



# **Waterville Landing TIS**

**Waterville, Ohio**

September 8, 2022

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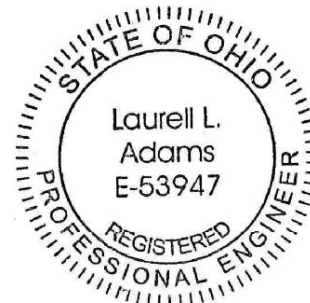
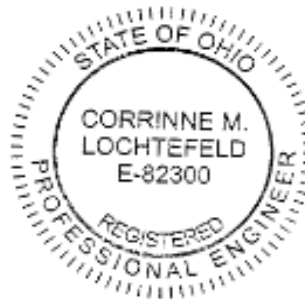
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# Traffic Impact Study

## 1. EXECUTIVE SUMMARY

DGL was commissioned by HB Concerts Inc. to analyze the impacts of a proposed amphitheater in the Waterville Landing development in Waterville, Ohio. The proposed site is located between SR-64 and Neapolis-Waterville Road, to the east of US-24 on Pray Boulevard. The existing site is currently undeveloped land with residential facilities to the east, and a small commercial development to the north. The proposed development will also extend the existing Pray Boulevard south to Neapolis Waterville Road.

The proposed site will provide an outdoor concert facility with both lawn and reserved seating as well as various small buildings to be used for concessions, utilities, production, and restrooms. It is expected that the venue will hold 25-30 events per year, with not all events being sold-out occurrences.

Analysis has been performed in accordance with the Ohio Department of Transportation (ODOT) and Lucas County requirements. Traffic counts were collected at the intersections adjacent to the proposed site. The ITE Trip Generation Manual does not have a land use for Amphitheater nor any other land use that would be similar. A factor of 3.0 tickets per car was used to generate the total trips for the development, which was developed based on similar venue ticket/car occupancy, locally and nationally previously approved studies. The counted peak hour does not correspond to the peak hour of venue traffic, but in order to analyze the “worst-case scenario” all proposed trips to the amphitheater site were added to the peak hour volumes to create the event conditions. It can be expected that local drivers may find other routes when well-known acts are scheduled. This study does not attempt to adjust local traffic away from the area.

The proposed development will impact the entire surrounding roadway system during event days, with SR-64, Pray Boulevard, Waterville-Monclova Road, and Neapolis-Waterville Road being the most affected. While analysis can be done using the event traffic, HCS does not accurately analyze the conditions. Although, HCS analysis was conducted for the Event Traffic Conditions, relief of the traffic impacts from the event traffic through permanent infrastructure improvements would be expensive and only necessary the 25-30 times a year when an event occurs. Conversion of the existing infrastructure during events to a Maintenance of Traffic plan with cones, signage and message boards would be just as effective as the HCS suggested infrastructure improvements.

To mitigate the additional traffic generated by the development, an event Maintenance of Traffic plan has been provided and the following are recommended:

- Employ local Law Enforcement Officers to direct and manage traffic during ingress and egress.
- Set up temporary traffic signs and flashing message boards for events.
- Set cones to adjust for the large traffic flow on SR-64 and Pray Boulevard.
- Construct 415' eastbound left turn lane on Neapolis Waterville Road at Pray Boulevard.



# Traffic Impact Study

## 2. INTRODUCTION

HB Concerts, Inc. is proposing to construct an amphitheater at the current extension of Pray Boulevard. The development known as “Project Guitar” is located in Waterville, Lucas County Ohio on SR 64 (Waterville-Swanton Road) between the US 24 interchange and Pray Boulevard. Figure 1 illustrates the location of the development area.

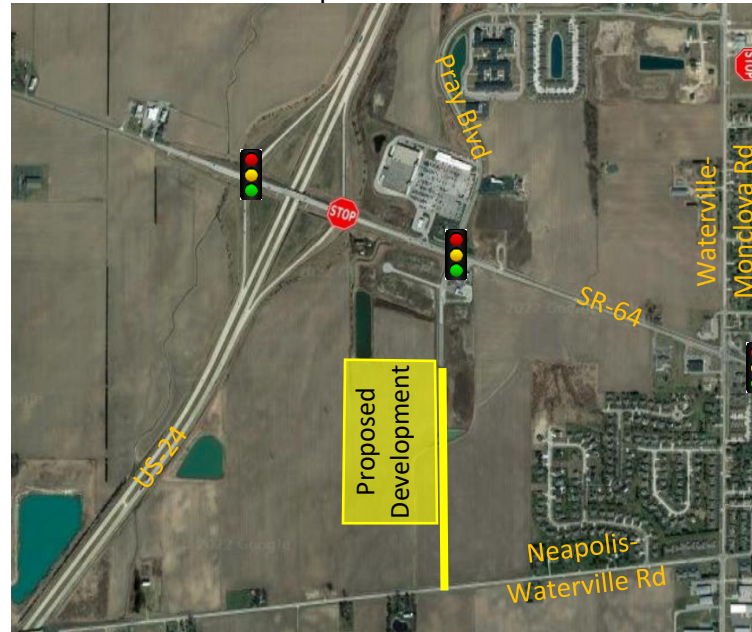


Figure 1 - Proposed Location

## 3. STUDY LOCATION

The proposed development is located in a suburban area southwest of Toledo, Ohio. The site is located near the interchange of US-24 to SR-64 and is expected to draw visitors from a regional area. US-24 offers freeway access to I-475 to the northeast which then can access I-75 and the Ohio Turnpike. To the southwest, US-24 provides access to various communities.

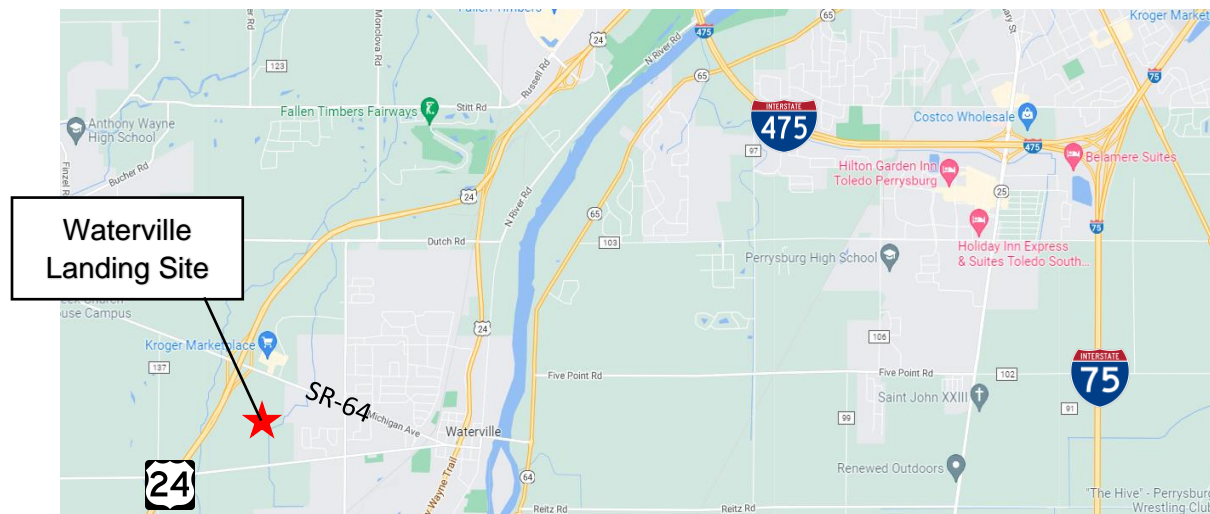


Figure 2 - Study Location

# Traffic Impact Study

## 4. EXISTING CONDITIONS

Roadway classification and Annual Average Daily Traffic (AADT) were collected from the ODOT Transportation Information and Mapping System (TIMS) website.

- SR-64 (Waterville-Swanton Road/Michigan Avenue) is a two-lane roadway with an AADT of 13,920 vehicles. It is classified as a major collector with a speed limit of 50 MPH.
- US-24 is a Principal Arterial Freeway, with an AADT of 25,059 and a speed limit of 70 MPH.
- Waterville-Monclova Road is also a two-lane road, classified as a major collector with an AADT of 4,056 vehicles with a speed limit of 35 MPH.
- Pray Boulevard is a local road with no documented AADT. It is a two-lane roadway with a speed limit of 35 MPH.
- Neapolis-Waterville Road is a two-lane, Major Collector with an AADT of 1,519 and a speed limit of 55 MPH.

## 5. TRAFFIC DATA COLLECTION

Traffic Data was collected by DGL via video counts at the following locations:

- SR-64 & US-24 Southbound Ramps
  - Thursday - May 5<sup>th</sup>, 2022 – 4:15 PM to 6:15 PM
  - Saturday - May 7<sup>th</sup>, 2022 – 12:30 PM to 1:30 PM
- SR-64 & US-24 Northbound Ramps
  - Thursday - May 5<sup>th</sup>, 2022 – 4:15 PM to 6:15 PM
  - Saturday - May 7<sup>th</sup>, 2022 – 12:30 PM to 1:30 PM
- SR-64 & Pray Boulevard
  - Thursday - May 5<sup>th</sup>, 2022 – 4:15 PM to 6:15 PM
  - Saturday - May 7<sup>th</sup>, 2022 – 12:30 PM to 1:30 PM
- SR-64 & Waterville-Monclova Road
  - Thursday - May 5<sup>th</sup>, 2022 – 4:15 PM to 6:15 PM
  - Saturday - May 7<sup>th</sup>, 2022 – 12:30 PM to 1:30 PM
- Waterville-Monclova Road & Pray Boulevard
  - Thursday - May 5<sup>th</sup>, 2022 – 4:15 PM to 6:15 PM
  - Saturday - May 7<sup>th</sup>, 2022 – 12:30 PM to 1:30 PM
- ATR along SR-64 – 5/7/2022
- ODOT MS2 ATR data was collected for Neapolis Waterville Road

The PM Peak Hour occurred from 4:30 PM to 5:30 PM and the Weekend Peak Hour occurred from 12:30 PM to 1:30 PM. It should be noted that only the Weekday PM Peak Hour and Weekend Peak Hour were counted as most amphitheater events occur in the evenings and on weekends.

# Traffic Impact Study

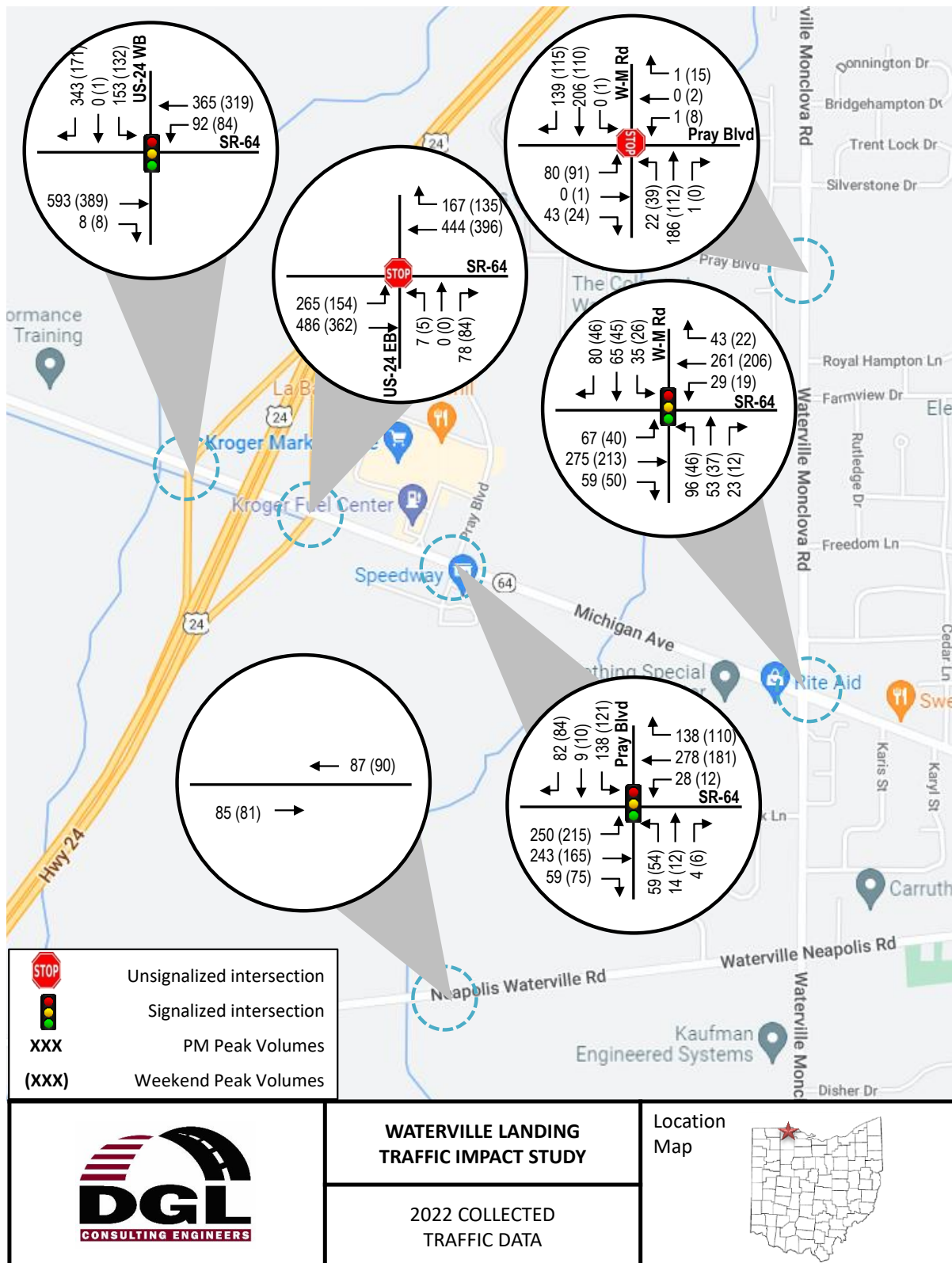


Figure 3 - 2022 Existing Traffic Volumes

# Traffic Impact Study

## 6. PROPOSED CONDITIONS

### 6a. Access Locations

The proposed Waterville Landing venue is shown in Figure 4. The site is located approximately 1,000 feet from the SR-64/Pray Boulevard intersection. All site drives will access Pray Boulevard. There will be three access points into the parking lot, although specific locations of site drives are not critical to this study. It has been determined that assistance in directing traffic to and from the site drives will be conducted by venue staff and local law enforcement.

At this time the extension of Pray Boulevard to Neapolis Waterville has not been finalized, Figure 4 is a concept layout with design to be completed at a later date.



Figure 4 - Access Locations



# Traffic Impact Study

## 7. ANALYSIS

### 7a. Trip Generation

The ITE Trip Generation Manual does not have a land use for an Amphitheater nor any other land use that would be similar. It is estimated that the capacity of the amphitheater will be 10,300 seats. A factor of 3.0 tickets per car was used to generate the maximum trips to the development. Trip generation rates from similar venues and studies were used to confirm this rate. See Appendix C for a Trip Generation Memo. A small volume of exiting trips during the pre-event period were included in the study for vehicles dropping off attendees and exiting the site.

The Peak Hour trips for a sold-out event at the Waterville Landing amphitheater were calculated as follows:

Table 1 Overall Trip Generation Calculations				
Trip Generator				
	PM Event Enter	PM Event Exit	Weekend Event Enter	Weekend Event Exit
Amphitheater Concert	3,262	172	3,091	343
<b>Total Trips</b>	<b>3,262</b>	<b>172</b>	<b>3,091</b>	<b>343</b>

### 7b. No Build Conditions

Collected traffic volumes were grown by 1.0% per year to estimate the 2023 and 2043 traffic volumes. The growth rate was calculated using the ODOT SHIFT Tool. Figure 5 and Figure 6 show the No Build traffic conditions.

### 7c. Trip Distribution

The new trips to the proposed Waterville Landing site were distributed based on the surrounding area. A smaller portion of the trips were assigned to the site from the City of Waterville and from south (30%). A majority of the trips (70%) were assigned to the US-24 interchange which services the greater Toledo area. Figure 7 shows the proposed trip distributions.

### 7d. Event Conditions

Like the No-Build Conditions, traffic volumes were grown by 1.0% to estimate the 2023 and 2043 traffic volumes at the intersection surrounding the proposed site. Trips from the trip generation calculations were then added to the grown volumes to obtain the projected traffic at the intersections.

It is anticipated that the peak hours of the roadway will not necessarily align with the peak hour of the amphitheater. With a 7:00 PM event start time and gates opening at 5:30 PM, the end of the weekday PM peak hour may be impacted. To create a “worst-case scenario”, the sold-out event trips were added to the peak hour traffic. It can be expected that local drivers may find other routes when well-known acts are scheduled. This study does not attempt to adjust local traffic away from the area. Figure 8 to Figure 11 illustrate Build traffic conditions.

# Traffic Impact Study

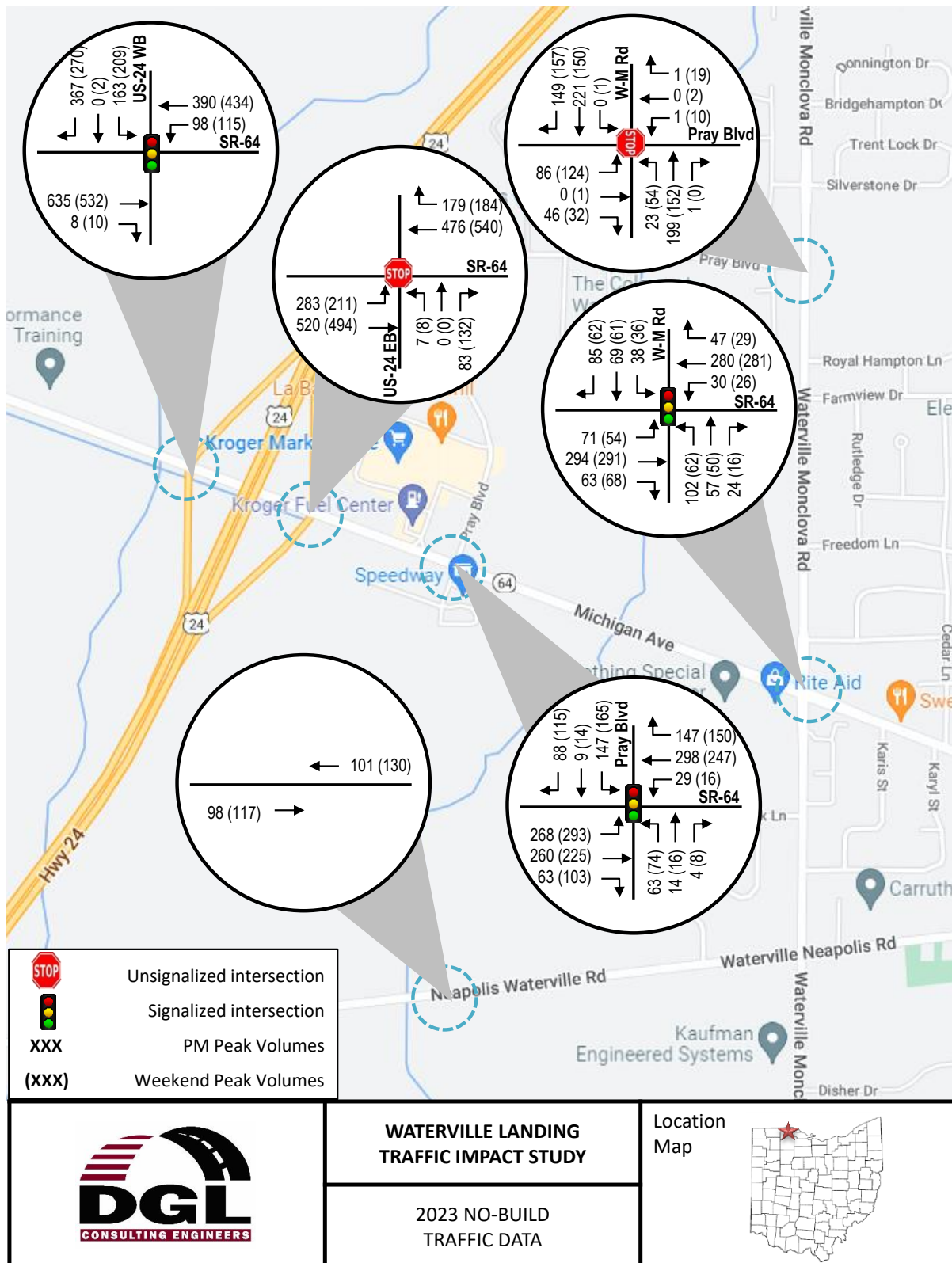


Figure 5 - 2023 No-Build Traffic Volumes

# Traffic Impact Study

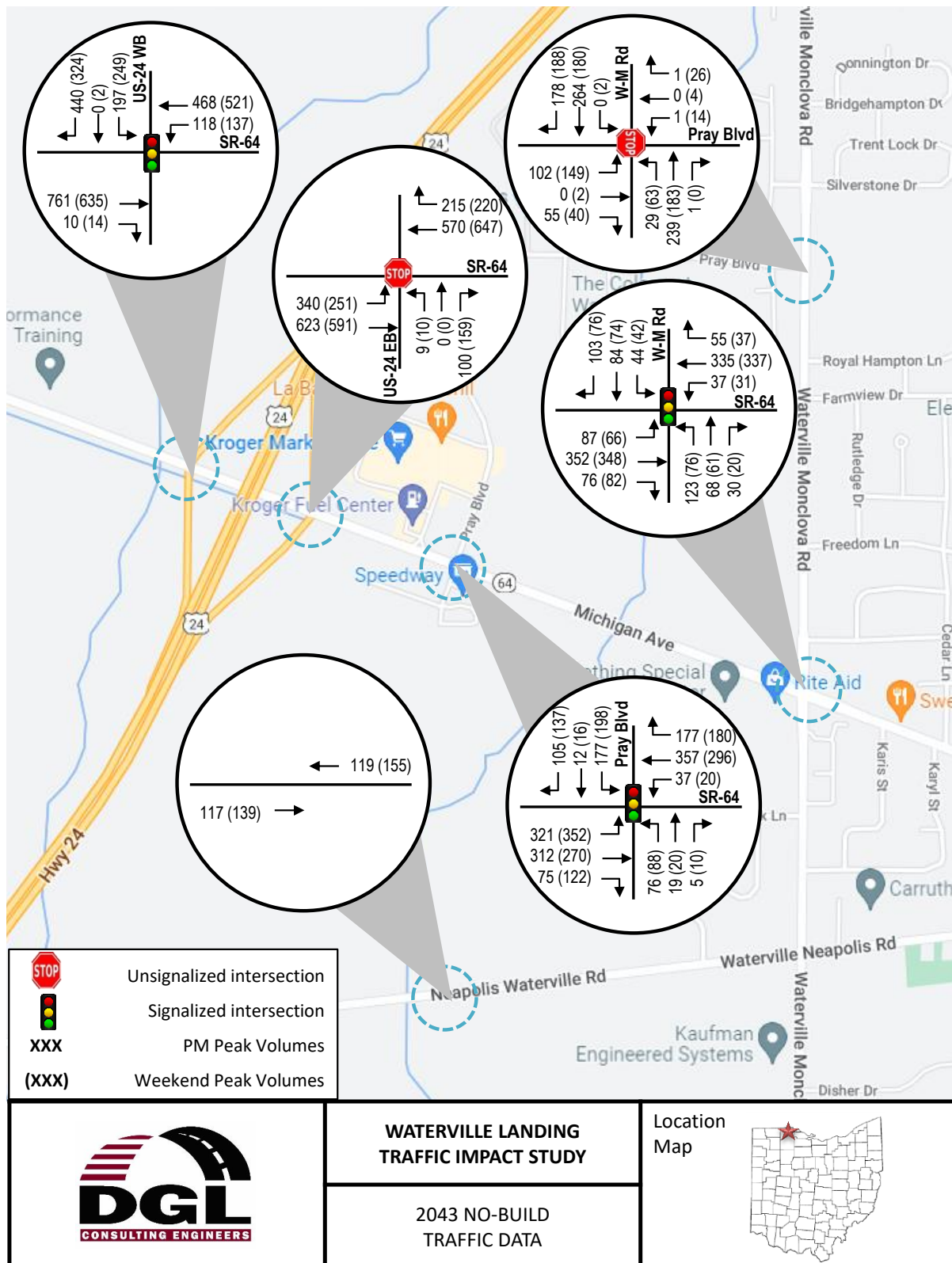


Figure 6 - 2043 No-Build Traffic Volumes



# Traffic Impact Study

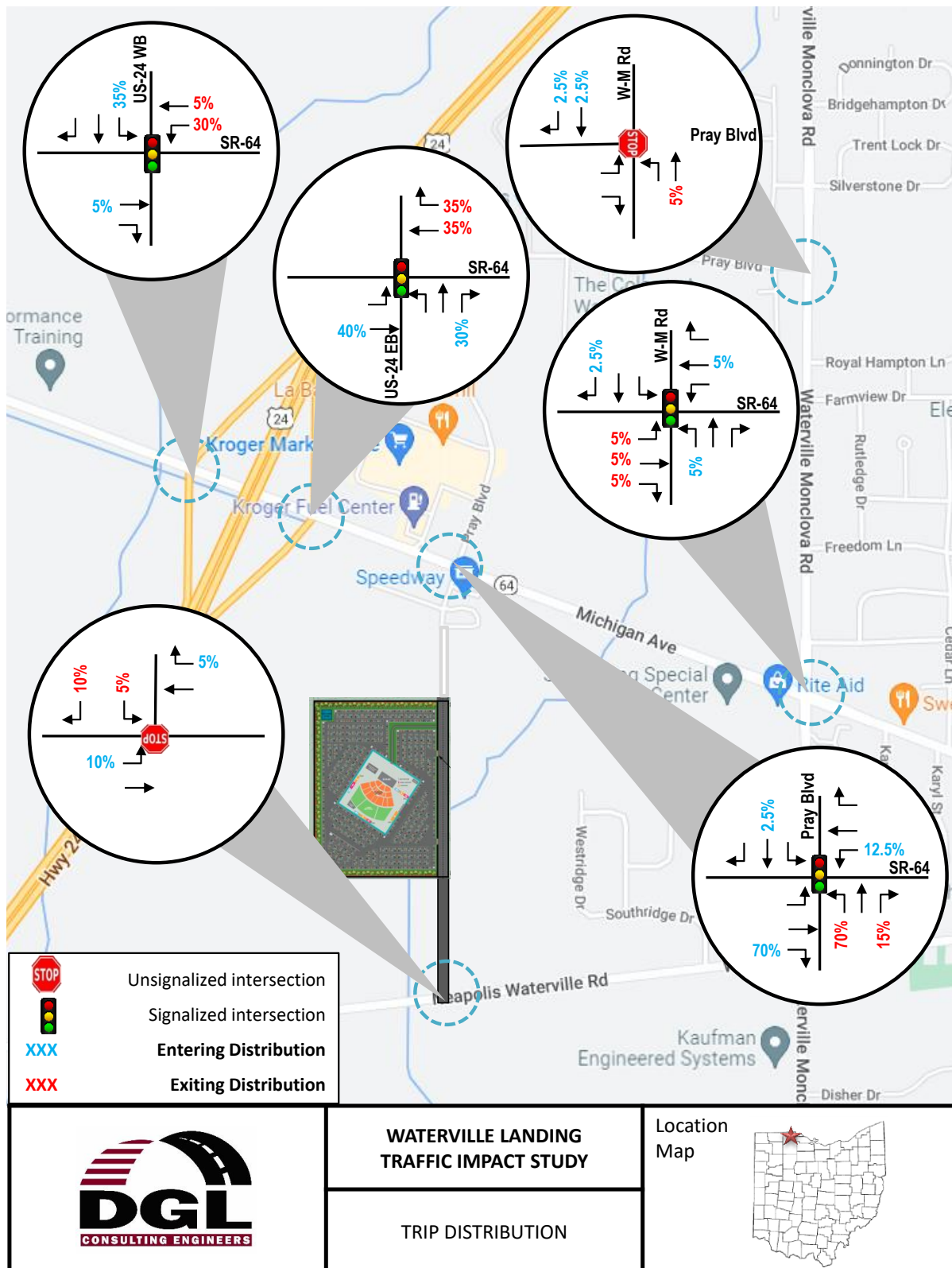


Figure 7 - Trip Distribution

# Traffic Impact Study

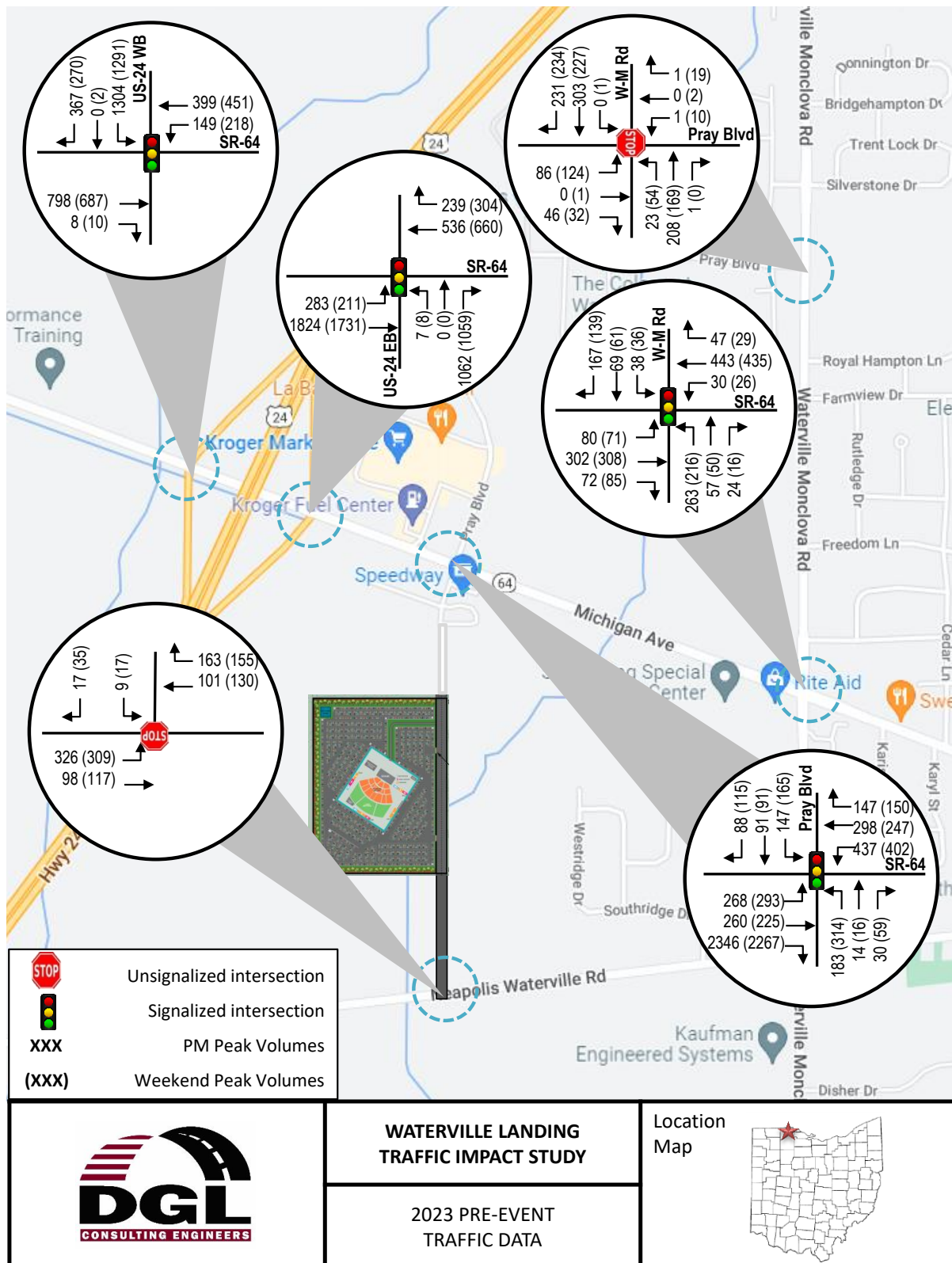


Figure 8 - 2023 Pre-Event Build Traffic Volumes

# Traffic Impact Study

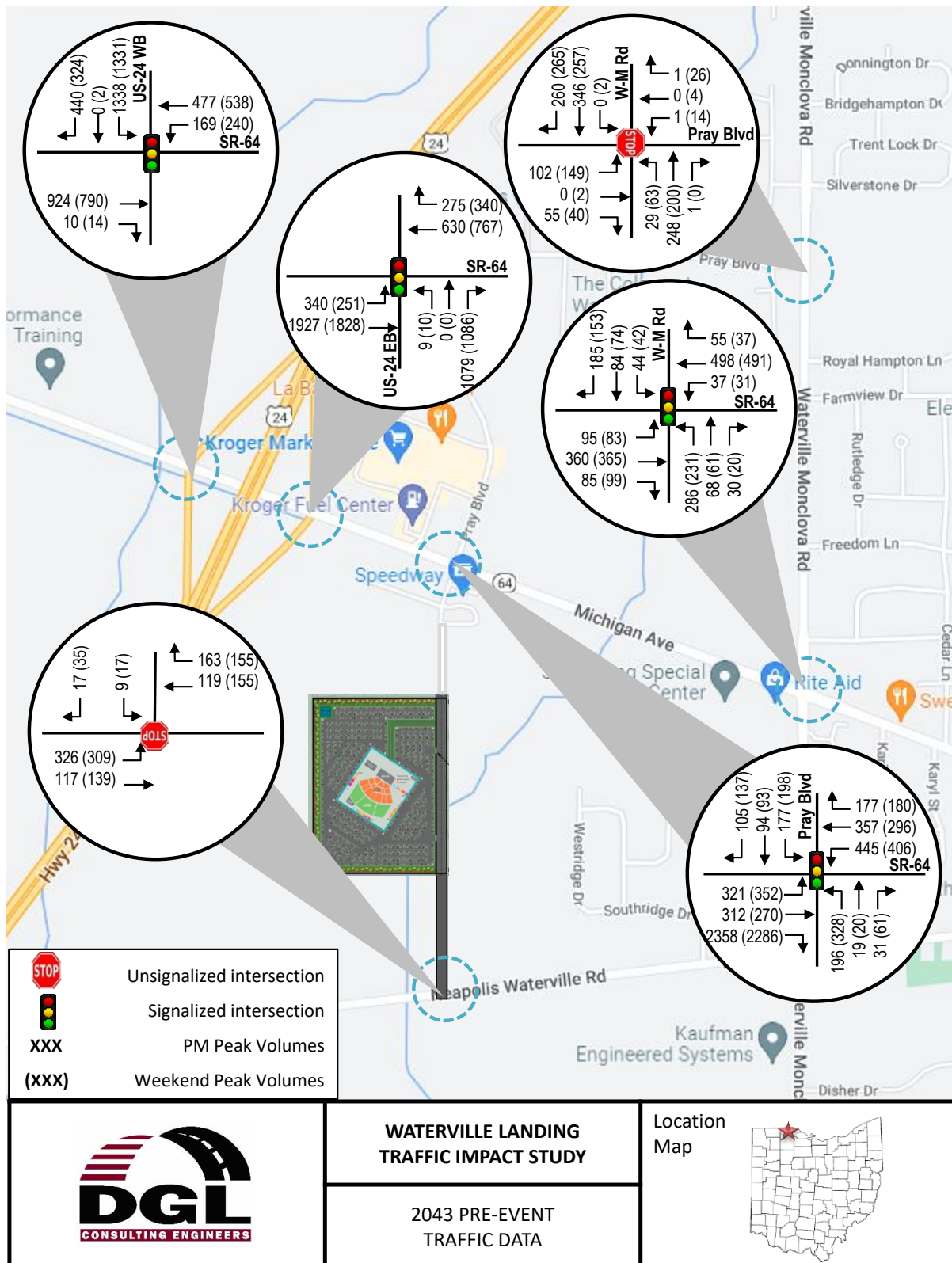


Figure 9 - 2043 Pre-Event Build Traffic Volumes



# Traffic Impact Study

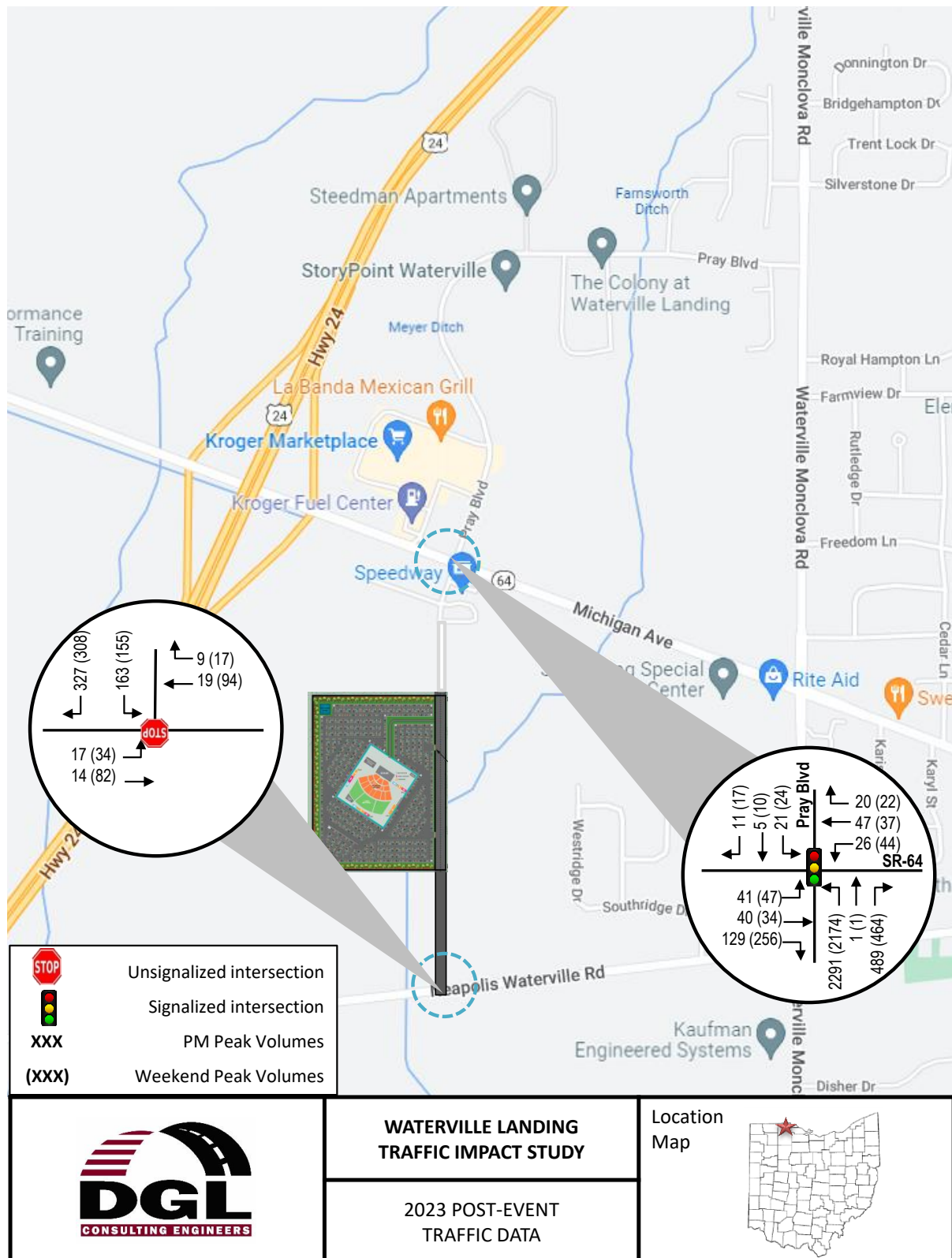


Figure 10 - 2043 Pre-Event Build Traffic Volumes

# Traffic Impact Study

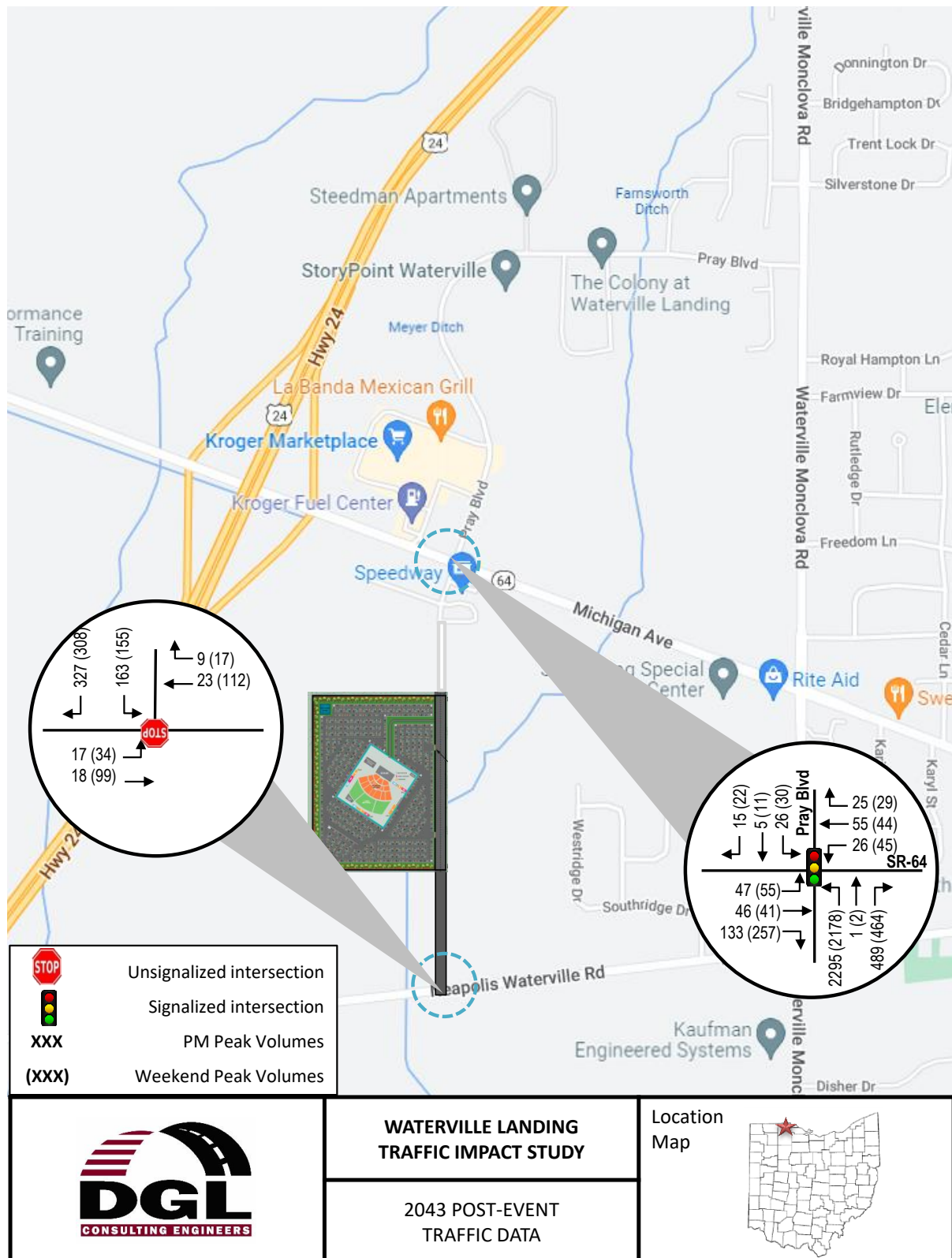


Figure 11 - 2043 Pre-Event Build Traffic Volumes

# Traffic Impact Study

## 7e. Neapolis Waterville Road & Pray Boulevard Turn Lane Analysis

With the extension of Pray Boulevard to Neapolis Waterville Road it is anticipated that the current traffic patterns will change and Pray Boulevard to Neapolis Waterville Road will be used for more for typical daily traffic as well as event traffic. Therefore, turn lane warrants were reviewed for the intersection.

Turn lanes will reduce congestion while making the corridor safer by moving turning vehicles out of the through traveling traffic.

The analyses were conducted using the Ohio Department of Transportation Location and Design Manual (L&D) Volume 1 using 2023 and 2043 Build Scenario volumes.

The results of the analyses reveal the following:

- Neapolis Waterville Road at Pray Boulevard – warrant requirements were met for a left turn lane for Eastbound Neapolis Waterville Road. Warrant requirements were not met for a right turn lane for Westbound Neapolis Waterville Road

Turn lane lengths were also developed based on the 2043 Weekday Event Peak Volumes in accordance with the ODOT L&D Manual and can be found in Table 1 below.

Table 1: Turn Lane Length Recommendations				
Location	Left Turn Lane Length	Right Turn Lane Length	Thru Block Length	Recommended Turn Lane Length
EB Neapolis Waterville	415'	Not Warranted	0'	Construct 415' EB left turn lane

## 7f. Intersection Capacity

The level of service (LOS) is a way to classify the intersection on a scale of A to F, from a functional standpoint. Intersections and approaches are assigned an overall grade based on traffic volumes, capacity, and overall delay experienced by drivers.

Capacity Analysis was conducted for various geometric and traffic control alternatives. HCS 7 Software was used to determine the LOS for the signalized and stop-controlled intersections. LOS is generally identified for each movement or approach. LOS C is considered acceptable in all conditions, while LOS D is considered acceptable in congested urban areas, such as interchanges and commuter corridors. For Two-Way Stop controlled intersections, the LOS is undefined for the overall intersection.

Table 2 Intersection Level of Service and Delay (in seconds)					
Signalized Intersection			Unsignalized Intersection		
A	<=	10s	A	<=	10s
B	>	10-20s	B	>	10-15s
C	>	20-35s	C	>	15-25s
D	>	35-55s	D	>	25-35s
E	>	55-80s	E	>	35-50s
F	>	80s	F	>	50s

# Traffic Impact Study

## Existing Conditions

The 2022 counted traffic was analyzed with existing road conditions to review how the intersections are currently functioning. Currently, all surrounding intersections function at acceptable level of service.

Table 3 Existing Conditions				
	PM Peak		Weekend Peak	
	2022 Existing		2022 Existing	
	LOS	Delay	LOS	Delay
<b>SR-64 &amp; US-24 Westbound - Signalized</b>				
Eastbound (SR-64)	B	17.1	B	13.0
Westbound (SR-64)	B	15.3	B	13.5
Southbound (US-24)	C	20.9	B	17.4
<b>Overall</b>	<b>B</b>	<b>17.8</b>	<b>B</b>	<b>14.4</b>
<b>SR-64 &amp; US-24 Eastbound - Unsignalized</b>				
Eastbound (SR-64)	B	10.6	A	9.3
Northbound (US-24)	C	18.0	B	12.6
<b>SR-64 &amp; Pray Boulevard - Signalized</b>				
Eastbound (SR-64)	B	13.1	B	11.4
Westbound (SR-64)	B	10.2	A	9.6
Northbound (Pray)	C	21.4	C	21.3
Southbound (Pray)	C	22.7	C	22.4
<b>Overall</b>	<b>B</b>	<b>14.3</b>	<b>B</b>	<b>13.8</b>
<b>SR-64 &amp; Waterville-Monclova Road - Signalized</b>				
Eastbound (SR-64)	C	25.7	C	24.0
Westbound (SR-64)	C	25.7	C	23.9
Northbound (W-M)	C	25.5	C	23.3
Southbound (W-M)	C	23.6	C	22.7
<b>Overall</b>	<b>C</b>	<b>25.3</b>	<b>C</b>	<b>23.7</b>
<b>Waterville-Monclova Road &amp; Pray Boulevard - Unsignalized</b>				
Eastbound (Pray)	B	12.4	B	11.5
Westbound (Pray)	B	11.7	B	10.2
Northbound (W-M)	A	8.1	A	7.8
Southbound (W-M)	A	7.6	A	7.4

## No-Build Conditions

The No-Build Conditions were also analyzed at the surrounding intersections as they are functioning currently, two-way-stop-controlled and signalized intersections. The existing intersections are anticipated to function at acceptable levels of service for both 2023 and 2043 peak hours.



# Traffic Impact Study

Table 4 No-Build Conditions								
	PM Peak				Weekend Peak			
	2023 No-Build		2043 No-Build		2023 No-Build		2043 No-Build	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
<b>SR-64 &amp; US-24 Westbound - Signalized</b>								
Eastbound (SR-64)	B	18.6	C	28.1	B	15.6	B	19.2
Westbound (SR-64)	B	16.1	C	22.0	B	16.0	B	19.5
Southbound (US-24)	C	22.1	C	28.4	B	19.2	C	21.3
<b>Overall</b>	<b>B</b>	<b>19.0</b>	<b>C</b>	<b>26.4</b>	<b>B</b>	<b>16.8</b>	<b>B</b>	<b>19.9</b>
<b>SR-64 &amp; US-24 Eastbound - Unsignalized</b>								
Eastbound (SR-64)	B	11.1	B	13.0	B	10.8	B	12.6
Northbound (US-24)	C	19.9	<b>D</b>	<b>34.1</b>	C	17.3	<b>D</b>	<b>25.2</b>
<b>SR-64 &amp; Pray Boulevard - Signalized</b>								
Eastbound (SR-64)	B	13.8	B	17.2	B	13.2	B	16.1
Westbound (SR-64)	B	10.4	B	10.9	B	10.0	B	10.4
Northbound (Pray)	C	21.5	C	21.8	C	21.8	C	22.0
Southbound (Pray)	C	22.9	C	23.6	C	23.3	C	24.0
<b>Overall</b>	<b>B</b>	<b>14.7</b>	<b>B</b>	<b>16.4</b>	<b>B</b>	<b>15.0</b>	<b>B</b>	<b>16.5</b>
<b>SR-64 &amp; Waterville-Monclova Road - Signalized</b>								
Eastbound (SR-64)	C	27.0	C	333.5	C	28.9	<b>D</b>	<b>38.0</b>
Westbound (SR-64)	C	26.8	C	30.9	C	26.6	C	30.8
Northbound (W-M)	C	25.9	C	27.2	C	24.2	C	25.1
Southbound (W-M)	C	23.8	C	24.4	C	23.3	C	23.8
<b>Overall</b>	<b>C</b>	<b>26.2</b>	<b>C</b>	<b>30.2</b>	<b>C</b>	<b>26.7</b>	<b>C</b>	<b>31.9</b>
<b>Waterville-Monclova Road &amp; Pray Boulevard - Unsignalized</b>								
Eastbound (Pray)	B	12.9	B	14.9	B	14.0	C	17.1
Westbound (Pray)	B	12.0	B	13.3	B	11.1	B	12.2
Northbound (W-M)	A	8.2	A	8.5	A	8.1	A	8.3
Southbound (W-M)	A	7.6	A	7.7	A	7.5	A	7.6

## Event Traffic

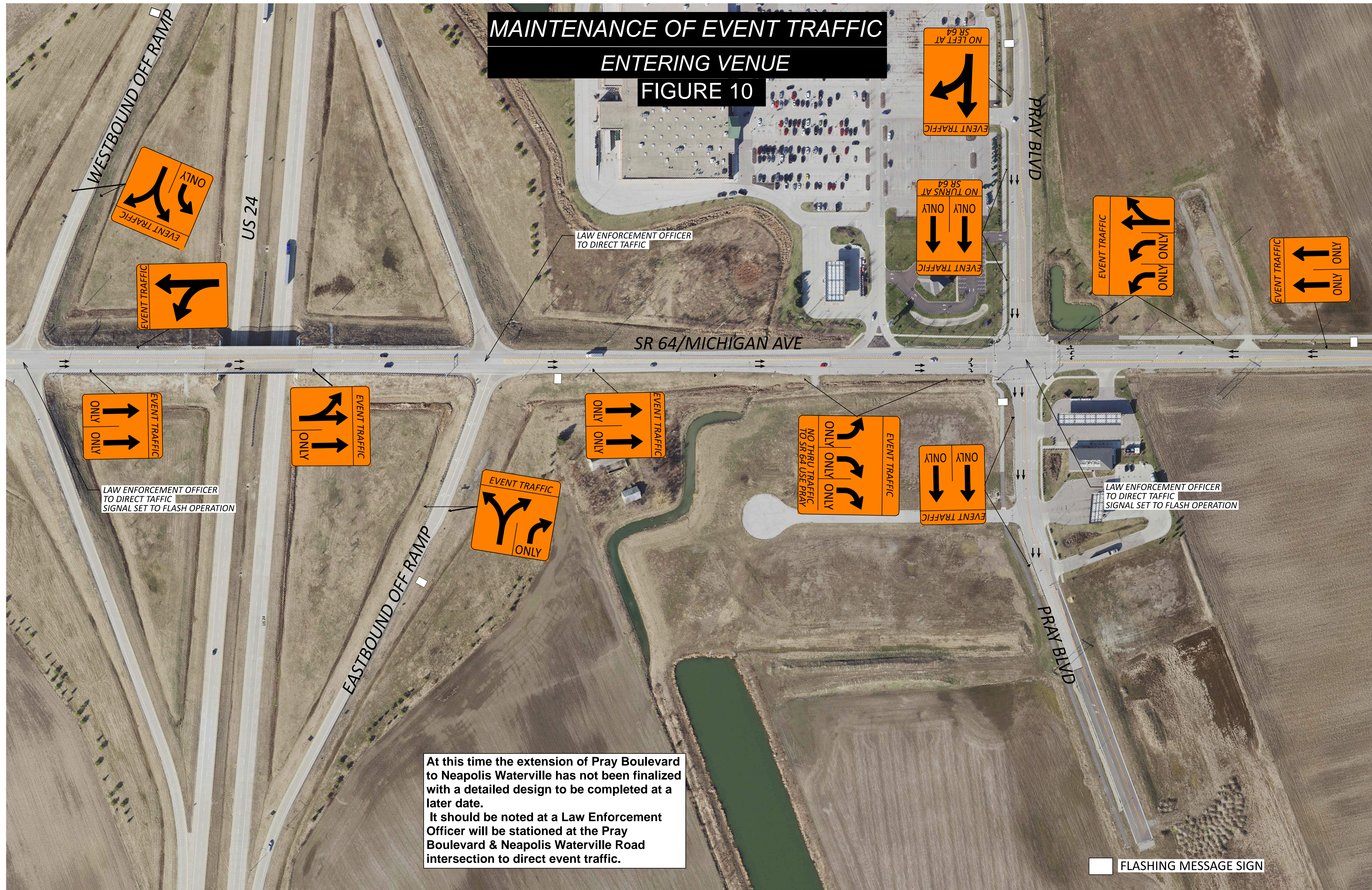
It is well known that traffic for an event venue can create major traffic congestion before and after the actual event. HCS analysis was conducted to determine what mitigation is needed under the Event Traffic Conditions. The analyses revealed the infrastructure improvements that would mitigate the additional event traffic. Construction of these improvements would be costly and only needed 25-30 times a year. This led to the development of an Event Traffic plan that could be implemented on Event dates.

SR-64 is wide enough to accommodate two lanes in a single direction as well as a single opposing lane. Dual lefts from the Westbound US 24 ramps to a two lane Eastbound Right Turn at Pray Boulevard would greatly improve entering traffic volumes. Existing Northbound Pray Boulevard to SR-64 dual left lanes to the Westbound US-24 ramp would be maintained. The width of SR-64 and Pray Boulevard will allow for two lanes of ingress or egress traffic.

It is expected that Law Enforcement Offices and traffic cones will be used to direct traffic to and from the venue. Flashing message signs, temporary signs along SR-64 between US-24 and Waterville-Monclova Road and the surrounding roadways should also be utilized during the events.

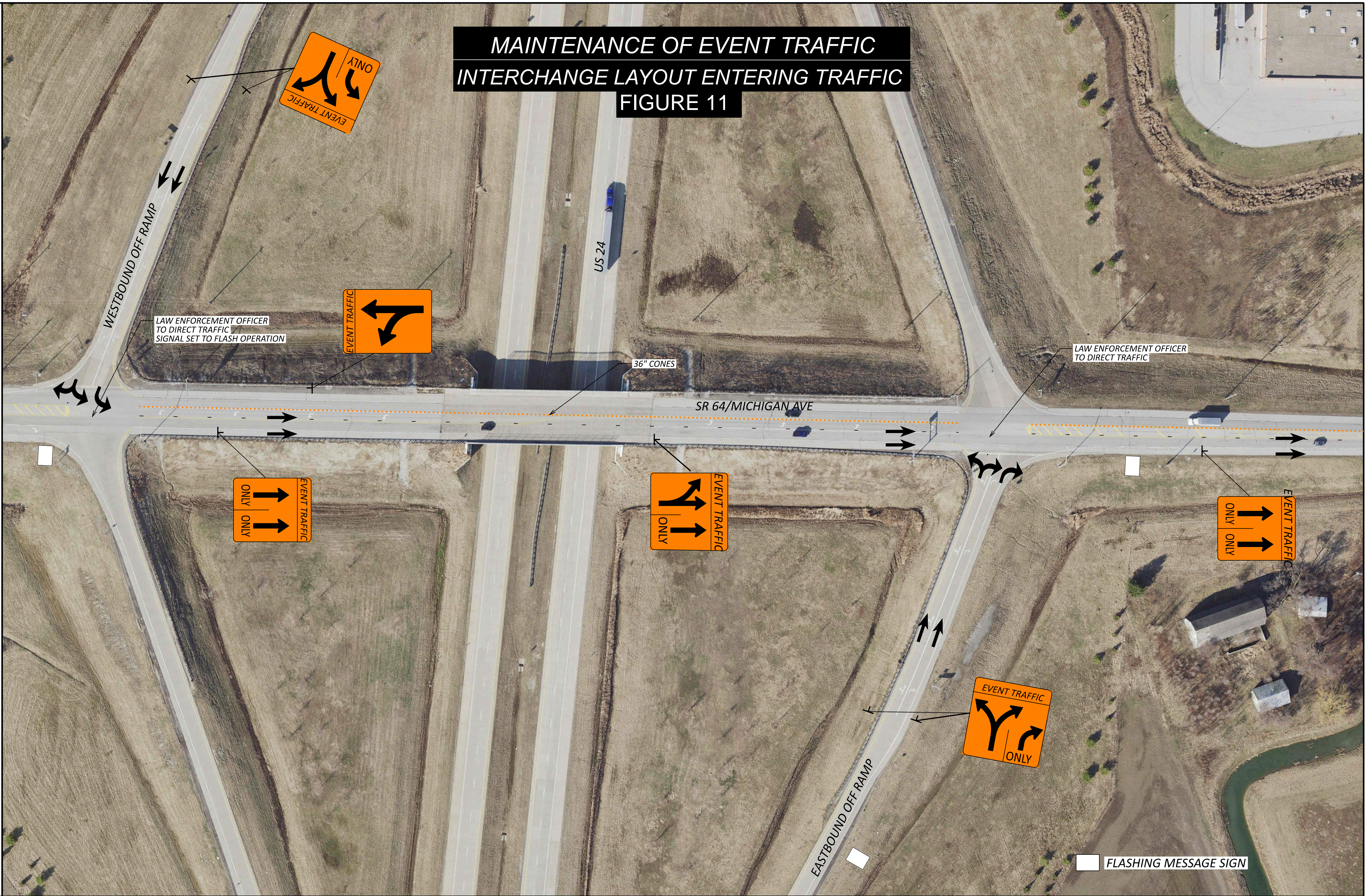
An Event Traffic Plan has been designed and can be found in figures Figure 12 to Figure 15.



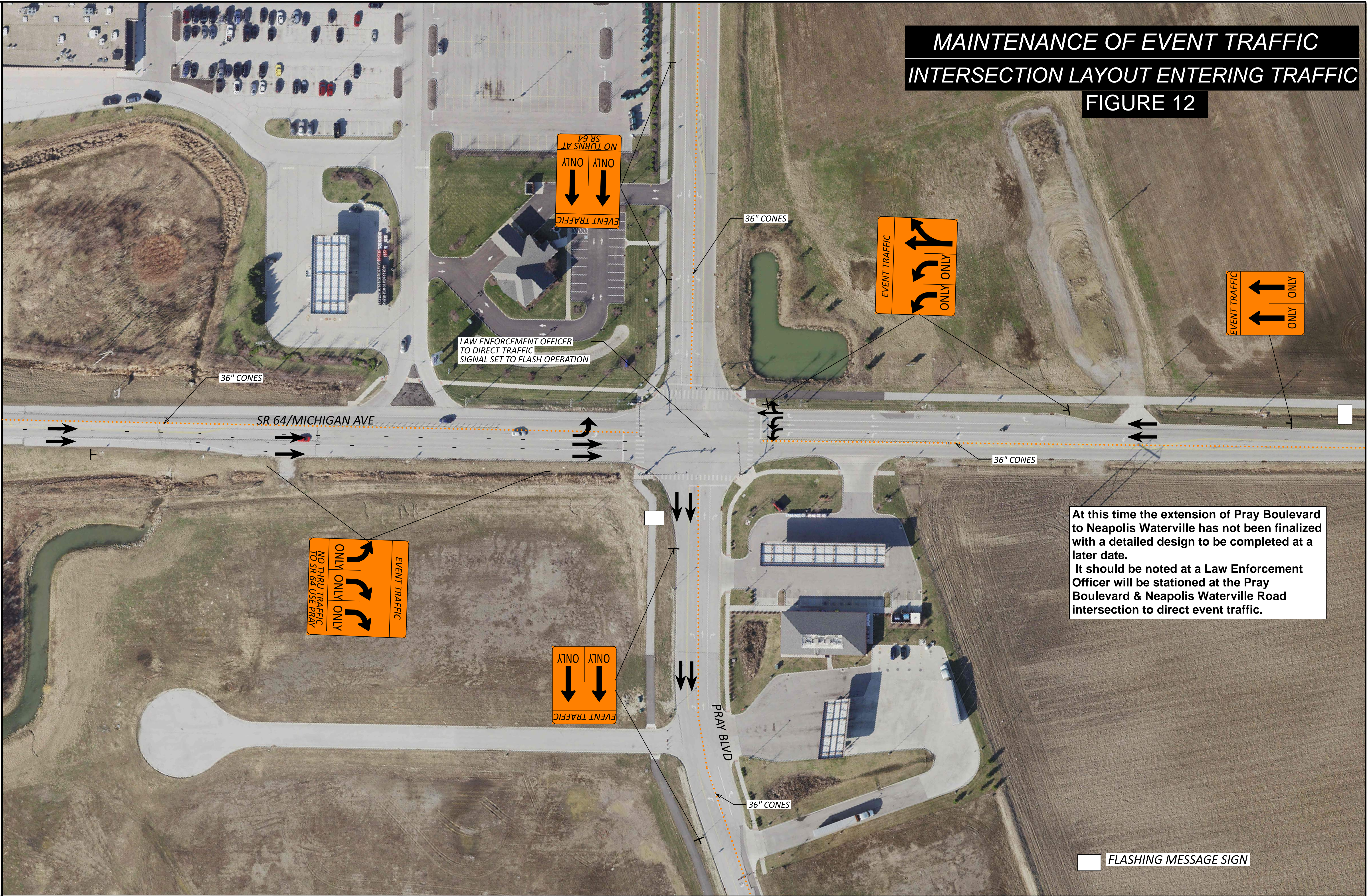




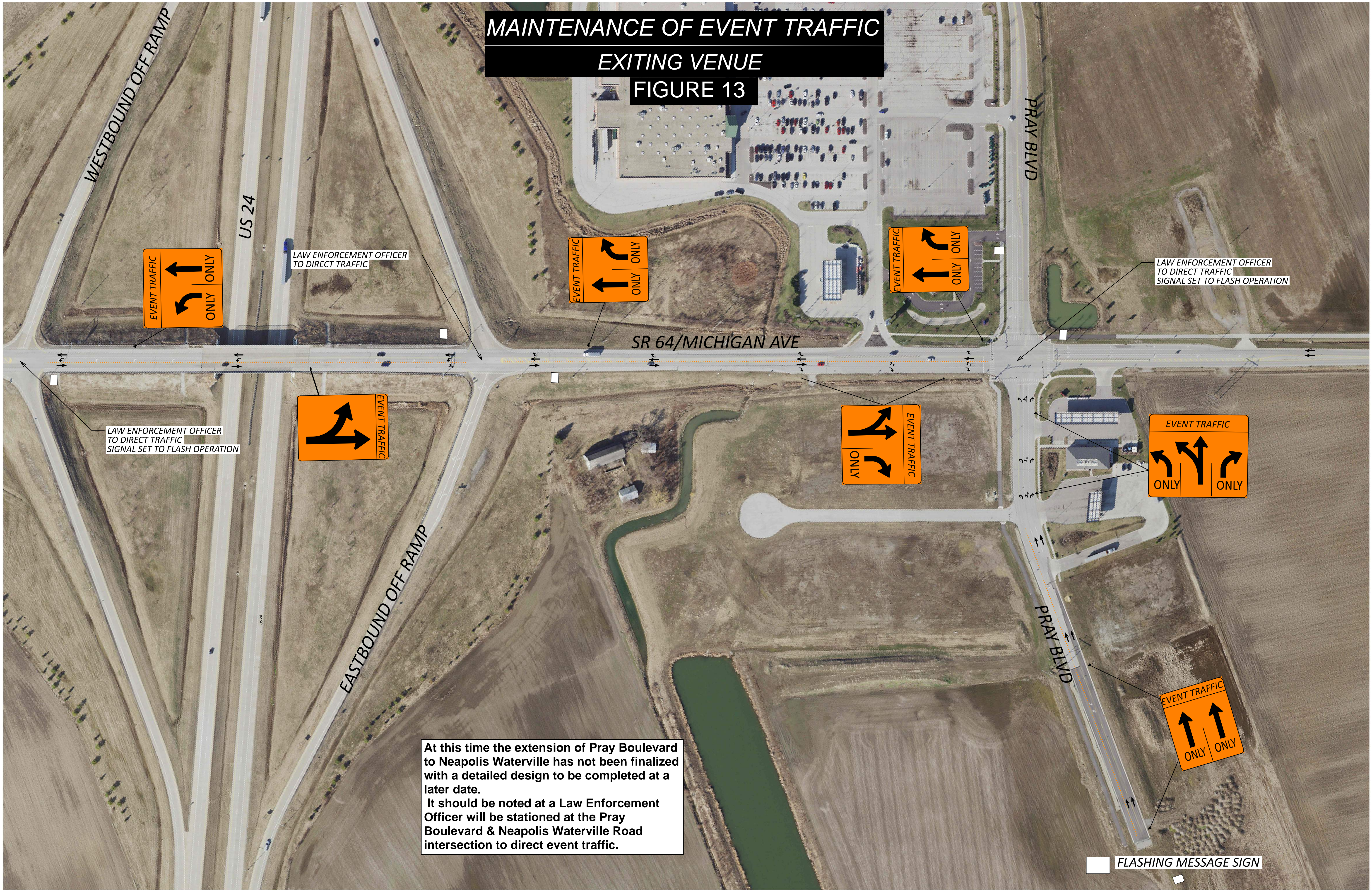
MAINTENANCE OF EVENT TRAFFIC  
INTERCHANGE LAYOUT ENTERING TRAFFIC  
FIGURE 11





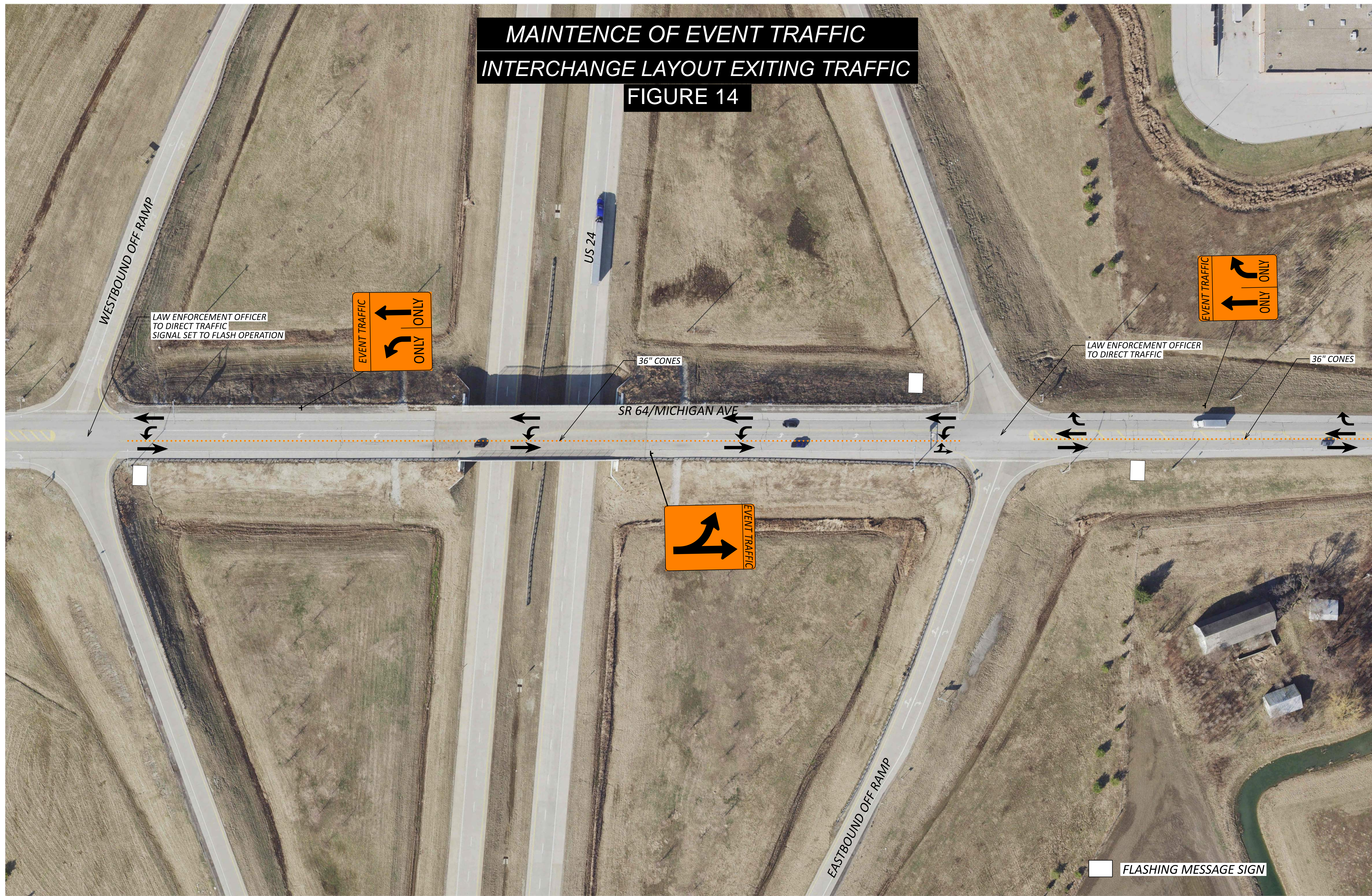




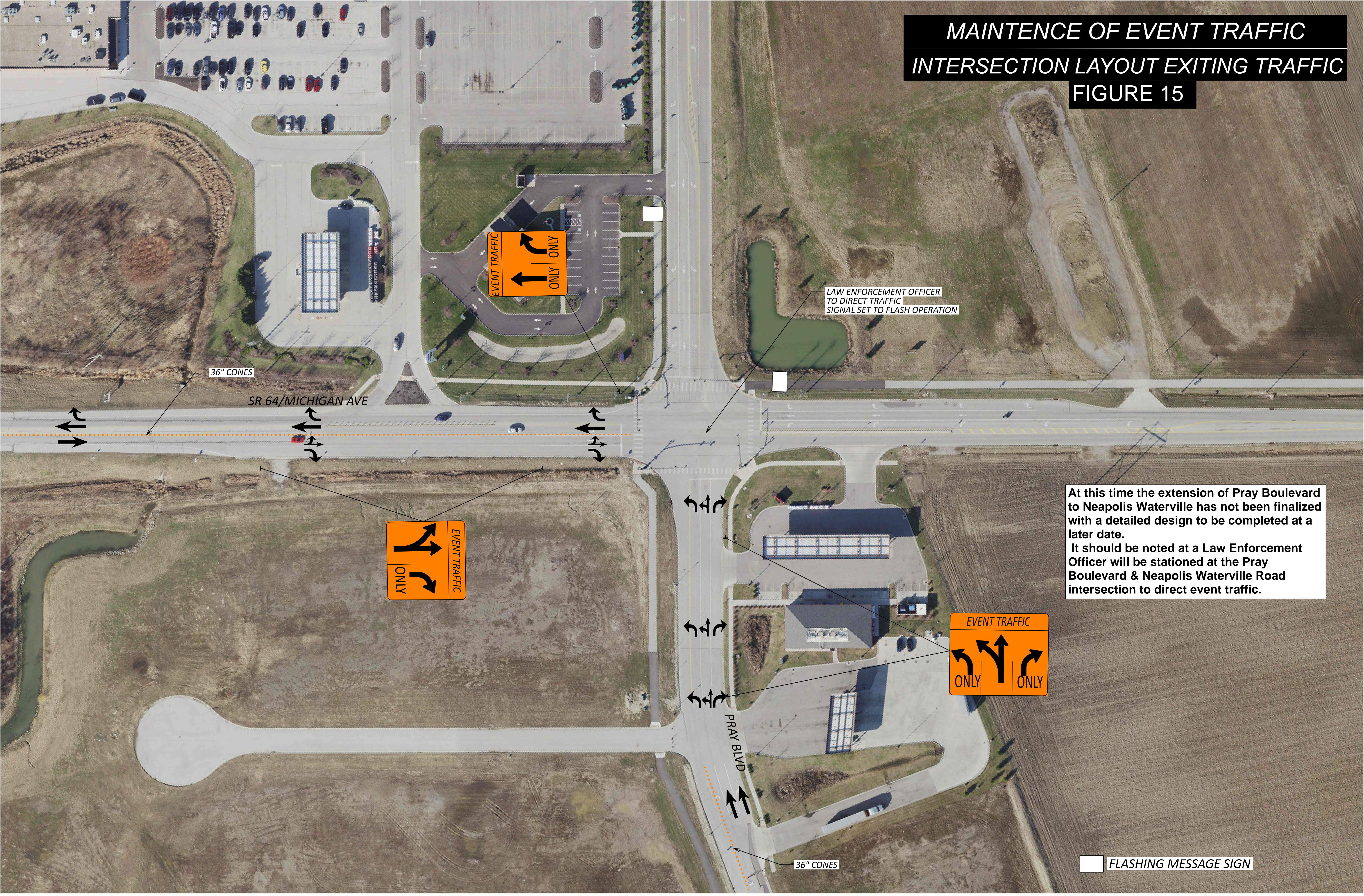




MAINTENCE OF EVENT TRAFFIC  
INTERCHANGE LAYOUT EXITING TRAFFIC  
FIGURE 14







MAINTENCE OF EVENT TRAFFIC  
INTERSECTION LAYOUT EXITING TRAFFIC  
FIGURE 15

At this time the extension of Pray Boulevard to Neapolis Waterville has not been finalized with a detailed design to be completed at a later date.  
It should be noted at a Law Enforcement Officer will be stationed at the Pray Boulevard & Neapolis Waterville Road intersection to direct event traffic.

FLASHING MESSAGE SIGN



# Traffic Impact Study

## 8. CONCLUSIONS

The proposed amphitheater will create large traffic volumes prior to and after an event. It is anticipated that 25 to 30 events will take place per year and not all events will be sold-out. Mitigation of the traffic impacts from the event center though permanent infrastructure improvements would be expensive and only necessary when an event occurs. An Event Traffic Plan utilizing Law Enforcement Officers (LEOs), cones, signage and message boards would be just as effective as the HCS suggested roadway improvements, at much lower cost.

## 9. RECOMMENDATIONS

The construction of the Waterville Landing Amphitheater will impact the surrounding roads and intersections 25-30 times per year. To mitigate the additional traffic generated by the development, the following recommendations are presented for the adjacent intersections:

- Employ local Law Enforcement Officers to direct and manage traffic during ingress and egress.
- Set up temporary traffic signs and flashing message boards.
- Set cones to adjust for the large traffic flow on SR-64 and Pray Boulevard.
- Construct 415' eastbound left turn lane on Neapolis Waterville Road at Pray Boulevard.