

**Technical Appendix E Technical Memorandum #4A:
Circulation and Access
Opportunities and Constraints**

TECHNICAL MEMORANDUM #4A

Date: April 15, 2011 Project #: 11168
To: PPMT and PAC Members
From: Marc Butorac, PE, PTOE; Joe Bessman, PE, PTOE, and Casey Bergh, PE
Subject: Circulation and Access Opportunities and Constraints

This technical memorandum documents the development and preliminary screening of the intersection and corridor segment concepts that have been developed as part of the OR 126 project. Included in this memorandum is a description of the concepts developed, a qualitative assessment of each concept, and a preliminary project team recommendation of which concepts to carry forward for refinement and detailed evaluation. Further evaluation of the refined concepts by the Planning Project Management Team (PPMT) and Public Advisory Committee (PAC) will be documented in Technical Memorandum #5.

CONCEPT DEVELOPMENT PROCESS

Intersection and segment concepts were initially developed as sketches during several workshops held on February 2, 2011. The sketches were refined to a higher level of detail referred to herein as *concepts*, which illustrate the number of lanes on the highway segment, connectivity, and traffic control. Additional concepts were developed by the project team based on written comments and variations to the sketches presented. The concepts illustrate opportunities for improving mobility, safety, and connectivity along corridor segments and at primary intersections that were identified as deficient within Technical Memorandum #3.

INITIAL CONCEPT DEVELOPMENT

The development of the initial intersection and corridor segment concepts for the OR 126 project began with three separate concept development workshops. The first two workshops were held for members of the PPMT and PAC committees, while the third workshop was held for interested citizens, business owners, and landowners in a public workshop setting. All three workshops were held on February 2, 2011 in the Prineville City Hall.



Within each workshop, participants were presented with an overview of the existing and future traffic demand within the project study area, the identified operational and safety deficiencies, and the applicable intersection forms and basic design parameters. Following these presentation overviews, participants were asked to sketch and describe their ideas for improving operations, safety, and circulation at the intersections along the OR 126 study corridor.

After the completion of the PPMT, PAC, and public workshops, the project team took all of the individual sketches and grouped them by location. Each group was further sorted into similar intersection sketches (e.g., signalized alternatives, roundabout alternatives, interchanges, etc.) and corridor segment sketches. Based on this process, the project team made some refinements to the sketches for scaling, connectivity, and other technical details. This overall process identified several different intersection and corridor segment concepts, as separately described below.

A full summary of concepts developed and comments received from the workshops is provided in the Summary of Public Workshop #1 memorandum, which is available on the ODOT project [website](#).

Corridor Segment Concepts

A range of corridor segment concepts were considered throughout the study area. The OR 126 study corridor was divided into six segments based on the county line and key intersections identified in Technical Memorandum #3, including: Powell Butte Highway, Williams Road, Millican Road/Airport Road, Tom McCall Road, O'Neil Highway, and the Prineville "Y." The segments and variation of existing Right-of-Way are illustrated in Figure 4-1.

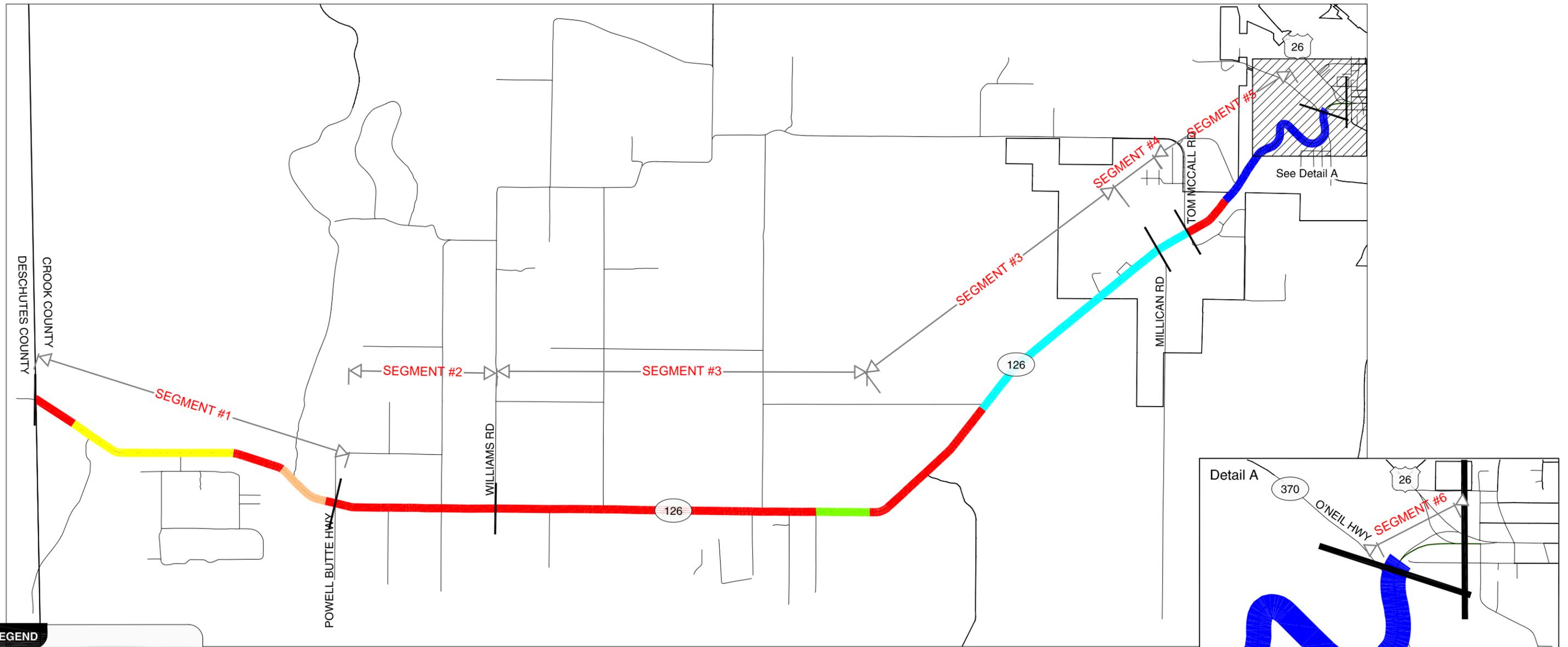
Within each segment the improvement concepts vary in terms of the cross-section (i.e., number of lanes and presence of a median) and how the widening would be accommodated (to the north, south, or along the centerline). These variations were considered to understand the most effective means of widening the highway with respect to right-of-way, environmental impacts, cost, and impact to existing structures. It should be noted that during the final design process any potential widening could shift north or south of the current centerline further limiting the impact to specific structures or areas.

The potential alignment options and how they could occur with respect to the current centerline are illustrated in Figure 4-2 through Figure 4-4. Figure 4-2 illustrates the range of cross-section treatments considered, assuming widening occurs on both sides of the existing highway centerline. Figure 4-3 and Figure 4-4 illustrates how alignment of the same cross-section could vary if all highway widening occurs to the north or south side of existing pavement, respectively.

Each corridor segment concept is described below for context and figures illustrating the various alignment options within each segment are provided in Appendix A. Within each segment the alignment and cross-section to be constructed may vary, but for the purposes of initial screening a consistent cross-section and alignment is assumed. Further review of where appropriate transitions will occur will be conducted as part of the refined screening effort and will be summarized in Technical Memorandum #5.



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LEGEND

RIGHT-OF-WAY WIDTH

	60 FT.
	60-145 FT.
	100 FT.
	180-330 FT.
	200 FT.
	200-320 FT.

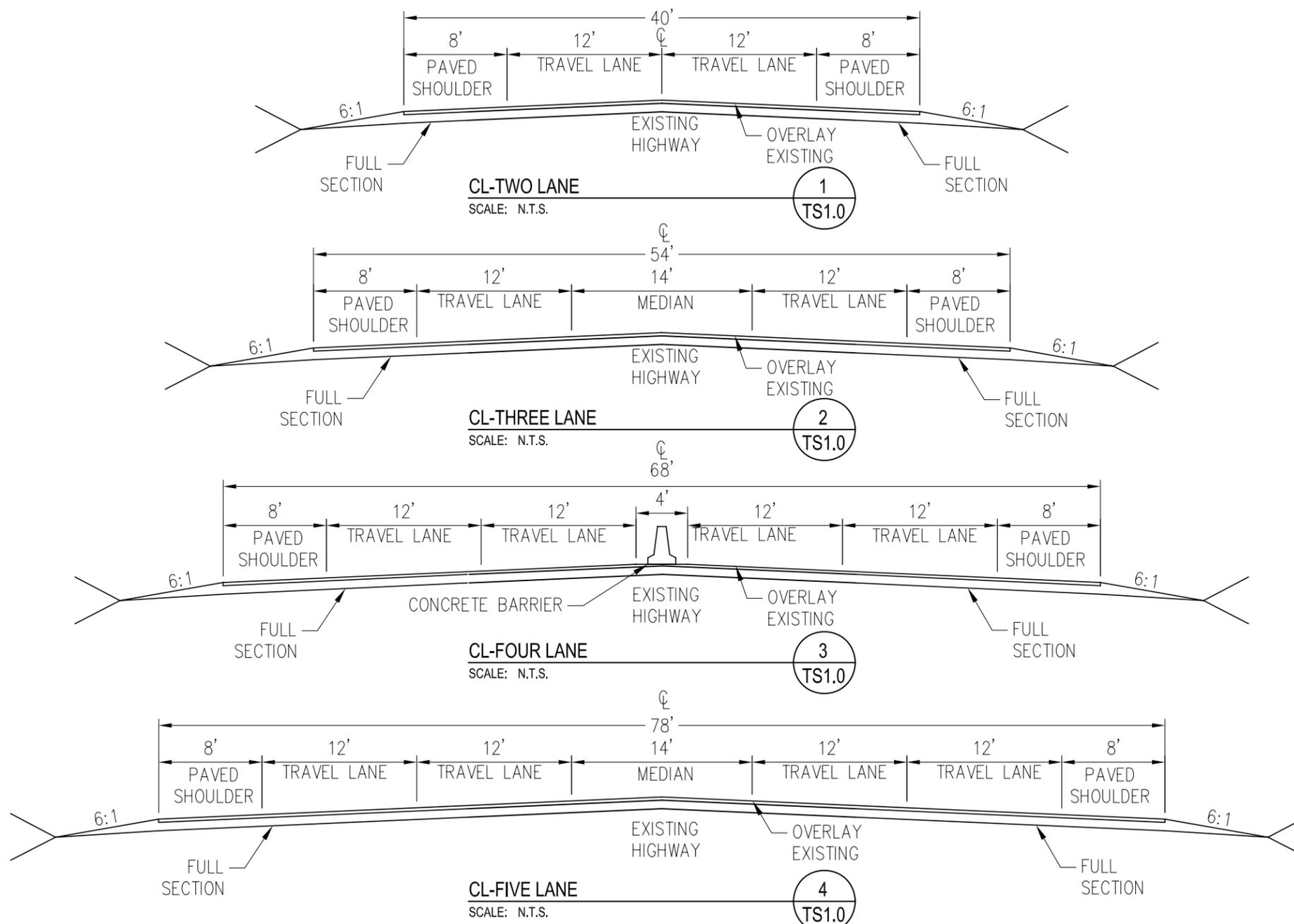
OR HIGHWAY 126 INITIAL CONCEPT SCREENING SEGMENTS CROOK COUNTY, OR



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TYPICAL SECTIONS - CENTERLINE ALIGNMENT
CROOK COUNTY, OREGON

FIGURE
4-2

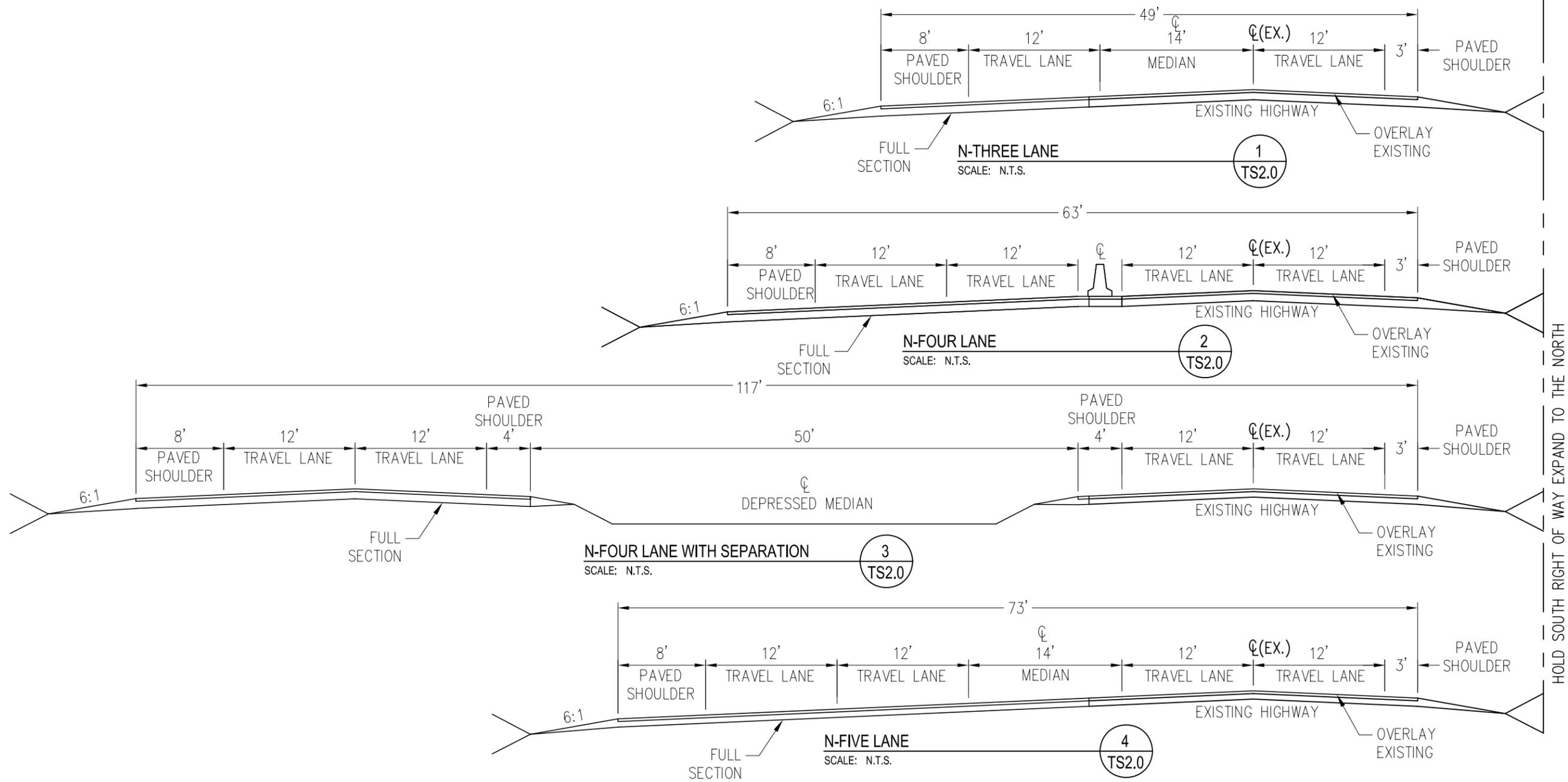
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HOLD SOUTH RIGHT OF WAY EXPAND TO THE NORTH

TYPICAL SECTIONS - NORTH ALIGNMENT
CROOK COUNTY, OREGON

FIGURE
4-3

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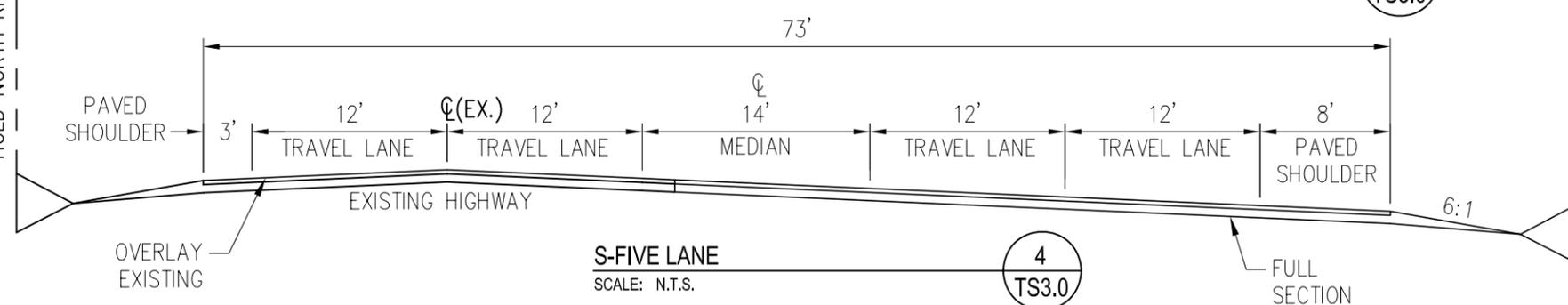
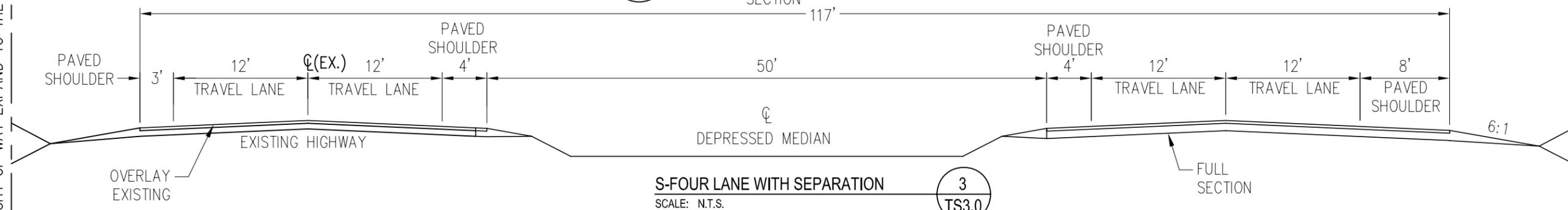
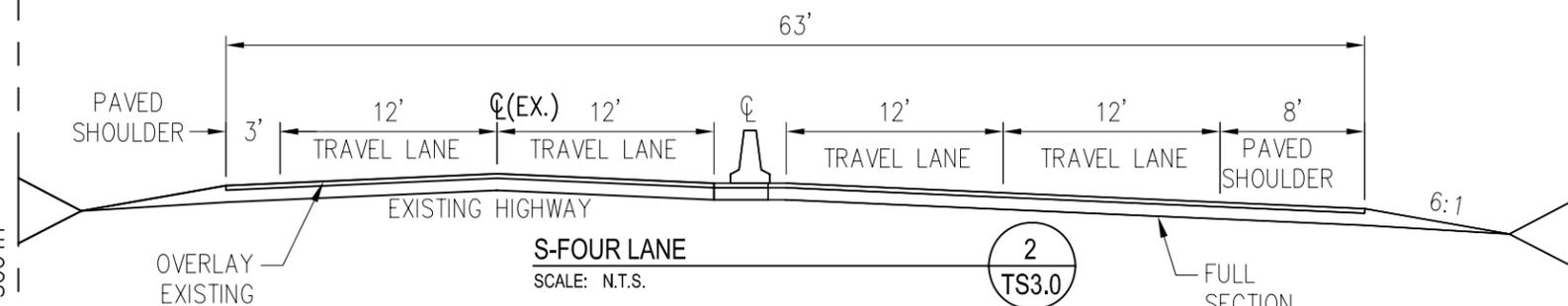
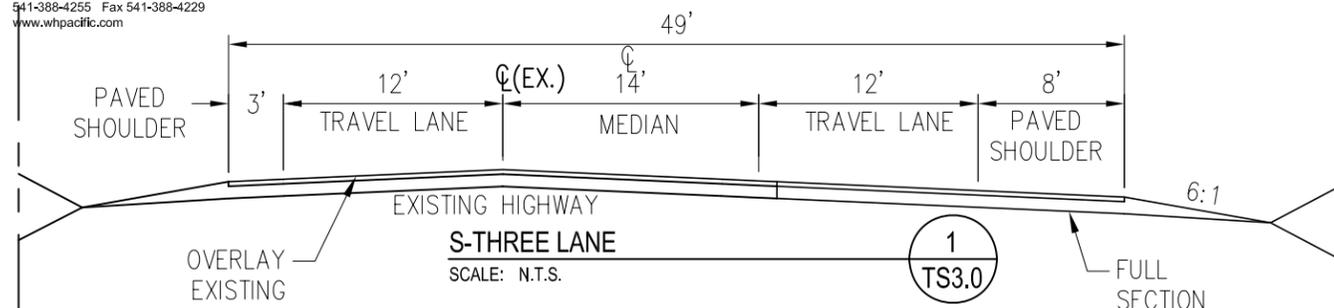
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HOLD NORTH RIGHT OF WAY EXPAND TO THE SOUTH

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TYPICAL SECTIONS - SOUTHERN ALIGNMENT
CROOK COUNTY, OREGON

FIGURE
4-4

Segment 1: Crook County Line to Powell Butte Highway (Milepost 3.58 to 6.84)

As assessed within Technical Memorandum #3, traffic volumes along the OR 126 corridor increase from the Crook County line toward the City of Prineville. The need for highway widening is lowest from a capacity perspective within this westernmost segment. While forecasts identify adequate capacity through 2030 with a two-lane highway, vertical and horizontal curvature is pronounced in this segment, and limited clear zones within the paved and gravel shoulder provide limited recovery space for vehicles that leave the pavement.



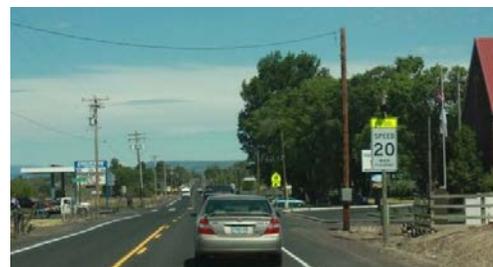
This slightly greater than three-mile corridor segment does not contain any collector or arterial intersections, and passing lanes are present west of the Remington Ranch access. There is a very low private access density with the Remington Ranch entrance and Mt. Rainier Drive representing the most significant accesses in this section. Both of these accesses contain a dedicated left-turn lane on the highway; Remington Ranch has a right-turn deceleration lane and Mt. Rainier Drive is located within the five-lane section. Other accesses within this segment carry low traffic volumes, and while the frequency of use is low so is the expectation of turning movements for following drivers along this rural expressway segment, causing opportunities for rear-end collisions. Opportunities for conflict of this type will increase with higher speeds; speeds are expected to be higher due to the presence of the passing lanes.

As documented within the existing conditions analysis, right of way within this segment ranges from 60 to 330 feet and the paved shoulders - generally four feet wide - are less than the standard 8-foot width for the designation. Zoning surrounding this segment is primarily *Rural Residential* to the south and *Exclusive Farm Use* to the north.

Figure S1-1 in Appendix A illustrates the various widening and alignment options considered between the County Line and the Powell Butte Highway intersection.

Segment 2: Powell Butte Highway to Williams Road (Milepost 6.84 to 8.34)

The second 1.5-mile corridor segment is largely defined by its straight alignment and the surrounding farm uses (the transition into the Powell Butte Community is separately discussed within the intersection junction section of this memorandum). The eastern portion of this segment and the segment to the east (through Williams Road to Parrish Road) contains the highest access density along the corridor with approximately 10 access points per mile. The Powell Butte to Williams Road segment of OR 126 contains two collector intersections (Kissler Road and Reif Road).



This segment of roadway is characterized by its limited right-of-way width of approximately 60 feet, narrow shoulders, and portions that contain little to no recovery

space beyond the shoulders primarily due to existing structures. Utility poles are located immediately adjacent to the roadway and along substantial portions of the shoulders, which limits space available for agricultural or service equipment to travel or park.

Figure S2-1 in Appendix A illustrates the various widening and alignment options considered between the Powell Butte Highway and Williams Road.

Segment 3: Williams Road to Millican Road (Milepost 8.34 to 15.52)

The approximate seven mile segment from Williams Road to Millican Road generally contains a two-lane cross-section with widening for passing lanes just west of the City boundary, and widening for left-turn lanes at Stillman Road and Millican Road. Zoning immediately adjacent to the highway is largely *Exclusive Farm Use*. This segment also includes access points that serve *Rural Residential* land via Stillman Road and Valley View Road.



Within this segment portions of the highway contain a two-foot paved shoulder and the right-of-way varies between 60 and 200 feet. The section of highway near Williams Road to Parrish Lane contains the highest access density along the corridor with approximately 10 accesses per mile.

Figure S3-1 through Figure S3-3 in Appendix A illustrate the various widening and alignment options considered between Williams Road and Millican Road at points with different existing Right-of-Way.

Segment 4: Millican Road to Tom McCall Road (Milepost 15.52 to 15.84)

OR 126 between Millican Road and Tom McCall Road is approximately 1,600 feet in length with a two-lane section that widens to provide left-turn lanes at Millican Road and slightly widens to add an eastbound right-turn taper at Tom McCall Road. This short highway segment is paralleled by the unpaved alignment of High Desert Drive that extends into the Baldwin Industrial Center. The terrain along this segment is flat, with a 200-foot right-of-way width. Millican Road serves as a regional connection between US 20 and OR 126. Tom McCall Road serves the City's industrial lands surrounding the airport heading west and becoming Houston Lake Road.



Corridor segment concepts identified within this short highway segment will need to address the short spacing between intersections, whether through consolidation or other systems approach. Due to the close intersection spacing the needs of the corridor segment will be largely defined by the selected intersection concepts.

Figure S4-1 in Appendix A illustrates the various widening and alignment options considered between Millican Road and Tom McCall Road.

Segment 5: Tom McCall Road to O'Neil Highway (Milepost 15.84 to 17.92)

The portion of the OR 126 study corridor east of Tom McCall Road currently experiences the highest traffic volumes and contains the highest growth potential within the City's largely undeveloped industrial lands. This segment is defined by the severe topographic constraints along the grade, which will influence the ability to widen this section of the highway. Because of the topographic constraints only a north alignment has been considered in the evaluation.

Currently this section of highway includes a climbing lane for westbound motorists along the grade and turn lanes at Rimrock Road and the Ochoco Wayside State Park. Within this segment portions of the highway have little to no paved shoulder and right-of-way varies between 210 to 320 feet. Guardrails are in place along the rimrock.

Figure S5-1 and Figure S5-2 in Appendix A illustrates the various widening and alignment options considered between the Tom McCall Road and the O'Neil Highway.

Segment 6: O'Neil Highway to US 26 (Milepost 17.92 to 18.24)

This segment serves as a transition from rural to urban as the highway enters the downtown City core. Speeds transition from 45 miles per hour along the grade to 30 miles per hour near 2nd Street, with a school crossing and school zone at the eastern edge of the study area at the Meadow Lakes intersection. The ability to widen the highway is constrained by the Crooked River Bridge at milepost 17.97 which can accommodate up to four travel lanes and bicycle lanes that connect recreational cyclists to the O'Neil Highway.

Given the fixed width and location of the Crooked River Bridge, no figures were developed to illustrate widening and alignment options along this segment.

Intersection Concepts

Intersection concepts were developed at the six intersections that were forecast to exceed performance standards through the horizon period, as documented in Technical Memorandum #3. Intersection concepts include the area in and around the intersection to account for turn-lane widening, speed treatments, and other related geometric improvements that will be required.

Roundabout and signalized alternatives, as well as grade-separated interchange alternatives were considered at each of the study intersections. For planning purposes single-lane roundabouts include single-lane entries on all approaches and multi-lane roundabouts were assumed to include two entering lanes on the highway approaches. Signalized concepts were assumed to have left-turn lanes on the highway and on higher-volume minor streets.



Grade-separated interchanges were assumed to be developed as traditional diamond interchanges. Characteristics of each intersection and the concepts developed for each are summarized from west to east. Illustrations of these concepts are included in Appendix B.

Powell Butte Highway

Six intersection concepts were developed at the OR 126/Powell Butte Highway intersection. Each Powell Butte (PB#) intersection concept is described in Table 4-1 and illustrated in Figures PB1 through PB6 in Appendix B.

**Table 4-1
 Powell Butte and OR 126 Intersection Concepts**

Concepts	Description
PB1	Single-Lane Roundabout
PB2	Double-Lane Roundabout
PB3	2-3 Lane Traffic Signal
PB4	4-5 Lane Traffic Signal
PB5	Eastbound OR 126 Acceleration Lane for Northbound Right-turn
PB6	Interchange

Williams Road

Table 4-2 summarizes the intersection concepts at Williams Road. These concepts improve the existing intersection and/or realign OR 126 to avoid land within the East Powell Butte Rural Service Center. Figures W1 through W9 in Appendix B illustrate the concepts.

**Table 4-2
 Williams Road and OR 126 Intersection Concepts**

Concepts	Description
W1	Single-Lane Roundabout
W2	Multi-Lane Roundabout
W3	2-3 Lane Traffic Signal
W4	4-5 Lane Traffic Signal
W5	5- to 3-Lane Transition to Signal
W6	North Reroute, Traffic Signal
W7	North Reroute, Roundabout
W8	North Reroute, Unsignalized
W9	Northern Interchange

Millican Road

Table 4-3 summarizes seven intersection concepts at the Millican Road/Airport Road intersection with OR 126. Figures M1 to M7 in Appendix B illustrate the intersection concepts. Several concepts recommended full or partial closure of Millican Road and its interconnection with Tom McCall Road.

**Table 4-3
 Millican Road and OR 126 Intersection Concepts**

Concept	Description
M1	Single-Lane Roundabout
M2	Double-Lane Roundabout
M3	2-3 Lane Signal
M4	4-5 Lane Signal
M5	Close/Reroute to Tom McCall Road
M6	"T" Intersection - Millican Road Reroute
M7	Right-in, Right-out Access to Millican Road/Airport Road

Tom McCall Road

Five intersection concepts were developed at Tom McCall Road as described in Table 4-4 and illustrated in Figures T1 to T5 in Appendix B. Several of the Tom McCall Road concepts consider treatments at Millican Road as a single system of improvements.

**Table 4-4
 Tom McCall Road and OR 126 Intersection Concepts**

Concept	Description
T1	Single-Lane Roundabout
T2	Multi-Lane Roundabout
T3	2-3 Lane Traffic Signal
T4	4-5 Lane Traffic Signal
T5	Interchange

O'Neil Highway

Four intersection concepts were identified at the O'Neil Highway intersection, as described in Table 4-5, ranging from intersection improvements to a reroute of the highway to include a new Ochoco River crossing and connection to US 26. The concepts are illustrated in Figures O1 through O4 in Appendix B.

**Table 4-5
 O'Neil Highway (OR 370) and OR 126 Intersection Concepts**

Concept	Description
O1	Double-Lane Roundabout
O2	3-Lane Signal
O3	4-5 Lane Signal
O4	West Reroute to US 26

US 26/OR 126 (Prineville "Y" Intersection)

Four intersection concepts for the Prineville "Y" were identified. Concepts ranged from minor geometric improvements to reconstruction of the "Y" as a multi-lane roundabout. The concepts are described in Table 4-6 and illustrated in Figures Y1 through Y4 in Appendix B.

**Table 4-6
 Tom McCall Road and OR 126 Intersection Concepts**

Concept	Description
Y1	Single-Lane Roundabout
Y2	Double-Lane Roundabout
Y3	4-5 Lane Signal
Y4	Geometric Improvements

CONCEPT SCREENING

Two levels of screening were conducted to narrow the range of concepts within this memorandum. The first level of screening was a comparison of the concepts to the project goals and objectives to ensure that the concepts meet the project intent. The second level of screening was based on the capacity of the concepts to accommodate the projected traffic volumes.

PRELIMINARY PURPOSE AND PROBLEM STATEMENT SCREENING

The project team performed a preliminary assessment to determine if any of the concepts did not meet the basic intent of the project purpose and statement of need. The official Project Purpose and Need Statement, as approved by the PPMT and PAC is outlined below and summarized within the *Project Purpose and Need, Project Goals, Objectives, and Evaluation Framework* memorandum.

Purpose of the Project:

To establish a long-term vision for OR 126 and effectively address corridor congestion, improve safety, support future development, serve expected population growth in Crook County and Prineville, and to serve the growing travel demand.

Statement of Need:

The project purpose is demonstrated with the following Statement of Need:

- *Limited alternative routes and modes of travel to Prineville result in reliance on OR 126.*
- *Inability of the unsignalized intersections to meet State mobility standards coupled with the inability to fund grade-separated improvements results in increased congestion and reduced roadway safety.*
- *Conflicting use of the facility by farming equipment and high speed trucks decreases mobility and increases potential for crashes.*
- *Inconsistency between the Oregon Highway Plan (OHP) Expressway designation for the corridor and posted speed limits, cross-section, access, and roadside character.*

The project purpose and need statement was applied to identify specific criteria for evaluation of the intersection and segment concepts. Concepts that were carried forward were found to do the following:

- provide intersection and segment capacity or move toward increasing capacity for the long-term operations of the corridor;
- decrease the number and frequency of highway access; or,
- direct the form and function of the corridor to be more consistent with ODOT's *Expressway* designation.

Based on these criteria only one intersection concept, Y4: Geometric Improvements, was removed from further consideration. This concept could help extend the functionality of the existing configuration (and could potentially serve as an interim improvement) but would not provide the long-term capacity needs required of that intersection to serve US 26 and OR 126 regional trips.

Other corridor segment and intersection concepts identified move toward the project purpose and statement of need of enhancing system capacity and meeting the *Expressway* designation goals.

QUALITATIVE CONCEPT SCREENING

A basic screening of the remaining concepts was conducted to identify which concepts warrant further evaluation. The initial evaluation criteria¹ included: mobility/operations, local access, safety, impacts to natural environment, impacts to the built environment, land use compatibility,

¹ Evaluation criteria were developed within Technical Memoranda #1, *Purpose and Need, Project Goals, Objectives, and Evaluation Framework*.

flexibility of implementation, and cost effectiveness. Within this qualitative assessment, safety, land use compatibility, flexibility of implementation, and local access were not considered.

At each intersection or within each segment, the various concepts were evaluated against the criteria using a combination of qualitative information. The following outlines the elements considered in the initial evaluation and aspects of each that characterized the largest variations between concepts.

Mobility/Operations

The addition of lanes on OR 126 and improvements at the intersections will improve traffic flow along the corridor consistent with the *Expressway* designation goals. The amount of additional capacity provided by each concept varies depending on the traffic control type, number of lanes added to the highway, and the forecast volumes over the 20-year planning period.

A qualitative assessment of mobility and operations took into account the relative amount of capacity expected from each concept. The capacity constraints identified in Technical Memorandum #3 were compared to the capacity provided under each concept to identify which concepts are expected to satisfy mobility needs and which will not.

Impacts to the Built Environment

Widening of OR 126 and many of the intersection concepts require more land area and right-of-way than the existing facility contains, which may impact existing structures adjacent to the corridor. These impacts were estimated based on the general footprint each concept, and were quantified simply as the number of structures impacted.

Impacts to the Natural Environment

The natural environment criterion was applied to capture the impact of the concepts on identified wetlands, the Crooked River, canals, the rimrock, and irrigation ponds. For this initial screening process the impacts to the natural environment from highway widening and increased sizing needs of intersection treatments were considered, with the impacts noted as occurring but without further details on the extent of the impact.

Cost

Cost estimates for initial screening included the amount of land (right-of-way) required to be purchased, which was estimated at a constant price per acre of \$90,000, and preliminary construction cost estimates for physically constructing the facility illustrated in each concept. Cost estimates did not include the impacts that may occur to existing structures as these costs could vary substantially depending on the use.

CONCEPT SCREENING

An evaluation matrix for each segment and intersection was created to qualitatively assess the concepts based on the criteria outlined above. The concepts that were found to perform best in each category are shown with a green circle, those that perform the worst are shown with a red circle, and those that neither outperform other concepts nor create negative impacts are shown with a yellow circle.

Corridor Segment Concept Screening

With respect to the screening criteria, the highest-performing corridor segment concepts (shown with green circle), generally:

- Provide an optimal balance of additional capacity (with respect to forecast needs), the amount of additional ROW required, and construction costs relative to other concepts;
- Minimize impacts to existing structures relative to other concepts; and,
- Minimize environmental impacts.

Corridor segment concepts that perform moderately compared to other concepts (shown in yellow in Table 4-7), generally:

- Provide adequate capacity to accommodate future volume over the 20-year planning horizon;
- Require a moderate amount of ROW dedication compared to other concepts; and,
- May have moderate impact on the built or natural environment and adjacent structures.

The corridor segment concepts that were identified as the worst-performing concepts (shown in red) in each category, generally:

- Fail to provide adequate capacity to accommodate future volume over the 20-year planning horizon;
- Require substantial ROW dedication compared to other concepts; and,
- Impact multiple structures of significance to the community.

The matrices for evaluation of segment concepts are provided in Table 4-7. *Appendix "C" provides detailed scoring materials and assumptions applied in the qualitative evaluation of corridor segments.*

Table 4-7 Preliminary Screening of Corridor Segment Concepts

Concept	Mobility	ROW (acres)	Structural Impacts	Cost (total)	Environmental Impacts (other)
Segment 1: County Line to Powell Butte Highway					
CL2	●	●	●	●	●
CL3	●	●	●	●	●
CL4	●	●	●	●	●
CL5	●	●	●	●	●
N3	●	●	●	●	●
N4	●	●	●	●	●
N4S	●	●	●	●	●
N5	●	●	●	●	●
S3	●	●	●	●	●
S4	●	●	●	●	●
S4S	●	●	●	●	●
S5	●	●	●	●	●
Segment 2: Powell Butte Highway to Williams Road					
CL2	●	●	●	●	●
CL3	●	●	●	●	●
CL4	●	●	●	●	●
CL5	●	●	●	●	●
N3	●	●	●	●	●
N4	●	●	●	●	●
N4S	●	●	●	●	●
N5	●	●	●	●	●
S3	●	●	●	●	●
S4	●	●	●	●	●
S4S	●	●	●	●	●
S5	●	●	●	●	●
Segment 3: Williams Road to Millican Road/Airport Road					
CL2	●	●	●	●	●
CL3	●	●	●	●	●
CL4	●	●	●	●	●
CL5	●	●	●	●	●
N3	●	●	●	●	●
N4	●	●	●	●	●
N4S	●	●	●	●	●
N5	●	●	●	●	●
S3	●	●	●	●	●
S4	●	●	●	●	●
S4S	●	●	●	●	●
S5	●	●	●	●	●
Segment 4: Millican Road/Airport Road to Tom McCall Road					
CL2	●	●	●	●	●
CL3	●	●	●	●	●
CL4	●	●	●	●	●
CL5	●	●	●	●	●
N3	●	●	●	●	●
N4	●	●	●	●	●
N4S	●	●	●	●	●
N5	●	●	●	●	●
S3	●	●	●	●	●
S4	●	●	●	●	●
S4S	●	●	●	●	●
S5	●	●	●	●	●
Segment 5: Tom McCall Road to O'Neil Highway					
N4	●	●	●	●	●
N5	●	●	●	●	●
Segment 6: O'Neil Highway to Prineville "Y"					
CL3	N/A	N/A	●	N/A	●
CL4	N/A	N/A	●	N/A	●
●	Greatest performance; Low est negative impacts				
●	Moderate performance; Moderate negative impacts				
●	Low est performance; Greatest negative impacts				

Intersection Concepts Screening

With respect to the screening criteria, the highest-performing intersection concepts (shown with a green circle in Table 4-8) generally:

- Maximize capacity and minimize delay on OR 126 and minor street approaches;
- Minimize the amount of additional ROW required relative to other concepts;
- Minimize impacts to existing structures relative to other concepts; and
- Minimize construction and ROW cost relative to other concepts.

The concepts that were identified as the moderate-performing intersection concepts (shown in yellow) in each category generally:

- Provide adequate capacity to accommodate future volume over the 20-year planning horizon;
- Require moderate ROW dedication compared to other concepts; and,
- Impact one or more structures of significance to the community.

The concepts that were identified as the worst-performing intersection concepts (shown in red) in each category generally:

- Fail to provide adequate capacity to accommodate future volume over the 20-year planning horizon;
- Require substantial ROW dedication compared to other concepts;
- Impact multiple structures of significance to the community; and,
- Cost more than \$5 million per intersection.

Preliminary evaluations of impacts to the natural environment were based on limited information and could not conclusively identify specific elements of the natural environment that could be impacted by intersection concepts that require greater land area. Therefore, impacts to the natural environment were not included in the intersection screening matrices. An Environmental, Social, Economic, and Energy (ESEE) review will be completed by the project team, which will document an assessment of specific environmental impacts in the Plan ESEE Analysis memorandum.

The matrices for evaluation of intersection concepts are provided in Table 4-8. *Appendix "D" provides detailed scoring materials and assumptions applied in the qualitative evaluation of intersection concepts.*

Table 4-8 Preliminary Screening of Intersection Concepts

Concept Number	Concept Description	Mobility/ Operations	ROW (acres)	Structural Impacts	Cost (Total)
Powell Butte Highway					
PB1	Single-Lane Roundabout	●	●	●	●
PB2	Double-Lane Roundabout	●	●	●	●
PB3	2-3 Lane Signal	●	●	●	●
PB4	4-5 Lane Signal	●	●	●	●
PB5	Eastbound Acceleration Lane	●	●	●	●
PB6	Interchange	●	●	●	●
Williams Road					
W1	Single-Lane Roundabout	●	●	●	●
W2	Double-Lane Roundabout	●	●	●	●
W3	2-3 Lane Signal	●	●	●	●
W4	4-5 Lane Signal	●	●	●	●
W5	5- to 3-Lane Signal	●	●	●	●
W6	North Reroute, Signal	●	●	●	●
W7	North Reroute, Roundabout	●	●	●	●
W8	North Reroute, Unsignalized	●	●	●	●
W9	Northern Interchange	●	●	●	●
Millican Road/Airport Road					
M1	Single-Lane Roundabout	●	●	●	●
M2	Double-Lane Roundabout	●	●	●	●
M3	2-3 Lane Signal	●	●	●	●
M4	4-5 Lane Signal	●	●	●	●
M5	Full Reroute	●	●	●	●
M6	"T" Intersection	●	●	●	●
M7	RIRO	●	●	●	●
Tom McCall Road					
T1	Single-Lane Roundabout	●	●	●	●
T2	Double-Lane Roundabout	●	●	●	●
T3	2-3 Lane Signal	●	●	●	●
T4	4-5 Lane Signal	●	●	●	●
T5	Interchange	●	●	●	●
O'Neil Highway					
O1	Double-Lane Roundabout	●	●	●	●
O2	3-Lane Signal	●	●	●	●
O3	4-5 Lane Signal	●	●	●	●
O4	West Reroute to US 26	●	●	●	●
Prineville "Y"					
Y1	Single-Lane Roundabout	●	●	●	●
Y2	Double-Lane Roundabout	●	●	●	●
Y3	4-5 Lane Signal	●	●	●	●
●	Greatest performance; Low est negative impacts				
●	Moderate performance; Moderate negative impacts				
●	Low est performance; Greatest negative impacts				

INITIAL SCREENING RECOMMENDATIONS

Based on the initial screening and evaluation the project team has assigned the corridor segment and intersection concepts into the following three categories:

- **Concepts Recommended for Further Review** contribute toward achieving the project goals with minimal negative impacts and should be carried forward to the next phase of evaluation
- **Concepts Recommended for NO Further Review** show the least ability to meet the project objectives in the matrix and have been recommended by the project team to no longer be assessed during subsequent evaluation phases
- **Concepts Under Consideration for NO Further Review** generally do not outperform in every category, but do not create multiple impacts. These concepts are under consideration by the project team to determine whether they should be further evaluated during the next evaluation phase. These concepts will be presented to the PPMT and PAC for final determination on whether these concepts warrant further review or not.

The project team's initial recommendations for roadway segments and intersection concepts are separately summarized below in Table 4-9 and Table 4-10, respectively.

Corridor Segment Concept Screening Recommendations

Table 4-9 summarizes the segment concept screening process and the consultant team recommendation. The screening process described above resulted in recommendations to refine and conduct detailed evaluation of two to four concepts per segment, and a recommendation that the PPMT and PAC further review additional concepts to determine whether those should be forwarded. The key issues and concerns with concepts not recommended for further consideration and those that are recommended for PPMT and PAC consideration are also provided within the table.

**Table 4-9
Initial Project Team Corridor Segment Concept Screening Recommendations**

Concept	Recommendation	Reason for Recommendation
Segment 1: County Line to Powell Butte Highway		
CL2	✓	
CL3	●	Limited access points within segment and turn lanes already in place at key intersections
CL4	✓	
CL5	✗	Limited access points within segment and turn lanes already in place at key intersections
N3	✓	
N4	✓	
N4S	●	Requires substantially more ROW than other 4-lane options
N5	●	Limited access points within segment and turn lanes already in place at key intersections
S3	✓	
S4	✓	
S4S	●	Requires substantially more ROW than other 4-lane options
S5	✗	Limited access points within segment and turn lanes already in place at key intersections
Segment 2: Powell Butte Highway to Williams Road		
CL2	✓	
CL3	●	Need for continuous center turn lane may not exceed cost
CL4	●	Higher cost than two or three-lane sections, provides more capacity than is needed.
CL5	✗	Need for continuous center turn lane may not exceed cost and ROW impacts
N3	✓	
N4	✓	
N4S	●	Requires substantially more ROW than other 4-lane options, impacts structures
N5	✗	Need for continuous center turn lane may not exceed cost and ROW impacts
S3	✓	
S4	✓	
S4S	●	Requires substantially more ROW than other 4-lane options, impacts structures
S5	✗	Need for continuous center turn lane may not exceed cost and ROW impacts
Segment 3: Williams Road to Millican Road/Airport Road		
CL2	●	Does not provide turn lanes or passing opportunities
CL3	✓	
CL4	●	Mobility improvements may not exceed impacts to adjacent property owners and cost
CL5	●	Access density may warrant incremental cost of continuous turn lane
N3	✓	
N4	●	Mobility improvements may not exceed impacts to adjacent property owners and cost
N4S	●	Mobility improvements may not exceed impacts to adjacent property owners and cost
N5	●	Access density may warrant incremental cost of continuous turn lane
S3	✓	
S4	✓	
S4S	●	Mobility improvements may not exceed impacts to adjacent property owners and cost
S5	●	Mobility improvements may not exceed impacts to adjacent property owners and cost
Segment 4: Millican Road/Airport Road to Tom McCall Road		
CL2	●	Cross-section is dependent on intersection concepts selected at Millican and Tom McCall
CL3	●	
CL4	●	
CL5	●	
N3	●	
N4	●	
N4S	●	
N5	●	
S3	●	
S4	●	
S4S	●	
S5	●	
Segment 5: Tom McCall Road to O'Neil Highway		
N4	✓	
N5	✗	ROW limited on grade, need for continuous turn lane minimal
Segment 6: O'Neil Highway to Prineville "Y"		
CL3	✓	
CL4	✓	Current Crooked River bridge structure limits cross-section to four lanes
✓	Concepts Recommended for Further Review	
●	Concepts Under Consideration for NO Further Review	
✗	Concepts Recommended for NO Further Review	

Based on the No Build analysis of highway capacity summarized in Technical Memorandum #3 the Tom McCall intersection serves as a transition point for highway widening. East of the intersection the existing two-lane highway will likely need to be widened to four lanes as development occurs in the industrial area. West of the Tom McCall intersection the two-lane highway can provide adequate capacity, but widening may have safety and operation benefits that need to be weighed against the impacts (cost, structural, etc.).

From Tom McCall Road to the Prineville "Y" only three- and four-lane concepts were recommended for further consideration based on the capacity needs and the physical constraints presented by the rimrock along the grade.

Further review is recommended to consider a five-lane cross-section between Williams Road and Millican Road where access density ranges from 10 to 14 access points per mile, which is the highest density within the study corridor. In this section, the benefits of providing a center median lane for turning vehicles may offset the construction costs through improved safety and mobility.

The width of the Crooked River Bridge restricts alignment and cross-section options between O'Neil Highway and the Prineville "Y." A five-lane section was determined to be infeasible considering the costs to widen or replace the current bridge.

Intersection Concept Screening Recommendations

A similar ranking system was applied to the intersection concepts to identify the consultant team recommendation to forward, consider, or set aside the various concepts. Table 4-10 summarizes the initial project team recommendations for the intersection concepts. The project team will be soliciting further input and feedback through the PPMT and PAC on these concepts. Based on this feedback, the PPMT will make a final recommendation to which corridor alignment concepts continue to the next evaluation phase.

**Table 4-10
Initial Project Team Intersection Concept Screening Recommendations**

Concept Number	Concept Description	Recommendation	Reason for Recommendation
Powell Butte Highway			
PB1	Single-Lane Roundabout	✗	Does not provide long-term capacity
PB2	Double-Lane Roundabout	✓	
PB3	2-3 Lane Signal	●	Limited capacity
PB4	4-5 Lane Signal	✓	
PB5	Eastbound Acceleration Lane	✗	Does not provide long-term capacity
PB6	Interchange	●	Structural impacts, ROW impacts
Williams Road			
W1	Single-Lane Roundabout	✗	Does not provide long-term capacity
W2	Double-Lane Roundabout	●	Structural impacts
W3	2-3 Lane Signal	✓	
W4	4-5 Lane Signal	✓	
W5	5- to 3-Lane Signal	✗	Combine with segment treatments
W6	North Reroute, Signal	✓	
W7	North Reroute, Roundabout	✓	
W8	North Reroute, Unsignalized	✓	
W9	Northern Interchange	✗	Additional cost does not provide proportionate value
Millican Road/Airport Road			
M1	Single-Lane Roundabout	✗	Does not provide long-term capacity
M2	Double-Lane Roundabout	●	Rerouting traffic to Tom McCall Road may be more cost effective
M3	2-3 Lane Signal	✗	Does not provide long-term capacity
M4	4-5 Lane Signal	●	Rerouting traffic to Tom McCall Road may be more cost effective
M5	Full Reroute	✓	
M6	"T" Intersection	✓	
M7	RIRO	✓	
Tom McCall Road			
T1	Single-Lane Roundabout	✗	Does not provide long-term capacity
T2	Double-Lane Roundabout	✓	
T3	2-3 Lane Signal	✗	Does not provide long-term capacity
T4	4-5 Lane Signal	✓	
T5	Interchange	✓	
O'Neil Highway			
O1	Double-Lane Roundabout	✗	ROW constrained by Crooked River Bridge and rimrock
O2	3-Lane Signal	✗	Does not provide long-term capacity
O3	4-5 Lane Signal	✓	
O4	West Reroute to US 26	✓	
Prineville "Y"			
Y1	Single-Lane Roundabout	✗	Does not provide long-term capacity
Y2	Double-Lane Roundabout	✓	
Y3	4-5 Lane Signal	✓	
✓	Concepts Recommended for Further Review		
●	Concepts Under Consideration for NO Further Review		
✗	Concepts Recommended for NO Further Review		

As shown in Table 4-10, the initial screening process described above resulted in recommendations to further review two to five concepts per intersection, and consideration for further review of an additional concepts throughout the system. The key issues and concerns with concepts not recommended for further consideration and those that are recommended for PPMT and PAC consideration are also provided within the table.

At-grade roundabout and signal concepts are recommended for further evaluation at intersections west of Millican Road. These locations did not show a need for an interchange by the planning horizon and would incur significantly higher construction costs and right-of-way as compared to the at-grade concepts. With the recommendation not to forward an interchange concept for the Powell Butte Highway, the project team recommends that to the extent practical the at-grade concepts forwarded be designed to accommodate long-term (beyond 20 years) grade separation at this critical regional connection.

At Millican Road and Tom McCall Road, the concepts recommended for further evaluation are those that combine the two closely spaced intersections or provide opportunities for a phased approach to construction that can occur over the 20-year period. To the east of Tom McCall Road, the concepts recommended for further evaluation accommodate the four-lane highway section identified as a need within the planning period.

For consistency with the project goals and objectives, all concepts recommended for further review will be refined to allow the concepts to accommodate oversized freight loads, and over-dimensional and slow-moving vehicles. This may include modifications to the placement of signing and illumination, larger truck apron sizing at roundabouts, curbing style consideration to include mountable treatments, larger inscribed roundabout diameters, and signage indicating that trucks should occupy both lanes of multi-lane roundabout approaches as appropriate. Design considerations for the type of vehicle traffic apply to all of the corridor segment and intersection concepts.

Conclusions and Recommendations

As part of the corridor and intersection concept screening process there were several key findings identified, as summarized below.

- West of Millican Road OR 126 would benefit from widening, but this widening should be considered a much lower priority than widening along the eastern segment due to the available reserve capacity. Within this segment corridor improvements will likely be focused toward: increased passing opportunities; shoulder widening for service vehicles, emergency vehicles, and agricultural equipment; and, enhanced clear zone/recovery areas.
- Within the East Powell Butte Rural Service Center the constrained right-of-way will require an acceptance of higher delay and increased congestion, significant right-of-way acquisition, or realignment of the highway to the north.

- At-grade intersection concepts are recommended west of Millican Road. To the extent practical, the critical Powell Butte intersection should be designed to accommodate long-term (beyond 20 years) grade-separation.
- Intersection treatments at Millican Road and Tom McCall Road will need to consider both locations as a system, with cost considerations of grade-separation balanced against the costs to separately improve both intersections. Any at-grade treatments should be designed as phasing options toward grade separation, noting the access spacing required for that longer-range improvement.
- Widening OR 126 along the eastern section from Tom McCall Road to the “Y” to a four- or five-lane section will be required, and will need to occur into the rimrock from a construction feasibility and cost perspective.
- OR 126 corridor treatments along the eastern segment will be restricted by the width of the Crooked River Bridge. The proximity of the bridge to the O’Neil Highway and topographic constraints will significantly limit the range of viable options at the intersection.
- Widening can be provided throughout the majority of the corridor either to the north or south without impacts to structures. Widening of the highway from the centerline requires increased construction costs.
- The need to widen OR 126 to provide a four-lane section into Prineville conflicts with the City’s three-lane cross-section along 3rd Street. A subsequent, separate planning effort should be considered to address the transition into the City’s downtown core.
- All of the concepts identified for OR 126 segments and intersections should consider design needs to accommodate oversized freight and over-dimensional and slow-moving agricultural vehicles along this freight route.

APPENDIX

Appendix A: OR 126 Corridor Segment Concepts

Appendix B: OR 126 Intersection Concepts

Appendix C: Corridor Segment Concept Screening Data

Appendix D: Intersection Concept Screening Data

Appendix A
OR 126 Corridor
Segment Concepts



NORTH SHIFT WIDENING



CENTERLINE WIDENING OPTION



SOUTH SHIFT WIDENING OPTION



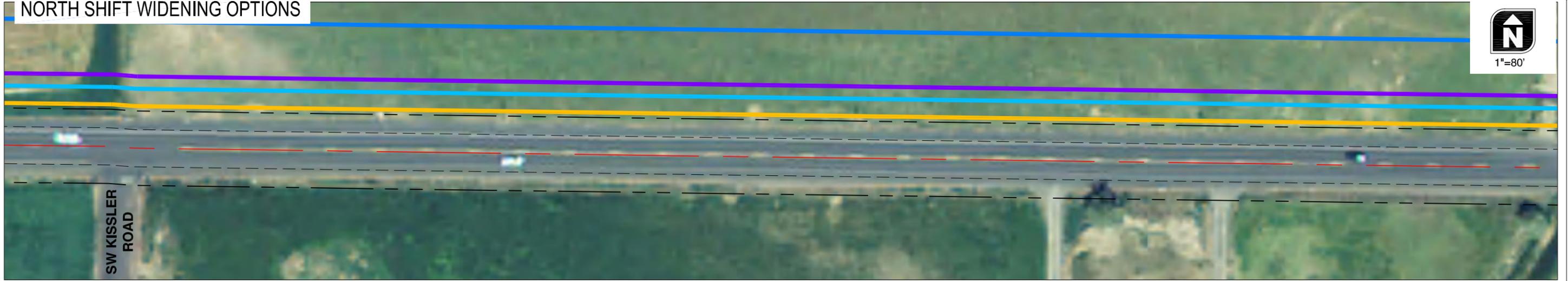
- LEGEND:**
- 2 - LANES
 - 3 - LANES
 - 4 - LANES
 - 4 - LANES WITH MEDIAN
 - - - - - EXIST. ROW (APPROX)
 - - - - - EXIST. CENTERLINE (APPROX)
 - - - - - EXISTING EDGE OF PAVEMENT

OR HIGHWAY 126 CORRIDOR SEGMENT CONCEPTS
60' ROW OPTION - CROOK COUNTY LINE TO POWELL BUTTE HIGHWAY
CROOK COUNTY, OREGON

FIGURE
S1-1

H:\projects\11188 - OR 126 Powell Butte Corridor Evaluation\dwg\design\hrooming\segments\CM\037213-TRANS-LINK-CL-PB.dwg Mar 08, 2011 - 6:27pm - openbnd Layout Tab: L1.1

NORTH SHIFT WIDENING OPTIONS



CENTERLINE WIDENING OPTIONS



SOUTH SHIFT WIDENING OPTIONS



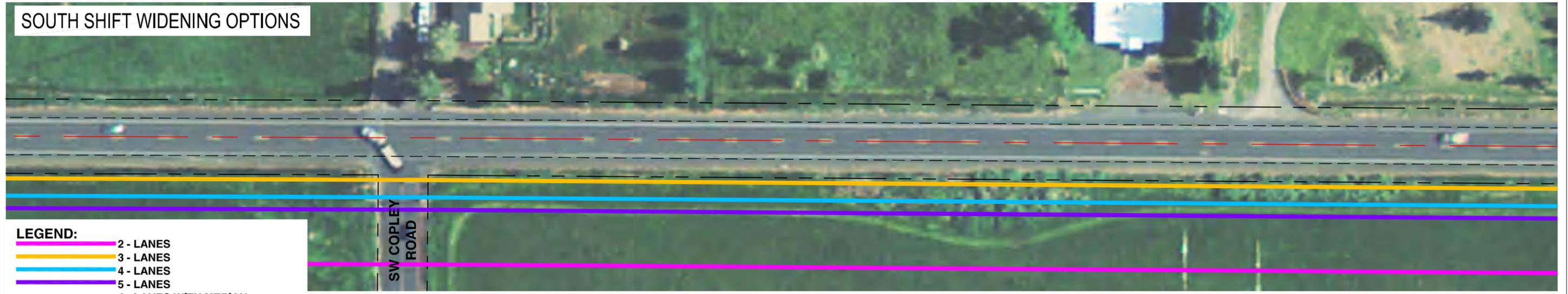
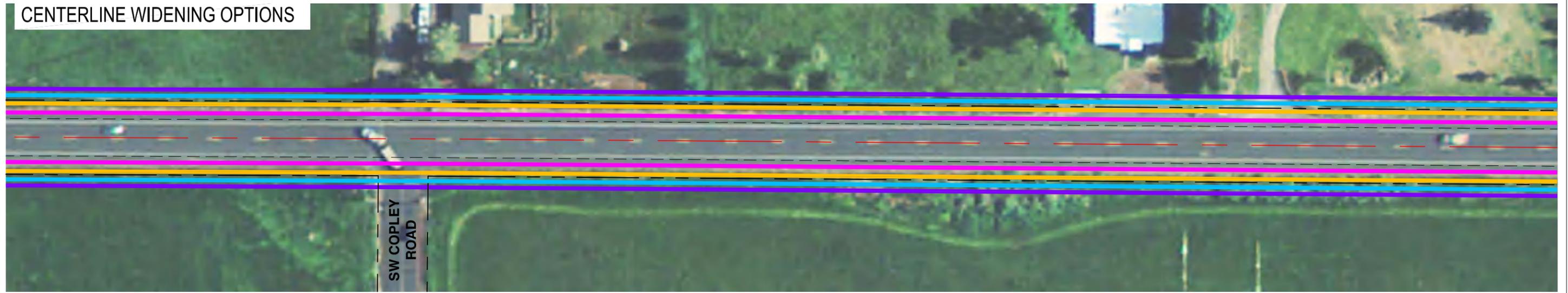
LEGEND:

- 2 - LANES
- 3 - LANES
- 4 - LANES
- 5 - LANES
- 4 - LANES WITH MEDIAN
- - - EXIST. ROW (APPROX)
- - - EXIST. CENTERLINE (APPROX)
- - - EXISTING EDGE OF PAVEMENT

OR HIGHWAY 126 CORRIDOR SEGMENT CONCEPTS
60' ROW OPTION - POWELL BUTTE HIGHWAY TO WILLIAMS ROAD
CROOK COUNTY, OREGON

FIGURE
S2-1

H:\projfile\11168 - OR 126 Powell Butte Corridor Evaluation\dwgs\design\incoming\segments\Civil\037213-TRANS-LINK-PB-W.dwg Mar 09, 2011 - 6:29pm - openbnd Layout Tab: L2.1



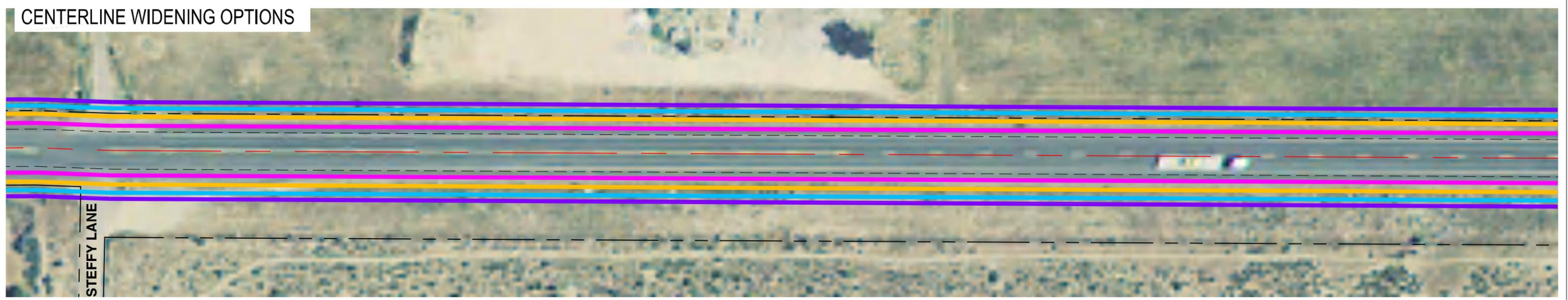
LEGEND:

- 2 - LANES
- 3 - LANES
- 4 - LANES
- 5 - LANES
- 4 - LANES WITH MEDIAN
- - - EXIST. ROW (APPROX)
- - - EXIST. CENTERLINE (APPROX)
- - - EXISTING EDGE OF PAVEMENT

OR HIGHWAY 126 CORRIDOR SEGMENT CONCEPTS
60' ROW OPTION - WILLIAMS ROAD TO MILLICAN ROAD
CROOK COUNTY, OREGON

FIGURE
S3-1

H:\projfile\11168 - OR 126 Powell Butte Corridor Evaluation\dwgs\design\incoming\segments\Civil\037213-TRANS-LINK-W-M.dwg Mar 09, 2011 - 5:32pm - cbergh Layout Tab: L3.1



LEGEND:

- 2 - LANES
- 3 - LANES
- 4 - LANES
- 5 - LANES
- 4 - LANES WITH MEDIAN
- - - - - EXIST. ROW (APPROX)
- - - - - EXIST. CENTERLINE (APPROX)
- - - - - EXISTING EDGE OF PAVEMENT

OR HIGHWAY 126 CORRIDOR SEGMENT CONCEPTS
100' ROW OPTION - WILLIAMS ROAD TO MILLICAN ROAD
CROOK COUNTY, OREGON

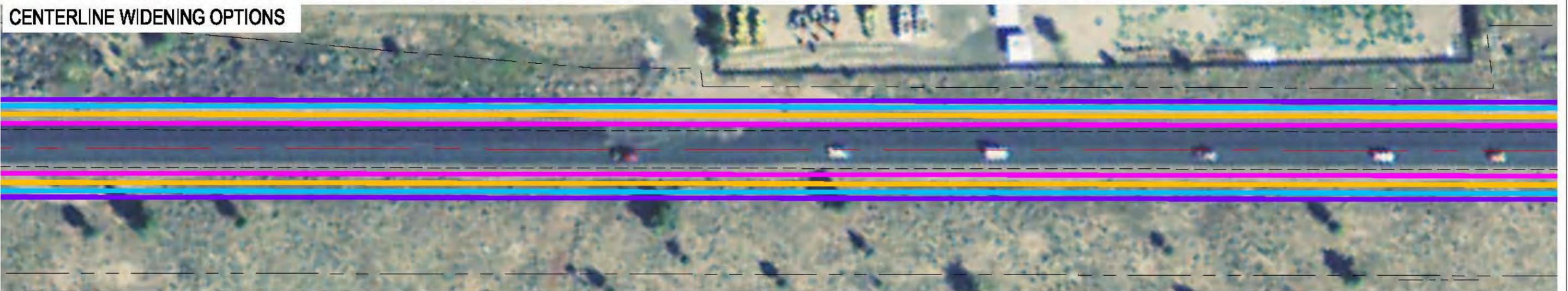
FIGURE
S3-2

H:\projfile\11168 - OR 126 Powell Butte Corridor Evaluation\dwgs\design\incoming\segments\Civil\037213-TRANS-LINK-W-M.dwg Mar 09, 2011 - 5:31pm - cbergh Layout Tab: L3.2

NORTH SHIFT WIDENING OPTIONS



CENTERLINE WIDENING OPTIONS



SOUTH SHIFT WIDENING OPTIONS



- LEGEND:**
- 2 - LANES
 - 3 - LANES
 - 4 - LANES
 - 5 - LANES
 - 4 - LANES WITH MEDIAN
 - - - - - EXIST. ROW (APPROX)
 - - - - - EXIST. CENTERLINE (APPROX)
 - - - - - EXISTING EDGE OF PAVEMENT

OR HIGHWAY 126 CORRIDOR SEGMENT CONCEPTS
200' ROW OPTION - WILLIAMS ROAD TO MILLICAN ROAD
CROOK COUNTY, OREGON

FIGURE
S3-3

H:\proj\11188 - OR 126 Powell Butte Corridor Evaluation\dwg\design\incoming\segments\CM\037213-TRANS-LINK-W-M.dwg Mar 06, 2011 - 6:29pm - cbergh Layout Tab: L3.3

NORTH SHIFT WIDENING OPTIONS



CENTERLINE WIDENING OPTIONS



SOUTH SHIFT WIDENING OPTIONS



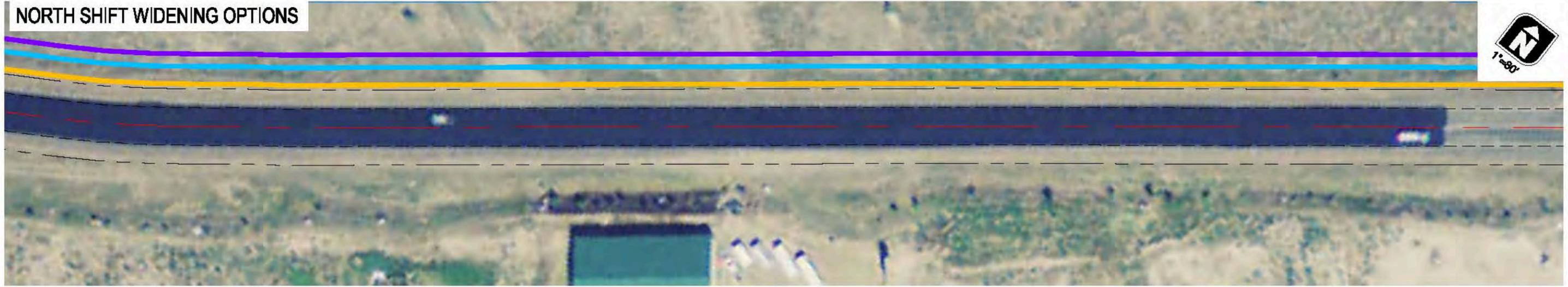
- LEGEND:**
- 2 - LANES
 - 3 - LANES
 - 4 - LANES
 - 5 - LANES
 - 4 - LANES WITH MEDIAN
 - - - - - EXIST. ROW (APPROX)
 - - - - - EXIST. CENTERLINE (APPROX)
 - - - - - EXISTING EDGE OF PAVEMENT

OR HIGHWAY 126 CORRIDOR SEGMENT CONCEPTS
200' ROW OPTION - MILLICAN ROAD TO TOM McCALL ROAD
CROOK COUNTY, OREGON

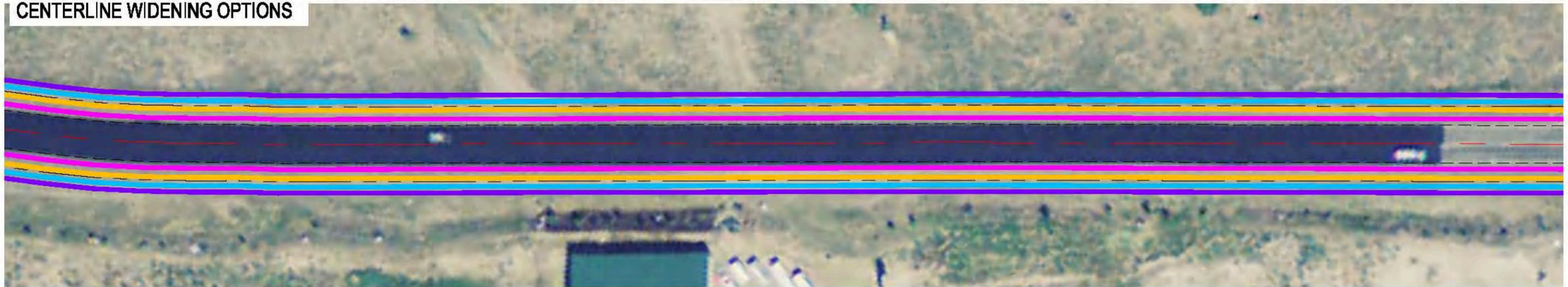
FIGURE
S4-1

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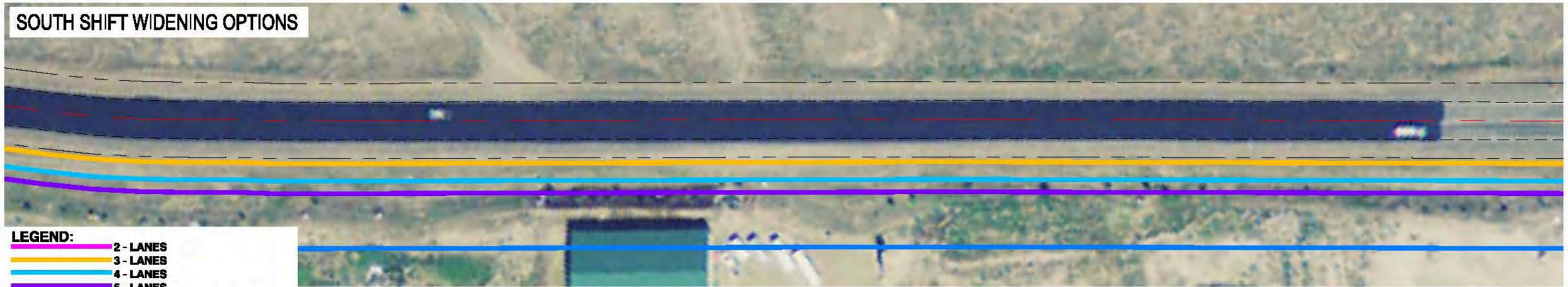
NORTH SHIFT WIDENING OPTIONS



CENTERLINE WIDENING OPTIONS



SOUTH SHIFT WIDENING OPTIONS



- LEGEND:**
- 2 - LANES
 - 3 - LANES
 - 4 - LANES
 - 5 - LANES
 - 4 - LANES WITH MEDIAN
 - - - EXIST. ROW (APPROX)
 - - - EXIST. CENTERLINE (APPROX)
 - - - EXISTING EDGE OF PAVEMENT

OR HIGHWAY 126 CORRIDOR SEGMENT CONCEPTS
60' ROW OPTION - TOM MCCALL TO O'NEIL HIGHWAY
CROOK COUNTY, OREGON

FIGURE
S5-1

H:\projects\11188 - OR 126 Powell Butte Corridor Evaluation\dwg\design\incoming\segments\CW1037213-TRANS-LINK-TM-O.dwg Mar 09, 2011 - 6:49pm - cbergh Layout Tab: L6.1



NORTH SHIFT WIDENING OPTIONS



- LEGEND:**
- 2 - LANES
 - 3 - LANES
 - 4 - LANES
 - 5 - LANES
 - 4 - LANES WITH MEDIAN
 - - - - - EXIST. ROW (APPROX)
 - - - - - EXIST. CENTERLINE (APPROX)
 - - - - - EXISTING EDGE OF PAVEMENT

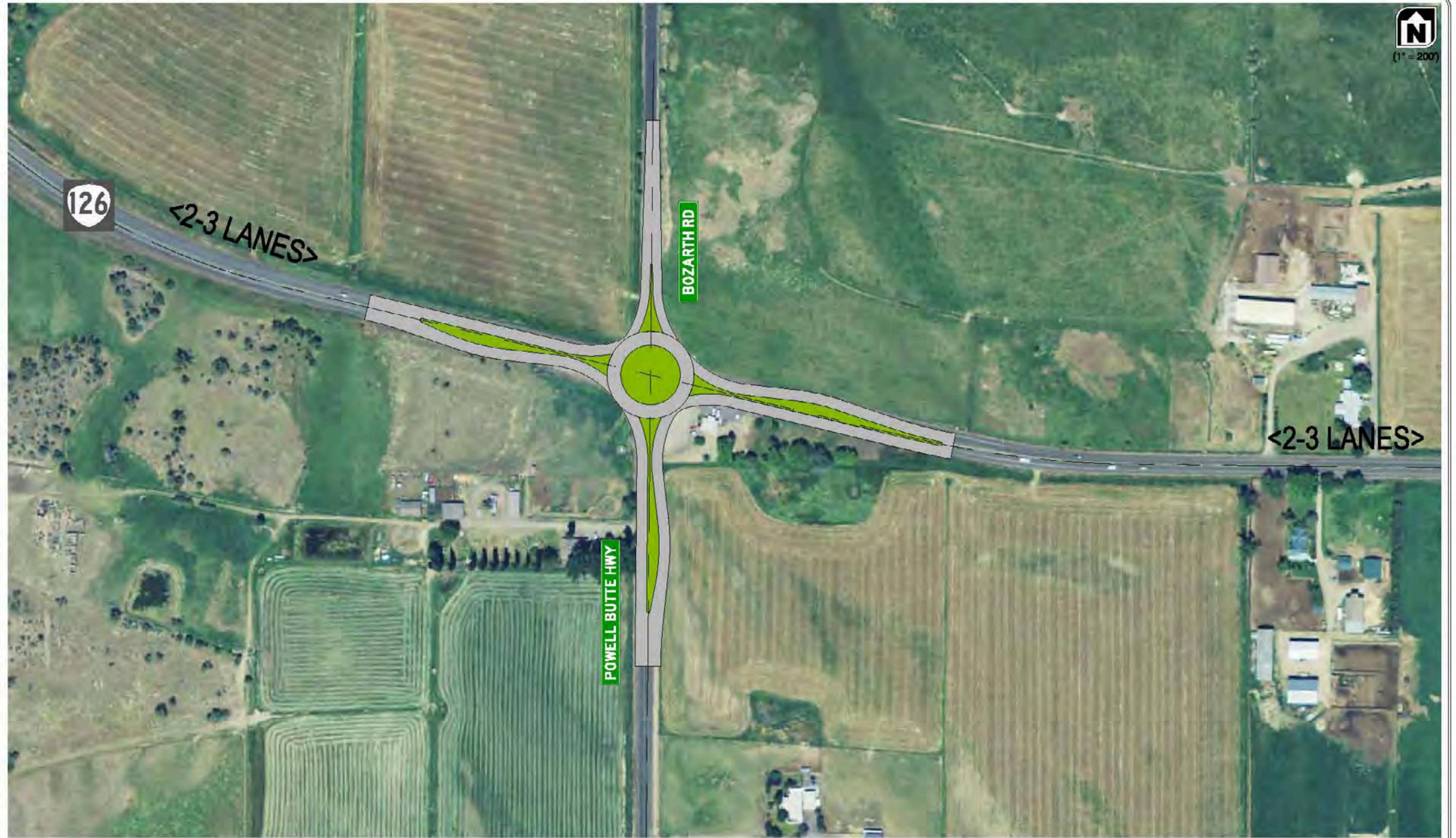
OR HIGHWAY 126 CORRIDOR SEGMENT CONCEPTS
60' ROW OPTION - TOM MCCALL TO O'NEIL HIGHWAY
CROOK COUNTY, OREGON

FIGURE
S5-2

H:\projects\11188 - OR 126 Powell Butte Corridor Evaluation\dwg\design\incoming\segments\CM\037213-TRANS-LINK-TM-O.dwg Mar 09, 2011 - 6:04pm - cbergh Layout Tab: L&2

Appendix B
Intersection Concepts

Filepath: \\1168 - CIR 126 Powell Butte Corridor Eyal\ekun\design\in\m\1168\057213 - Standard\CH\057213-TRANS-PS\butte-D000.dwg Mar 06, 2011 - 11:16am - open\and Layout Tab: 1 POWELL BUTTE HWY



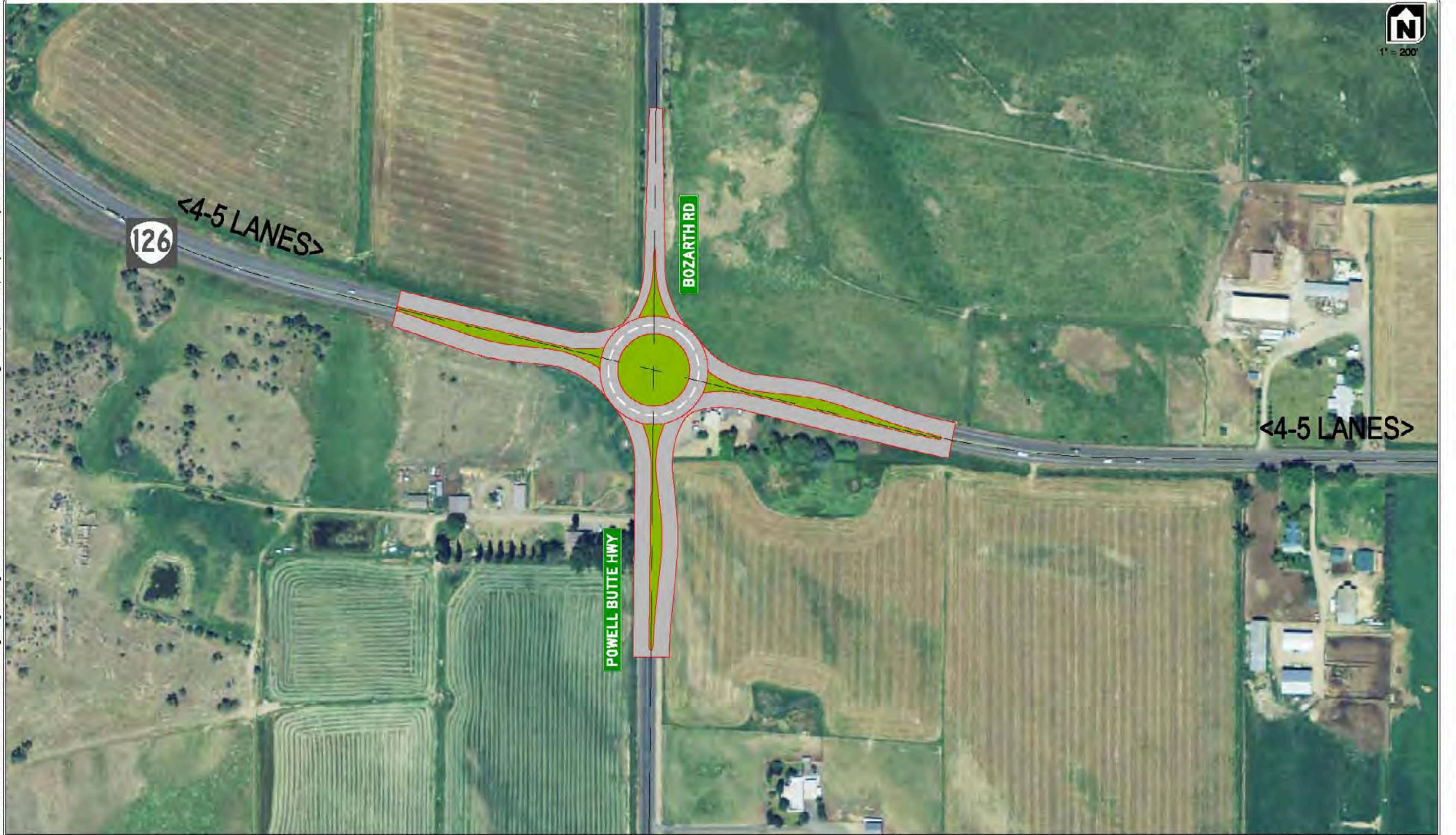
OR 126/POWELL BUTTE HIGHWAY INTERSECTION CONCEPT
SINGLE-LANE ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
PB1



1" = 200'

H:\proj\11168 - CIR 126 Powell Butte Corridor Eyal\ak\ok\gis\design\in\m\11057213 - Standard\CHW\037219-TRANS-PB\butte-D000.dwg Mar 06, 2011 - 11:20am - open\and Layout Tab: 2 POWELL BUTTE HWY



OR 126/POWELL BUTTE HIGHWAY INTERSECTION CONCEPT
DOUBLE-LANE ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
PB2



(1" = 200')

H:\projects\11168 - CR 126 Powell Butte Corridor Evaluation\design\hvac\img\057213 - Standard\CHW057213-TRANS-PB\butte-D000.dwg Mar 06, 2011 - 11:21am - openband Layout Tab: 3 POWELL BUTTE HWY



OR 126/POWELL BUTTE HIGHWAY INTERSECTION CONCEPT
2-3 LANE SIGNAL
CROOK COUNTY, OREGON

FIGURE
PB3

H:\projects\11168 - CR 126 Powell Butte Corridor Evaluation\design\mxd\057213 - Standard\CHW057213-TRANS-PBButte-D000.dwg Mar 06, 2011 - 11:24am - openband Layout Tab: 4 POWELL BUTTE HWY



OR 126/POWELL BUTTE HIGHWAY INTERSECTION CONCEPT
4-5 LANE SIGNAL
CROOK COUNTY, OREGON

FIGURE
PB4



Filepath: \\11168 - CIR 126 Powell Butte Corridor Evaluation\design\graphics\057213 - Standard\CHW057213 - TRANS-PBButte-D000.dwg Mar 06, 2011 - 11:26am - openband Layout Tab: 5 POWELL BUTTE HWY



OR 126/POWELL BUTTE HIGHWAY INTERSECTION CONCEPT
EASTBOUND OR 126 ACCELERATION LANE
CROOK COUNTY, OREGON **FIGURE PB5**



H:\proj\11168 - CR 126 Powell Butte Corridor Evals\ukh\design\h\m\110627213 - Standard\CH\1027213-TRANS-PB\butte-D000.dwg Mar 06, 2011 - 11:28am - openband Layout Tab: 6 POWELL BUTTE HWY



OR 126/POWELL BUTTE HIGHWAY INTERSECTION CONCEPT INTERCHANGE CROOK COUNTY, OREGON

FIGURE PB6



(1" = 200')

H:\proj\11168 - CR 126 Powell Butte Corridor Evaluation\design\in\m\11057213 - Standard\CHW037213-TRANS-Williams-DOOD.dwg Mar 08 2011 - 7:05pm - cbsgh Layout Tab: 1 WILLIAMS ROAD



OR 126/WILLIAMS ROAD INTERSECTION CONCEPT
SINGLE-LANE ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
W1



(1" = 200')

H:\proj\11168 - CR 126 Powell Butte Corridor Evaluation\design\incom\fig\057213 - Standard\CHW057213-TRANS-Williams-D000.dwg Mar 08, 2011 - 1:05:23pm - opened Layout Tab: 2 WILLIAMS ROAD



OR 126/WILLIAMS ROAD INTERSECTION CONCEPT
DOUBLE-LANE ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
W2



Filepath: \\1168 - CIR 126 Powell Butte Corridor Evaluation\design\in\m\11687213 - Standard\CHW037213-TRANS-Williams-0000.dwg Mar 08, 2011 - 10:53pm - opened Layout Tab: 3 WILLIAMS ROAD



<2-3 LANES>

<2-3 LANES>

126

WILLIAMS RD

OR 126/WILLIAMS ROAD INTERSECTION CONCEPT
2-3 LANE SIGNAL
CROOK COUNTY, OREGON

FIGURE
W3



(1" = 200')

Filepath: \\1168 - CIR 126 Powell Butte Corridor Evaluation\design\graphics\057213 - Standard\Civil\057213-TRANS-Williams-DOOO.dwg Mar 08, 2011 - 1:25:49pm - opened Layout Tab: 4 WILLIAMS ROAD



<4-5 LANES>



<4-5 LANES>

OR 126/WILLIAMS ROAD INTERSECTION CONCEPT
4-5 LANE SIGNAL
CROOK COUNTY, OREGON

FIGURE
W4



(1" = 200')

H:\p\proj\11168 - CIR 126 Powell Butte Corridor Evaluation\design\in\img\057213 - Standard\CHW057213 - TRANS-Williams-0000.dwg Mar 08, 2011 - 1:00pm - openbnd Layout Tab: 5 WILLIAMS ROAD



OR 126/WILLIAMS ROAD INTERSECTION CONCEPT
5- TO 3-LANE TRANSITION TO SIGNAL
CROOK COUNTY, OREGON

FIGURE
W5



H:\projects\11188 - CIR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - standard\CIR\057213-TRANS-Williams-DO00.dwg Mar 22, 2011 - 9:08am - cbergh Layout Tab: 6 WILLIAMS ROAD



OR 126/WILLIAMS ROAD INTERSECTION CONCEPT
NORTH REROUTE, SIGNAL
CROOK COUNTY, OREGON

FIGURE
W6



H:\proj\11168 - CIR 126 Powell Butte Corridor Evaluation\design\incom\fig\057213 - Standard\CHW057213-TRANS-Williams-5000.dwg Mar 08, 2011 - 11:10pm - opened Layout Tab: 7 WILLIAMS ROAD



OR 126/WILLIAMS ROAD INTERSECTION CONCEPT
NORTH ROUTE, ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
W7



Filepath: \\11168 - CR 126 Powell Butte Corridor Evaluation\design\working\057213 - Standard\CHW057213-TRANS-Williams-D000.dwg Mar 08, 2011 - 11:12pm - openbnd Layout Tab: 8 WILLIAMS ROAD



OR 126/WILLIAMS ROAD INTERSECTION CONCEPT
NORTH REROUTE, UNSIGNALIZED
CROOK COUNTY, OREGON

FIGURE
W8



(1" = 200')

H:\projects\11168 - CR 126 Powell Butte Corridor Evaluation\design\income\1057213 - Standard\CHW087619-TRANS-Williams-DOOO.dwg Mar 08, 2011 - 11:13pm - openbnd Layout Tab: 9 WILLIAMS ROAD



OR 126/WILLIAMS ROAD INTERSECTION CONCEPT
NORTHERN INTERCHANGE
CROOK COUNTY, OREGON

FIGURE
W9



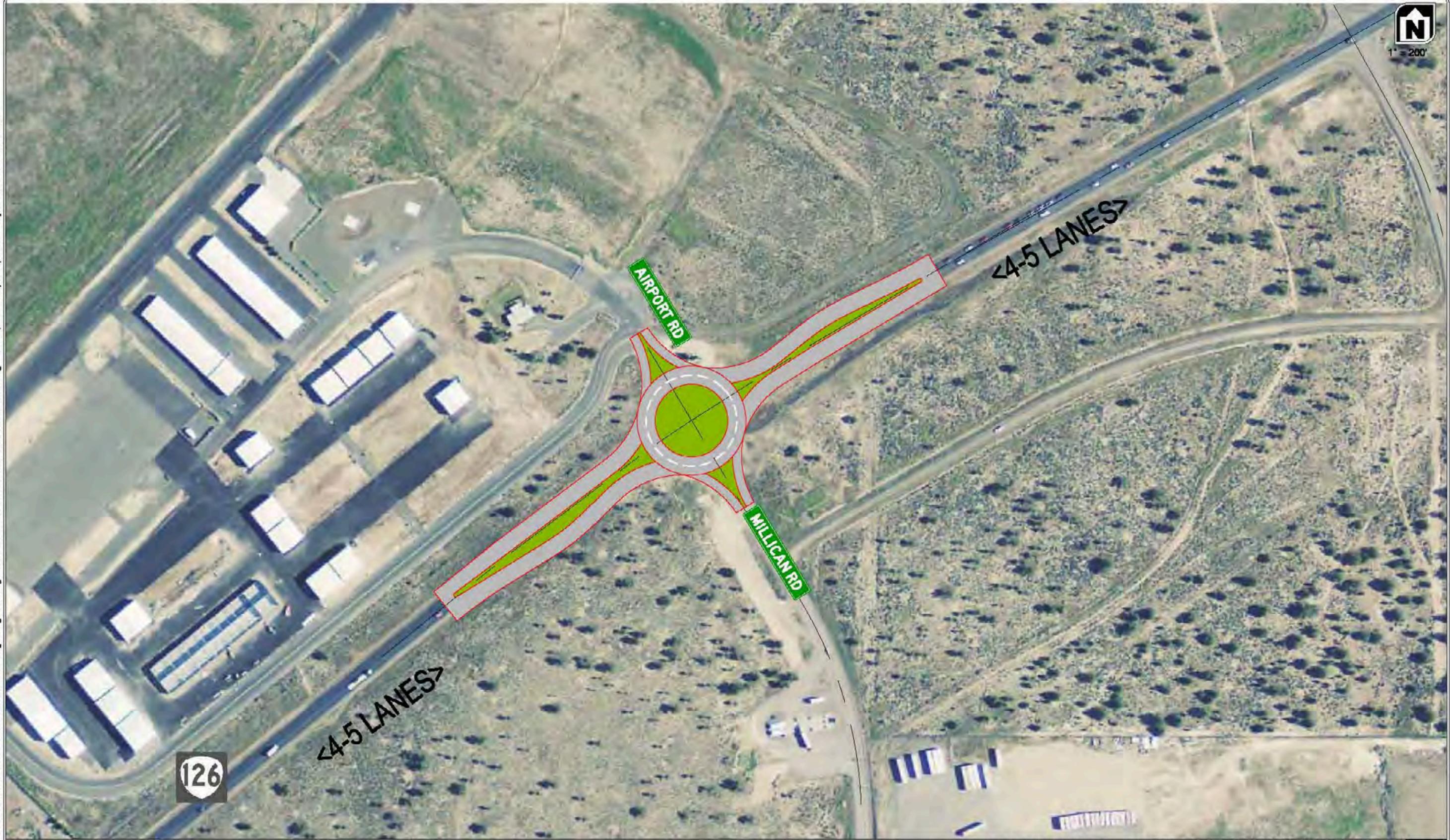
Filepath: \\1168 - CIR 126 Powell Butte Corridor Evaluation\design\in\m\1057213 - Standard\CH\037219-TRANS-Millican-DD00.dwg Mar 05, 2011 - 1:41pm - opened Layout Tab: 1 MILLICAN ROAD



OR 126/MILICAN ROAD/AIRPORT ROAD INTERSECTION CONCEPT
SINGLE-LANE ROUNDABOUT
CROOK COUNTY, OREGON **FIGURE M1**



H:\p\proj\11168 - CR 126 Powell Butte Corridor Evaluation\design\in\m\057213 - Standard\CHW057213-TRANS-Millican-DD00.dwg Mar 05, 2011 - 1:49pm - opened Layout Tab: 2 MILLICAN ROAD



OR 126/MILICAN ROAD/AIRPORT ROAD INTERSECTION CONCEPT
MULTI-LANE ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
M2



1" = 200'

H:\projects\11168 - CR 126 Powell Butte Corridor Evaluation\design\m3\m3_213 - Standard\CHW027213 - TRANS-Millican-DD00.dwg Mar 05, 2011 - 1:46pm - opened Layout Tab: 3 MILLICAN ROAD



OR 126/MILLICAN ROAD/AIRPORT ROAD INTERSECTION CONCEPT
2-3 LANE SIGNAL
CROOK COUNTY, OREGON

FIGURE
M3

Filepath: \\11168 - CIR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - Standard\CHW057213-TRANS-Millican-DD00.dwg Mar 05, 2011 - 1:52pm - opened Layout Tab: 4 MILLICAN ROAD



OR 126/MILLICAN ROAD/AIRPORT ROAD INTERSECTION CONCEPT
 4-5 LANE SIGNAL
 CROOK COUNTY, OREGON

FIGURE
M4

H:\projects\11168 - OR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - standard\CHW\057213-TRANS-Millican-DIGG.dwg Apr 01, 2011 - 5:37pm - change Layout Tab: 5 MILLICAN ROAD



OR 126/MILICAN ROAD/AIRPORT ROAD INTERSECTION CONCEPT
CLOSE AIRPORT ROAD, REROUTE TO TOM MCCALL ROAD
CROOK COUNTY, OREGON

FIGURE
M5

Filepath: \\11168 - CIR 126 Powell Butte Corridor Evaluation\design\in\m\1057213 - Standard\CH\037219-TRANS-Millican-DD00.dwg Mar 05, 2011 - 2:04pm - opened Layout Tab: 6 MILICAN ROAD



OR 126/MILICAN ROAD/AIRPORT ROAD INTERSECTION CONCEPT
"T" INTERSECTION, MILICAN ROAD REROUTE
CROOK COUNTY, OREGON

FIGURE
M6



1" = 200'

H:\projects\11168 - OR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - standard\CH\057213-TRANS-Millican-D000.dwg Mar 14, 2011 - 5:47pm - csteigh Layout Tab: 7 MILLICAN ROAD



OR 126/MILlicAN ROAD/AIRPORT ROAD INTERSECTION CONCEPT
RIGHT-IN, RIGHT-OUT ACCESS TO AIRPORT ROAD
CROOK COUNTY, OREGON

FIGURE
M7

H:\projects\11188 - CIR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - Standard\CHW057213-TRANS-TMcCall-0200.dwg Mar 08, 2011 - 1:45pm - cheng Layout Tab: 1 TOM McCALL ROAD



OR 126/TOM MCCALL ROAD INTERSECTION CONCEPT
SINGLE-LANE ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
T1



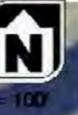
1" = 100'



H:\projects\11188 - CIR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - Standard\CHW037213-TRANS-TMcCall-D200.dwg Mar 09, 2011 - 1:57pm - ebaigh Layout Tab: 2 TOM McCALL

OR 126/TOM MCCALL ROAD INTERSECTION CONCEPT
MULTI-LANE ROUNDABOUT
CROOK COUNTY, OREGON

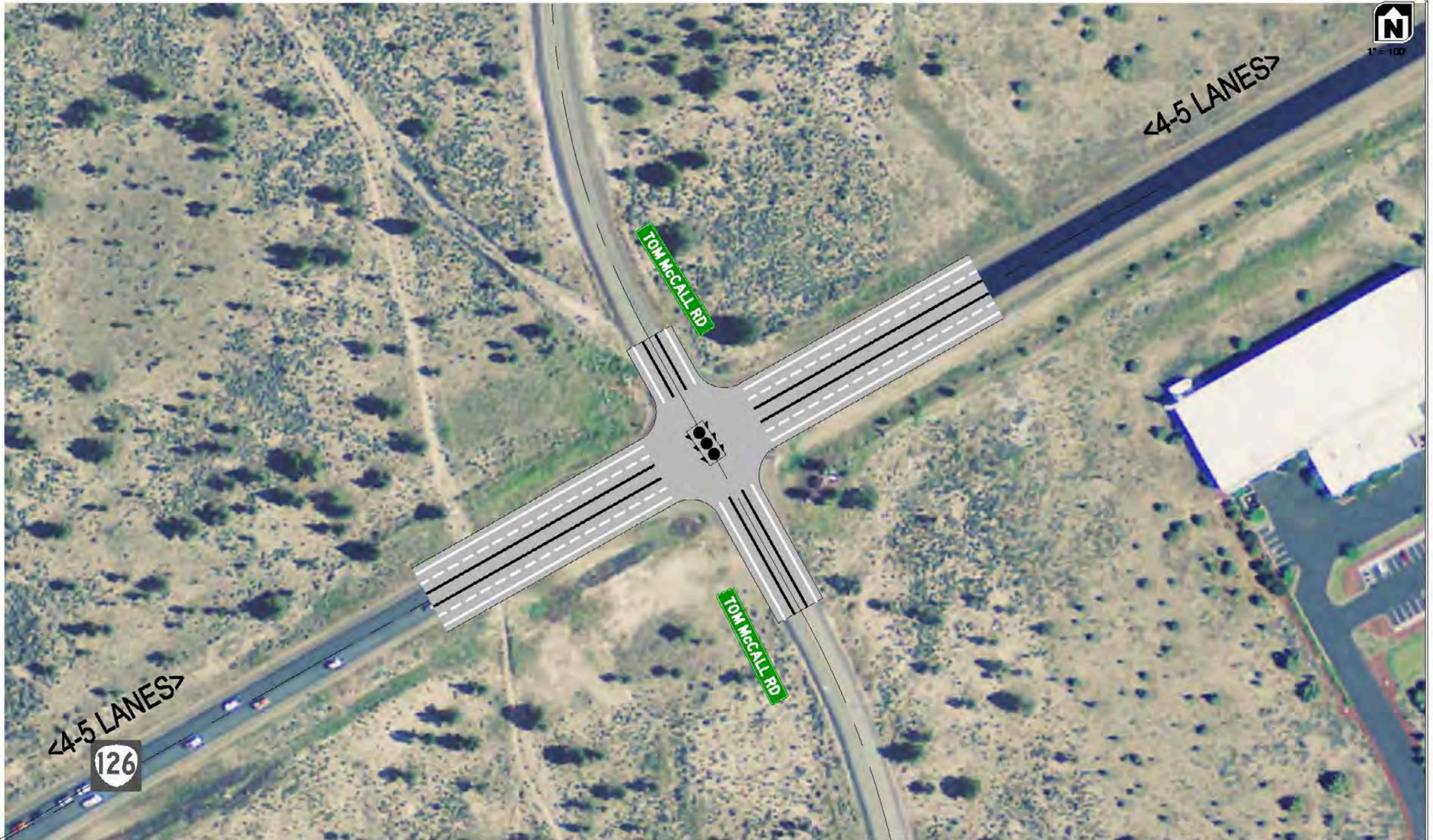
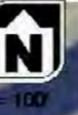
FIGURE
T2



OR 126/TOM MCCALL ROAD INTERSECTION CONCEPT
 2-3 LANE SIGNAL
 CROOK COUNTY, OREGON

FIGURE
T3

H:\projects\11188 - CIR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - Standard\CHW\057213-TRANS-TMcCall-D200.dwg Mar 09, 2011 - 1:53pm - ebaigh Layout Tab: 3 TOM McCALL



H:\projects\11188 - CIR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - Standard\CHW\057213-TRANS-TMcCall-D200.dwg Mar 09, 2011 - 2:05pm - ebaugh Layout Tab: 4 TOM McCALL

**OR 126/TOM MCCALL ROAD INTERSECTION CONCEPT
4-5 LANE SIGNAL
CROOK COUNTY, OREGON**

**FIGURE
T4**

H:\projects\11188 - CIR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - Standard\CHW087219-TRANS-TMcCall-0200.dwg Mar 11, 2011 - 5:34pm - ebaigh Layout Tab: 5 TOM McCALL



OR 126/TOM MCCALL ROAD INTERSECTION CONCEPT
SINGLE-LANE ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
T5

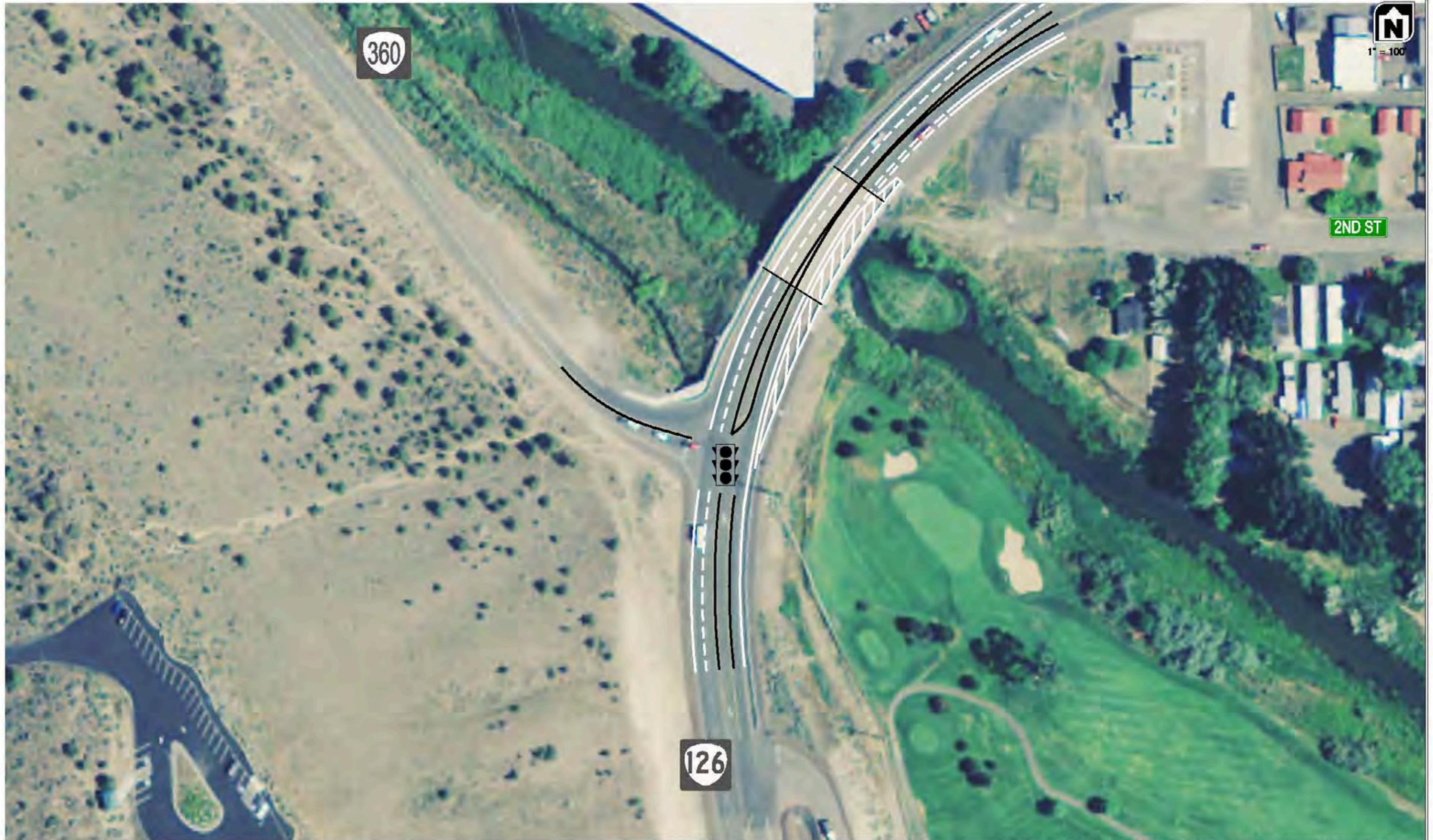
H:\projects\111158 - OR 126 Powell Butte Corridor Evaluation\design\income\057219 - Standard\Civil\057219 - TRAVIS-O'Neill-Hwy (OR 360) Layout Tab - open.dwg Mar 06, 2011 - 3:17pm - open.dwg



OR 126/O'NEIL HIGHWAY (OR 360) INTERSECTION CONCEPT
MULTI-LANE ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
01

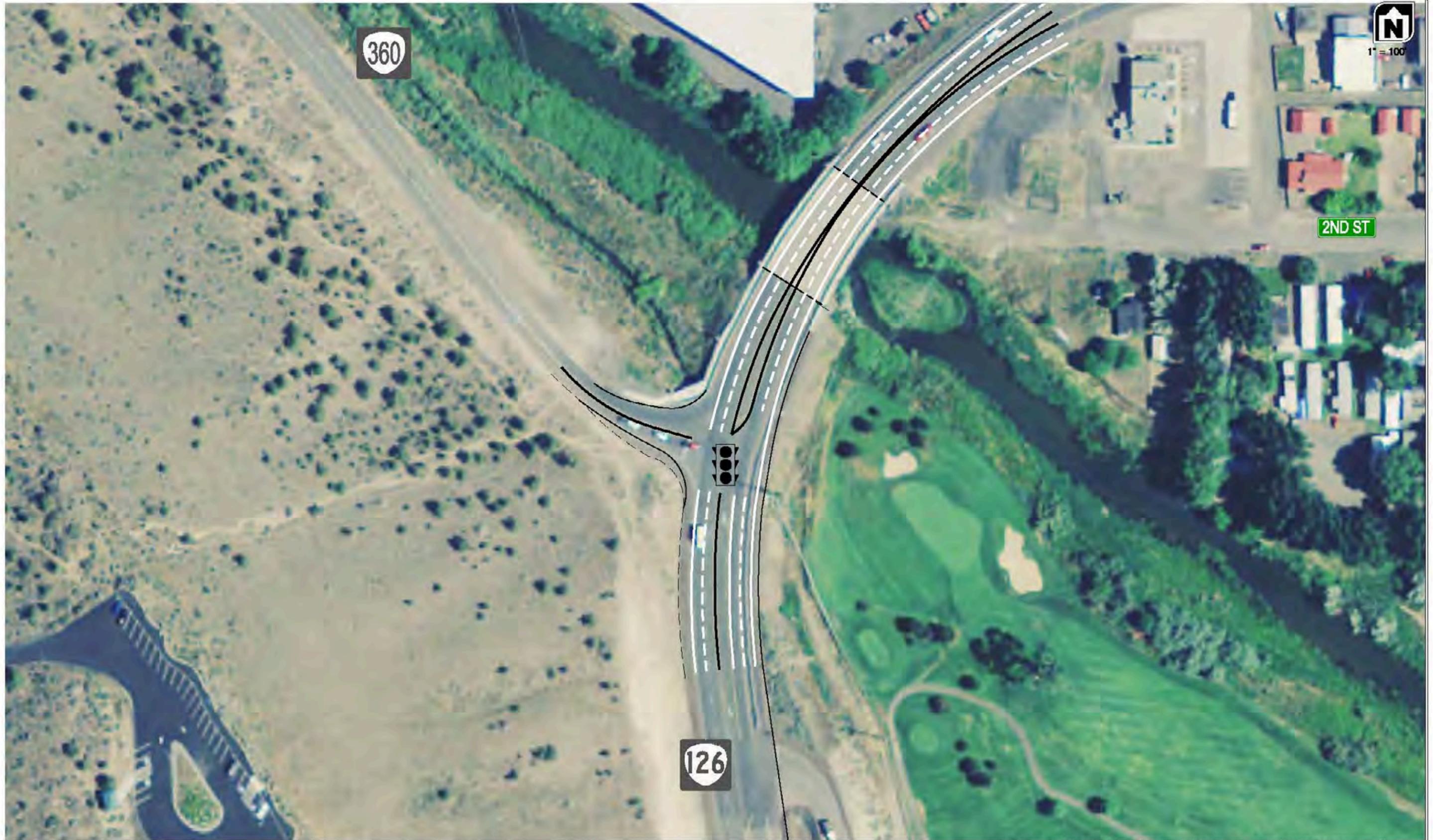
H:\projects\111588 - OR 126 Powell Butte Corridor Evaluation\design\income\057213 - Standard\Civil\057213 - TRAMS-Crowell-DD00.dwg Mar 06, 2011 - 3:15pm - gpenland Layout Tab: 02 O'NEIL HWY (OR 360)



OR 126/O'NEIL HIGHWAY (OR 360) INTERSECTION CONCEPT
4-LANE SIGNAL
CROOK COUNTY, OREGON

FIGURE
02

H:\projects\111588 - OR 126 Powell Butte Corridor Evaluation\design\income\057219 - Standard\Civil\057219 - TRAMS-O'Neill-DD00.dwg Mar 06, 2011 - 8:15pm - gpenland Layout Tab: 03 O'NEILL HWY (OR 360)



OR 126/O'NEIL HIGHWAY (OR 360) INTERSECTION CONCEPT
5-LANE SIGNAL
CROOK COUNTY, OREGON

FIGURE
03

H:\projects\111588 - OR 126 Power Burdette Corridor Evaluation\design\incoming\057213 - Standard\Civil\057213 - TRAMS-Crowell-DD000.dwg Mar 06, 2011 - 8:15pm - gpendard Layout Tab: 04 O'NEIL HWY (OR 360)



OR 126/O'NEIL HIGHWAY (OR 360) INTERSECTION CONCEPT
WEST ROUTE TO US 26
CROOK COUNTY, OREGON



1" = 100'



OR 126/PRINEVILLE "Y" INTERSECTION CONCEPT
SINGLE-LANE ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
Y1

H:\projects\11188 - CR 126 Powell Butte Corridor Evaluation\design\incoming\Ch\037213-TRANS-US26-0000.dwg Mar 14, 2011 - 9:56am - abargh Layout Tab: 1 US26



1" = 100'

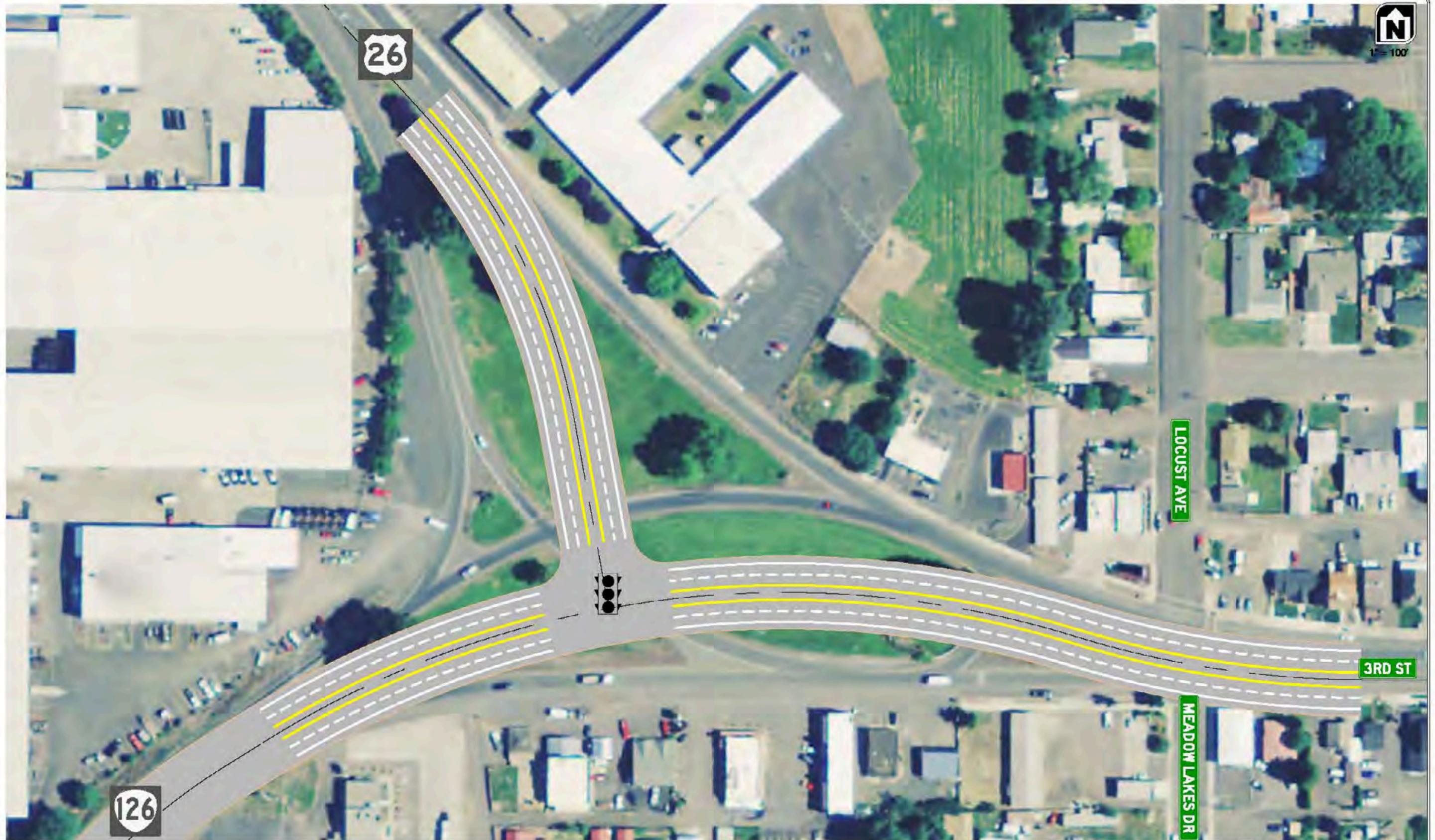


OR 126/PRINEVILLE "Y" INTERSECTION CONCEPT
MULTI-LANE ROUNDABOUT
CROOK COUNTY, OREGON

FIGURE
Y2

H:\p\proj\11188 - CR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - standard\CHK\037213-TRANS-US26-DD00.dwg Mar 14, 2011 - 10:46am - cbeigh Layout Tab: 2 US26

H:\projects\11188 - CR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - Standard\CHW037213-TRANS-US26-DD00.dwg Mar 11, 2011 - 7:49pm - opened Layout Tab: 3 US26



OR 126/PRINEVILLE "Y" INTERSECTION CONCEPT
4-5 LANE SIGNAL
CROOK COUNTY, OREGON

FIGURE
Y3

H:\projects\11188 - CR 126 Powell Butte Corridor Evaluation\design\incoming\057213 - Standard\CHW037213-TRANS-US26-DD00.dwg Mar 11, 2011 - 7:53pm - opened Layout Tab: 4 US26



OR 126/PRINEVILLE "Y" INTERSECTION CONCEPT
GEOMETRIC IMPROVEMENTS
CROOK COUNTY, OREGON

FIGURE
Y4

Appendix C
Corridor Segment
Concept Screening Data

Segment	Centerline Sections				North Shift Sections				South Shift Sections			
	CL2	CL3	CL4	CL5	N3	N4	N4S	N5	S3	S4	S4S	S5
R-O-W VISUALIZATION (ACRES)												
CL/PB	0.00	2.33	4.46	6.05	2.23	4.46	13.06	6.05	2.23	4.46	13.06	6.05
PB/W	0.00	2.67	5.10	6.92	2.55	5.10	14.93	6.92	2.55	5.10	14.93	6.92
W/M	0.00	8.92	17.03	23.11	8.51	17.03	49.87	23.11	8.51	17.03	49.87	23.11
M/TM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TM/O	N/A	N/A	N/A	N/A	N/A	1.64	N/A	3.17	N/A	N/A	N/A	N/A
O/PY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STRUCTURAL IMPACTS												
CL/PB	0	0	0	0	0	0	0	0	0	0	0	0
PB/W		1 barn (ROW), 1 parking	1 barn, 1 parking	1 barn, 1 parking	0	0	3 houses, 1 irr. strc.,	1 house(ROW)		1 store, 1 church (ROW)	1 post office, 1 church, 2 houses, 1 shed, 1 barn	1 post office, 1 church, 1 shed, 1 barn
W/M			1 gas pumps(ROW)	1 gas pumps, 1 parking	1 gas pumps(ROW)	1 gas pumps	1 gas pumps, 1 store 3 houses, 1 greenhouse, 1 outbuilding(ROW), 2 outbuildings	1 gas pumps, 1 greenhouse, 1 outbuilding (ROW)	0	1 schoolyard	1 schoolyard, 1 school, 3 houses	1 schoolyard
M/TM	0	0	0	0	0	0	0	0	0	0	0	0
TM/O	0	0	0	0	0	0	0	0	0	0	1 business	0
O/PY	0	0	0	0	0	0	1 business	0	0	0	0	0
COST (ROW)												
CL/PB	\$0	\$210,000	\$390,000	\$530,000	\$200,000	\$390,000	\$1,140,000	\$530,000	\$200,000	\$390,000	\$1,140,000	\$530,000
PB/W	\$0	\$240,000	\$450,000	\$610,000	\$230,000	\$450,000	\$1,310,000	\$610,000	\$230,000	\$450,000	\$1,310,000	\$610,000
W/M	\$0	\$780,000	\$1,490,000	\$2,020,000	\$750,000	\$1,490,000	\$4,350,000	\$2,020,000	\$750,000	\$1,490,000	\$4,350,000	\$2,020,000
M/TM	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TM/O	N/A	N/A	N/A	N/A	N/A	\$150,000	N/A	\$280,000	N/A	N/A	N/A	N/A
O/PY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COST (Construction)												
CL/PB	\$1,280,000	\$2,340,000	\$3,420,000	\$3,760,000	\$1,800,000	\$3,370,000	\$3,130,000	\$3,400,000	\$1,800,000	\$3,370,000	\$3,130,000	\$3,400,000
PB/W	\$1,470,000	\$2,670,000	\$3,920,000	\$4,300,000	\$2,060,000	\$3,860,000	\$3,580,000	\$3,890,000	\$2,060,000	\$3,860,000	\$3,580,000	\$3,890,000
W/M	\$4,890,000	\$8,910,000	\$13,060,000	\$14,360,000	\$6,860,000	\$12,870,000	\$11,950,000	\$12,960,000	\$6,860,000	\$12,870,000	\$11,950,000	\$12,960,000
M/TM	\$0	\$570,000	\$840,000	\$920,000	\$440,000	\$830,000	\$770,000	\$830,000	\$440,000	\$830,000	\$770,000	\$830,000
TM/O	N/A	N/A	N/A	N/A	N/A	\$7,130,000	N/A	\$13,370,000	N/A	N/A	N/A	N/A
O/PY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COST (Total)												
CL/PB	\$1,280,000	\$2,550,000	\$3,810,000	\$4,290,000	\$2,000,000	\$3,760,000	\$4,270,000	\$3,930,000	\$2,000,000	\$3,760,000	\$4,270,000	\$3,930,000
PB/W	\$1,470,000	\$2,910,000	\$4,370,000	\$4,910,000	\$2,290,000	\$4,310,000	\$4,890,000	\$4,500,000	\$2,290,000	\$4,310,000	\$4,890,000	\$4,500,000
W/M	\$4,890,000	\$9,690,000	\$14,550,000	\$16,380,000	\$7,610,000	\$14,360,000	\$16,300,000	\$14,980,000	\$7,610,000	\$14,360,000	\$16,300,000	\$14,980,000
M/TM	\$0	\$570,000	\$840,000	\$920,000	\$440,000	\$830,000	\$770,000	\$830,000	\$440,000	\$830,000	\$770,000	\$830,000
TM/O	N/A	N/A	N/A	N/A	N/A	\$7,280,000	N/A	\$13,650,000	N/A	N/A	N/A	N/A
O/PY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WETLAND IMPACTS (# Wetlands)												
note: this table excludes wetland/riparian impact areas associated with irrigation ponds and canal crossings, see next table (Environmental Impacts) below for # of canal and pond impacts.												
CL/PB	0	0	0	0	0	0	0	0	0	0	0	0
PB/W	1	1	1	1	1	1	1	1	0	0	0	0
W/M	0	0	0	0	0	0	0	0	0	0	0	0
M/TM	0	0	0	0	0	0	0	0	0	0	0	0
TM/O	0	0	0	0	0	0	0	0	0	0	0	0
O/PY	None, excluding any Crooked River bridge x-ing modifications											
ENVIRONMENTAL IMPACTS (Other)												
CL/PB	COID Canal/Dry Canyon Crossing, 1 irr pond											
PB/W	1 x-ing for COID I-Lateral Crossing. 3 x-ings for COID canal											
W/M	3 x-ings for COID N-Lateral canal, 1 x-ing for Central Oregon Canal,											
M/TM	0	1 irr pond	2 irr ponds	2 irr ponds	1 irr pond	1 irr pond	1 irr pond	1 irr pond	2 irr ponds	2 irr ponds	4 irr ponds	2 irr ponds
TM/O	0	0	0	0	0	0	0	0	0	0	0	0
O/PY	None, excluding any Crooked River bridge x-ing modifications											

CL/PB = Crook County to Powell Butte Highway (Milepost 3.58 to 6.84)
PB/W = Powell Butte Highway to Williams Road (Milepost 6.84 to 8.34)
W/M = Williams Road to Millican Road (Milepost 8.34 to 15.52)
M/TM = Millican Road to Tom McCall Road (Milepost 15.52 to 15.84)
TM/O = Tom McCall Road to O'Neil Highway (Milepost 15.84 to 17.92)
O/PY = O'Neil Highway to Prineville "Y"/US 26 (Milepost 17.92 to 18.16)

Highway 126 Corridor Impact Assumptions

1. "Highway 126 Corridor Estimate Assumptions" applicable.
2. O/PY link excluded from ROW impact and construction cost analysis.
3. Generally, ROW acquisition and construction costs based on length of existing 60' ROW in each link. Exceptions are M/TM and TM/O.
4. ROW acquisition is assumed to be \$2/SF, equivalent to \$87,120/acre.
5. Construction cost for TM/O link, N4 option based on N3 cost per lineal foot + \$400/LF to include construction of an average 6' tall retaining wall or to account for additional earthwork.
6. Construction cost for TM/O link, N5 option based on N4 cost per lineal foot + \$750/LF to include construction of an average 12' tall retaining wall or to account for additional earthwork.
7. Wetland and environmental impacts based on Crook County GIS 2005 Wetland Inventory Mapping as well as the U.S. Fish & Wildlife Service National Wetlands Inventory overlay onto Google Earth, and only one wetland impact other than irrigation ponds and canals was shown. Possible additional localized wetlands may occur from approx. 1660' west of Powell Butte Hwy. to 3 Springs Ranch Road. Typical wetland locations occur along canal banks and at low points near irrigated fields. More detailed on-site wetland assessment required to accurately identify number and extent of potential wetland impacts.

Appendix D
Intersection Concept
Screening Data

Concept Number	Concept Description	ROW (acres)	Structural Impacts	Cost (ROW)	Cost (Construction)	Cost (Total)
Powell Butte Highway						
PB1	Single-Lane Roundabout	2.00	Existing drainage facilities, dry utilities, parking, overhead power	\$170,000	\$3,000,000	\$3,170,000
PB2	Double-Lane Roundabout	3.00	Existing drainage facilities, dry utilities, parking, overhead power	\$260,000	\$4,000,000	\$4,260,000
PB3	2-3 Lane Signal	1.50	Existing drainage facilities, dry utilities, parking, overhead power	\$130,000	\$1,390,000	\$1,520,000
PB4	4-5 Lane Signal	2.50	Existing drainage facilities, dry utilities, parking, overhead power	\$220,000	\$2,150,000	\$2,370,000
PB5	Eastbound Acceleration Lane	1.00	Existing drainage facilities, dry utilities, parking, overhead power	\$90,000	\$250,000	\$340,000
PB6	Interchange	8.00	Existing building (SE corner) drainage facilities, dry utilities, parking, overhead power	\$700,000	\$6,600,000	\$7,300,000
Williams Road						
W1	Single-Lane Roundabout	2.00	Existing building (SW corner), fuel pum	\$170,000	\$2,480,000	\$2,650,000
W2	Double-Lane Roundabout	3.00	Existing buildings (SW & NW corners), fuel pumps (NE corner) dry utilities, parking, permanent signs, overhead power	\$260,000	\$3,630,000	\$3,890,000
W3	2-3 Lane Signal	1.50	Possible fuel pumps (NE corner) dry utilities, parking, permanent signs, overhead power	\$130,000	\$1,890,000	\$2,020,000
W4	4-5 Lane Signal	2.50	Fuel pumps (NE corner), existing building (SE Corner) dry utilities, parking, permanent signs, overhead power	\$220,000	\$2,360,000	\$2,580,000
W5	5- to 3-Lane Signal	1.50	Possible fuel pumps (NE corner) dry utilities, parking, permanent signs, overhead power	\$130,000	\$1,890,000	\$2,020,000
W6	North Reroute, Signal	9.00	Possible building impacts to home west of intersection, overhead power, dry utilities	\$780,000	\$2,770,000	\$3,550,000
W7	North Reroute, Roundabout	8.00	Possible building impacts to homes west of intersection & SE corner of roundabout, overhead power, dry utilities	\$700,000	\$3,760,000	\$4,460,000
W8	North Reroute, Unsignalized	9.00	Possible building impacts to home and pump house west of intersection, overhead power, dry utilities	\$780,000	\$2,110,000	\$1,810,000
W9	Northern Interchange	9.00	Country Store, multiple homes, overhead power, dry utilities	\$780,000	\$8,710,000	\$9,490,000
Millican Road/Airport Road						
M1	Single-Lane Roundabout	2.00	Existing street light, dry utilities	\$170,000	\$2,480,000	\$2,650,000
M2	Double-Lane Roundabout	3.00	Existing street light, dry utilities	\$260,000	\$3,630,000	\$3,890,000
M3	2-3 Lane Signal	1.50	Existing street light, dry utilities	\$130,000	\$1,890,000	\$2,020,000
M4	4-5 Lane Signal	2.50	Existing street light, dry utilities	\$220,000	\$2,360,000	\$2,580,000
M5	Full Reroute	5.00	Existing street light	\$440,000	\$1,400,000	\$1,840,000
M6	"T" Intersection	2.50	No noticeable impacts	\$220,000	\$710,000	\$930,000
M7	RIRO	2.50	No noticeable impacts	\$220,000	\$770,000	\$990,000
Tom McCall Road						
T1	Single-Lane Roundabout	2.00	Existing dry utilities, permanent signs	\$170,000	\$2,480,000	\$2,650,000
T2	Double-Lane Roundabout	3.00	Existing dry utilities, permanent signs	\$260,000	\$3,630,000	\$3,890,000
T3	2-3 Lane Signal	1.50	No noticeable impacts	\$130,000	\$1,890,000	\$2,020,000
T4	4-5 Lane Signal	2.50	Existing dry utilities, permanent signs	\$220,000	\$2,360,000	\$2,580,000
T5	Interchange	9.00	Existing dry utilities, permanent signs	\$780,000	\$10,500,000	\$11,280,000
O'Neil Highway						
O1	Double-Lane Roundabout	1.50	Existing bridge, cut slope and golf course.	\$120,000	\$5,000,000	\$5,120,000
O2	3-Lane Signal	0.00	None	\$0	\$400,000	\$400,000
O3	4-5 Lane Signal	0.50	Bridge rail realignment on the south end of the bridge	\$40,000	\$1,030,000	\$1,070,000
O4	West Reroute to US 26	6.50	Existing Municipal waste water facilities	\$565,000	\$7,000,000	\$7,565,000
Prineville "Y"						
Y1	Single-Lane Roundabout	0.25	Existing parking, possible existing building (Gee's), business access	\$20,000	\$2,480,000	\$2,500,000
Y2	Double-Lane Roundabout	0.50	Existing parking, existing building (Gee's), business access	\$40,000	\$3,630,000	\$3,670,000
Y3	4-5 Lane Signal	0.50	Existing parking, existing building, business access	\$40,000	\$3,000,000	\$3,040,000
Y4	Geometric Improvements	0.00	Existing parking, existing buildings (South of 3rd, North of Meadow Lakes Drive), business access	\$0	\$400,000	\$400,000

Highway 126 Intersection Estimate Assumptions

1. Improvements will extend 1,000 feet on each leg from center of intersection.
2. For interchanges, right of way visualization includes area between on/off ramps and OR 126.
3. Added width to receive 4" asphalt concrete over 8" aggregate base.
4. A 2" asphalt overlay will be placed over existing and added section.
5. Excludes costs associated with utility relocation.
6. Contingency (65%) based on Surveying (2%), Mobilization (10%), TP&DT (2%), Erosion Control (1%), Engineering (10%), Construction Management (10%), Misc. (30%).
7. For intersection concept PB3, it is assumed OR 126 will receive overlay only since it currently is a three lane road at the intersection. Bazarth Road and Powell Butte Highway to receive widening and overlay.
8. Excludes intersection lighting replacement.
9. Excludes replacement of private permanent signs.

037213-HIGHWAY 126 CORRIDOR STUDY
 INTERSECTION IMPROVEMENTS
 2/28/2011

PB1

Intersection: OR 126 @ Powell Butte HWY and Bozarth Road
 Configuration: Single Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	SINGLE LANE ROUNDABOUT	LS	1	\$1,500,000.00	\$1,500,000
				SUBTOTAL	\$1,500,000
				CONTINGENCY (65%)	\$975,000
				TOTAL	\$2,475,000

PB2

Intersection: OR 126 @ Powell Butte HWY and Bozarth Road
 Configuration: Double Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	DOUBLE LANE ROUNDABOUT	LS	1	\$2,200,000.00	\$2,200,000
				SUBTOTAL	\$2,200,000
				CONTINGENCY (65%)	\$1,430,000
				TOTAL	\$3,630,000

PB3

Intersection: OR 126 @ Powell Butte HWY and Bozarth Road
 Configuration: Three lane with signals

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	0.56	\$10,000.00	\$5,600
0330-010500K	GENERAL EXCAVATION	CUYD	596	\$11.29	\$6,729
BASES					
0640-0100000M	AGGREGATE BASE	TON	1,206	\$17.00	\$20,502
0640-0101000M	AGGREGATE SHOULDERS	TON	80	\$20.00	\$1,600
WEARING SURFACES					
0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	6	\$650.00	\$3,900
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	3,311	\$80.00	\$264,880
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	199	\$625.00	\$124,375
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	120	\$40.00	\$4,800
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	13,000	\$0.30	\$3,900
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000
				SUBTOTAL	\$841,406
				CONTINGENCY (65%)	\$546,914
				TOTAL	\$1,388,320

PB4

Intersection: HWY 126 @ Powell Butte HWY and Bozarth Road
 Configuration: Five lane (OR 126) three lane (Powell Butte HWY/Bozarth Road)

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
ROADWORK					
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	8,000	\$1.28	\$10,240
0320-0100000R	CLEARING AND GRUBBING	ACRE	2.70	\$10,000.00	\$27,000
0330-010500K	GENERAL EXCAVATION	CUYD	2,878	\$11.29	\$32,493
BASES					
0640-0100000M	AGGREGATE BASE	TON	4,623	\$17.00	\$78,591
0640-0101000M	AGGREGATE SHOULDERS	TON	160	\$20.00	\$3,200
WEARING SURFACES					
0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	12	\$650.00	\$7,800
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	6,173	\$80.00	\$493,840
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	370	\$625.00	\$231,250
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
PAVEMENT MARKINGS					

0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	27,000	\$0.30	\$8,100
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000

SUBTOTAL \$1,300,514
CONTINGENCY (65%) \$845,334
TOTAL \$2,145,847

PB5

Intersection: HWY 126 @ Powell Butte HWY and Bozarth Road

Configuration: OR 126 ACCELERATION LANE

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
ROADWORK					
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	1,300	\$1.28	\$1,664
0320-0100000R	CLEARING AND GRUBBING	ACRE	0.60	\$10,000.00	\$6,000
0330-010500K	GENERAL EXCAVATION	CUYD	645	\$11.29	\$7,282
BASES					
0640-0100000M	AGGREGATE BASE	TON	1,306	\$17.00	\$22,202
0640-0101000M	AGGREGATE SHOULDERS	TON	26	\$20.00	\$520
WEARING SURFACES					
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	963	\$80.00	\$77,040
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	58	\$625.00	\$36,250
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	48	\$40.00	\$1,920
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	3,900	\$0.30	\$1,170

SUBTOTAL \$154,048
CONTINGENCY (65%) \$100,131
TOTAL \$254,179

PB6

Intersection: HWY 126 @ Powell Butte HWY and Bozarth Road

Configuration: Tom McCall overpass, on and off ramps both north and south

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	OVERPASS W/ ON AND OFF RAMPS	LS	1	\$4,000,000.00	\$4,000,000

SUBTOTAL \$4,000,000
CONTINGENCY (65%) \$2,600,000
TOTAL \$6,600,000

037213-HIGHWAY 126 CORRIDOR STUDY
 INTERSECTION IMPROVEMENTS
 2/28/2011

W1

Intersection: OR 126 @ Williams Road
 Configuration: Single Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	SINGLE LANE ROUNDABOUT	LS	1	\$1,500,000.00	\$1,500,000
				SUBTOTAL	\$1,500,000
				CONTINGENCY (65%)	\$975,000
				TOTAL	\$2,475,000

W2

Intersection: OR 126 @ Williams Road
 Configuration: Double Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	DOUBLE LANE ROUNDABOUT	LS	1	\$2,200,000.00	\$2,200,000
				SUBTOTAL	\$2,200,000
				CONTINGENCY (65%)	\$1,430,000
				TOTAL	\$3,630,000

W3

Intersection: OR 126 @ Williams Road
 Configuration: Three lane with signals

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	2.20	\$10,000.00	\$22,000
0330-010500K	GENERAL EXCAVATION	CUYD	2,382	\$11.29	\$26,893
BASES					
0640-0100000M	AGGREGATE BASE	TON	4,795	\$17.00	\$81,515
0640-0101000M	AGGREGATE SHOULDERS	TON	160	\$20.00	\$3,200
WEARING SURFACES					
0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	10	\$650.00	\$6,500
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	5,033	\$80.00	\$402,640
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	302	\$625.00	\$188,750
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	3,500	\$0.30	\$1,050
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000
				SUBTOTAL	\$1,145,668
				CONTINGENCY (65%)	\$744,684
				TOTAL	\$1,890,352

W4

Intersection: OR 126 @ Williams Road
 Configuration: Five lane (OR 126) three lane (Williams Road)

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
ROADWORK					
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	3.30	\$10,000.00	\$33,000
0330-010500K	GENERAL EXCAVATION	CUYD	3,573	\$11.29	\$40,339
BASES					
0640-0100000M	AGGREGATE BASE	TON	7,236	\$17.00	\$123,012
0640-0101000M	AGGREGATE SHOULDERS	TON	160	\$20.00	\$3,200
WEARING SURFACES					
0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	12	\$650.00	\$7,800
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	6,847	\$80.00	\$547,760
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	411	\$625.00	\$256,875
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
PAVEMENT MARKINGS					

0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	27,000	\$0.30	\$8,100
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000

SUBTOTAL \$1,433,206
CONTINGENCY (65%) \$931,584
TOTAL \$2,364,790

W5

Intersection: OR 126 @ Williams Road

Configuration: Three lane with signals

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	2.20	\$10,000.00	\$22,000
0330-010500K	GENERAL EXCAVATION	CUYD	2,382	\$11.29	\$26,893

BASES

0640-0100000M	AGGREGATE BASE	TON	4,795	\$17.00	\$81,515
0640-0101000M	AGGREGATE SHOULDERS	TON	160	\$20.00	\$3,200

WEARING SURFACES

0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	10	\$650.00	\$6,500
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	5,033	\$80.00	\$402,640
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	302	\$625.00	\$188,750

PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS

0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
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PAVEMENT MARKINGS

0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	3,500	\$0.30	\$1,050
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000

SUBTOTAL \$1,145,668
CONTINGENCY (65%) \$744,684
TOTAL \$1,890,352

W6

Intersection: OR 126 @ Williams Road

Configuration: Three lane north of the Country Store, signalized, with access roads to existing OR 126

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	6.00	\$10,000.00	\$60,000
0330-010500K	GENERAL EXCAVATION	CUYD	6,005	\$11.29	\$67,796

BASES

0640-0100000M	AGGREGATE BASE	TON	12,160	\$17.00	\$206,720
0640-0101000M	AGGREGATE SHOULDERS	TON	264	\$20.00	\$5,280

WEARING SURFACES

0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	14	\$650.00	\$9,100
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	7,723	\$80.00	\$617,840
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	463	\$625.00	\$289,375

PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS

0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
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PAVEMENT MARKINGS

0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	32,500	\$0.30	\$9,750
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000

SUBTOTAL \$1,678,981
CONTINGENCY (65%) \$1,091,338
TOTAL \$2,770,319

W7

Intersection: OR 126 @ Williams Road

Configuration: Three lane north of the Country Store, single lane roundabout.

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	SINGLE LANE ROUNDABOUT	LS	1	\$1,500,000.00	\$1,500,000
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	4.80	\$10,000.00	\$48,000
0330-010500K	GENERAL EXCAVATION	CUYD	5,211	\$11.29	\$58,832

BASES

0640-010000M	AGGREGATE BASE	TON	10,552	\$17.00	\$179,384
0640-0101000M	AGGREGATE SHOULDERS	TON	200	\$20.00	\$4,000

WEARING SURFACES

0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	9	\$650.00	\$5,850
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	3,922	\$80.00	\$313,760
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	235	\$625.00	\$146,875

PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS

0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
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PAVEMENT MARKINGS

0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	32,500	\$0.30	\$9,750
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SUBTOTAL \$2,279,571
CONTINGENCY (65%) \$1,481,721
TOTAL \$3,761,292

W8

Intersection: OR 126 @ Williams Road

Configuration: Three lane north of the Country Store, unsignalized, with access roads to existing OR 126.

		Unit	Quantity	Unit Cost	Total
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Bid Item #	Bid Item Name				
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ROADWORK

0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	6.00	\$10,000.00	\$60,000
0330-010500K	GENERAL EXCAVATION	CUYD	6,005	\$11.29	\$67,796

BASES

0640-0100000M	AGGREGATE BASE	TON	12,160	\$17.00	\$206,720
0640-0101000M	AGGREGATE SHOULDERS	TON	264	\$20.00	\$5,280

WEARING SURFACES

0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	14	\$650.00	\$9,100
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	7,723	\$80.00	\$617,840
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	463	\$625.00	\$289,375

PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS

0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
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PAVEMENT MARKINGS

0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	32,500	\$0.30	\$9,750
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SUBTOTAL \$1,278,981
CONTINGENCY (65%) \$831,338
TOTAL \$2,110,319

W9

Intersection: OR 126 @ Williams Road

Configuration: Interchange with three lane north of the Country Store, unsignalized, with access roads to existing OR 126.

		Unit	Quantity	Unit Cost	Total
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Bid Item #	Bid Item Name				
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1	W8 CONFIGURATION	LS	1	\$1,278,981.45	\$1,278,981
2	INTERCHANGE	LS	1	\$4,000,000.00	\$4,000,000

SUBTOTAL \$5,278,981
CONTINGENCY (65%) \$3,431,338
TOTAL \$8,710,319

037213-HIGHWAY 126 CORRIDOR STUDY
 INTERSECTION IMPROVEMENTS
 2/28/2011

M1

Intersection: OR 126 @ Millican Road
 Configuration: Single Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	SINGLE LANE ROUNDABOUT	LS	1	\$1,500,000.00	\$1,500,000
				SUBTOTAL	\$1,500,000
				CONTINGENCY (65%)	\$975,000
				TOTAL	\$2,475,000

M2

Intersection: OR 126 @ Millican Road
 Configuration: Double Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	DOUBLE LANE ROUNDABOUT	LS	1	\$2,200,000.00	\$2,200,000
				SUBTOTAL	\$2,200,000
				CONTINGENCY (65%)	\$1,430,000
				TOTAL	\$3,630,000

M3

Intersection: OR 126 @ Millican Road
 Configuration: Three lane with signals

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	2.20	\$10,000.00	\$22,000
0330-010500K	GENERAL EXCAVATION	CUYD	2,382	\$11.29	\$26,893
BASES					
0640-0100000M	AGGREGATE BASE	TON	4,795	\$17.00	\$81,515
0640-0101000M	AGGREGATE SHOULDERS	TON	160	\$20.00	\$3,200
WEARING SURFACES					
0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	10	\$650.00	\$6,500
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	5,033	\$80.00	\$402,640
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	302	\$625.00	\$188,750
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	3,500	\$0.30	\$1,050
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000
				SUBTOTAL	\$1,145,668
				CONTINGENCY (65%)	\$744,684
				TOTAL	\$1,890,352

M4

Intersection: OR 126 @ Millican Road
 Configuration: Five lane (OR 126) three lane (Millican Road)

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
ROADWORK					
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	3.30	\$10,000.00	\$33,000
0330-010500K	GENERAL EXCAVATION	CUYD	3,573	\$11.29	\$40,339
BASES					
0640-0100000M	AGGREGATE BASE	TON	7,236	\$17.00	\$123,012
0640-0101000M	AGGREGATE SHOULDERS	TON	160	\$20.00	\$3,200
WEARING SURFACES					
0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	12	\$650.00	\$7,800
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	6,847	\$80.00	\$547,760
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	411	\$625.00	\$256,875
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
PAVEMENT MARKINGS					

0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	27,000	\$0.30	\$8,100
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000

SUBTOTAL \$1,433,206
CONTINGENCY (65%) \$931,584
TOTAL \$2,364,790

M5

Intersection: OR 126 @ Millican Road

Configuration: OR 126 with 2-two lane frontage roads north and south of OR 126

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
ROADWORK					
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	100	\$1.28	\$128
0320-0100000R	CLEARING AND GRUBBING	ACRE	3.30	\$10,000.00	\$33,000
0330-010500K	GENERAL EXCAVATION	CUYD	4,528	\$11.29	\$51,121
BASES					
0640-0100000M	AGGREGATE BASE	TON	7,236	\$17.00	\$123,012
0640-0101000M	AGGREGATE SHOULDERS	TON	144	\$20.00	\$2,880
WEARING SURFACES					
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	5,332	\$80.00	\$426,560
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	320	\$625.00	\$200,000
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	100	\$40.00	\$4,000
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	21,600	\$0.30	\$6,480

SUBTOTAL \$847,181
CONTINGENCY (65%) \$550,668
TOTAL \$1,397,849

M6

Intersection: OR 126 @ Millican Road

Configuration: OR 126 with 1-two lane frontage road south.

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
ROADWORK					
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	50	\$1.28	\$64
0320-0100000R	CLEARING AND GRUBBING	ACRE	1.65	\$10,000.00	\$16,500
0330-010500K	GENERAL EXCAVATION	CUYD	2,481	\$11.29	\$28,010
BASES					
0640-0100000M	AGGREGATE BASE	TON	3,618	\$17.00	\$61,506
0640-0101000M	AGGREGATE SHOULDERS	TON	72	\$20.00	\$1,440
WEARING SURFACES					
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	2,666	\$80.00	\$213,280
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	160	\$625.00	\$100,000
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	100	\$40.00	\$4,000
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	10,800	\$0.30	\$3,240

SUBTOTAL \$428,040
CONTINGENCY (65%) \$278,226
TOTAL \$706,267

M7

Intersection: OR 126 @ Williams Road

Configuration: OR 126 with 1-two lane frontage road south, with channelization and concrete barrier on OR 126

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	Channelization	LS	1.00	\$20,000.00	\$20,000
ROADWORK					
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	50	\$1.28	\$64
0320-0100000R	CLEARING AND GRUBBING	ACRE	1.65	\$10,000.00	\$16,500
0330-010500K	GENERAL EXCAVATION	CUYD	2,481	\$11.29	\$28,010
BASES					

0640-010000M	AGGREGATE BASE	TON	3,618	\$17.00	\$61,506
0640-010100M	AGGREGATE SHOULDERS	TON	72	\$20.00	\$1,440
WEARING SURFACES					
0745-020200M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	2,666	\$80.00	\$213,280
0745-062200M	PG 64-28 ASPHALT IN HMAC	TON	160	\$625.00	\$100,000
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0820-010000F	CONCRETE BARRIER	FT	380	\$55.00	\$20,900
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	100	\$40.00	\$4,000
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	10,800	\$0.30	\$3,240

SUBTOTAL	\$468,940
CONTINGENCY (65%)	\$304,811
TOTAL	\$773,752

037213-HIGHWAY 126 CORRIDOR STUDY
 INTERSECTION IMPROVEMENTS
 2/28/2011

T1

Intersection: OR 126 @ Tom McCall Road
 Configuration: Single Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	SINGLE LANE ROUNDABOUT	LS	1	\$1,500,000.00	\$1,500,000
				SUBTOTAL	\$1,500,000
				CONTINGENCY (65%)	\$975,000
				TOTAL	\$2,475,000

T2

Intersection: OR 126 @ Tom McCall Road
 Configuration: Double Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	DOUBLE LANE ROUNDABOUT	LS	1	\$2,200,000.00	\$2,200,000
				SUBTOTAL	\$2,200,000
				CONTINGENCY (65%)	\$1,430,000
				TOTAL	\$3,630,000

T3

Intersection: OR 126 @ Tom McCall Road
 Configuration: Three lane with signals

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	2.20	\$10,000.00	\$22,000
0330-010500K	GENERAL EXCAVATION	CUYD	2,382	\$11.29	\$26,893
BASES					
0640-0100000M	AGGREGATE BASE	TON	4,795	\$17.00	\$81,515
0640-0101000M	AGGREGATE SHOULDERS	TON	160	\$20.00	\$3,200
WEARING SURFACES					
0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	10	\$650.00	\$6,500
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	5,033	\$80.00	\$402,640
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	302	\$625.00	\$188,750
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	3,500	\$0.30	\$1,050
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000
				SUBTOTAL	\$1,145,668
				CONTINGENCY (65%)	\$744,684
				TOTAL	\$1,890,352

T4

Intersection: OR 126 @ Tom McCall Road
 Configuration: Five lane (OR 126) three lane (Tom McCall Road)

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
ROADWORK					
0310-0119000F	ASPHALT PAVEMENT SAW CUTTING	FT	4,000	\$1.28	\$5,120
0320-0100000R	CLEARING AND GRUBBING	ACRE	3.30	\$10,000.00	\$33,000
0330-010500K	GENERAL EXCAVATION	CUYD	3,573	\$11.29	\$40,339
BASES					
0640-0100000M	AGGREGATE BASE	TON	7,236	\$17.00	\$123,012
0640-0101000M	AGGREGATE SHOULDERS	TON	160	\$20.00	\$3,200
WEARING SURFACES					
0730-0104000J	EMULSIFIED ASPHALT IN TACK COAT	TON	12	\$650.00	\$7,800
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	6,847	\$80.00	\$547,760
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	411	\$625.00	\$256,875
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
PAVEMENT MARKINGS					

0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	27,000	\$0.30	\$8,100
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000

SUBTOTAL \$1,433,206
CONTINGENCY (65%) \$931,584
TOTAL \$2,364,790

T5
Intersection: OR 126 @ Millican Road
Configuration: Tom McCall overpass, on and off ramps both north and south

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
	1 OVERPASS W/ ON AND OFF RAMPS	LS	1	\$6,400,000	\$6,400,000
				SUBTOTAL	\$6,400,000
				CONTINGENCY (65%)	\$4,100,000
				TOTAL	\$10,500,000

037213-HIGHWAY 126 CORRIDOR STUDY
 INTERSECTION IMPROVEMENTS
 3/8/2011

126/O'neil 1

Intersection: OR 126 @ O'neil Highway
 Configuration: Double Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	DOUBLE LANE ROUNDABOUT	LS	1	\$2,200,000.00	\$2,200,000
				SUBTOTAL	\$2,200,000
				CONTINGENCY (65%)	\$1,430,000
				TOTAL	\$3,630,000

126/O'neil 2

Intersection: OR 126 @ O'neil Highway
 Configuration: 3 lane with signals

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
ROADWORK					
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000
				SUBTOTAL	\$400,000
				CONTINGENCY (65%)	\$260,000
				TOTAL	\$660,000

126/O'neil 3

Intersection: OR 126 @ O'neil Highway
 Configuration: 4-5 lane with signals

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
0320-0100000R	CLEARING AND GRUBBING	ACRE	0.50	\$10,000.00	\$5,000
0330-010500K	GENERAL EXCAVATION WITH GUARD RAIL REMOVAL	CUYD	350	\$30.00	\$10,500
BASES					
0640-0100000M	AGGREGATE BASE	TON	700	\$17.00	\$11,900
0640-0101000M	AGGREGATE SHOULDERS	TON	20	\$20.00	\$400
WEARING SURFACES					
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	1,243	\$80.00	\$99,440
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	75	\$625.00	\$46,875
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0810-0107000F	GUARDRAIL, TYPE 3	FT	765	\$50.00	\$38,250
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	13,000	\$0.30	\$3,900
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000
				SUBTOTAL	\$624,265
				CONTINGENCY (65%)	\$405,772
				TOTAL	\$1,030,037

126/O'neil 4

Intersection: OR 126 @ O'neil Highway
 Configuration: Reroute of O'neil Highway

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	STEEL GIRDER BRIDGE OVER CROOKED RIVER	LS	1	\$1,620,000.00	\$1,620,000
ROADWORK					
0320-0100000R	CLEARING AND GRUBBING	ACRE	7.00	\$10,000.00	\$70,000
0330-010500K	GENERAL EXCAVATION	CUYD	4,915	\$11.29	\$55,490
BASES					
0640-0100000M	AGGREGATE BASE	TON	9,475	\$17.00	\$161,075
0640-0101000M	AGGREGATE SHOULDERS	TON	150	\$20.00	\$3,000
WEARING SURFACES					
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	7,011	\$80.00	\$560,880
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	420	\$625.00	\$262,500
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	23,985	\$0.30	\$7,196
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000
				SUBTOTAL	\$3,148,141
				CONTINGENCY (65%)	\$2,046,292
				TOTAL	\$5,194,432

037213-HIGHWAY 126 CORRIDOR STUDY
 INTERSECTION IMPROVEMENTS
 2/28/2011

Y1

Intersection: OR 126 @ Prineville "Y"
 Configuration: Single Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	SINGLE LANE ROUNDABOUT	LS	1	\$1,500,000.00	\$1,500,000
SUBTOTAL					\$1,500,000
CONTINGENCY (65%)					\$975,000
TOTAL					\$2,475,000

Y2

Intersection: OR 126 @ Prineville "Y"
 Configuration: Double Lane Roundabout

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
1	DOUBLE LANE ROUNDABOUT	LS	1	\$2,200,000.00	\$2,200,000
SUBTOTAL					\$2,200,000
CONTINGENCY (65%)					\$1,430,000
TOTAL					\$3,630,000

Y3

Intersection: OR 126 @ Prineville "Y"
 Configuration: Five lane with signals

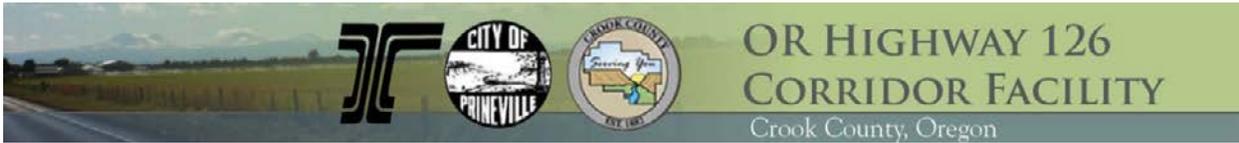
Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
0320-0100000R	CLEARING AND GRUBBING	ACRE	11.20	\$10,000.00	\$112,000
0330-010500K	GENERAL EXCAVATION	CUYD	6,000	\$11.29	\$67,740
BASES					
0640-0100000M	AGGREGATE BASE	TON	11,758	\$17.00	\$199,886
0640-0101000M	AGGREGATE SHOULDERS	TON	120	\$20.00	\$2,400
WEARING SURFACES					
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	8,665	\$80.00	\$693,200
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	520	\$625.00	\$325,000
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	400	\$40.00	\$16,000
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	21,000	\$0.30	\$6,300
0990-0101000A	TRAFFIC SIGNAL INSTALLATION	LS	1.00	\$400,000.00	\$400,000
SUBTOTAL					\$1,822,526
CONTINGENCY (65%)					\$1,184,642
TOTAL					\$3,007,168

Y4

Intersection: OR 126 @ Prineville "Y"
 Configuration: Traffic Loop for freight

Bid Item #	Bid Item Name	Unit	Quantity	Unit Cost	Total
ROADWORK					
0320-0100000R	CLEARING AND GRUBBING	ACRE	1.10	\$10,000.00	\$11,000
0330-010500K	GENERAL EXCAVATION	CUYD	3,000	\$11.29	\$33,870
BASES					
0640-0100000M	AGGREGATE BASE	TON	2,412	\$17.00	\$41,004
0640-0101000M	AGGREGATE SHOULDERS	TON	24	\$20.00	\$480
WEARING SURFACES					
0745-0202000M	LEVEL 2, 1/2 INCH DENSE HMAC	TON	1,777	\$80.00	\$142,160
0745-0622000M	PG 64-28 ASPHALT IN HMAC	TON	7	\$625.00	\$4,375
PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS					
0940-0010400A	PERMANENT SIGNING COSTS	SQFT	200	\$40.00	\$8,000
PAVEMENT MARKINGS					
0940-0010400A	LONGITUDINAL PAVEMENT MARKINGS-PAINT	FT	2,400	\$0.30	\$720
SUBTOTAL					\$241,609
CONTINGENCY (65%)					\$157,046
TOTAL					\$398,655

**Technical Appendix F Technical Memorandum #4B:
Alternative Land Use
Strategies White Paper**



TECHNICAL MEMORANDUM #4B: Alternative Land Use Strategies White Paper

OR Highway 126 Corridor Facility Plan

Date: March 10, 2011 Project #: 11168

To: PPMT and PAC Members

From: Darci Rudzinski, AICP; Cathy Corliss, AICP
Marc Butorac, PE, PTOE; Joe Bessman, PE, PTOE, and Casey Bergh, PE

Subject: Alternative Land Use Strategies in Support of OR Highway 126 Mobility, Safety & Performance Standards

This white paper presents land use strategies and related land use ordinance amendments that can have a positive effect on preserving capacity and enhancing safety and performance in the OR Highway 126 corridor. The strategies and associated modifications necessary to implement them contained here are intended to supplement and enhance the Initial Opportunity and Constraints Analysis contained in Technical Memorandum #4A. It is the intent of this white paper to provide insight into how potential changes related to land use and development regulations can impact corridor performance. The strategies explored here can inform the refinement of the transportation improvement alternatives, a process that will be detailed in Technical Memorandum #5.

The information contained in this white paper is organized into a series of sections, organized by topic. The following topics are covered in this white paper:

- Rural Cluster Zoning
- Mix of Uses in Employment Areas
- Employment Retention in Prineville
- Planning for Alternate Modes and Connectivity
- Rural Service Area Land Uses

Rural Cluster Zoning

Technical Memorandum #2 summarizes the access management standards that govern OR 126 and documents that only one of the 83 access points meets the spacing standards associated with a Rural Expressway. The number and close spacing of existing access points along the highway degrade its safety and efficiency. Reducing access points along the highway would improve



corridor mobility/safety. One of the goals of the Corridor Facility Plan is to identify ways to reduce the number of existing approaches through long-term planning efforts.

As mentioned later in this memorandum, consolidated and shared access can be a condition of development approval in areas along the corridor that can be more intensely developed (i.e. parcels either within the City of Prineville or a Rural Community Service). However, a large majority of parcels that have private accesses on the highway are zoned exclusive farm use (EFU-3, Powell Butte Area) and, with few exceptions,¹ are restricted to farm use and associated dwellings. Each of these parcels has a legal right to access; if access from OR 126 is prohibited and an alternate access is not available, ODOT must provide an alternate access or compensate the property owner by purchasing the property.

Transportation solutions to providing alternate access include planning for a local roadway system that connects to collector- or arterial-level streets that then provide access to the highway at intersections. A local access or frontage road, one that parallels the highway and provides access to many parcels that would otherwise take direct access from the highway, is another means to reduce the number of access points. These and other transportation-related solutions are explored in Technical Memorandum #4 as part of the transportation improvement alternatives. Providing alternate access – which ultimately means building more roadways – adds to the expense of a transportation solution and, because of the restrictions on the use of EFU land, the cost for this type of improvement is unlikely to be offset by development-related fees or contributions in a large part of the corridor.

An innovative land use approach that has the potential to consolidate access points and provide access to EFU parcels is allowing rural cluster development. If the right to develop one dwelling unit on a parcel were transferable to another parcel or, put another way, if the permitted number of dwelling units on multiple parcels could be consolidated under a single development application, then dwellings could be developed in closer proximity to each other in a “cluster.” The number of allowed dwelling units would not increase (or decrease), as the parcels that had transferred their allowance would be deed restricted or would be subsumed into the larger development and designated on the recorded plat as areas restricted from development (or, conversely, preserved for farm use). Access to multiple residences would be consolidated to one point on the highway; ideally at a public intersection.

This approach allows for more flexibility in siting rural residential in areas that are better capable of supporting that land use and restricting residential dwellings on EFU land, where currently they are permitted outright. Similar to a planned unit development in an urban area, rural cluster zoning would allow for residential development and would protect open space for agricultural or environmental protection. Aggregated or deed restricted parcels could provide larger, less

¹ See ORS 215.283 for permitted uses.

² The first public hearing on the Land Use Code update is scheduled for March 15, 2011.

³ Proposed amendments to the Land Use Code include moving permitted uses and dimensional standards to tables. Some additional permitted uses are proposed for the AC zone, including “child care center,” but these changes are not extensive and may not achieve the objectives described here.

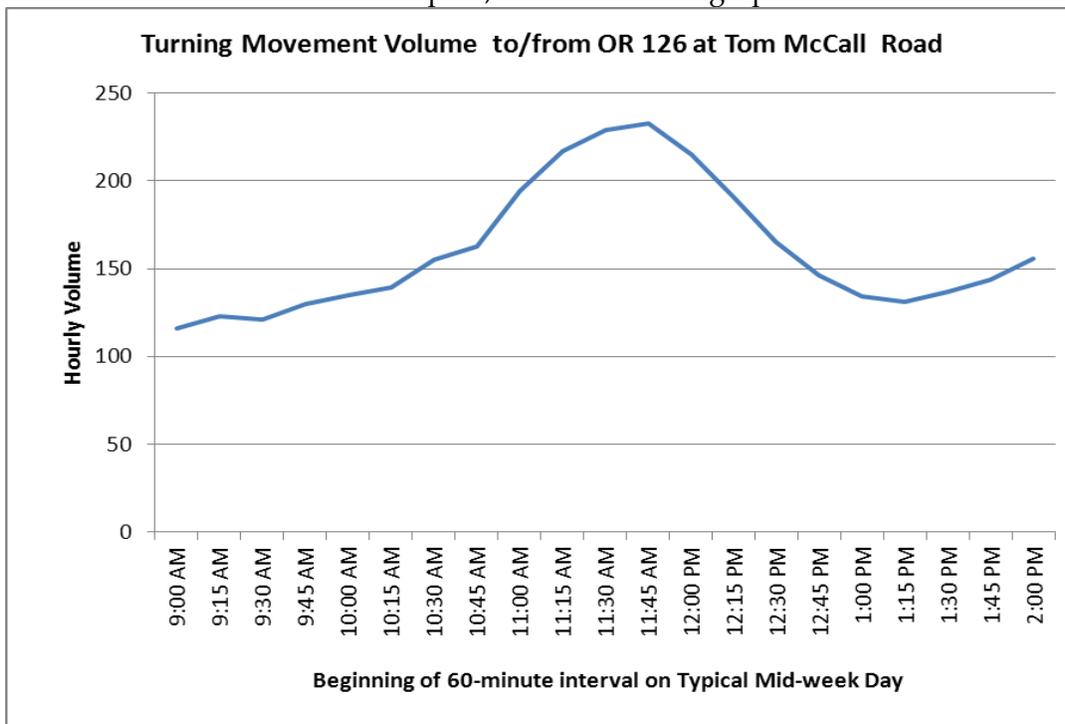
fragmented, and possibly more viable, farm areas restricted from development. An access permit, issued by ODOT, would be a development requirement and access to the development would be paid for by the developer. From a development standpoint, this cost would be offset by the cost benefit in providing utilities to a cluster of housing.

A significant impediment to applying a rural cluster zoning is Oregon state law. EFU zoning restricts subdividing and precludes transfer of development rights (TDR) or cluster development. Amendments to state statute (ORS 215 County Planning; Zoning; Housing Codes) would need to be made to allow for rural residential cluster development on EFU.

Mix of Uses in Employment Areas

The concept of “mixed use development” - allowing a variety of different activities to happen in one building, a set of buildings, or in a neighborhood or particular area of a community – is a popular land use approach to mitigate traffic. When jobs, housing, and commercial activities are located close together, the length of each trip decreases, trips can be “chained” (more destinations reached efficiently), and a community’s transportation options (bus, bike, foot) increase. However, because of the rural nature of most of the OR 126 corridor, opportunities for providing additional goods and services to serve the existing rural residential population are limited. Exploring the potential for providing more goods and services to employees in the industrial areas of Prineville along the corridor holds more promise in reducing trips on the highway.

Currently, employees at the airport and in the industrial areas in and around Millican Road need to return to OR 126 to access goods and services, which are located either along US 26 or in downtown Prineville. The number of trips to and from the employment area peak around the noon hour. Hourly turning movement volume to/from OR 126 at Tom McCall Road peaks at 233 vehicles from 11:45 a.m. to 12:45 p.m., as shown in the graph below.



One way to reduce these noon-time trips is to allow the types of goods and services that are being sought by employees that are not available close to their place of work. The City of Prineville's Land Use Code currently restricts uses around the airport to airport-dependent uses. However, the City has anticipated the need to provide a greater mix of uses in the vicinity of the airport through an ongoing Land Use Code update.² Proposed amendments include expanding uses in the Airport Commercial AC Zone to include:

Business and commercial activities designed to serve users of the airport facilities (i.e. cafes, restaurants, coffee stands, mini-marts, overnight lodging, etc) are also permitted in this zone provided they are determined to be of appropriate scale, location and orientation so as to focus primarily on airport users and not the general public.

Also within the city limits in the vicinity of the OR 126 corridor, both by the airport and along Millican Road, are areas zoned Limited Industrial (proposed to be renamed "Light Industrial"). The purpose of this zone is to provide for a wide range of industrial uses, excluding those uses which are "generally not considered compatible with adjoining commercial or residential areas and which, in many cases, involve industrial uses which involve hazardous or nuisance creating conditions (153.054.A)." Land zoned Limited Industrial provide areas for light manufacturing and campus industrial, uses that could be compatible with a limited amount of service commercial.

While limited commercial uses within employment areas could reduce the amount of vehicle miles traveled, it must be stressed that permitting too much commercial in industrial areas can be counter-productive to City, County, and State long-range planning. Where commercial is permitted, the amount should be restricted so that it does not become an attractor of trips outside its intended service area, compete with other established commercial areas/downtown, or significantly impact the industrial land supply. As discussed in the next section, the City has identified an employment land shortfall; permitting commercial in areas already accounted for as industrial can both erode the available inventory and potentially raise the costs of industrial land. Restrictions in the Land Use Code can limit the size of commercial development, specify siting requirements (e.g., interior to industrial development/away from major arterials), and restrict the types of uses. Commercial uses should be restricted to small suppliers who cater to industrial users (e.g., office supply store, mailing services, etc.) and employee services (e.g., daycare, restaurant, banks, etc.).³

² The first public hearing on the Land Use Code update is scheduled for March 15, 2011.

³ Proposed amendments to the Land Use Code include moving permitted uses and dimensional standards to tables. Some additional permitted uses are proposed for the AC zone, including "child care center," but these changes are not extensive and may not achieve the objectives described here.

Employment Retention in Prineville

Another land use strategy for reducing trips on OR 126 is increasing employment opportunities in Prineville and on County-zoned industrial land near the airport. This is a strategy that both the County and the City have memorialized in adopted policy. Crook County Comprehensive Plan (2002) policy under the Industry Chapter includes protecting “existing industrial development and establish the Airport and Railroad Industrial Sites as a high priority for industrial expansion” and directing growth to the “airport vicinity between Houston Lake Road and the Redmond Highway.”

The 2007 City of Prineville Urban Area Comprehensive Plan articulates the community’s desire to provide jobs in the community and reduce daily commuting to other cities. Existing conditions information the Comprehensive Plan includes the statement that car commuting in the County is higher than other places in Central Oregon due to the rural setting and distances from employment areas in Bend and Redmond. The commute traffic to Redmond or Bend is due in part to a jobs/housing imbalance in Prineville. As summarized in Technical Memorandum #1, the Comprehensive Plan identifies the Prineville Airport as a major industrial area and a top local priority for infrastructure planning and economic expansion incentives. This area includes the Tom McCall Industrial Park, over 100 acres owned by the County and private developers, the Prineville Industrial Park (Tom McCall Expansion), 118 acres of privately owned land, and the Prineville Airport Business/Industrial Park, which has sites available for industrial and commercial development (lease only). The economic analysis concludes that there is a need for additional industrial lands that are situated near the airport, which will require a future UGB expansion.⁴

Determining the need for additional industrial land, and where future urbanization should occur adjacent to the existing urban growth boundary, will need to occur as part of a future buildable lands analysis. Such a process would need to be consistent with Statewide Planning Goal 14, Urbanization, and follow the methodology in ORS 197.296. Providing services, including access and transportation options, to proposed new urban areas is part of the buildable lands inventory process. Transportation system plan updates, including the Corridor Facility Plan process, provide opportunities to plan for alternate routes off OR 126 and improved connectivity to existing, as well as planned, employment areas. Connectivity can also be achieved through development approval requirements, as explored in the next section.

Planning for Alternate Modes and Connectivity

Local land development ordinances can impact traffic demand and travel behavior and patterns by requiring street connectivity and facilities for transportation modes other than cars as a

⁴ Removing constrained land and land that has been identified for rezoning from industrial to other uses the Plan now estimates the long term industrial need at 1,393 acres (p. 84). It does not specify how much of this need should be accommodated near the airport.

condition of development approval. This approach to reducing automobile traffic is to plan and provide for convenient and safe bicycle and pedestrian travel within and between areas where people live, work, and conduct the business of their lives (e.g., schools, shopping, community centers, etc.). This is a particularly valid approach for urban areas and, for this corridor study, is specifically applicable in the employment areas in the eastern portion of the OR 126 corridor. Specific measures include, for example, constructing walkways between cul-de-sacs and adjacent roads, providing walkways between buildings, and providing direct access between adjacent uses. Both City and County zoned land create a single employment hub in this area, but development regulations vary, depending on the governing jurisdiction.

As explored in Technical Memorandum #1, the City has code provisions applicable to new development in City employment zones that are directly linked to traffic operations. These include requiring new development to be designed so that traffic does not have to back onto a public street right-of-way to enter or leave the site and, in the Airport Commercial zone, requiring the use of existing or future lower order roads for access and providing for shared access or frontage roads. The City also requires that development “provide for the continuation or appropriate projection of existing principal streets in surrounding areas (Section 153.194.E.1)” and that future streets extended to the boundary of the proposed development or subdivision “where necessary to give access to or permit future subdivision or development of adjoining land (Section 153.194.H).” Requiring a connected roadway system promotes efficiency, allowing travelers to reach destinations more directly and, where congestion occurs, to provide for alternate routes. There is, however, very little adopted code language that would allow the City to require facilities for alternate (non-auto) modes of transportation as part of the development approval process.

For development within Prineville, all uses except single family and two-family/duplex dwellings and their accessory structures are subject to the site design review (Land Use Code Section 153.098). Site design review evaluation criteria includes, where appropriate, creating pedestrian/bike pathway and/or open system that connects several properties or uses. Pedestrian or bicycle ways also can be required where cul-de-sacs or long blocks limit car traffic (Section 153.192, Easements). The City can require sidewalk and bike lanes on arterial, collector and local residential streets (Section 153.194). Sidewalks requirements are also specified in the commercial zones, but are not included as part of the residential or industrial zones’ requirements.⁵

Although the grade on OR 126 between downtown Prineville and the industrial areas near Tom McCall Road may deter employees from bicycling to work, requiring bicycle and pedestrian facilities as part of industrial development, particularly for light industrial, or campus-type developments, typically provides future employees with more ways to get to work. Other development requirements that can facilitate travel by alternate modes include providing bicycle

⁵ It should be noted that the City sidewalk requirements under Land Use Code Section 153.194 specify standards for residential and commercial zones, but are silent regarding industrial zones.

parking⁶ and shower room facilities for employees and preferential parking for vanpool or carpool vehicles. Jurisdictions can also provide incentives to developers that incorporate design elements that encourage using alternate modes of transportation. Reduction in required parking spaces is a typical provision, allowed where a development reduces single vehicle trips to and from the site by incorporating transit stops or providing vanpool programs or parking.⁷

Promoting alternate modes of transportation is more difficult in the County. County land near the airport is zoned for heavy industrial (H-I zoning) and the types and scale of allowed uses make it less likely that pedestrian and bicycle facilities would be utilized. However, this area is vital both to the County and City for economic development and consistent development practices could improve circulation and enhance the identity of the industrial area. Currently, sidewalks and bicycle lanes are required as part of development approval in the County.⁸

In the County, development in the vicinity of the airport can further corridor safety and mobility objectives through roadway connectivity. County development standards require that new roadways “provide for the continuation or appropriate projection of existing roads in surrounding areas (Development Code Section 17.36.020, Road Standards).” However, because the City and County have different standards for the design of streets, the local transportation system plans and land development ordinances do not guarantee that roadways in the industrial areas near the airport will be built to similar standards.⁹ For industrial development near the airport, consistency between City and County roadway standards, both geometric (street cross-section) and pavement requirements, will ensure that the employment area develops an efficient roadway system.

⁶ Pursuant to OAR 660-12-045(3), local land use or subdivision regulations should require bike parking in new retail, office and institutional developments, transit facilities, and multi-family developments of 4 units or more.

⁷ These types of strategies are typically referred to under the term “travel demand management” or TDM. TDM is the application of policies, strategies, and programs that reduce automobile travel by encouraging drivers to change their behavior. Some strategies focus on alternative travel modes while other strategies work by shifting automobile demand to different locations or to a different time of day. Actions that the public sector can take have been explored here. Techniques that the private sector can employ include rideshare programs or institutionalize off-peak shifts. The net result is that more trips can be accommodated on the system without investing in expensive capital projects.

⁸ Subdivision approval is an exception; sidewalks may be required as part of subdivision approval, pursuant to Development Code Section 17.40.030, Improvements in Subdivisions.

⁹ See Figure 7-2, Typical Roadway Cross Sections, in the Crook County Transportation System Plan (2005) and Figure 7-2, Prineville Transportation System Plan (2005).

Rural Service Area Land Uses

The amount of traffic on the transportation system is directly tied to existing and planned (future) land uses. This white paper earlier explored the relationship between trip generation and providing mixed use; another approach to managing future trips on the corridor is by restricting high-trip generating uses. Technical Memorandum #3 documented land uses along and surrounding the OR 126 corridor and made assumptions about the potential these uses had for increasing or changing traffic in the future. The dominant land use along the corridor is EFU, which is a very low traffic-generating use. Outside of the employment land by the airport, higher intensity development potential exists within the Powell Butte Rural Service Centers, which are zoned RSC. Relatively few uses are permitted in the RSC zone, and these are primarily limited to residential and farm-related uses. Two notable exceptions are service stations and retail stores, which are uses that generate commercial traffic. Other uses that are allowed conditionally under “commercial amusement or recreation establishment”¹⁰ have the potential to be open to the public and become a destination, drawing trips that wouldn’t otherwise use the corridor.

The West Powell Butte Rural Service Center allows higher-intensity limited commercial uses through RSC zoning on 1.24 acres. There is currently a post office, a commercial mini-market, and three residential dwelling units within the zone; these uses have been in place for over 40 years. Due to its relatively small size and the existing uses, the assumption is that this area’s development potential will not exceed regional growth projections during the planning time horizon considered by the Corridor Facility Plan.

The East Powell Butte Rural Service Center consists of approximately 27.1 acres zoned Rural Service Center (RSC). More than half of this area is already developed with a school, church, service station (market/deli and fuel), and single-family homes, all of which are allowed within the RSC zone. However, there are approximately 12.8 acres of undeveloped land that contain development potential within this subarea. The land is owned by the Central Oregon Irrigation District and the Powell Butte Community Church.

Ideally, uses in the Rural Service Centers would be restricted to only those uses that most directly serve the needs of the rural residents and that do not attract trips from outside the immediate vicinity. With only a few exceptions, most of the uses currently allowed in the County RSC can be said to fit that criteria. Greater intensity development in the East Powell Butte is possible in the future. Further restrictions on land use through Development Code modifications could include exclusion of the identified uses that generate the greatest amount of trips – service stations, retail stores and recreational establishments.¹¹ Existing dimensional and lot coverage

¹⁰ The terms “commercial amusement” and “recreation establishment” are not defined in the County Development Code.

¹¹ Such a change in the RSC zoning would change the status of two existing uses – a mini-market and a service station – to non-conforming legal uses. They could continue to exist as a legal violation of the amended zoning ordinance because the use of the land (or structure) existed before the ordinance was passed. Nonconforming uses are often referred to as “grandfathered” uses.

limitations could also be made more restrictive. Currently, structures cannot cover over 30% of the total lot area and heights are limited to two stories or 25 feet. This could, in theory, result in as much as 334,541 square feet of additional development on the 12.8 acres available. To reduce the intensity of development allowed, the Development Code could be modified to restrict buildings to one story and to either decrease the percentage of lot coverage for structures, or to include all improvements – including parking – in the permitted amount of coverage. Technical Memorandum #3 concluded that the regional growth rate will adequately capture growth within this area given the limited development that has occurred in area to date and the fact that approach volumes are already moderately high due to the current uses.

Summary and Next Steps

The previous sections have provided information regarding a variety of alternative land use strategies that could alter how land in the OR 126 corridor develops in the future, with the consequence of positively affecting traffic operations and safety. This information provides an indication of the benefits of implementing particular alternatives, as well as some of the challenges, without concluding that one or another approach should be implemented. The next step is to solicit feedback regarding the merit of further exploring any given land use alternative in the context of the concepts being analyzed for the Corridor Refinement Plan (see Technical Memorandum #4). Project participants are asked to consider each approach discussed in this white paper, to weigh its merits based on the qualitative analysis provided and experiential knowledge of the corridor, and indicate in Table 4a-1 below if the alternative should be further examined, and possibly included as part of the recommendations in the Corridor Facility Plan.

Table 4a-1: Alternative Land Use Options Preference Scorecard

Alternative Land Use Option	Evaluation Preference			
	Evaluate Further (strongly agree)	Possibly Evaluate Further	Eliminate from Further Evaluation	Evaluate Further with Suggested Modifications (<i>Please indicate below.</i>)
Rural Cluster Zoning				
Mix of Uses in Employment Areas				
Employment Retention in Prineville				
Planning for Alternate Modes and Connectivity				
Rural Service Area Land Uses				