

March 17, 2022

Mr. Misha Rabinowitch  
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211 North Pennsylvania Street, Suite 1800  
Indianapolis, Indiana 46204

Dear Mr. Rabinowitch:

Subject: Response to Yarger Engineering Review Comments  
Traffic Impact Study for the proposed Willows Redevelopment  
City of Indianapolis, Marion County, Indiana  
CEC Project 314-872

Civil & Environmental Consultants, Inc. (CEC), is in receipt of review comments prepared by Yarger Engineering (Yarger) on behalf of the Oxbow Estates Home Owners' Association, dated January 26, 2022 and referencing our Traffic Impact Study for the proposed Willows Redevelopment, dated November 15, 2021.

On the following pages, each of the Yarger review comments will be reiterated, followed immediately by our response to each comment.

- (1) *The study leaves out the two key all-way stop intersections of 65<sup>th</sup> Street at Westfield Boulevard, and Westfield Boulevard at Winthrop Avenue and Riviera Drive East.*

RESPONSE: While CEC concurs that the intersections of Westfield Boulevard with 65<sup>th</sup> Street and Westfield Boulevard with Winthrop Avenue/Riviera Drive East were not included in the scope of the Traffic Impact Study, CEC questions whether these intersections would be considered "key" intersections.

It is noted that the scope of the Traffic Impact Study was reviewed and approved by representatives of the City of Indianapolis. In selecting the intersections to be included in the study, the intersection of Westfield Boulevard with 64<sup>th</sup> Street was chosen over the intersection of Westfield Boulevard with 65<sup>th</sup> Street for two (2) primary reasons:

1. The intersection of 64<sup>th</sup> Street with College Avenue is controlled by a traffic signal, whereas, the intersection of 65<sup>th</sup> Street with College Avenue is not. It is assumed that more people will utilize 64<sup>th</sup> Street to travel to College Avenue in order to perform turns to and from 64<sup>th</sup> Street at a traffic signal in lieu of waiting for gaps in traffic along College Avenue at the unsignalized intersection with 65<sup>th</sup> Street; and
2. The all-way Stop control at the intersection of Westfield Boulevard with 65<sup>th</sup> Street creates gaps in traffic to allow vehicles to turn out from 65<sup>th</sup> Street onto Westfield Boulevard with the traffic on Westfield Boulevard stopped, whereas traffic on 64<sup>th</sup> Street needs to wait for

gaps in traffic along Westfield Boulevard because Westfield Boulevard moves as a free-flow movement with no Stop sign control. Therefore, the impacts of the development traffic would be anticipated to be greater at the intersection of Westfield Boulevard with 64<sup>th</sup> Street.

The intersection of Westfield Boulevard with Winthrop Avenue/Riviera Drive East was not included because Westfield Boulevard becomes a one-way street toward Winthrop Avenue/Riviera Drive one block west of the intersection of Westfield Boulevard with Winthrop Avenue/Riviera Drive East and Riviera Drive East is a dead end street that ends in private parking areas. Therefore, no development traffic would have been assigned to turn at this intersection and all additional traffic from the proposed development would have been assumed to be through movements along Westfield Boulevard/Winthrop Avenue, resulting in minimal increases in delay at the intersection.

However, additional turning movements have been performed by CEC at the intersections of Westfield Boulevard with 65<sup>th</sup> Street and Westfield Boulevard with Winthrop Avenue/Riviera Drive East. These turning movement counts were performed on Wednesday, February 9, 2022 and Thursday, February 10, 2022 respectively. Summaries of the turning movement count data collected by CEC at the intersections of Westfield Boulevard with 65<sup>th</sup> Street and Westfield Boulevard with Winthrop Avenue/Riviera Drive East have been included with this correspondence.

Capacity calculations were performed at the intersections of Westfield Boulevard with 65<sup>th</sup> Street and Westfield Boulevard with Winthrop Avenue/Riviera Drive East using the data collected in February of 2022. Based on the results of these capacity calculations, both the intersection of Westfield Boulevard with 65<sup>th</sup> Street and the intersection of Westfield Boulevard with Winthrop Avenue/Riviera Drive East currently operate at an overall intersection Level of Service B during the weekday A.M. peak hour and an overall intersection Level of Service C during the weekday P.M. peak hour.

These traffic volumes at the intersections of Westfield Boulevard with 65<sup>th</sup> Street and Westfield Boulevard with Winthrop Avenue/Riviera Drive East were then grown to forecasted 2028 conditions, site-generated trips were added to each intersection and capacity calculations were performed for each of the intersections under forecasted 2028 build (with development conditions). The results of these additional capacity calculations revealed that each intersection can be anticipated to continue to operate at an overall intersection Level of Service B during the weekday A.M. peak hour and an overall intersection Level of Service C during the weekday P.M. peak hour.

- (2) *The study's traffic counts were taken on Thursday, October 7<sup>th</sup>, 2021 during the morning and afternoon peak hours by CEC/QC (Quality Counts?). Yarger Engineering, Inc. took traffic counts on December 15<sup>th</sup> and 16<sup>th</sup>, 2021, and January 5<sup>th</sup> and 6<sup>th</sup>, 2022.*
  - (a) *The study's peak 15 minute and hourly periods within the morning and afternoon don't reflect what is typical in Indianapolis and Broad Ripple The following Table lists the*

*peak 15 minutes and hours for counts in the study and by Yarger Engineering, Inc. The study's counts show peaks about 45 minutes to an hour earlier than what Yarger Engineering, Inc. found. The City should get the study's videos and manually count the traffic with a person observing for unusual items. We would want copies of the videos.*

Intersection		Study Counts				Yarger Engineering Counts			
		AM Street Peak		PM Street Peak		AM Street Peak		PM Street Peak	
East-West	North-South	15 Minutes	Hour	15 Minutes	Hour	15 Minutes	Hour	15 Minutes	Hour
75 <sup>th</sup> Street	Westfield Boulevard	7:00	7:00	4:30	4:00				
Willows Driveway	Westfield Boulevard	7:00	7:00	4:15	4:15				
Westfield Road	Westfield Boulevard	7:00	7:00	4:15	4:00	7:45	7:40	5:10	5:00
65 <sup>th</sup> Street	Westfield Boulevard					7:40	7:35	5:35	4:50
64 <sup>th</sup> Street	Westfield Boulevard	7:00	7:00	4:30	4:00				
Westfield Boulevard	Winthrop Avenue					8:45	8:00	5:10	4:40
Broad Ripple Avenue	Winthrop Avenue	7:30	7:15	4:45	4:00	8:45	8:00	5:00	4:40
Average		7:06	7:03	4:27	4:03	8:08	7:48	5:15	4:47

RESPONSE: CEC has been provided with copies of the traffic counts performed by Yarger, and, while CEC concurs that the peak hours of the counts performed by Yarger differ from those performed by CEC, it is noted that it is the volume of traffic traveling through the intersection that would impact the results of the analyses included in the report and not the time at which the peak hour occurred. The results of the counts performed by Yarger resulted in traffic volumes that were a minimum of 16 percent lower than the counts performed by CEC. The following is a summary of the difference between the counts used to perform the Traffic Impact Study and those performed by Yarger:

**Westfield Boulevard and Westfield Road**

- CEC Study A.M. Peak Hour – 7:00 A.M. to 8:00 A.M. – 528 vehicles
- Yarger A.M. Peak Hour – 7:40 A.M. to 8:40 A.M. – 428 vehicles
  - *Yarger counts are 23% lower than counts used to perform TIS*
- CEC Study P.M. Peak Hour – 4:00 P.M. to 5:00 P.M. – 820 vehicles
- Yarger P.M. Peak Hour – 5:00 P.M. to 6:00 P.M. – 589 vehicles
  - *Yarger counts are 39% lower than counts used to perform TIS*

### **Winthrop Avenue and Broad Ripple Avenue**

- CEC Study A.M. Peak Hour – 7:00 A.M. to 8:00 A.M. – 1,225 vehicles
- Yarger A.M. Peak Hour – 8:00 A.M. to 9:00 A.M. – 976 vehicles
  - *Yarger counts are 26% lower than counts used to perform TIS*
- CEC P.M. Peak Hour – 4:00 P.M. to 5:00 P.M. – 1,779 vehicles
- Yarger P.M. Peak Hour – 4:50 P.M. to 5:50 P.M. – 1,535 vehicles)
  - *Yarger counts are 16% lower than counts used to perform TIS*

Therefore, while it is understood that the peak traffic times observed by Yarger may have varied from those observed by our sub-consultant, Quality Counts, the traffic volumes used by CEC to perform the TIS are significantly higher than those observed by Yarger and, therefore, result in a significantly more conservative analysis of the existing traffic volumes and the impact of the proposed Willows redevelopment.

- (b) *The study's counts are from a single day. Yarger Engineering, Inc. prefers to use counts from two or more days to confirm that the counts are reasonable, which we did in this case.*

RESPONSE: As noted in the review comment, it is Yarger's preference to use counts from two or more days. However, while this may be Yarger's preference, neither the City of Indianapolis nor the Indiana Department of Transportation (INDOT) requires that turning movement counts be performed on multiple days. Furthermore, both the Institute of Transportation Engineers (ITE) Traffic Engineering Handbook and the ITE Manual of Transportation Engineering Studies verify that data collection on one single day is sufficient for analyses purposes, as long as no known events (federal holidays, school holidays, etc.) would significantly impact the traffic volumes on the day selected.

- (c) *There is no mention in the study of Covid-19 or business closings in Broad Ripple, but this should be at least mentioned and the counts checked against pre-Covid counts if available.*

RESPONSE: Discussions with both the Indiana Department of Transportation and the City of Indianapolis on multiple occasions prior to the data collection in October of 2021 revealed that traffic volumes in and around the City of Indianapolis had returned to pre-COVID-19 conditions and the use of adjustment factors to account for variations in traffic volumes due to the COVID-19 pandemic are not required.

- (d) *Eastbound 65<sup>th</sup> Street carries about three times as much traffic as eastbound 64<sup>th</sup> Street during the hours counted, and yet, the 65<sup>th</sup> Street intersection was omitted from the study.*

RESPONSE: Although additional manual turning movement count data collected by CEC at the intersection of Westfield Boulevard with 65<sup>th</sup> Street did confirm that the volume of traffic on 65<sup>th</sup> Street at its intersection with Westfield Boulevard is approximately 2.5 times greater than the volume of traffic on 64<sup>th</sup> Street at its intersection with Westfield Boulevard, it is standard practice in the traffic engineering industry that motorists follow the path of least resistance between their origin and destination. In addition to the discussion included in CEC's response to Comment #1, it is CEC's opinion that more motorists will utilize 64<sup>th</sup> Street in order to avoid the additional traffic volumes on 65<sup>th</sup> Street. It is also CEC's opinion that, because the intersection of Westfield Boulevard with 65<sup>th</sup> Street is controlled by multi-way Stop sign control, more capacity exists at this intersection than the standard two-way Stop sign controlled intersection of Westfield Boulevard with 64<sup>th</sup> Street, which has already been shown in the TIS to operate at Levels of Service B or better.

- (3) *Their traffic distribution method based on their turning movement counts leaves out key intersections of 65<sup>th</sup> Street at Westfield Boulevard, and Westfield Boulevard at Winthrop Avenue for traffic to and from the west. Yarger Engineering, Inc. prefers to use the gravity model that is based on demographics and trip types rather than mixing in other trip types that are present in the study's turning movement counts.*

RESPONSE: Multiple methods for distribution of site generated trips are available to analysts, including both the use of observed peak hour traffic distributions (as used by CEC) and the use of a gravity model (as suggested by Yarger). Again, as noted in the review comment, the gravity model is Yarger's *preference*. It is not required or standard methodology. In addition, it is CEC's experience that, while the methodology that uses existing traffic volume distributions could potentially include other trip types, the weekday A.M. and weekday P.M. peak hour traffic streams are primarily comprised of home-based work trips and the use of these volumes is an accurate methodology for determining the distribution of trips generated by residential development. In addition, the distribution of trips used in the report is further confirmed by a review of the peak hour distributions into and out from the Oxbow neighborhood, which mirror the distributions used for the proposed development.

Although the higher traffic volumes along 65<sup>th</sup> Street, as previously discussed, may have resulted in additional site traffic being assigned to the west along 65<sup>th</sup> Street, it remains CEC's opinion that motorists follow the path of least resistance between their origin and destination and more site-generated traffic volumes will utilize 64<sup>th</sup> Street in order to avoid the additional traffic volumes on 65<sup>th</sup> Street. In addition, a higher traffic volume destined to the west would result in lower traffic volumes arriving from/destined to the intersection of Broad Ripple Avenue with Winthrop Avenue, which has already been shown to have no significant impact from development traffic.

Finally, as previously discussed, CEC questions the identification of the intersection of Westfield Boulevard with Winthrop Avenue as a “key” intersection, as Westfield Boulevard becomes a one-way street toward Winthrop Avenue/Riviera Drive one block west of the intersection of Westfield Boulevard with Winthrop Avenue/Riviera Drive East. Therefore, although a small percentage of traffic destined to the site may use Westfield Boulevard to travel toward the site from College Avenue, the same traffic cannot return to College Avenue using Westfield Boulevard because of the one-way restriction. Based on data collected during additional manual turning movement counts performed by CEC at the intersection of Westfield Boulevard with Winthrop Avenue/Riviera Drive East, the intersection currently operates at an overall Level of Service B during the weekday A.M. peak hour and an overall intersection Level of Service C during the weekday P.M. peak hour and the proposed Willows redevelopment would be anticipated to have no impact on these overall intersection Levels of Service.

- (4) *There appear to be issues with their level of service analyses at the signalized intersections.*
- (a) *Their signal timings are for isolated fully actuated signals with no pedestrians, so the cycle length would be allowed to vary. Closely spaced signals such as those on Broad Ripple Avenue are usually coordinated with all signals having the same cycle length. At Broad Ripple Avenue and Winthrop Avenue, we measured consistent 55-60 second cycle lengths in the morning and afternoon peaks, while the study’s actuated cycle lengths per their analyses outputs were 49.5 on the morning and 66.6 in the afternoon. These timings should be compared with what is actually in the signals.*

RESPONSE: While it is agreed that closely spaced traffic signals are usually coordinated, field measurements performed at the intersection of Winthrop Avenue with Broad Ripple Avenue revealed varying traffic signal cycle lengths on the days during which the traffic volume data was collected. While these cycle lengths varied between 70 and 80 seconds, the variation in the cycle lengths between cycles of the traffic signal indicate that the intersections along Broad Ripple Avenue are not currently operating under coordination.

Capacity analyses were performed using the observed cycle lengths of 70 to 80 seconds, which is a more accurate methodology for analyzing the traffic conditions than using maximum timings programmed in the traffic signal controller. The 49.5 second and 66.6 second cycle length time referenced in the review comment is the actuated cycle length reported from Synchro. This is a calculation performed by the Synchro software that represents the average cycle length over the study period analyzed (one hour during each peak period). These values are not equal to the sum of the actuated splits because of skipped phases and dwell time modeled in Synchro and is not a direct comparison to cycle lengths measured in the field.

- (b) *Their signal analyses don’t include pedestrians, but even in January, we observed pedestrians in the area. Our counts include the pedestrians and bikes using the crosswalks on Broad Ripple Avenue at Winthrop Avenue. We also counted Westfield Boulevard at Winthrop Avenue and Riviera Drive where the Monon Trail cross with numerous pedestrians and bicycles, but their study omitted this key intersection. I often*

*drive through the 75<sup>th</sup> Street at Westfield Boulevard intersection and observe numerous pedestrians and bicycles crossing 75<sup>th</sup> Street since the west crosswalk serves the Monon Trail.*

RESPONSE: While it is agreed that the analyses performed for the intersection of Winthrop Avenue with Broad Ripple Avenue did not include pedestrians, the number of pedestrians observed during the manual turning movement counts was not significant enough to impact the results of the analyses performed at the intersection. These pedestrians move with the traffic signal and typically do not even activate the pedestrian push button before crossing the roadway.

As previously discussed, CEC questions the designation of Westfield Boulevard with Winthrop Avenue/Riviera Drive as a “key” intersection with the minimal increases in through traffic at the intersection that would be anticipated.

Similar to the intersection of Winthrop Avenue with Broad Ripple Avenue, while it is agreed that the analyses performed for the intersection of Westfield Boulevard with 75<sup>th</sup> Street did not include pedestrians, the number of pedestrians observed during the manual turning movement counts was not significant enough to impact the results of the analyses performed at the intersection. These pedestrians move with the traffic signal and typically do not even activate the pedestrian push button before crossing the roadway. Field observations of the operation of the intersection showed that the exclusive pedestrian phase was rarely, if ever, called by pedestrians and bicyclists at the intersection of Westfield Boulevard with 75<sup>th</sup> Street.

(c) *Their traffic signal minimum split times do not reflect the pedestrian timings which at Broad Ripple Avenue were on recall in the morning and afternoon for at least the west crosswalk and probably others. The east crosswalk may not be on pedestrian recall since the phase was skipped from time to time.*

RESPONSE: As previously noted in our response to review comment #4a, the traffic signal timings and phases at the intersection of Winthrop Avenue with Broad Ripple Avenue were based upon field measured signal timings during each of the peak hours analyzed. Although the pedestrian timings may impact the actuated cycle length reported by the Synchro software (see our response to review comment #4a), the timings used in these analyses exceed the pedestrian timings at the intersection, which operate concurrently with the vehicular movements.

(d) *The 75<sup>th</sup> Street signal includes an exclusive pedestrian phase which was not included in their analyses.*

RESPONSE: While it is understood that the traffic signal at the intersection of Westfield Boulevard with 75<sup>th</sup> Street includes an exclusive pedestrian phase, a review of the videos containing the traffic counts revealed that most pedestrians and bicyclists through the intersection do not push the pedestrian push button to activate the pedestrian phase. These pedestrians and bicyclists simply wait for a gap in traffic and proceed through the intersection

without calling and waiting for the exclusive pedestrian phase. However, including this exclusive pedestrian phase in the analyses would result in the phase being called with each cycle of the traffic signal, which would ultimately result in analyses that depicted unrealistic delays for vehicles traveling through the intersection waiting for a phase of the traffic signal that was not regularly called. Therefore, the exclusive pedestrian phase was not included in the analyses.

(e) *Because they assumed an isolated signal on Broad Ripple Avenue, there is no accounting for influence from adjacent signals, such as platoon formation and queue spill back which is common in Broad Ripple, and which we observed during our counts.*

RESPONSE: As previously noted, the variation in the cycle lengths observed between cycles of the traffic signal indicate that the intersections along Broad Ripple Avenue are not currently operating under coordination. If the signal were operating under coordination, the impacts of adjacent signals, such as platoon formation and queue spill back, would not impact the results of the capacity calculations included in the Traffic Impact Study. While these results of the queueing analyses in the study may be impacted by the adjacent signals, these impacts would not be seen in the analyses unless traffic volume data for these adjacent signals were to be included in the analyses.

(f) *There is parking on both sides of Broad Ripple Avenue west of Winthrop Avenue, but no adjustment is shown for it in their analyses.*

RESPONSE: The number of parking maneuvers along Broad Ripple Avenue, west of Winthrop Avenue, were not observed as part of the data collection performed for the proposed development. However, while it is agreed that parking is permitted on both the northern and southern sides of Broad Ripple Avenue, west of Winthrop Avenue, only the parking maneuvers on the southern side of Broad Ripple Avenue would be included in the analyses. Furthermore, a significant number of parking maneuvers would need to be observed prior to these movements impacting the results of the analyses included in the Traffic Impact Study, and these impacts would be consistent across all conditions analyzed within the study, as the parking maneuvers are used to reduce the base saturation flow rate used in the analyses. Therefore, the parking maneuvers would be anticipated to have no impact on the conclusions of the study.

(5) *A future sidewalk is shown in the study's graphics between the White River Bridge and Westfield Road, but it would require fill which would impact floodplain/floodway. It may be possible to do so, but a hydraulic study would be required to determine if it could be done. The graphic also doesn't show who will be providing it and when. It is dashed in so presumably it would not be the developer with this redevelopment project.*

RESPONSE: All studies and analyses required to permit the construction of the proposed sidewalk between the White River Bridge and Westfield Road will be performed and approved prior to the construction of the sidewalk, which will be constructed as part of the proposed redevelopment project. However, it should be noted that the area depicted on the Site Plan for



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new sidewalk does not lie within the Floodway, and, therefore, a DNR Construction in a Floodway Permit would not be required. A Floodplain Review and Drainage Review will be requested by the City of Indianapolis.

This completes CEC's response to the review comments prepared by Yarger Engineering (Yarger) on behalf of the Oxbow Estates Home Owners' Association, dated January 26, 2022 and referencing our Traffic Impact Study for the proposed Willows Redevelopment, dated November 15, 2021.

If you have any questions or require anything additional, please do not hesitate to contact us.

Very truly yours,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.



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