**SR162 AND 128TH STREET EAST STUDY REPORT
INTERSECTION CONTROL ANALYSIS
July 31, 2018
Summary and Analysis**

***(NOTE: This document includes excerpts from WSDOT’s Report in regular font and our comments are in bold in parenthesis or otherwise noted throughout this document.)***

(P4)

*Sidra 6.1* … model setting used for the roundabout alternative were based on the guidelines in the *WSDOT Sidra Policy Setting*s. November 2015. (P 4)

***(What exactly is this? Does this model reflect the current or future traffic of this intersection – volume, make up and direction of flow?)***

**Intersection Feasibility Comparison** (P4)

**Signalized**

Environmental Concerns. There are no wetlands or sensitive areas located within the intersection footprint. The total impervious surface area for the traffic signal would be 283,000 square feet.

Access. Public comments have indicated that there are properties that access directly onto SR 162 that use the traffic signal to provide gaps and allow vehicles to enter the traffic stream.

Right of Way Requirements

Full Property = 4
Partial Property = 26
With partial property required, 2 would have access compromised

**Roundabout**

Environmental Concerns. There are no wetlands or sensitive areas located within the roundabout footprint. The total impervious surface area for the roundabout alternative would be 264,500 square feet. Given the additional ROW and access impacts to the McMillin community including the historical buildings and properties, there would likely be more SEPA impacts. ***(Underlined for emphasis)***

Access. The roundabout would result in continuous flow and reduce the number of gaps for properties that access directly onto SR 162 to enter the traffic stream. Left-turns may be more difficult from driveways so drivers may need to turn right and travel out of direction using the roundabout to turnaround. This could be more difficult for property on the eastside of SR 162 when there is no roundabout at SR 162/Military Road East to facilitate U-turns

Right of Way Requirements

Full Property = 7
Partial Property = 23
With partial property required, 4 would have access compromised

Land Use

The Pierce County Comprehensive Plan designates the parcels adjacent to this intersection within the Alderton-McMillin area as rural neighborhood center. The traffic signal would minimize the impacts to these parcels and allow for future redevelopment consistent with the County’s Comprehensive Plan.

Pedestrian

Pedestrian crossing distances for the roundabout and signal would be similar; however, the signal would provide a designated phase for crossing between the regionally significant Foothills trail and the regional trail to the plateau proposed by the County Road Project (New Rhodes Lake Road East). The signal would also accommodate visually impaired pedestrians although audible pedestrian signals (APS).

Land Use
As noted with the traffic signal, the County Comprehensive Plan designates the parcels adjacent to this intersection as rral neighborhood center. Because of additional ROW take and additional access restrictions imposed by the roundabout, the roundabout would impact the redevelopment potential of the McMillin neighborhood as envisioned in the County’s Comprehensive Plan.

Pedestrian

Pedestrian crossing distances for the
roundabout and signal would be similar; however, the roundabout would provide a
pedestrian refuge and allow for shorter crossings in two stages. Pedestrian beacon or a HAWK signal would need to be installed to accommodate pedestrians including the visually impaired. The two-stage crossing of the roundabout helps the operational flows at the intersections because traffic is accommodated after the pedestrian crosses halfway rather than at a signal where vehicles need to wait for the pedestrians to cross the full distance before vehicles can flow in the opposing direction

***(Re: Environmental – Notice that under the roundabout scenario, they document here that a SEPA review would be necessary to ascertain the environmental impacts of the excessive property requirements of the roundabout over the signal.
Re: Access - Considering a great majority of access is needed from the east side, this is not a minor factor. Consider 121st St E and 122nd St E alone, a retirement mobile home community. Entering the non-stop traffic, even to make a right turn into it, as well as making a left turn through it to exit is a serious safety issue.
Re: Pedestrian – Since this roundabout would have non-stop traffic, particularly in the commute hours, there would be no opportunity for a pedestrian to enter through the traffic even to get to the refuge and then get through the traffic on the other side. Not a safe scenario! Far safer to have a signal that both the drivers and the pedestrians can feel confident in a safe crossing.
Re: Right of Way Requirements – the signal requires far less property acquisition with fewer access impacts than the roundabout.)***

**Traffic Volumes** (P6)

(P8) The most recent ADT volumes available from WSDOT are from April 2016 and represent SR162 at milepost 6.11 (just south of 128th Street East).
Future daily traffic volumes are reported for the segment of SR162 just north of 128th Street East

***(This is not an accurate comparison of traffic when 128th street is the significant traffic corridor in question. Why did you not do an ADT analysis on the north side of 128th so you have an accurate comparison? There are about 45 trucks per hour currently that make the left turn from SR162 to 128th Street and another 45 turning right from 128th onto SR162 per hour every day. Those trucks and other traffic were not considered in the 2016 count south of 128th.)***

**Traffic Operations** (P8)

**Vehicle Queues** (P9)

All the vehicle queues would be accommodated within the anticipated storage for both alternatives except for the southbound through/right-turn queue during the weekday PM peak hour for the signal alternative. It is noted that roundabout queues are moving queues, which are not perceived by drivers to be as negative as signal queues and is therefore better for drivers. Pedestrian beacons would need to be installed on the multilane roundabout approaches to facilitate crossings for visually impaired.

**(What is the queue for northbound traffic from Orting? With traffic this heavy, the roundabout will be fully congested and access from the south that requires a lane change within the roundabout to travel north requires a closer look. Please provide the data on the northbound traffic queue.)**

**Traffic Safety** (P11-12)

The SR 162/128th Street East intersection major and minor AADT [Annual Average Daily Traffic] are forecasted to be above the thresholds designated in the Predicted Safety Performance spreadsheet; therefore, **it is** **not possible to quantitatively predict expected crash frequency for the study intersection during the analysis year of 2030. Based on discussion and coordination with WSDOT Safety staff, the appropriate method to estimate the differences in traffic safety between the two intersection alternatives is to analyze the existing collisions at the intersection and apply crash modification factors (CMFs). *(Bold emphasis added, not in original)***

17 reported collisions over the 5 years with an average of about 3.4 collisions per year. None of these reported collisions involved a fatality or serious injury. Based on this review of historical collisions, no specific adverse safety condition for vehicles, pedestrians, or bicyclists were identified at the signalized intersection.

Roundabouts have the potential to reduce the total amount of collisions and the severity compared to signalized intersections. …converting four-way stop or signalized intersections to roundabouts shows:
• 90 percent reduction in fatal and serious injury collisions
• 75 percent in all injury collisions
***(This must be a single lane roundabout as a multiple lane intersection would not be a four way stop. That makes all this a moot point as it does not apply to this intersection now or in the future.***

 ***Fact just noted above is that there are no fatality accidents here and no recorded serious injury accidents. So, your ability to reduce something that doesn’t exist is fuzzy math. If you are projecting the likelihood of injury or fatality accidents in the future because of higher traffic volumes, then you should say so and provide documentation on the injury accidents in a roundabout serving similar traffic – type, volume and direction -- as this one is expected to have. Otherwise, there are no grounds upon which to base your claims.)***

Using the percent reduction in collisions noted above, the existing annual average number of collisions per year were factored to demonstrate how the observed collisions per year may be reduced by converting the signal to a roundabout.

***(Here you verify your faulty fuzzy math. You are not converting the existing traffic from a signal to a roundabout. This is for future traffic which is 150% more than the current traffic. You cite no statistics upon which to base your claims for the future.)***
The analysis of existing data shows that conversion from the existing signal control to a roundabout would reduce the annual collisions from 3.4 with the traffic signal to 2.2 with the roundabout. As traffic volumes increase, the number of conflicts at the intersection will increase and collisions could also potentially increase. As noted above, roundabouts have a significant impact on reducing the severity of collisions.

***(Only true when comparing with single lane roundabouts. This one is going to have three lanes, two encircling the roundabout and a through lane southbound with right turn slip lanes. Your claims do not apply to the roundabout design or the traffic conditions expected at this location. This is totally unrelated: you are considering a single lane roundabout without the truck traffic this intersection will have.)***

***(Nowhere do you address the safety and even the potential access issues the residents on 128th Street East will have with the continuous traffic the roundabout would create. Please include that safety factor in your safety analysis. Same question for all uncontrolled access points on this corridor, for farms and businesses as well as residences.)***

**Benefit/Cost Analysis** (P13)

This section summarizes the benefits and costs associated with each intersection alternative in terms of the following factors:
• Project costs related to design, ROW, and construction
• Societal cost savings

**Table 6. Cost/Benefit Analysis** (P13)

 Signal Alternative Roundabout Alternative

Fixed Costs
Project Cost (Design, Right-of-Way,
 Construction) $8,393,170 $10,632,653
Annual Costs
Societal Cost Savings (Collisions)(1) $72,000(2) $0
20-Year Annual Cost $1,440,000 $0
20-Year Total Cost (Annual + Fixed) $9,833,170 $10,632,653
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1. Based on societal cost of $60,000 per possible injury crash found in Chapter 1300 Step 4 of WSDOT Design Manual and the reduction in possible injury collisions as discussed in Step 3.
2. This means the signal has no cost savings in terms of safety compared to the roundabout.
3. This could be an over estimate given the unique configuration of the roundabout, which is not consistent with the roundabouts that were used to determine this value.
4. This assumes a flat rate benefit over the 20-year period with any interest rate.

As shown in Table 6, the total cost (fixed plus annual) for the roundabout alternative would be more than the signal alternative.

***(What has the “Societal Costs” been over the past 5 or 10 years as a signal? Document that. What has the Annual cost for the signal been over the past 5 or 10 years? What are the actual annual expenses? Document those for this signal. Further, I don’t believe there would not be some repair costs to the roundabout due to the heavy truck traffic that will be making left turns at this intersection. Prove that with other roundabouts with this type and volume of truck traffic – there must be some evidence from industrial areas with roundabouts – for a 20-year period. Then let’s talk about the operating cost of a signal vs. a roundabout. The construction cost estimates are $8,393,170 for the signal and $10,632,653 for the roundabout. That’s a difference of $2,239,483! Quite significant indeed.)***

However, based on a qualitative analysis, the roundabout alternative would experience less overall average delay per vehicle as compared to the traffic signal. The signal would have approximately 33 seconds more average delay per vehicle during the weekday AM peak hour and 49 seconds more average delay per vehicle during the PM peak hour.

**Selection** (P14-15)

Based on the evaluation presented in steps 2 through 4, the roundabout alternative is recommended. Selection of the recommended alternative was based on key factors including:

• Context Sensitive/Sustainable Design:
Pedestrians, bicyclists, and vehicles would be accommodated with both alternatives. The roundabout would provide a pedestrian refuge and allow for shorter crossings in two stages. Traffic flows at the roundabout are also improved compared to the signal with the two-stage crossing allowing for vehicles in the opposing direction to flow after pedestrians cross halfway instead of waiting for pedestrians to cross the entire leg. Pedestrian beacons or a HAWK signal would need to be installed to accommodate pedestrians including the visually impaired.

***(You are not considering the context of the entire environment of this corridor that this intersection and traffic management impacts. This is a complete failure in the true purpose of Context Sensitive Design. Look at your goals to preserve the character of the broader community. This is a complete failure to address that.)***

• Traffic Operations:
The roundabout alternative would have less overall average delay per vehicle and shorter vehicle queues as compared to the traffic signal. In addition, during the off-peak hours, when delay for both the roundabout and traffic signal would be considerably less, the roundabout alternative is anticipated to continue to result in less delay per vehicle compared to a traffic signal. Roundabout queues are moving queues, which are not perceived by drivers to be as negative as signal queues. Overall, the roundabout alternative is expected to show cumulative vehicular delay savings over the life cycle of the intersection when compared to the signal alternative.

***(No mention is made of the nature of the traffic that will be traveling through this roundabout, especially making left turns through it. The conflict points are significant and cause a delay factor that do not appear to be factored into the calculations of the efficiency of this assessment of traffic operation. No mention of the impact it will have on the safety issues of the corridor or the welfare of the residents. Emergency access and evacuation issues exist on this corridor. Where is that considered in this study?)***

• Traffic Safety:
The analysis of existing data shows that conversion from the existing signal control to a roundabout would reduce the annual collisions.

***(We are not converting the current signal to a roundabout. The reason any change is necessary is because of future traffic. Your models do not reflect the traffic or the flow this intersection will have to serve in 2035. Because it seems no roundabout exists that has the traffic this intersection must accommodate, you cannot make assumptions that this one will perform as other roundabouts. This is a unique situation. The traffic management systems chosen for this corridor, including this intersection, must be determined on their own unique demands and context.)***

Insurance Institute of Highway Safety reports roundabouts have a significant impact on reducing the severity of collisions when compared to traffic signals.

***(That would be when all things remain the same, converting and existing signal to a roundabout. But nothing will remain same here. The traffic volume will change significantly and the truck traffic that is already a challenge, will become more so when commercial vehicles will be travelling to the plateau. Is the Institute referring to single lane roundabouts or multiple lane systems as this one would be with the mix of big trucks and variety of other traffic?)***