



# Oregon

Kate Brown, Governor

**Department of Transportation**  
Region 3 Planning and Programming  
3500 NW Stewart Parkway  
Roseburg, Oregon, 97470  
Phone: (541) 957-3500

January 25, 2022

Eric Evans  
Malheur County Planning Director  
251 "B" Street, West #12  
Vale, OR 97918

**RE: Conditional Use Permit for Cairo Roundabout Intersection @ US 20/OR 201**

Dear Mr. Evans,

ODOT is proposing to construct a roundabout at the Cairo Junction Intersection of US 20 and OR201. This intersection improvement was selected and funded through the All Roads Transportation Safety (ARTS) program because this intersection has been recognized as having a safety issue for a number of years. The roundabout was made part of a larger project that includes freight improvements along US 20 between Burns and Ontario. This project is scheduled for construction in 2023 and will improve US 20 for all traffic, including the over-dimension loads that currently have to detour along OR 78 and US 95.

The centerline of the northwest leg of the roundabout and the southwest oversized load bypass extend outside of the existing right of way lines onto farm land and can be considered a realignment under the Transportation Planning Rule (TPR). This requires an alternative analysis review under OAR 660-012-0065(5). Road realignments on rural lands are permitted consistent with Goals 3, 4, 11, and 14 without a goal exception, subject to the criteria of OAR 660-012-0065(5) and ORS 215.296.

Submitted are the following documents:

1. Findings addressing ORS 215.283 and OAR 660-012-0065(5)
2. Malheur County CUP Application form
3. Sketch of roundabout
4. Assessor Parcel Map
5. 2-FHWA Roundabout Brochures

MCC 6.4.8(C) allows for transportation related conditional use permits to be authorized for a period of up to three years. Based on the extensive state review process, ODOT is requesting the full three-year allowance for the commencement of construction.

If you have any questions please contact me at (541) 957-3521 or email me at [janell.stradtner@odot.oregon.gov](mailto:janell.stradtner@odot.oregon.gov).

Sincerely,

*Janell Stradtner*  
Janell Stradtner

ODOT Transportation Planner

Enclosures

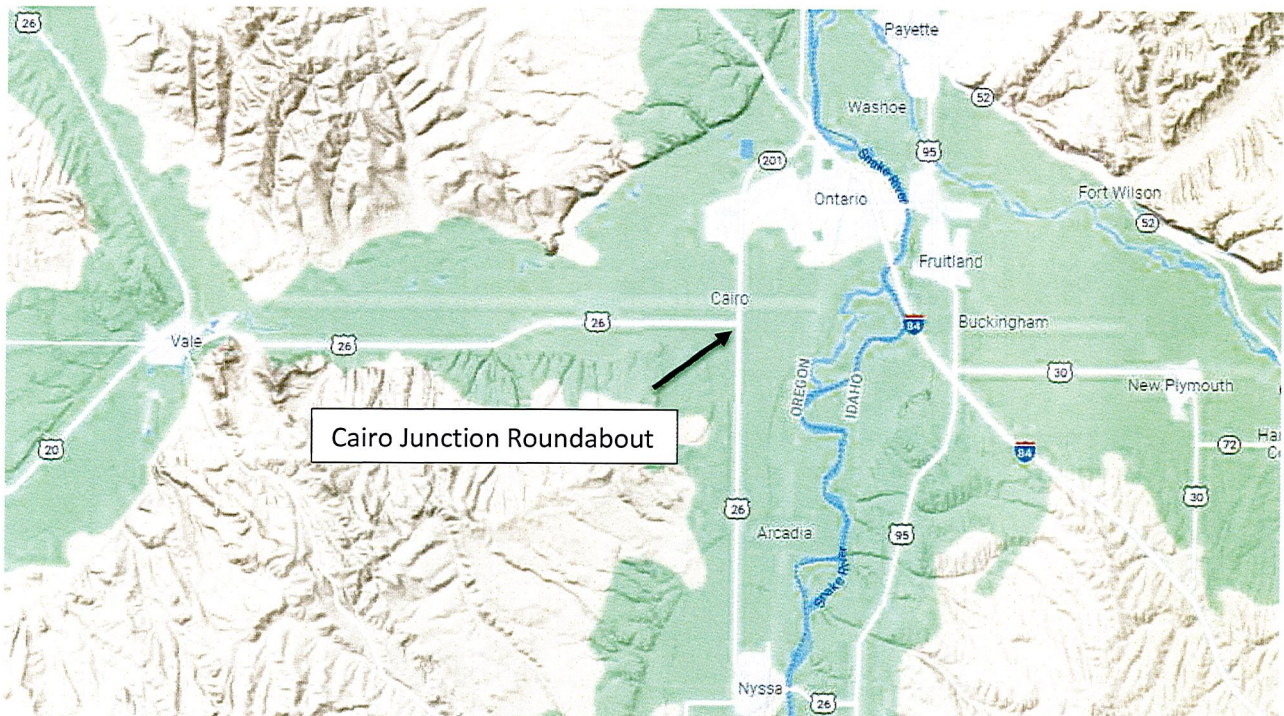
**Oregon Department of Transportation**  
**US 20/OR 201: Burns to Ontario (STIP Key #21230)**  
**Conditional Use Permit with Alternative Analysis Findings**

A conditional use permit (CUP) is required for the construction of a roundabout at the US 20/OR 201 intersection as part of the Freight and Safety Improvement project. These findings address the required criteria, and demonstrate compliance with the Malheur County Code and Oregon rules and statutes.

**Location and Background**

US 20 stretches from the Newport, Oregon east to Boston, Massachusetts, at roughly 3,365 miles it is the longest road in the United States. US 20 in Oregon is a designated statewide freight route. OR 201 is a north-south state highway that runs from Interstate 84 to the Idaho state line. This CUP focuses on the intersection of US 20 and OR 201, four miles south of Ontario.

This project was elevated because of safety concerns at the Cairo Junction Intersection. The intersection has a higher than average crash rate. The roundabout was made part of a larger project that includes freight improvements along US 20 between Burns and Ontario. This project is scheduled for construction in 2023 and will improve US 20 for all traffic, including the over-dimension loads that currently have to detour along OR 78 and US 95. This will be done by paving over 20 existing and new pull out areas between Riley Junction and Ontario. Large loads that impact traffic will move in stages. Paved turn out areas will allow traffic to pass before traveling to the next pull out. Upgrades will improve the efficiency of freight movement. Safety will increase for all travelers, especially when large loads are on the road.



The roundabout is funded through the All Roads Transportation Safety (ARTS) program and was selected because of the safety problem that has been identified at this intersection. This intersection has been recognized as having a safety issue for a number of years. The issues seem to be mostly related to high speeds and left turns at this intersection. Even though a number of safety improvements have been made over the years, crashes have continued to occur at this location. Funding for the remainder of the

project was secured through the HB2017 Freight and Safety Improvements Project and is listed in the Statewide Transportation Improvement Program (STIP) as US20/OR201 Burns – Ontario Project, Freight and Safety Improvements, Key No. 21230.

Roundabouts are designated by the Federal Highway Administration (FHWA) as a Proven Safety Countermeasure. FHWA's Proven Safety Countermeasures initiative (PSCi) is a collection of countermeasures and strategies effective in reducing roadway fatalities and serious injuries on our Nation's highways. Transportation agencies are strongly encouraged to consider widespread implementation of PSCs to accelerate the achievement of local, State, and National safety goals.

Roundabouts are a Proven Safety Countermeasure because they can substantially reduce crashes that result in serious injury or death. The project will include the installation of a roundabout to improve safety for all travelers at this intersection. The design will create safe access to east-side properties and provide a dedicated turn lane for westbound traffic headed towards Vale. This rural connector is critical for local residents, ranching, agriculture, mining and other traffic.

The section of OR 201 between Cairo Junction and Interstate 84 is a designated expressway. It is designed to improve traffic flow to/from the interstate system. The project enhancements will help this section meet current expressway standards by reducing access points along the corridor.

The Mobility Advisory Committee/Stakeholder Forum gave formal support for the roundabout design at the US20/OR201 (Cairo) Intersection, during the March 11, 2021 Mobility Advisory Committee Meeting.

Very early in project development ODOT met with key industry stakeholders and the Southeast and Northeast Area Commission on Transportation in Ontario, Oregon. Key stakeholders included local/state officials, trucking industry, and local agriculture haulers. The meeting focused on roundabouts and intersection safety. ODOT also met with the Malheur County Safety Commission to discuss the project and potential impacts.

Public Engagement for the Freight Improvement Project included numerous advertising through the three area newspapers, two radio stations with ads playing daily, and through social media in addition to the following:

- 2019 (fall): ODOT met with key industry stakeholders and the South East and North East Area Commission on Transportation.
- 2020 (summer): ODOT met with the Malheur County Safety Commissions.
- 2021 (summer): Online and in-person open house. Media notices announced time and web access information for this event.

### **Purpose and Need**

The OR 201 Corridor Refinement Plan states that the US 20/ OR 201 intersection is forecasted to exceed maximum operating standards through the year 2025. To mitigate the year 2025 buildout deficiencies, a rural single-lane roundabout is recommended. The Plan recognizes that OR 201 corridor is a designated Freight Route, and that a roundabout would need to take into account the ability of oversized truck loads to successfully navigate it.

The OR 201 Corridor Refinement Plan was adopted by the Malheur County Court into the county Transportation System Plan (TSP) and by the Oregon Transportation Commission (OTC) into the Oregon Highway Plan (OHP). As such, the roundabout is consistent with both the county's TSP and the state's

OHP. In addition, the roundabout is consistent with Goal 4 of the Refinement Plan, which states “Ensure the continued function of OR 201 as a designated Freight Route” and the objective being to “Promote safe and efficient travel along the OR 201 study corridor by minimizing through travel delay.”

The ODOT Traffic Signal Policy and Guidelines, September 2017, states that operational approval for the installation of a traffic signal requires an engineering study that requires a comparison of reasonable alternatives including roundabouts. The results of that study further supported the roundabout.

Installing a roundabout will improve safety for all travelers at this intersection. The current design will create safe access to the east-side properties and provide a dedicated turn lane for westbound traffic headed towards Vale. This rural connector is critical for local residents, ranching, agriculture, mining and other traffic.

A roundabout at this intersection will:

- Improve safety by slowing traffic through the intersection and having it all move the same direction.
- Reduce the number of crashes.
- Reduce the number of injury crashes (expect an 80% reduction) and reduce or eliminate fatal injury crashes (based on historical data).
- Reduce crash severity, low speed sideswipe crashes in roundabouts vs. high speed, head-on or T-bone crashes at signalized intersections.
- Improve traffic flow by reducing wait times to merge during heavy traffic. Average travel time through roundabouts is similar to signalized intersections.
- Improve safety for local residents and businesses adjacent to Cairo Junction by creating direct links to the east leg of the roundabout at the cul-de-sac connector. This will also reduce the number of highway access driveways near the roundabout, which have a high potential for crashes.

A traffic signal was considered as an alternative to a roundabout. However, a signal would not be an improvement to safety. The Cairo Junction Intersection has had 31 reported crashes between 2009 and 2018, including 15 injury crashes and 1 fatality. There is a high probability of another fatality with the existing configuration or a traffic signal. The installation of a roundabout will virtually eliminate the possibility of another fatal or serious injury crash. National data shows an 82% reduction of fatal and injury crashes with roundabouts. Oregon has experienced even better safety performance from roundabouts with no fatalities at any state highway roundabout through 2021.

Signal installations typically do not help to reduce the rate of accidents and in some instances they have increased the rate of accidents after installation. For example, the traffic signal at OR 201/SW 18<sup>th</sup> intersection experienced higher crash rates after the installation of the traffic signal. In the 10 years before the signal was installed that intersection experienced 10 crashes. From 2010-2019 that same intersection experienced 22 crashes with 1 being a fatality and 10 being injury crashes. It is reasonable to expect similar results or even higher crash numbers, due to increased traffic volumes at Cairo Junction.

FHWA identified roundabouts including rural areas as a Proven Safety Countermeasure because of their ability to substantially reduce the types of crashes that result in injury or loss of life. Roundabouts are designed to improve safety for all users, including pedestrians and bicycles. They also provide significant operational benefits compared to conventional intersection improvements.

FHWA reports that much public opposition to roundabouts was rooted in misunderstanding about roundabouts—many people confused roundabouts with traffic circles or rotaries. Public outreach and education along with the engagement from the public brings an understanding of the benefits and operations of roundabouts.

Crashes at rural intersections often involve high speeds, which tend to result in severe injuries or fatalities. Roughly one-third of annual intersection fatalities in the U.S. occur along rural, two-lane highways. Roundabouts are geometrically designed for drivers to negotiate the intersection at speeds in the range of 15-25 mph, regardless of the posted speed limits on approaches. Roundabouts constructed at intersections along high-speed, two-lane rural highways reduced overall crashes by up to 68 percent and reduced injury crashes by up to 88 percent.

In many rural environments, drivers can miss a stop sign or traffic signal, leading to running through a stop sign or red light and resulting in an angle crash. Because roundabouts require vehicles to yield and then navigate around a raised, circular island, the possibility of an angle crash is significantly reduced. Roundabouts constructed at intersections along high-speed, two-lane rural highways eliminated 83 percent of angle-type crashes.

For a driver turning left across oncoming traffic, it can sometimes be difficult to judge the speed of the approaching vehicle, resulting in misjudged gaps, and potentially severe crashes. With roundabouts, there is no need to make a turn across opposing traffic. Entering vehicles yield to traffic already in the circle, and proceed when there is a safe gap. Researchers compared traffic speeds of approaches to roundabouts and stop-controlled intersections. At 100 feet before the yield or stop lines, the speed of traffic at the roundabouts was 2.5 mph lower than at the stop-controlled locations.

Why build something “different” when all that is needed is either stop signs or a traffic signal? Because improvements like stop signs and signals, while very familiar, aren’t always the safest choice. With intersections representing about one-quarter of annual U.S. traffic fatalities and roughly half of all injury crashes, safer designs are needed that improve mobility while saving lives. Since the late 1990s, an ever growing number of State DOTs and local road agencies are finding that roundabouts work in their jurisdictions. Their potential for saving lives is too significant to ignore.

Saving lives and preventing serious injuries are the highest priority of both first responders and highway agencies. Roundabouts are safer intersections that result in fewer severe crashes requiring emergency response. Safer intersections are important for first responder occupational safety and health, too. Studies show that most fatalities resulting from a crash involving a fire truck occur at, or are related to, an intersection. Further, angle crashes are the most common fatal crash type involving fire trucks. The International Association of Fire Fighters (IAFF) and others cite intersections as high risk locations for all emergency response disciplines.

Roundabouts are not designed to inhibit traffic. Rather, they are optimized for the safety and efficiency of all users. Roundabouts can be designed for large trucks, including a special purpose apparatus such as a ladder truck. This is accomplished by using features such as:

- Wider entry and exit lanes for efficient movement of traffic through the roundabout.
- Mountable aprons and curbs intended for use by vehicles with a wide and/or long wheelbase.
- Curvature and radii that allow for easy turning movements, including u-turns.

Roundabouts are also a very efficient type of intersection. They do not have the same stop-and-go conditions as traditional intersections.

- Roundabouts keep people moving, but at speeds where injury risk is greatly reduced.
- Roundabouts can reduce or eliminate lines of stopped traffic typical of stop signs and traffic signals, making them easier to navigate throughout the day and night.
- Unlike traffic signals, roundabouts don't depend on electricity to function, so they are not susceptible to power outages.
- Roundabouts have lower lifecycle costs. They eliminate the equipment, maintenance and electrical costs necessary for traffic signals.

**Permits**

The Malheur County Code (MCC) regulates the development and use of lands within the project area in compliance with the statutes and administrative rules associated with the Statewide Planning Program. This application concerns the roundabout at the US 20/OR 201 intersection and the need to acquire exclusive farm use zoned land for the highway realignment from two parcels located in Malheur County. All other transportation improvements for this project are permitted outright. (MCC 6.4.8(A)). MCC Chapter 3 and ORS 215.283 allow the acquisition of resource zoned land for the highway pullouts and right turn lane.

The centerline of the northwest leg of the roundabout, and the oversized load bypass in the southwest quadrant, extend outside of the existing right of way line onto farm zoned land, and can be considered a realignment under the Transportation Planning Rule (TPR) which requires an alternative analysis review under OAR 660-012-0065(5). Road realignments on rural lands are permitted consistent with Goals 3, 4, 11, and 14 without a goal exception, subject to the criteria of OAR 660-012-0065(5) and ORS 215.296.

Affected parcels:

Legal Description	Acreage	Acquired	Owner	Existing Use	Zone
T18S, R47E, Sect.19, TL 1100	34.72	1.09 ac.	Ray H. Winegar and Vicki Winegar, Trustees	Crops	A1/EFU
T18S, R47E, Sect.19, TL 1900	35.67	.03 ac.	Dee J. Winegar and Winegar Living Trust, James R. Winegar, Trustee	Crops	A1/EFU

**ORS 215.296 / MCC 6-6-7(H)**

The ORS and MCC prescribes standards for approval for projects in exclusive farm use zones. The proposed use must not:

- Force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use, or
- Significantly increase the cost of an accepted farm or forest practices on surrounding lands devoted to farm or forest use.

ORS 215.203(2)(c) defines “accepted farming practice” as a mode of operation that is common to farms of a similar nature, necessary for the operation of such farms to obtain a profit in money, and customarily utilized in conjunction with farm use.

Other uses, besides farming, within a quarter-mile of the project range from an elementary school, car repair, nursery, residences, retail, and self-storage unit and are all dependent on the highway for access to their properties.

The MCC states that the purpose of the EFU, ERU and EFFU zones is to maintain the resource based economy of Malheur County by permitting the establishment of only those uses that are compatible with agricultural activities. The intent is to ensure that the areas classified as such are preserved and protected from conflicting non-resource uses.

The statewide standard for minimum parcel sizes is 80 acres for farmland. Tax Lot 1100 is 34.72 acres and does not meet the minimum size standard. That being said the adjacent parcel, TL 1001, is under the same ownership and is 31.27 acres. Even if the two parcels were combined they would not meet the minimum parcel size for the EFU zone. The acquisition of 1.09 acres of farm land will not cause the parcel to be nonconforming.

Tax Lot 1900 is 35.67 acres, of which approximately 1 acre is zoned as Rural Service Center (C-RSC). This too does not meet the minimum parcel size of 80 acres for farm land. Approximately .03 acres of the farm zoned land would be acquired to accommodate the oversized load bypass in the southwest quadrant of the roundabout. Tax Lot 1900 will not become nonconforming as a result of the property acquisition.

The parcels will continue to support and complement existing crop rotation and any proposed farm uses. Access to the properties will be available during construction and adequate access will be provided after completion of the project. Any impacts will be negotiated through the right of way process.

The project will not bisect or interrupt critical farm practices. The acquisition of the resource zoned land occurs in the corners of the properties. The project will not cause the properties to be fragmented. Fragmentation can cause adverse impacts on farming practices and production when trying to access another parcel that is separated by a road. Because the proposed project is not fragmenting the subject parcels the adverse impacts to the resource zoned lands are therefore less than if the proposed project were to bisect the land.

The taking of exclusive farm use land for the roundabout will reduce the size of the parcels but not the uses of the subject parcels. While this may impact the income able to be generated by the parcels, nothing in the project is anticipated to increase the cost of conducting farm or forest practices on lands devoted to those uses, much less significantly increase the cost.

The acquisition of the farm land is for an existing use and the modification of the roadway will not create a new use nor will it create an incompatible use. A roadway is a necessary function of any farm operation. The proposed project does however remove some resource zoned land out of production. The subject properties will continue to support and complement existing and proposed farm uses. The siphon irrigation head ditch located west of the roundabout will not be impacted by this project.

The resource zone is intended to guarantee the preservation and maintenance of the areas so classified for farm use free from conflicting non-farm/non-forest uses and influences. The roundabout project will not create a new use; it is in response to a critical infrastructure need to address critical ongoing safety issues occurring at this intersection. The roundabout will remain compatible with farm and agricultural uses. The widened intersection will remove some resource zoned land from production but it will not render the parcels unusable for farm use. Roadways are an integral part of farming and agricultural operations. They provide a means of transportation that is a necessity of any farm operation. The

project as proposed will provide a safe and accessible transportation system to all parcels in the area. It does not pose a conflict to existing and permitted uses but provides a safe and efficient transportation network to their benefit. Farm operations that rely on the transport of goods and/or services will benefit from the improved transportation system. All users of the road will benefit from a safe and efficient transportation system.

The intent of this project is to provide for a safe intersection for all users and to prevent future fatalities and injuries that will continue to increase.

**OAR 660-012-0065 - Transportation Improvements on Rural Lands, and OAR 660-012-0070, Exceptions for Transportation Improvements on Rural Land.**

OAR 660-012-0065 describes highway improvements outside UGBs for which exceptions to Statewide Planning Goals are not required. OAR 660-012-0070(1) states “Transportation facilities and improvements which do not meet the requirements of OAR 660-012-0065 require an exception to be sited on rural lands.” OAR 660-012-0070 also defines the requirements, which a local government must meet when Goal exceptions are required, including for state highway improvements. The project would comply with the TPR because it would be exempt from the requirement for exceptions to Statewide Planning Goals.

**OAR 660-012-0065 - Transportation Improvements on Rural Lands**

***(5) For transportation uses or improvements listed in subsections (3)(d) to (g) and (o) of this rule within an exclusive farm use (EFU) or forest zone, a jurisdiction shall, in addition to demonstrating compliance with the requirements of ORS 215.296:***

***(a) Identify reasonable build design alternatives, such as alternative alignments, that are safe and can be constructed at a reasonable cost, not considering raw land costs, with available technology. The jurisdiction need not consider alternatives that are inconsistent with applicable standards or not approved by a registered professional engineer;***

***(c) Select from the identified alternatives, the one, or combination of identified alternatives that has the least impact on lands in the immediate vicinity devoted to farm or forest use.***

State highways must be designed, constructed, operated and maintained in accordance with State and Federal regulations, directives, safety standards, design standards, and construction standards. ODOT must meet applicable standards for alternative design (e.g., lane width, distance between intersections, signal locations and traffic capacity). As a government agency, ODOT is committed and obligated to build a safe and functional road system.

For this project many factors such as; topography, road geometry, engineering standards, existing features and development, and available funding limited the design alternatives for accommodating future traffic on US20/OR201 highways. A roundabout has 75% fewer conflict points than a traditional 4-way traffic signal. A signalized intersection has 32 conflict points as opposed to 8 conflict points with a roundabout.

Based on the purpose and need of this project the following primary goals and objectives have been established:

1. Address the historic safety concerns at the Cairo Junction Intersection
2. Make a long term fix
3. Employ sound engineering
4. Accommodate farm equipment and large loads



Due to the potential for serious crashes associated with the high turning volumes and high speeds, an upgrade to the traffic control at the intersection is necessary. The ARTS project looked at several potential traffic control scenarios. The intent of the project was to create a long term solution to the crash issue at this intersection.

A safety analysis was performed for the Cairo Junction intersection. The intersection is a 2016 Top 10% SPIS location. Between 2009 and 2018 this intersection was the site of 31 reported crashes including 15 injury crashes and 1 fatality. Leading crash causes included; turning movements and rear-end crashes. This intersection had a fatal crash that was caused by not yielding at the stop sign.

The OR 201 Corridor Refinement Plan states that the US 20/ OR 201 intersection is forecasted to exceed maximum operating standards through the year 2025.

This project was elevated because of safety concerns at the Cairo Junction Intersection. Other issues with this intersection are:

- High speeds
- Acceleration lane adds complexity
- High crash history for the ADT (average daily traffic)
- Injury crashes and fatalities
- SPIS site
- Crash rate is higher at the Cairo intersection vs other intersections

Ultimately two alternatives were considered for the Cairo Junction Intersection at US20/OR 201.

#### **Alternative 1 (Proposed intersection improvement): Roundabout**

This alternative would construct a roundabout slightly north of the existing intersection, this option was selected based on the following:

- Installing a roundabout will improve safety for all travelers at this intersection.
  - Improve safety by slowing traffic through the intersection and having it all move the same direction.
  - Reduce the number of crashes.
    - Reduce the number of injury crashes (expect an 80% reduction) and reduce or eliminate fatal injury crashes (based on historical data).
  - Reduce crash severity, low speed sideswipe crashes in roundabouts vs. high speed, head-on or T-bone crashes at signalized intersections.
- Improve traffic flow by reducing wait times to merge during heavy traffic. Average travel time through roundabouts is similar to signalized intersections.
- Meets the goals of the OR 201 Corridor refinement plan in two key areas:
  - Improve safety for local residents and businesses adjacent to Cairo Junction by creating direct links to the east leg of the roundabout at the cul-de-sac connector. This will also reduce the number of highway access driveways near the roundabout, which have a high potential for crashes.
  - The layout allows for the future development of a minor collector roadway connecting OR 201 easterly to Alameda Avenue.

#### **Alternative: Signalized intersection**

This alternative would construct a signalized intersection at the exiting intersection location, after examination by professional engineers (consultants and ODOT staff), it was determined that a signalized intersection would not meet standards for the following reasons:

- Unlikely to meet any signal warrants.
- Increased crash history on the OR 201/18<sup>th</sup> Street signalized intersection since signal installation in 2003

- The crash rate more than doubled in the 10 years since the signal installation vs. the ten years prior to the signal installation.
- Unable to meet the needs of the OR 201 Corridor refinement plan in two key areas:
  - The plan calls for adding a minor collector roadway serving the Cairo Junction Rural Service Center. This would be challenging at this location due to the irrigation ditch and the location of the storage unit business.
  - The plan calls for improving access to those properties located within the Cairo Junction Rural Service Center. This would be nearly impossible with a signal due to the signal/intersection location, and a signal would likely make access to these properties more difficult (queuing in front of the existing driveway).
  - Challenges with driver expectation requiring OR201 through traffic going 55mph having to come to a complete stop.

The intent of the project was to create a long term solution to the crash issue at this intersection. After review, a roundabout was proposed to address the crash problem. According to the ODOT traffic manual, a roundabout will reduce all injury crashes by 76%, all crashes by 35% and all fatal crashes by 90%. Additionally, this project will combine access on the east side of this intersection and bring them in as the easterly leg of the roundabout. The roundabout will incorporate splitter islands and reversing curves to calm and slow traffic approaching the intersection to increase safety. This improvement will reduce speeds and the conflict points to increase safety.

A 16-hour pedestrian count performed at the existing intersection in 2019 indicated no pedestrian use. There is one multilane approach that pedestrians may need to cross. This multilane approach leg has a rectangular rapid flashing beacon and raised island between the two lanes providing a refuge for pedestrians.

The signalized intersection alternative could not be supported by state engineers because of these operational and safety issues and was thus dropped from further consideration.

Between 2009 and 2018 this intersection was the site of 31 reported crashes including 15 injury crashes and 1 fatality. Alternative 1 is the only reasonable build alternative that meets the engineering standards for a safe rural highway intersection. The roundabout will operate efficiently in the near future and the 20 year planning horizon and is within a reasonable cost without considering the raw land costs with the available budget. Roundabouts are proven effective in increasing safety for rural high speed intersections.

The design for the approaches to the roundabout help in reducing speeds

Installing a roundabout at this intersection is expected to:

1. Improve safety by slowing traffic through the intersection and having it all move the same direction.
2. Reduce the total number of crashes.
3. Reduce the number of injury crashes by as much as 80%, and reduce or eliminate fatal injury crashes (based on historical data).
4. Reduce crash severity, crashes that could occur would be low speed sideswipe crashes in roundabouts rather than higher speed head-on or T-bone crashes, which are typical at signalized intersections.
5. Improve traffic flow by reducing wait times to merge during heavy traffic periods. Average travel time to circulate through roundabouts is similar to signalized intersections.
6. Improve safety for local residents and businesses adjacent to Cairo Junction by creating direct links to the east leg of the roundabout at the cul-de-sac connector. This should also reduce the

number of highway access driveways near the roundabout, which have a high potential for crashes.

**OAR 660-012-0065(5)**

***B. Assess the effects of the identified alternatives on farm or forest practices, considering impacts to farm and forest lands, structures and facilities, considering the effects of traffic on the movement of farm and forest vehicles and equipment and considering the effects of access to parcels created on farm and forest lands;***

Two alternatives that were considered are a traffic signal and a roundabout. The roundabout would acquire about 1.12 acres of farm land, whereas the traffic signal would not acquire any farmland. As noted in the above findings the removal of the 1.12 acres of farmland would reduce the size of the parcels but not the use of the parcels. While this may impact the income able to be generated by the parcels, nothing in the project is anticipated to increase the cost of conducting farm or forest practices on lands devoted to those uses, much less significantly increase the cost.

The Cairo Junction Intersection and highways have coexisted with the surrounding lands and provides access to the properties for farming. The highways provide critical access for intercity and interstate travelers. The realignment of the intersection allows for the ideal design of the roundabout to create a safe intersection.

The design of the roundabout took into consideration farm vehicles and large loads. The roundabout will provide for safer movement of farm vehicles and large loads through this critical intersection. The intent of the project was to create a long term solution to the crash issue at this intersection.

Roadways are an integral part of farming and agricultural operations. They provide a means of transportation that is a necessity of any farm operation. The project as proposed will provide a safe and accessible transportation system to all parcels in the area. It does not pose a conflict to existing and permitted uses but provides a safe and efficient transportation network to their benefit. Farm operations that rely on the transport of goods and/or services will benefit from the improved transportation system. All users of the road will benefit from a safe and efficient transportation system. The purpose and need of this project is to address the safety issues at this intersection.

After consideration of the alternatives and further evaluation of each of those alternatives, only one met the purpose and need of the proposed project while avoiding unreasonable economic impacts, or which could be built at a reasonable cost given the available budget. Based on the analysis of the proposed alternatives, only Alternative 1 was a reasonable alternative that met the requirements for safe highway operations and could be constructed at a reasonable cost without considering raw land costs. The impacts to protected farmlands are the result of the need to address the safety concern of the intersection and to accommodate efficient movement of traffic in this area and to meet the project goals and objectives.