

TECHNICAL MEMORANDUM #6 (Exit 207)

Pendleton IAMPs: Exit 207

Preferred Concept

Date: August 25, 2020

Project #: 24043

To: Technical Advisory Committee, Citizen Advisory Committee

From: Amy Griffiths; Nick Foster, AICP, RSP; and Matt Hughart, AICP

This memorandum describes and evaluates the preferred interchange and local circulation improvement concept developed for the Exit 207 Interchange Area Management Plan (IAMP). The preferred concept was developed through an evaluation process that included a high-level screening of initial interchange alternatives, a detailed evaluation of two selected alternatives, and feedback from the project's advisory committees.

SUMMARY OF CONCEPT EVALUATION

The Exit 207 interchange and local circulation improvement ideas were initially developed by members of the project team, the Technical Advisory Committee (TAC), and the Citizen Advisory Committee (CAC) to address known, and anticipated future, geometric and traffic operations and safety conditions. The project team distilled these ideas into unique concepts, which were evaluated in a tiered evaluation process against an established set of criteria. This evaluation was described in *Technical Memorandum #5* (Reference 1).

TAC/CAC Meeting #3 Results

The findings of *Technical Memorandum #5* (Reference 1) were discussed at TAC/CAC Meeting #3, which was held on June 10, 2020. It was determined at the meeting that the preferred concept would be Concept #1B with Accessory #2 (assuming a detailed engineering evaluation finds a roundabout at Airport Road physically possible). If it was determined that the Accessory #2 roundabout at Airport Road would not be possible, then the preferred concept would be Concept #1B paired with the signalization of Airport Road from Concept #3.

PREFERRED CONCEPT

This section describes and evaluates the preferred concept for the Exit 207 interchange. Figure 1 shows a concept drawing of the preferred concept.

The fundamental components of the preferred concept are listed below and shown in Figure 1.

- A. **I-84 Westbound Ramp Reconfiguration:** Convert the westbound interchange ramps to a diamond form with a roundabout at the ramp terminal intersection. This includes:
 - o Realigning the existing westbound off-ramp away from its current intersection across from Airport Road
 - o Removing the I-84 westbound looping on-ramp
 - o Realigning the I-84 westbound on-ramp on the north side of US 30 to align with the roundabout ramp terminal.
- B. **Airport Road/US 30 Intersection Reconfiguration:** Convert the existing intersection to a roundabout with four legs: Airport Road, US 30 (Westgate), and a new access road behind the businesses on the north side of US 30.
 - o The roundabout could be constructed with minimal impacts to private right-of-way.
 - o Based on initial consideration of elevation profiles in Google Earth and an overlay of the newly-constructed crime lab, this roundabout appears feasible to construct, though it will likely require significant cut and fill.
 - o The roundabout will require either relocating or eliminating the new public street that connects Airport Road and provides access to the Oregon State Police (OSP) crime lab. Access to the OSP lab may be relocated to the new access road described below or cross-access could potentially be provided through the property to the north.
- C. **New Access Road:** Construct a new access road for businesses on the north side of US 30 (Westgate). Access to US 30 is relocated to this road as properties redevelop to improve access spacing along US 30.

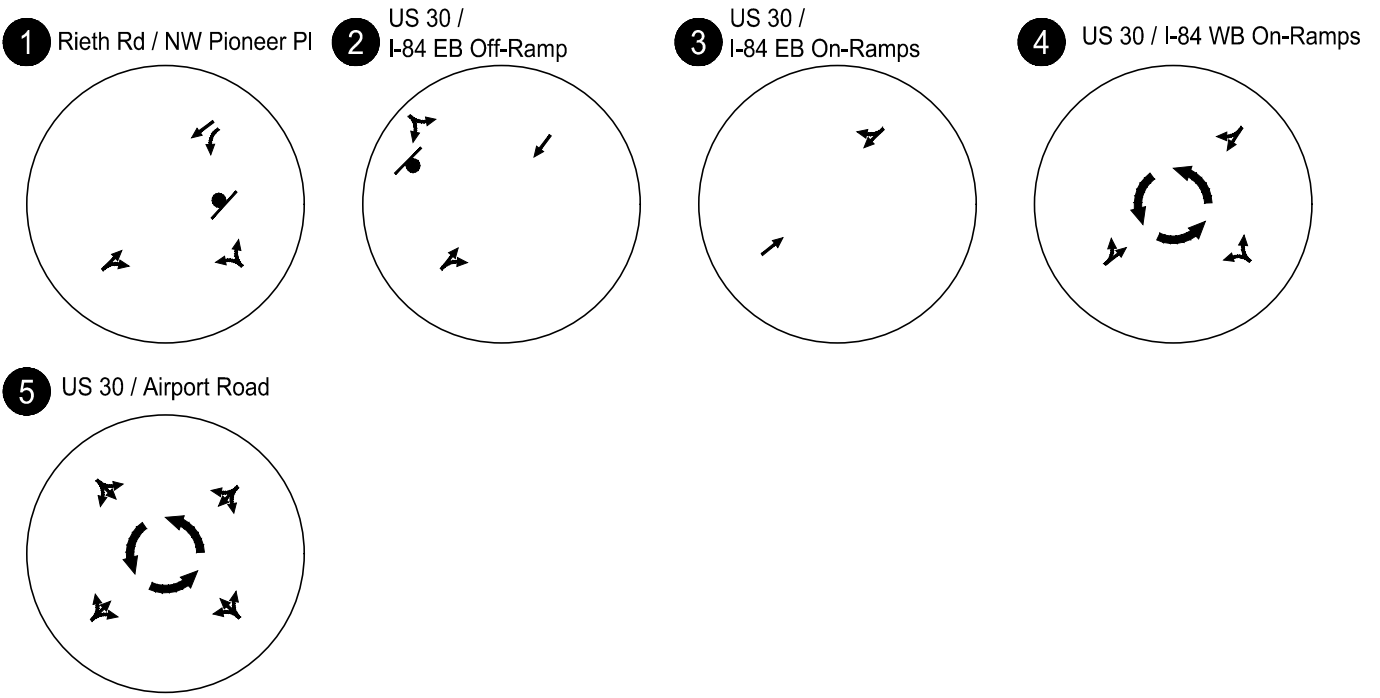
Operations Evaluations Results

The assumed lane configurations for the preferred concept are shown in Figure 2. The year 2040 AM and PM motor vehicle traffic volumes and operations are shown in Figure 3 and Figure 4 respectively. All intersections are projected to operate under-capacity and meet ODOT mobility targets with the lane configurations shown in Figure 2. *Traffic operations worksheets are shown in Attachment "A."*



Exit 207 Preferred Concept
Pendleton, OR

Figure
1



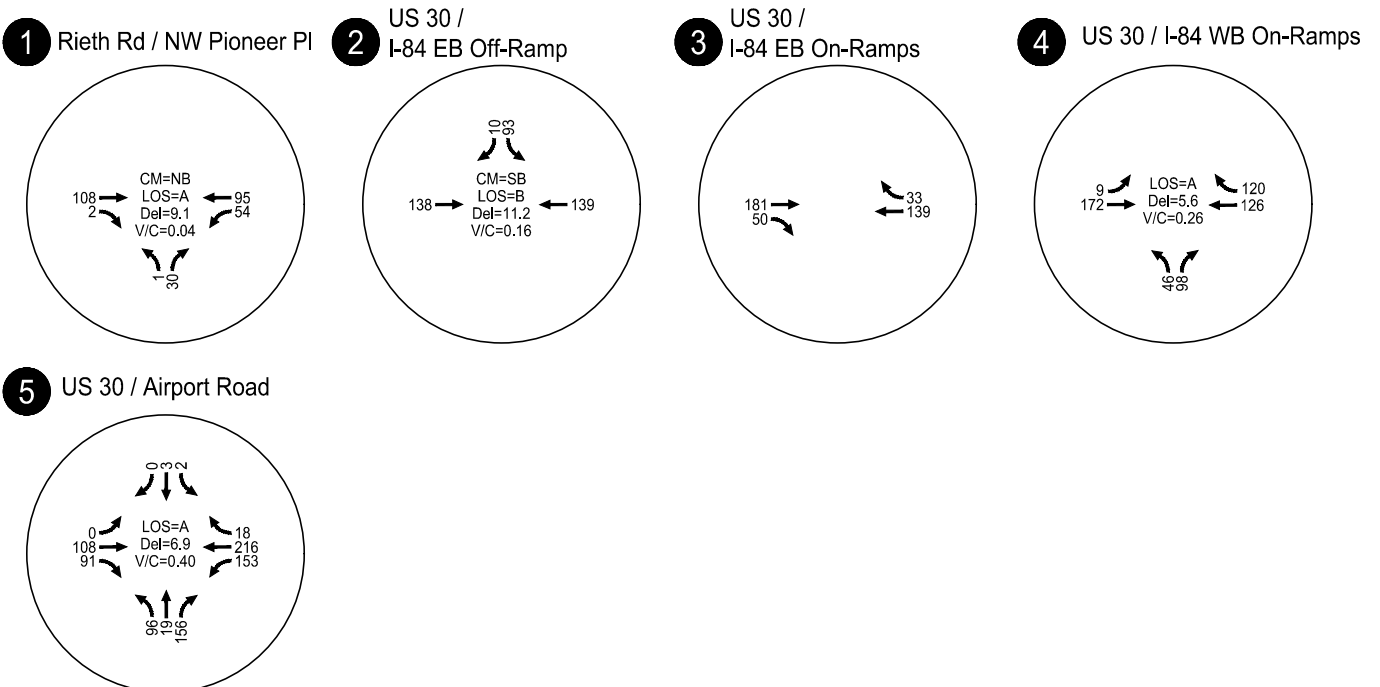
LEGEND

- Lane Movement
- Study Intersections
- Stop Sign

Lane Configurations
Exit 207 Preferred Concept
Pendleton, OR

Figure
2

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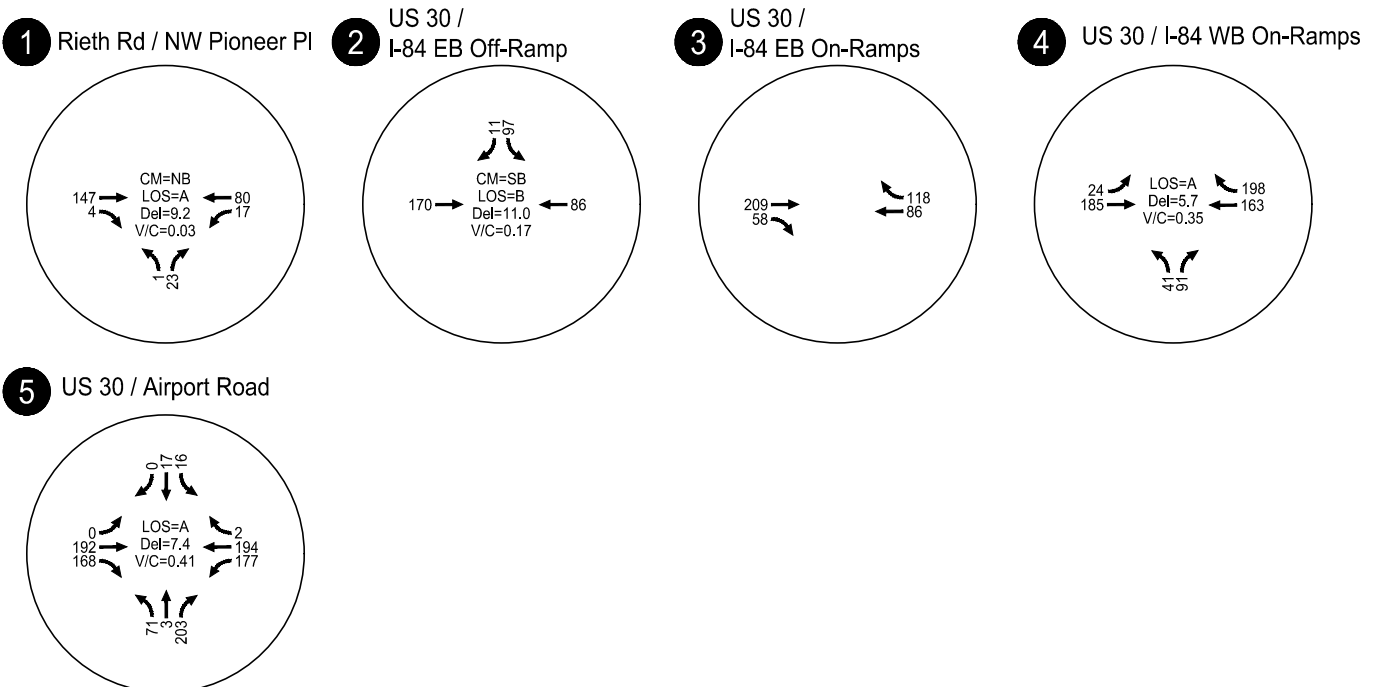


- Study Intersections
 CM - Critical Movement
 LOS - Level of Service
 Del - Vehicle Delay (s)
 V/C - Volume-To-Capacity Ratio

Future AM Peak Hour Traffic Operations
 Exit 207 Preferred Concept
 Pendleton, OR

Figure
 3

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- Study Intersections
 CM - Critical Movement
 LOS - Level of Service
 Del - Vehicle Delay (s)
 V/C - Volume-To-Capacity Ratio

Future PM Peak Hour Traffic Operations
 Exit 207 Preferred Concept
 Pendleton, OR

Figure
 4

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Future Safety Effects

The crash histories at the study intersections and along the study area roadways were reviewed in the *Existing Conditions: Transportation System Operations* memorandum (Reference 2). Crash reduction factors (CRFs) for the roadway and intersection treatments were identified for Concept #1B with Accessory #2 in *Technical Memorandum #5* (Reference 1). The CRFs are used to estimate the potential reduction in crashes that could occur with the implementation of the preferred concept.

Table 1 shows the countermeasures considered in developing the CRF.

Table 1 Crash Reduction Factors

Countermeasures Considered	Crash Reduction Factor (CRF)	Appropriate Intersections/Segments
Convert interchange ramp terminal to roundabout ¹	24% (All Crashes)	US 30 / I-84 WB On-Ramp
Convert intersection with minor-road stop control to modern roundabout ²	82% (Injury/Fatal Crashes)	US 30 / I-84 WB Off-Ramp / Airport Road
Change in driveway density ³	16% (All Crashes)	US 30

¹<http://www.cmfclearinghouse.org/detail.cfm?facid=9445>

²ODOT Crash Reduction Factor List H16

³Change in driveway density from 8 to 3 driveways in ¼ mile; <http://www.cmfclearinghouse.org/detail.cfm?facid=2507>

Table 2 shows the adjusted crash rates at the study intersections and roadway segments, based on the application of the CRFs presented in Table 1. The preferred concept is expected to reduce the study intersection and roadway segment crash frequencies in the study area.

Table 2: Crash Rate¹ Assessment

Study Intersection or Segment	Observed Crashes/Year ¹	Preferred Concept Adjusted Crashes/Year
Reith Road / NW Pioneer Place	0.00	0.00 ²
Rieth Road / I-84 EB Off-Ramp	0.20	0.20
US 30 / I-84 EB On-Ramp	0.00	0.00 ²
US 30 / I-84 WB On-Ramp	0.00	0.00 ²
US 30 / I-84 WB Off-Ramp / Airport Road	0.60	0.27
Airport Road / US 30	0.00	0.00 ²
Rieth Road (within Operation and Access Study Area)	0.40	0.40
US 30 (within Operation and Access Study Area)	0.40	0.33
Total	1.60	1.20

¹Observed crashes per year from 2013 to 2017.

²The number of crashes per year in the long-term is likely more than 0; however, no crashes were reported at this intersection from 2013 to 2017.

Slide-offs on the I-84 Westbound Off-Ramp

Comments from several agency staff at ODOT, the City of Pendleton, and Oregon State Police, indicate that multiple slide-offs occur each year on the I-84 westbound off-ramp during icy conditions. This information does not show up in crash reports, because no damage typically occurs. To try to quantify these occurrences, ODOT provided dispatch logs for the Exit 207 area. From June 2015 through May 2020, there were 30 incidences (i.e., closures, disabled vehicles, crashes) that occurred on or near the I-84 westbound Exit 207 interchange that may be winter weather related. It is not clear from the records what number of these incidences occurred on the off-ramp. It is also not clear if these incidences capture each event that City or State police have responded to.

This history of slide-offs influenced the advisory committees' preferred concept recommendation. Concept #1B includes a full realignment of the westbound off-ramp into a diamond form that is straighter than the current loop ramp. This should reduce the likelihood of future slide-offs on this off-ramp.

Bicycle and Pedestrian Elements

The City of Pendleton's Transportation System Plan includes a project to either build a multi-use path along the north side of US 30 or to build sidewalk and bike lanes along both sides of US 30 through the project area. The realigned portions of US 30 would build out this project along those sections. Further, it is expected that sidewalks would be built along all other new roads and intersections (i.e., both roundabouts and along both sides of the proposed backage road).

Cost Estimates

Table 3 shows the cost estimate for the I-84 westbound ramp reconfiguration, the Airport Road/US 30 intersection reconfiguration, and the and new access road. The cost estimates assume a construction contingency cost of 20 percent, a construction engineering cost of 15 percent, and a preliminary engineering costs of 15 percent. The total cost of the preferred concept is estimated to be \$8.8 million.

Table 3: Preferred Concept Cost Estimate

Component	Estimated Cost
I-84 Westbound Ramp Reconfiguration	\$5,400,000
Airport Road/US 30 Intersection Reconfiguration and New Access Road	\$3,400,000
Total	\$8,800,000

This cost estimate is greater than the estimate presented in *Technical Memorandum #5* (Reference 1). This is the result of the more detailed assessment of the feasibility of the roundabout at the Airport Road/US 30 intersection, which revealed more information about the level of fill that would be required, as well as the inclusion of the sidewalk and bike lanes described in the preceding section. *Detailed cost estimate sheets are shown in Attachment "B."*

Access Plan

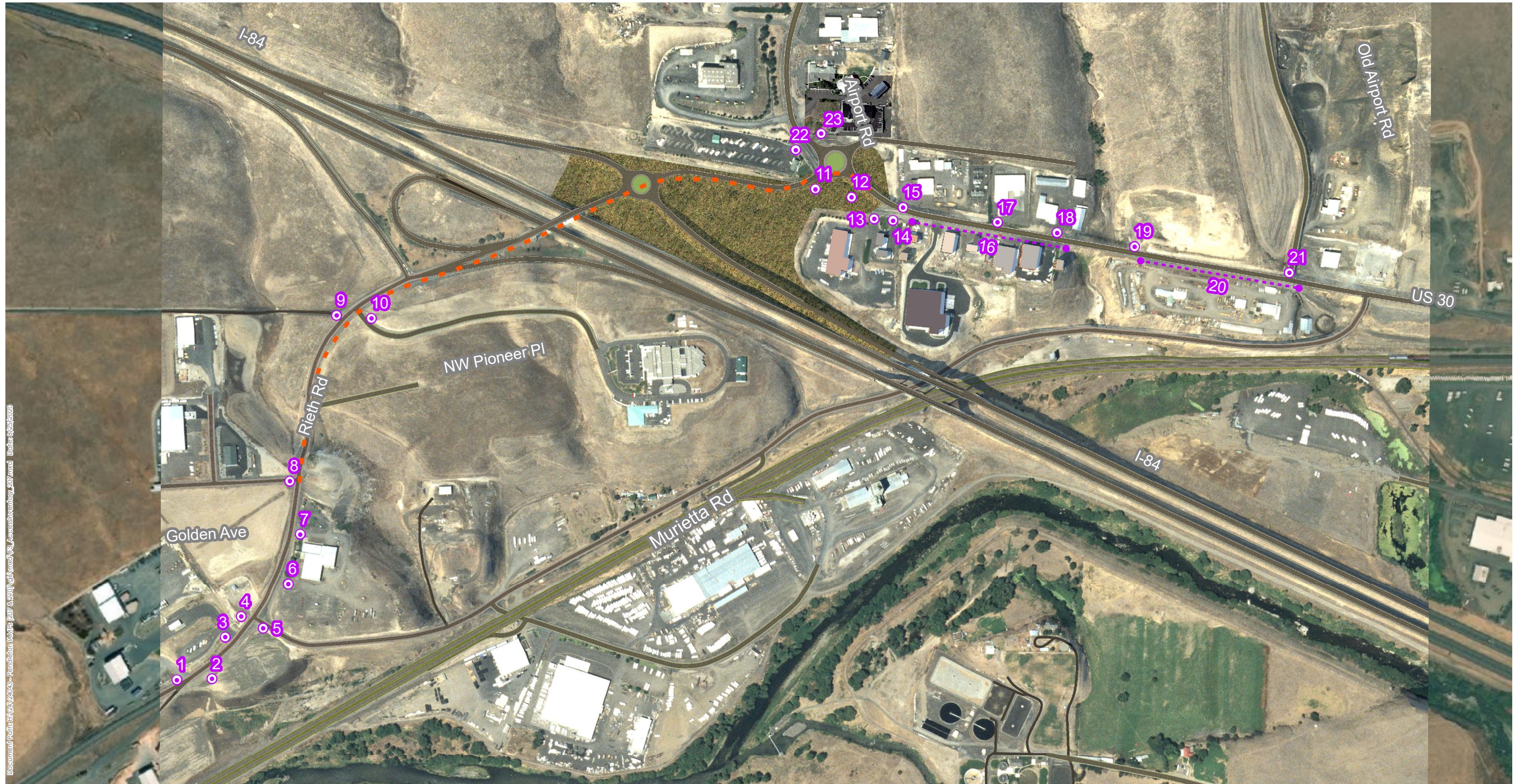
The project team has developed a preliminary access management plan for the Operations and Access Study Area (OASA) that reflects the preferred interchange concept. The plan aims to move access locations in the OASA towards ODOT’s access spacing standards through consolidation of driveways and relocation of public streets. Some of these access changes would need to be implemented with the interchange reconfiguration and others are anticipated to occur over time as properties develop or redevelop.

As Figure 5 shows, there are 23 accesses within the OASA. Table 4 summarizes the proposed access management plan for the Exit 207 OASA for accesses located within ODOT’s ¼-mile spacing standard. Accesses shaded grey are located within ¼ mile of the interchange ramp terminals.

Accesses 13, 14, 22, and 23 may be in the intersection influence area and may need to be modified to meet operational and safety performance standards. Details to be addressed in future design efforts.

Table 4 Access Management Plan for Exit 207 Interchange

Access Number	Roadway	Approach Type	Side of Roadway	Access Width (ft) ¹	Proposed Access Management Plan Action Under the Preferred Concept
1	Rieth Rd	Private	West	52	No changes are proposed to the accesses located outside of ODOT’s ¼-mile spacing standard.
2	Rieth Rd	Private	East	400	
3	Rieth Rd	Private	West	72	
4	Rieth Rd	Private	West	20	
5	Rieth Rd	Public	East	90	
6	Rieth Rd	Private	East	45	
7	Rieth Rd	Private	East	45	
8	Rieth Rd	Public	West	47	Revisit access location and configuration when property redevelops.
9	Rieth Rd	Private	West	43	Revisit access location and configuration when property redevelops.
10	Rieth Rd	Public	East	35	Revisit access location and configuration when property redevelops.
11	US 30	Public	North	60	These accesses between Airport Road to US 30 are consolidated into one leg of the US 30/Airport Road roundabout.
12	US 30	Public	North	240	
13	US 30	Private	South	55	Future design of US 30/Airport Road Roundabout will need to include consultation with the property owners to consider how these accesses function. Access may be able to remain where they are currently located or they may need to be relocated or otherwise modified to function with the realigned roadway and the needs of the adjacent properties.
14	US 30	Private	South	35	
15	US 30	Private	North	94	Access would be relocated to a backage road when property redevelops.
16	US 30	Private	South	900	Reduce access width to standards as part of property redevelopment or through negotiation with the property owner
17	US 30	Private	North	66	Access would be relocated to a backage road when property redevelops.
18	US 30	Private	North	37	Access would be relocated to a backage road when property redevelops.
19	US 30	Private	North	65	No changes are proposed to accesses located outside of ODOT’s ¼-mile spacing standard.
20	US 30	Private	South	900	
21	US 30	Public	North	54	
22	Airport Rd	Private	West	50	Future design of US 30/Airport Road Roundabout will need to include consultation with the property owners to consider how these accesses function. Access may be able to remain where they are currently located or they may need to be relocated or otherwise modified to function with the realigned roadway and the needs of the adjacent properties.
23	Airport Rd	Public	East	60	



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- Access Location - Driveway or Public Street
- Access Location - Open Frontage
- Minimum 1320' IAMP Limits



Figure 5

OASA Access Inventory
Exit 207
Pendleton, OR

NEXT STEPS

The preferred concept will be presented to the general public for feedback. That feedback will be used to refine the preferred concept for the Exit 207 interchange, which will be incorporated into the draft IAMP. Recommended code changes and supporting ordinances for implementation of the IAMP will be developed and presented in after the preferred concept is refined.

REFERENCES

1. Kittelson and Associates, Inc. *Pendleton IAMPs: Detailed Evaluation of Select Concepts*. 2020.
2. Kittelson and Associates, Inc. *Pendleton IAMPs: Exit 207 – Existing Conditions: Transportation System Operations*. 2019.