160th and Greenwood / Innis Arden Intersection Project

Open House #2 Summary

Meeting overview

The City of Shoreline and Shoreline Community College hosted a public open house on July 22, 2019, for the 160th and Greenwood / Innis Arden Intersection design project in support of Shoreline Community College's frontage improvements and on-campus residence hall project. The College did a traffic study as part of their project, which concluded that the City's delay standards are not being met at this intersection and will need to be improved to meet City traffic standards.

This was the second of two open houses after the project and design concepts were introduced to the community at the first open house on May 8, 2019. At the second open house, the community was given the opportunity to provide feedback on the design concepts the City is presently considering, which include a roundabout and signalized intersection, as well as the criteria the City is using to determine which concept will become the preferred concept design.

The information presented at the open house included:

- Explanation of the need to redesign the 160th and Greenwood / Innis Arden intersection
- How this project fits into the planned construction of Shoreline Community College's residence hall project
- Overview of the feedback the City received at the May 8 open house
- The alternatives analysis the City conducted to narrow the design concepts down from the initial large roundabout, small roundabout and signalized intersection they were considering
- The criteria the City is using to determine how they will choose the preferred concept
- Current traffic modeling highlighting the delay at the current intersection and for both design concepts
- The City's conceptual analysis of both design concepts outlining their strengths and weaknesses
- Project timeline and next steps

Key audiences

- Shoreline residents nearby and adjacent to the 160th and Greenwood / Innis Arden intersection
- Travelers who use the intersection, including drivers, transit riders, cyclists, people with disabilities, and pedestrians
- Shoreline Community College faculty, staff, and students

Outreach opportunities

The in-person open house took place on Monday, July 22, 2019 from 6:00 to 8:00 p.m. The open house provided attendees with information and the opportunity to comment on the upcoming redesign of the N 160th Street, Greenwood Avenue N, and NW Innis Arden Way intersection. Attendees also had the opportunity to engage with both City and College staff, as well as members of the project team.

Key participant information from the in-person open house:

- **Number of attendees:** Seven community members (excluding event volunteers) signed in at the open house. Nine community members were in attendance.

- **Notification:** Attendees heard about the event from a neighbor, the College, their neighborhood association, via social media, or after seeing a yard sign.
- **Location:** Attendees lived in the Highland Terrace, Trophy Highlands, Echo Lake, Richmond Beach, and Innis Arden neighborhoods.

Notification and engagement tools

A variety of notification and engagement tools were used to advertise the in-person open house and inform Shoreline residents about progress on the 160th and Greenwood/Innis Arden Intersection Project.

Notification tools included:

- Project webpage
- Yard signs
- Social media
- Neighborhood alerts
- Neighborhood associations
- Highland Terrace Parent-Teacher Association outreach

Question and answer session

Attendees asked the following questions during the in-person open house question and answer session (scanned question and answer cards attached):

- Students are less experienced drivers. Have you included this in your traffic models?
- Will there be trees in the center of the roundabout? How do trees or art in the middle impact safety?
- What is the estimated cost of the signalized intersection vs. cost of the roundabout?
- During rush hour, how long could it take to enter the roundabout?
- Is there any thought on having cars exit the College onto Greenwood at 161st Street to minimize the use of Innis Arden Way?
- How will all cars be able to make it through the roundabout during the heaviest traffic flow periods?
- How many cars can be in the roundabout at any given time?

Comments

- Any roundabout is better than traffic lights, especially in what is essentially a neighborhood setting.

Feedback summary by theme

The project team gathered feedback from attendees using, rollplots, comment cards, and participant questions and comments. The major themes that emerged from participant feedback include:

Safety

- One participant suggested the need for speed bumps on Greenwood Avenue N
- One participant noted that the most dangerous area for people is the southbound lane on Greenwood Avenue N turning right onto Innis Arden Way at the stop sign

Traffic flow

- One commenter suggested that cars could exit the College onto Greenwood Avenue N at 161st Street to minimize traffic congestion on Innis Arden Way. If it can't be a solution for the public, can't more College employees be encouraged to use this exit, so the surface streets aren't as congested?
- One participant asked what the delay would be to enter the roundabout during the rush hour

Desire for more trees in the area

- During the Q&A period, one participant asked if there will be trees in the center of the roundabout and expressed concern about the removal of trees in the area
- One comment requested that the City work with the Highland Terrace Neighborhood Association to select plantings for the roundabout

Greater community engagement and collaboration

- One participant felt that the roundabout is already the City's preferred option and is being oversold by city staff, downplaying concerns of the community

Preference for the roundabout option

- One participant commented that this intersection is better suited for a roundabout rather than a signal

Evaluation criteria feedback

The project team received feedback on the evaluation criteria by asking participants to indicate which evaluation criteria were more important or less important to them on a display board. According to participants, the three most important criteria the City should consider are traffic flow, environmental impacts, and bicycle and pedestrian safety.

Construction costs

- Most participants indicated that construction costs were moderately less important while one participant indicated that it was not important to them.

Operation and maintenance costs

- Participants that provided feedback on this criterion were split between not important, moderately not important, moderately important and important.

Bicycle and pedestrian safety

- Participants indicated that safety for people biking and walking was moderately important and important.

Car safety

- Most participants indicated that safety for people driving was moderately important. One participant felt that it was important.

Traffic flow

- The majority of participants indicated that traffic flow was the most important evaluation criteria.

Environmental impacts

- Feedback on the environmental impacts ranged consistently between neutral, moderately important and important.

Impacts to college's current improvements

- All participants felt that the preferred concept design's impact to the college's current improvements is moderately less important.

Open house wrap-up

The open house concluded by 8:00 p.m. Several participants stayed a few minutes longer to continue talking with project staff and review the rollplots. Attendees were reminded to visit the project website for updates and that a summary would be available within two weeks of the meeting.

Table of Appendices

APPENDIX I: DISPLAY BOARDS 6

APPENDIX II: FAQ 13

APPENDIX III: PRESENTATION 15

Appendix I: Display Boards

Project overview

The City of Shoreline and Shoreline Community College are working together to improve safety and mobility at the intersection of Greenwood Avenue N with N 160th Street and NW Innis Arden Way.

Two concepts are being considered: one option is a **roundabout** and one option is a **signalized intersection**.

At tonight's open house you can **learn more** about the conceptual options and **provide input** to help inform the preferred concept design.

Existing conditions at the intersection of Greenwood Avenue N with N 160th Street and NW Innis Arden Way. Source: Google Earth

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Typical signalized intersections vs. typical roundabouts

Signalized intersection

Typical pros:

- Provide a familiar experience that drivers are comfortable with
- Provide orderly movement of traffic moving in different directions
- Provide clear guidance to people walking on when it is safe to cross

Typical cons:

- High maintenance costs
- Can fail during power outages
- Cause delay for people walking, biking, and driving during non-peak hours
- More conflict points and higher speeds compared to roundabouts resulting in poorer safety outcomes for people walking, biking, and driving

Roundabout

Typical pros:

- Improve safety for all users (90% reduction in fatalities[1], 76% reduction in injuries[2], and 35% reduction in all crashes[2])
- Reduced delay for people walking, biking, and driving at peak hours and other times
- Reduced air and noise pollution and fuel use with fewer stops, hard accelerations, and idling
- Low maintenance cost (relative to signalized intersection control)

Typical cons:

- People walking can find it uncomfortable to cross without the familiarity of a signalized crossing
- Drivers may not be familiar with how to drive through a roundabout, which can cause confusion and discomfort
- Can require more space
- More complicated construction phasing

[1] *"Safety Effect of Roundabout Conversions in the United States: Empirical Bayes Observational Before-After Study." Transportation Research Record 1751, Transportation Research Board (TRB), National Academy of Sciences (NAS), Washington, D.C., 2001.*

[2] *NCHRP Report 572: Roundabouts in the United States. National Cooperative Highway Research Program, TRB, NAS, Washington, D.C., 2007.*

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Roundabouts and traffic signals in other cities

Example roundabouts in nearby cities.

Five Corners Roundabout in Edmonds looking northwest
Source: MyEdmondsNews

Five Corners Roundabout in Edmonds
Source: Google Earth

Ash Way Roundabout in Lynnwood looking north
Source: Google Earth

Ash Way Roundabout in Lynnwood
Source: Google Earth

Example offset intersections in Seattle.

3rd Ave NE and NE Northgate Way looking east
Source: Google Maps

3rd Ave NE and NE Northgate Way
Source: Google Earth

NE 50th St at Latona Ave NE and Thackeray Pl NE looking east
Source: Google Maps

NE 50th St at Latona Ave NE and Thackeray Pl NE
Source: Google Earth

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Crosswalks at roundabouts

Five Corners roundabout in Edmonds, WA. Source: Carmanah Traffic.

- Using crosswalks at roundabouts can be predictable and safe
- The design will create shorter crossing distances
- The design will also include rapid flashing beacons to alert people driving of people crossing

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Conceptual option — Roundabout

- Provides operational efficiency and safety benefits
- Eliminates bus pull-off on Innis Arden Way, coordinating with Metro for new location
- Opportunity for public art or place-making in center island and area north of existing median
- Reduces travel path for left turns
- Accommodates buses and emergency vehicles
- Pedestrian-activated flashing beacons at crosswalks
- Some property acquisition from Shoreline School District required

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Conceptual option — Signalized intersection

- Operational benefits over existing stop signs
- Requires two signalized intersections, which would be coordinated to reduce congestion
- Maintains current configuration
- No property acquisition required
- Increased operations and maintenance cost
- Accommodates buses and emergency vehicles
- Pedestrian crossing signals

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Concept comparison

The table below demonstrates the strengths and weaknesses of each concept.

	Construction costs*	Operations and maintenance costs	Right of way costs	Safety	Traffic flow	Environmental impacts	Impacts to college's current improvements
Roundabout	$1.0M to $1.3M	Limted costs	Moderate costs	Significant improvement	Moderate improvement	Minimal impact	More impact
Signalized intersection	$0.9M to $1.2M	Significant costs	No costs	Improvement	Small improvement	Moderate impact	Less impact

Relative strength and weakness scale
Strongest | 2nd Strongest | 2nd Weakest | Weakest

*Does not include design, inflation, or street lighting costs.

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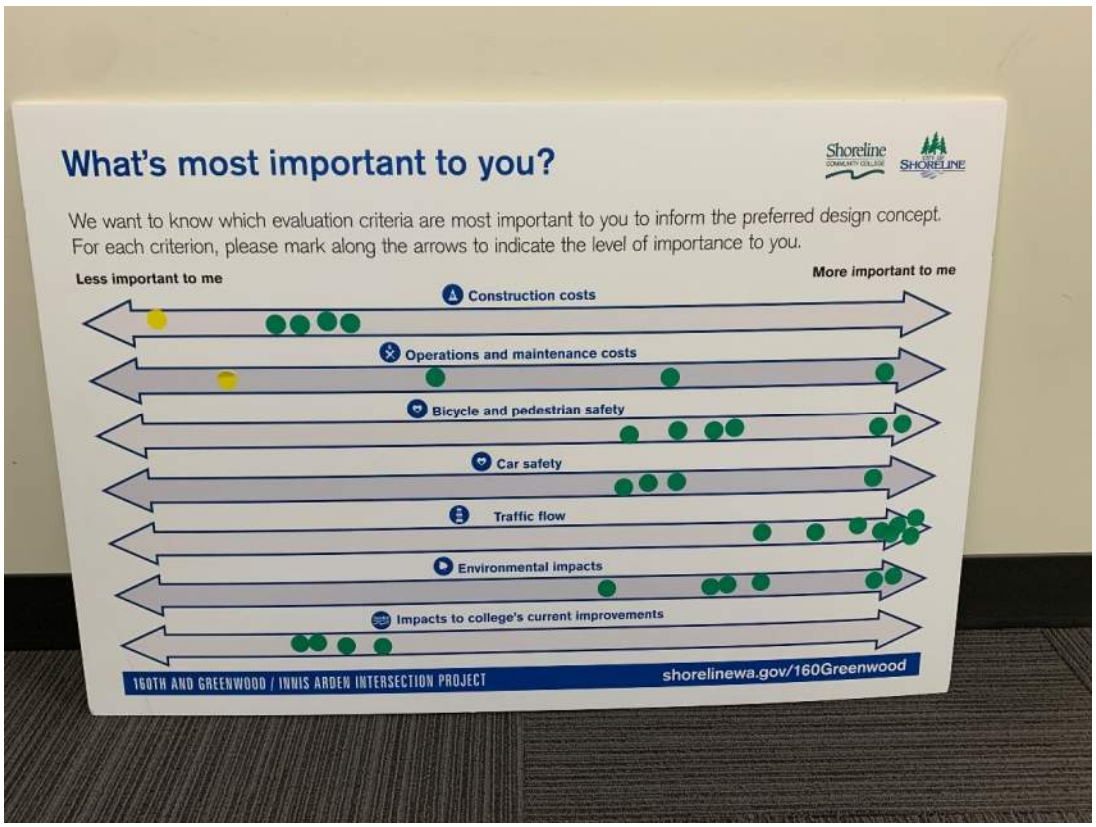
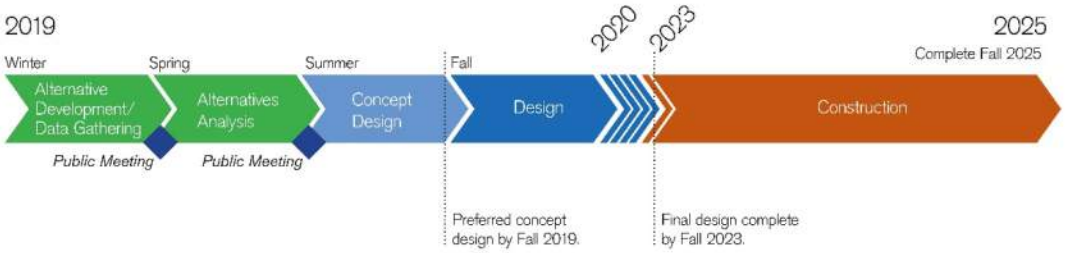


Project timeline



The College's Master Development Plan projects cause impacts to this intersection that must be mitigated to meet City codes. Intersection improvements must be completed within 6 years of the opening of the residence halls project.

The College will fund all or a large portion of the improvements that result from this alternatives analysis. Depending on the option selected, the City or College will construct the project by Fall 2025.

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Shoreline Community College residence hall

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Appendix II: FAQ

160TH AND GREENWOOD / INNIS ARDEN INTERSECTION PROJECT

Summer 2019

Frequently Asked Questions

Why are you redesigning the intersection of Greenwood Avenue N with N 160th Street and NW Innis Arden Way?

The City of Shoreline and Shoreline Community College are working together on a conceptual design for the N 160th Street and Greenwood Avenue N / NW Innis Arden Way intersection. The College did a traffic study as part of their new on-campus residence hall project. The study shows that the intersection does not function well today and will continue to get worse as traffic increases. Without changes, the intersection will not meet the City's delay standards when the new housing opens. Intersection improvements must be completed within six years of the opening of the new on-campus residence halls.

What has happened so far?

On May 8, 2019, the City and College held an open house to introduce the project to the community and get feedback on the three concept designs we were initially considering: a large roundabout, a small roundabout, and a signalized intersection. Participants at the first open house shared their concerns about the intersection and thoughts on the conceptual options, including:

- Concern about congestion at the intersection throughout the day
- Suggestion of more streetlights to improve safety for people walking, as well as interim measures to improve safety before the project is completed, such as rapid flashing beacons and speed bumps
- Discussion of roundabouts versus signals; some participants were in favor of the roundabout designs, citing how they work well in other countries where roundabouts are popular, while others expressed reservations, thinking roundabouts are less practical than signals
- Concern about the project timeline and funding availability to complete the project

Of the two roundabout options, the City selected the smaller concept as the recommended roundabout alternative after weighing both options against the evaluation criteria on the reverse. In the smaller roundabout, the smaller travel paths for vehicles should reduce speeds at the crosswalks and allow shorter travel times through the intersection for all users.

What options are you considering for redesigning the intersection?

Currently, the City and College are considering the small roundabout and a signalized intersection. Preliminary analysis shows both the roundabout and signalized concepts improve traffic flow compared to the existing intersection, with the roundabout performing better. Additional analysis is needed to determine how each concept will perform under future conditions.

Traffic signals provide a familiar experience with orderly movement for people driving but have higher maintenance costs and cause delays for people walking and driving when the roadway is not as busy. Roundabouts improve safety and reduce traffic delay, but can be unfamiliar for people driving and walking.

Roundabout

Signalized intersection

There is already work happening near the intersection. What is it for?

In conjunction with the residence hall, the College is investing approximately $2 million in street frontage improvements, including infrastructure and utility upgrades, new sidewalks and ADA improvements. This work will be completed by the end of September 2019. The College's contractor is finishing up construction on the new 68 unit on-campus residence hall. For more information about these Phase 1 Improvements please contact the College's Director of Facilities (see contact below).

Why are you considering roundabouts?

Roundabouts are used across the country and internationally to move traffic through large and small intersections. Roundabouts are shown to improve safety for people walking, biking, driving, and taking transit and improve the flow of traffic when installed in appropriate locations. The benefits of standard roundabouts include:

- 90% reduction in fatalities[1], 76% reduction in injuries[2], and 35% reduction in all crashes[2]
- Reduced delay for people walking, biking, and driving
- Reduced pollution and fuel use
- Reduced maintenance costs

What is the project timeline?

We are currently considering two concepts and continuing to gather data. The College will fund all or a large portion of the improvements that result from this alternatives analysis. The project will be constructed before Fall 2025.

How will you select a final concept?

The City's team will analyze the options based on the following evaluation criteria:

- Construction, operations, and maintenance costs
- Traffic operations (meeting the City's delay standards)
- Safety for people walking, biking, and driving (ADA inclusive)
- Right of way acquisition/impacts
- Environmental impacts
- Community feedback
- Impacts to existing and newly constructed infrastructure (including impacts to bus stops and new sidewalks installed with the College's Phase 1 Improvements)

How will residential properties be impacted?

To accommodate the new design, the City may have to acquire some property from the Shoreline School District. Based on current options, we do not anticipate needing to acquire property from residential properties. Construction impacts will be identified as construction gets closer.

How do I stay informed?

The preferred design concept will be shared later this year via the project website, email updates and outreach to neighborhood associations.

Visit shorelinewa.gov/160Greenwood to sign up for project email notifications.

Contact us: For additional project information, visit shorelinewa.gov/160Greenwood

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[1] "Safety Effect of Roundabout Conversions in the United States: Empirical Bayes Observational Before-After Study." Transportation Research Record 1751, Transportation Research Board (TRB), National Academy of Sciences (NAS), Washington, D.C., 2001.

[2] NCHRP Report 572: Roundabouts in the United States. National Cooperative Highway Research Program, TRB, NAS, Washington, D.C., 2007.

Appendix III: Presentation

160th and Greenwood / Innis Arden Intersection

Open House Presentation
July 22, 2019

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MEETING AGENDA

6:00 PM – Welcome & sign in

6:30 PM – Presentation and Q&A

7:00 PM – Open house

- View conceptual options
- Talk with staff who can answer questions
- Share your feedback on the conceptual options and your experience at this intersection

8:00 PM – Adjourn

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SHORELINE COMMUNITY COLLEGE MASTER DEVELOPMENT PLAN

- Master Development Plan to support growing College
- Sidewalk improvements under construction; completed concurrent with residence hall in September
- Improvements to 160th and Greenwood / Innis Arden intersection required within 6 years of residence hall project
- City and College developing intersection concepts and want your feedback

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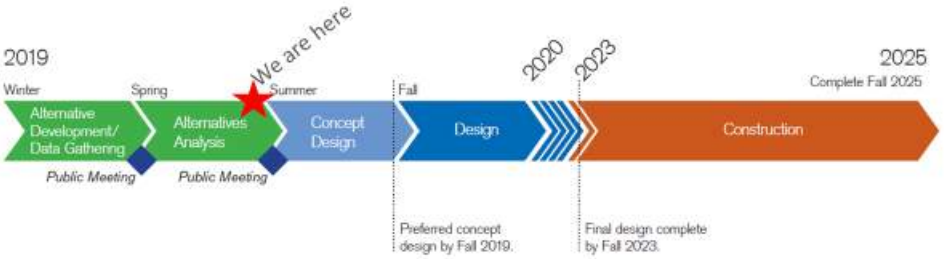
PROJECT TIMELINE



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WHAT ARE THE CURRENT CHALLENGES AT THIS INTERSECTION?

- Unusual alignment leads to confusion / poor operation
- Existing traffic delays, which are becoming longer with increased traffic
- Poor access for people walking and biking
- Metro buses, school buses, and other heavy vehicles are regular users
- Serves elementary school and College campus

Source: Google Earth

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WHAT WE HEARD IN MAY

- Concern about the congestion the intersection experiences throughout the day
- Importance of improving pedestrian safety
- Suggestion of interim measures to improve safety before the project is completed
- Many participates favored the roundabout design
- Some participants thought the roundabout options were less practical that the signalized option
- Concern about the project timeline

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ALTERNATIVE ANALYSIS

Three improvement options were presented the first open house:
two options were roundabouts and one option was a signalized intersection

Large roundabout

Small roundabout

CONCEPTUAL OPTIONS

Two improvement options are being considered: one roundabout and one signalized option

Roundabout intersection

Signalized intersection

CRITERIA FOR EVALUATION

- Safety and ease of use for people walking, biking, and driving (ADA inclusive)
- Traffic operations
- Construction, operational & maintenance costs
- Right of way acquisition/impacts
- Environmental impacts
- Community feedback
- Impacts to existing and newly constructed infrastructure

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PRELIMINARY INTERSECTION TRAFFIC MODELING

Existing 2018 delay (in seconds)			
Peak hour	Existing intersection	Signal	Roundabout
AM	64	44	8
Mid-day	81	39	14
PM	48	33	8

Note: The delay is the average amount of time a person waits at the intersection before traveling through it.

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CONCEPTUAL ANALYSIS

The table below demonstrates the strengths and weaknesses of each concept.

	Construction costs*	Operations and maintenance costs	Right of way costs	Safety	Traffic flow	Environmental impacts	Impacts to college's current improvements
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Relative strength and weakness scale: Strongest | 2nd Strongest | 2nd Weakest | Weakest

*Does not include design, inflation, or street lighting costs.

SIGNALIZED INTERSECTIONS

Typical pros:

- Provide familiar experience that drivers are comfortable with
- Provide orderly movement of traffic moving in different directions

  Note: Complex or offset intersections require coordination and present operational challenges
- Provide clear guidance to people walking on when it is safe to cross

Typical cons:

- High maintenance costs
- Can fail during power outages
- Cause delay for people walking, biking, and driving during non-peak hours
- More conflict points and higher speeds compared to roundabouts resulting in poorer safety outcomes for people walking, biking, and driving

ROUNDABOUTS

Typical pros:

- Reduced delay for people walking, biking, and driving at peak hours and other times
- Reduced air and noise pollution and fuel use with fewer stops, hard accelerations, and idling
- Low maintenance cost (relative to signalized intersection control)
- Improve safety for all users (90% reduction in fatalities, 76% reduction in injuries, and 35% reduction in all crashes

Typical cons:

- People walking can find it uncomfortable to cross without the familiarity of a signalized crossing
- Drivers may not be familiar with how to drive through a roundabout, which can cause confusion and discomfort
- Can require more space
- More complicated construction phasing

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ROUNDABOUT PEDESTRIAN FEATURES

Pedestrian-activated flashing beacons at crosswalks

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ROUNDABOUT PEDESTRIAN FEATURES

Pedestrian-activated flashing beacons at crosswalks

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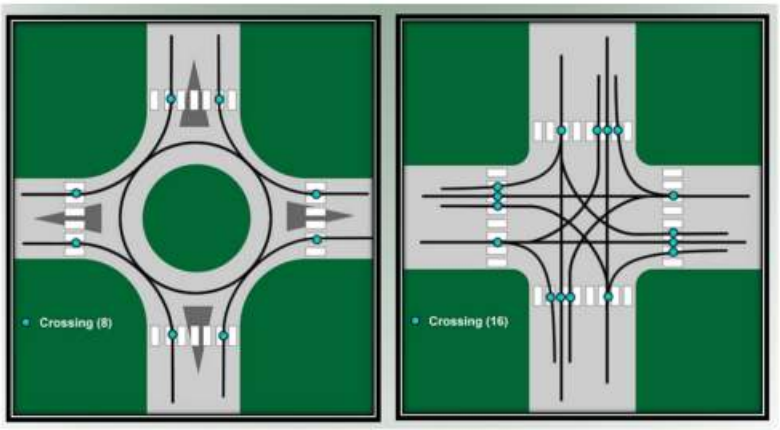
VEHICLE-PEDESTRIAN CONFLICT POINTS



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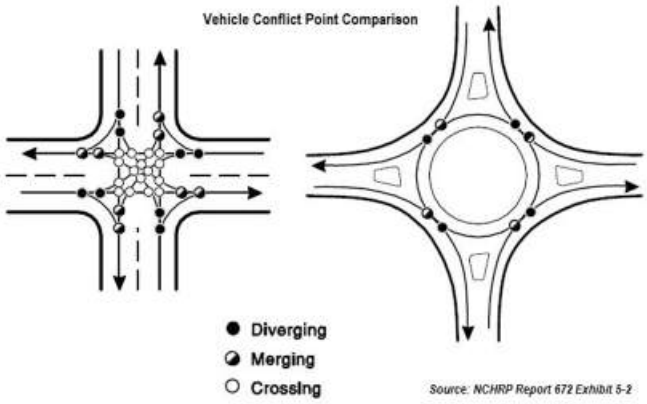
VEHICLE-VEHICLE CONFLICT POINTS



NEXT STEPS

- Listen to feedback and input from community
- Further refine technical information
  - Traffic flow
  - Construction costs
- Work with College to select a preferred concept
  - Either roundabout or signal
- Selection due Fall of 2019
  - Communicate results to the public

YOUR FEEDBACK

- What do you *like* or *dislike* about the roundabout concept?
- What do you *like* or *dislike* about the signalized concept?
- Which evaluation criteria are most important to you?

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YOUR FEEDBACK

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QUESTIONS?

THANK YOU FOR ATTENDING!

For questions or comments, contact:

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(206) 801-2428

For more information and future updates, please visit:
shorelinewa.gov/160Greenwood