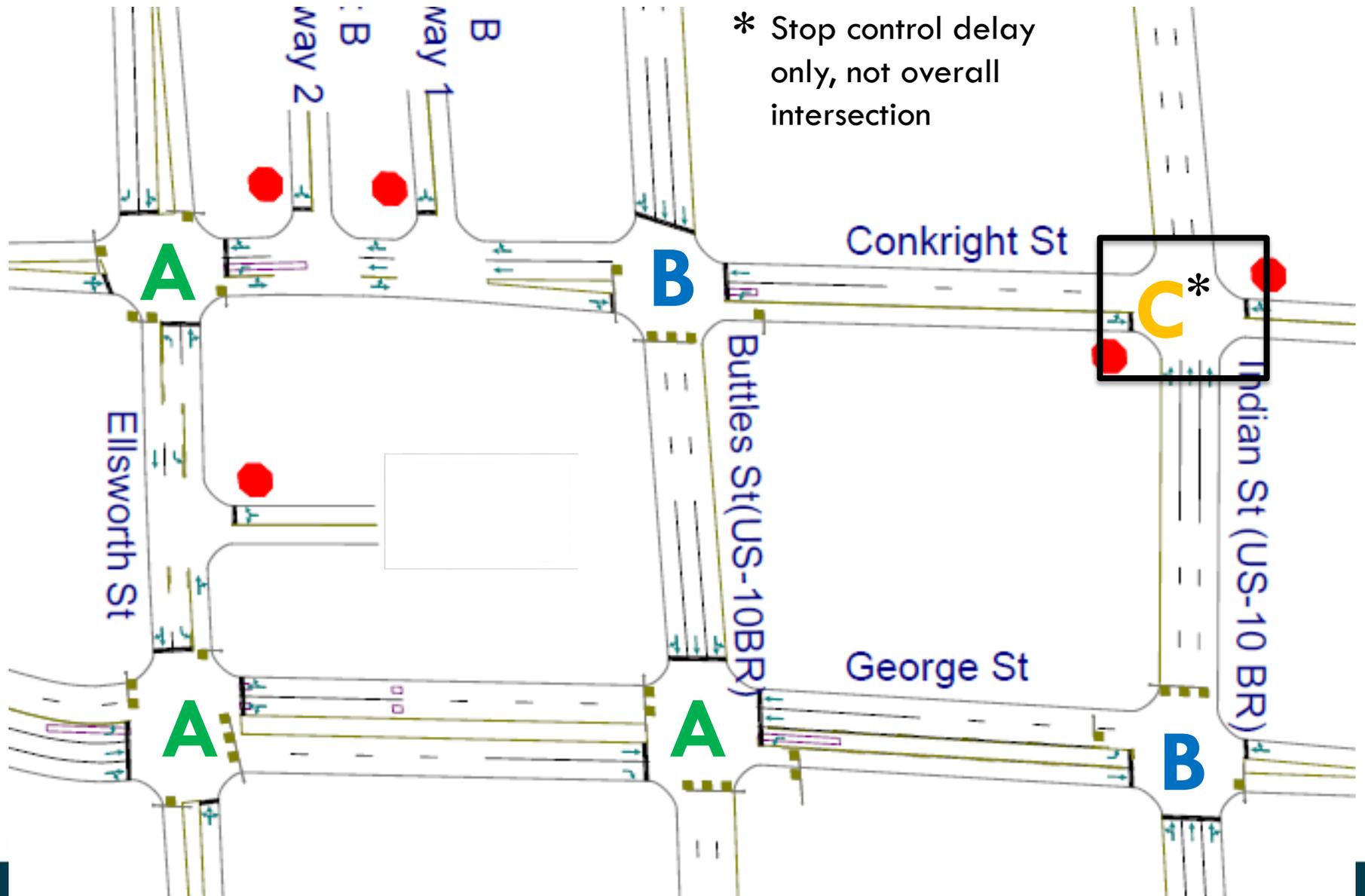


Install an additional southbound through lane from just south of George Street/Indian (US-10 BR) through the Ellsworth Street/ George Street intersection.

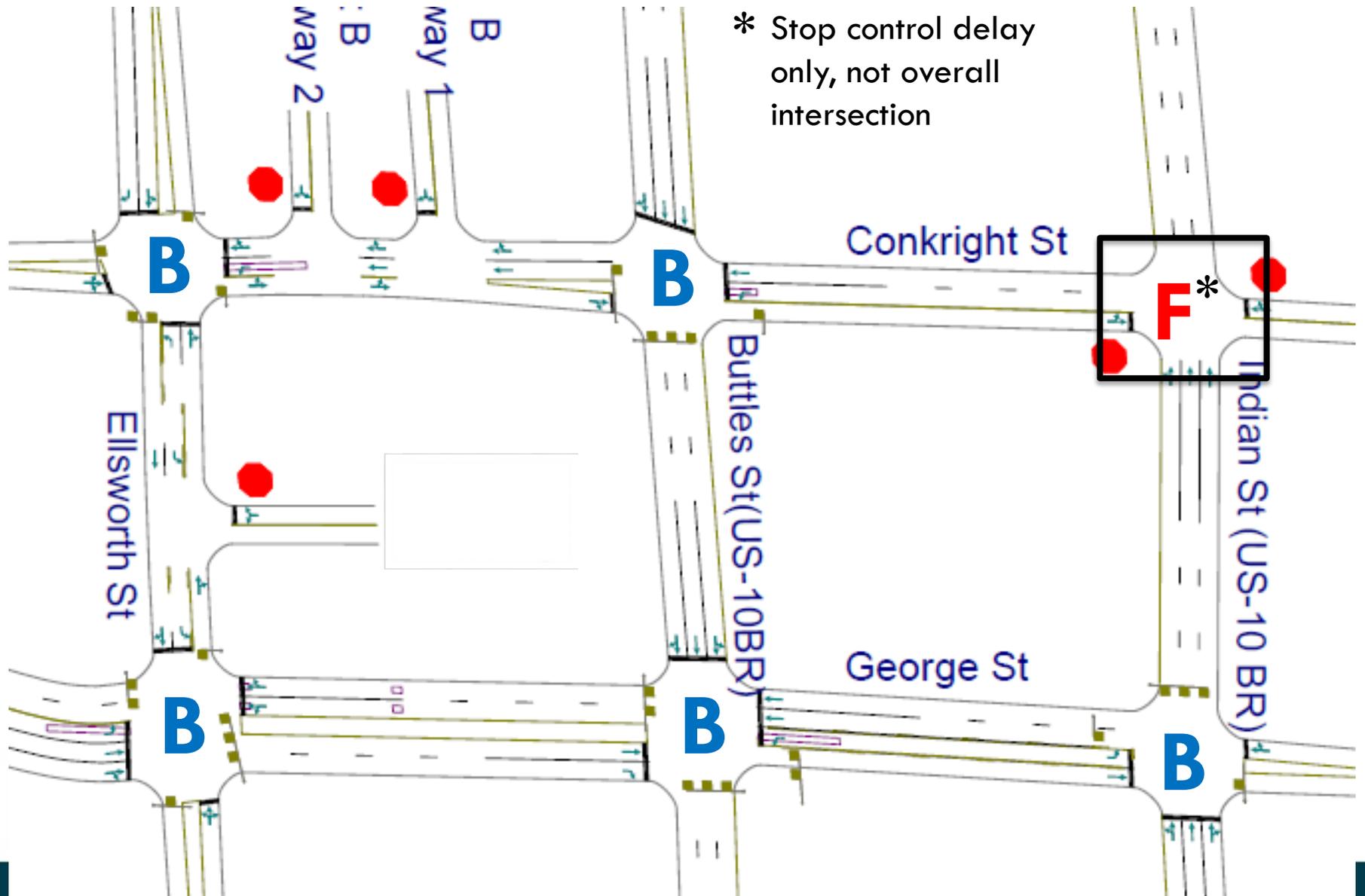
# Future Build (2040) Delays and Level of Service

Intersection	AM Peak Hour		PM Peak Hour	
	Overall LOS	Delay (sec/veh)	Overall LOS	Delay (sec/veh)
Poseyville at St. Charles (Unsignalized)*	<b>D</b>	<b>34.5</b>	<b>F</b>	<b>65.1</b>
Ellsworth at Cronkright (Signalized)	<b>A</b>	<b>8.4</b>	<b>B</b>	<b>12.9</b>
Ellsworth at George (Signalized)	<b>A</b>	<b>8.6</b>	<b>B</b>	<b>14.7</b>
Cronkright at Buttles (Signalized)	<b>B</b>	<b>13.6</b>	<b>B</b>	<b>14.8</b>
Cronkright at Indian (Unsignalized)*	<b>C</b>	<b>23.6</b>	<b>F</b>	<b>150.6</b>
George at Buttles (Signalized)	<b>A</b>	<b>8.9</b>	<b>B</b>	<b>10.8</b>
George at Indian (Signalized)	<b>B</b>	<b>11.3</b>	<b>B</b>	<b>16.9</b>

# Future Build Level of Service AM Peak



# Future Build Level of Service PM Peak



# Conclusions

- ✓ Yes, the southbound on ramps can be removed to allow the farmers market to relocate
- ✓ George Street can be converted to two way
- ✓ Some intersections and the widening of George Street would be necessary to retain current level of traffic operations in the design year

# Discussion

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