

US97/US20 Bend North Corridor (Key No. 21229)

Proposed Roundabout & Potential ORS 366.215 Impact

Presenters Names:

Mark Barrett

Gary Farnsworth

Other Notes:

Federal INFRA Grant (US97/US20)

City of Bend Funding Partnership

Private Development Partnership



AGENDA

Topics:

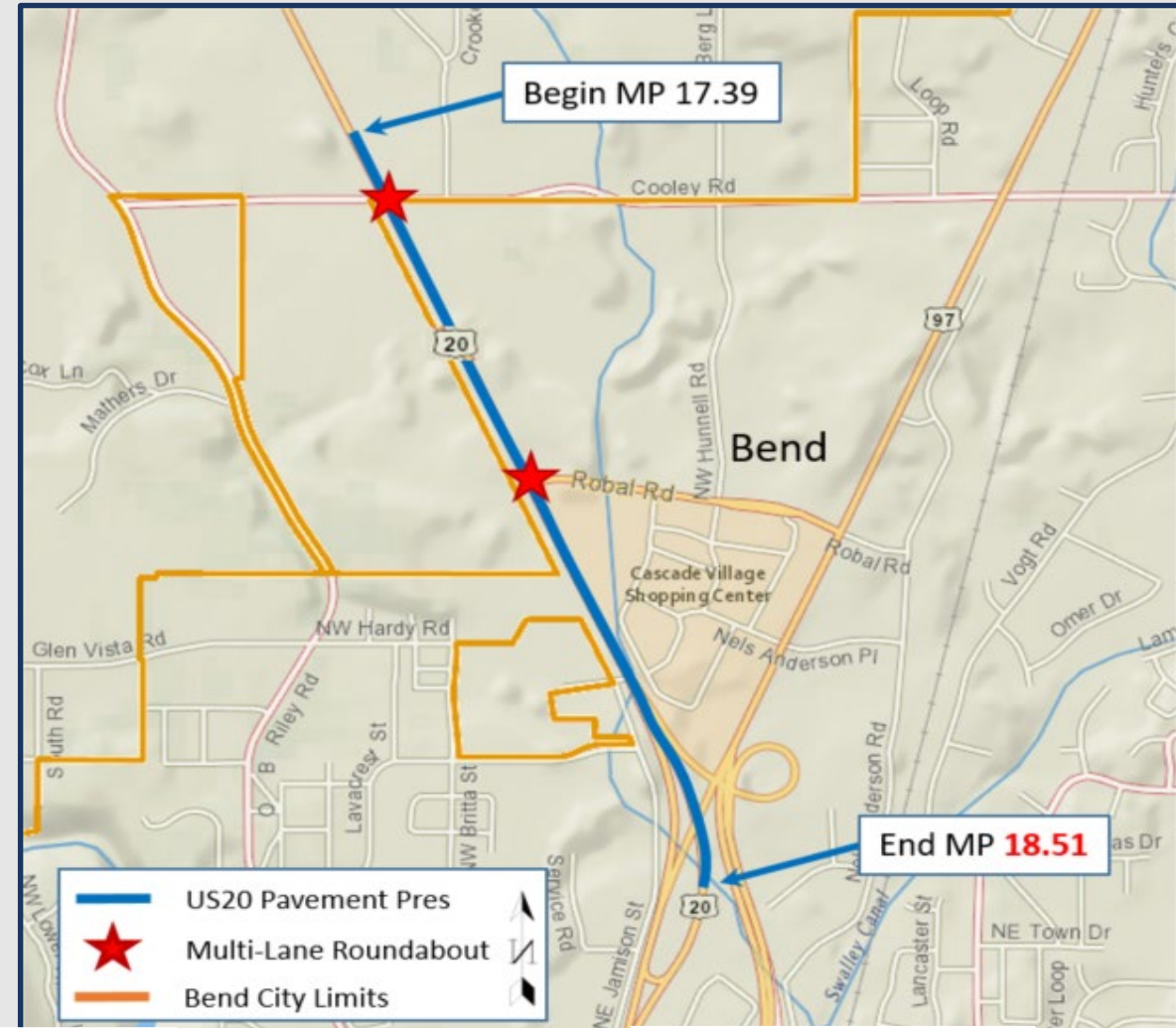
- Locations
- Issues & Options Considered
- Existing Conditions & Proposed Design
- Design Vehicle, Accommodation Vehicle(s)
- OD Permit Data
- Pinch Points
- Summary of Proposed Changes
- Next Steps

Objective:

- Seeking Stakeholder Forum Support for Proposed Action subject to ORS 366.215.
- Seeking Freight Industry support for and consensus on design items to be addressed to receive a Memorialized Agreement on Roundabout Sizing (Per Highway Directive DES-02).

US97/US20 Bend North Corridor

- US97/US20 Bend North Corridor (K21229)
- ODOT & City of Bend Jurisdiction
- Federal INFRA Grant (US97/US20)
- Development along US20
- US20 @ Cooley Road (MP 17.49)
- US20 @ Robal Road (MP 17.91)
- Rural to Urban Transition with Mixed-Commercial, Residential and Industrial Uses



RFQ
June 2021

RFP
Sept. 2021

Award
Spring 2022

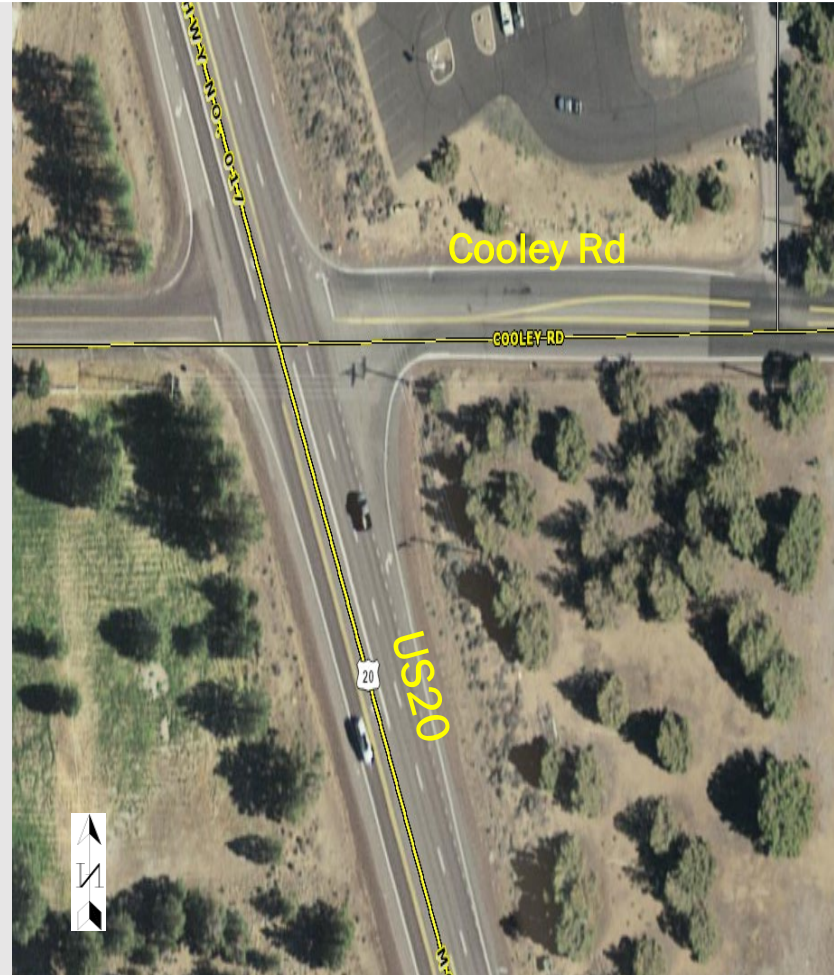
Construction
2022 - 2024

US97/US20 Bend North Corridor

Location	Signed Route No.	Hwy No.	Mile Point	ADT	% Truck Traffic
Cooley Road	US20	017	17.49	22,100	18.5%

McKenzie-Bend Hwy

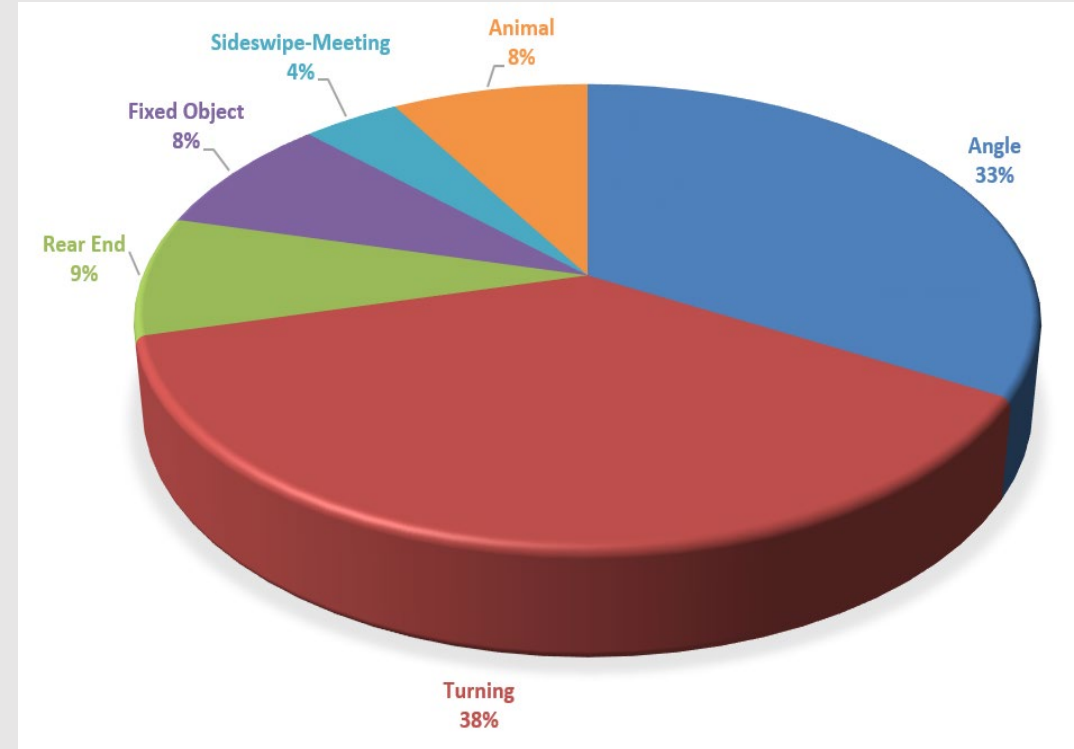
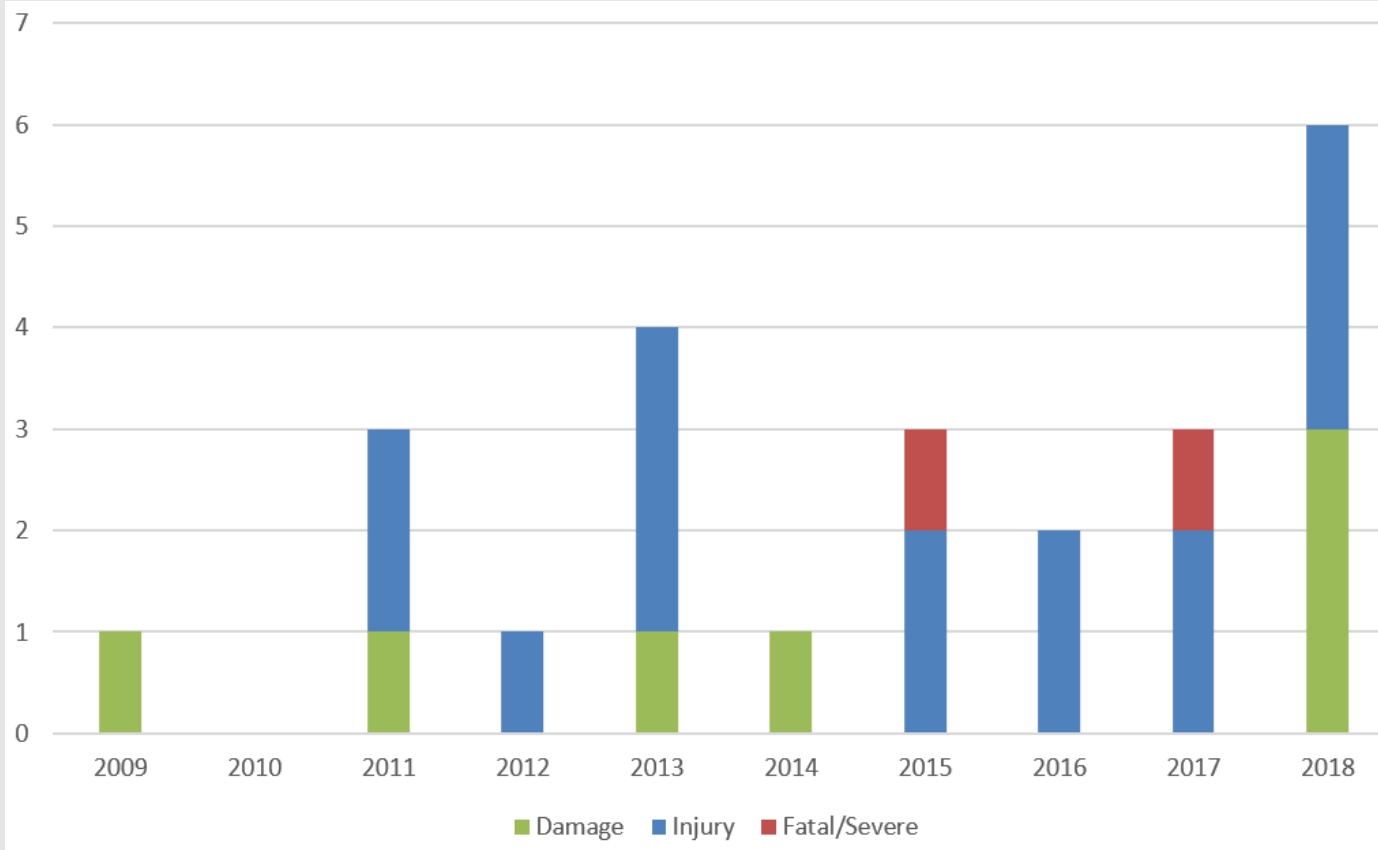
- *Urban Expressway*
- *High Speeds*
- *Significant Turning Movements*
- *Left Turn Lanes*



Cooley Road

- *Minor Arterial*
- *2400 vehicles per day*
- *9% trucks*
- *Stop Controlled*
- *Crossing/Turning Movements*
- *Peak Hour Delays/Queues*

US97/US20 Bend North Corridor Issues (Cooley Road)



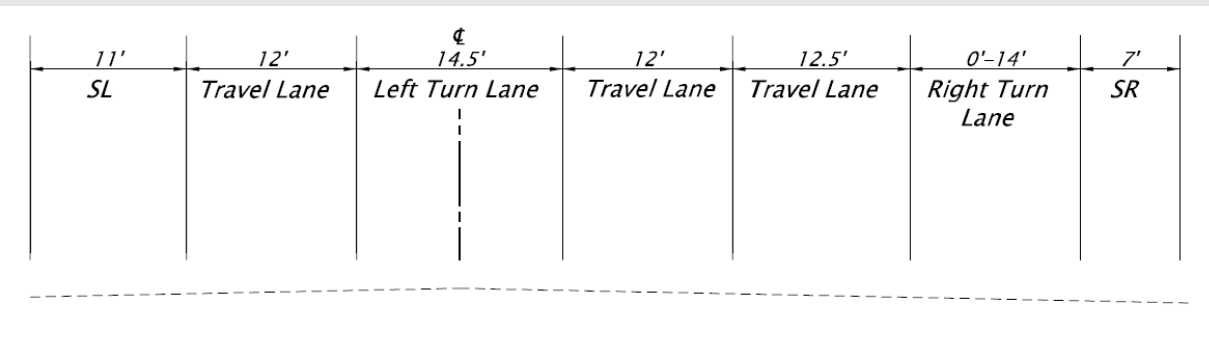
71% angle and turning movement

US97/US20 Bend North Corridor

Intersection Options Considered (Cooley Road)

Option	Pros	Cons	Cost
No Build (Do Nothing)	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Increased fatal & injury crashes Unacceptable delay on side streets Does not support local development. 	\$0
Multilane Roundabout	<ul style="list-style-type: none"> 71% reduction in fatal and injury crashes 32% reduction in all crashes Balances approach delays 	<ul style="list-style-type: none"> Increased highway delay May require future slip lanes. Limited information and modeling of truck operations within roundabouts. 	\$5-10M
Traffic Signal	<ul style="list-style-type: none"> Decrease side street delay (not below standards) 	<ul style="list-style-type: none"> 22% Increase in fatal and injury crashes 33% increase in all crashes Increase highway delays 	\$2-5M

US97/US20 Bend North Corridor Existing Condition Cross Section (Cooley Road)

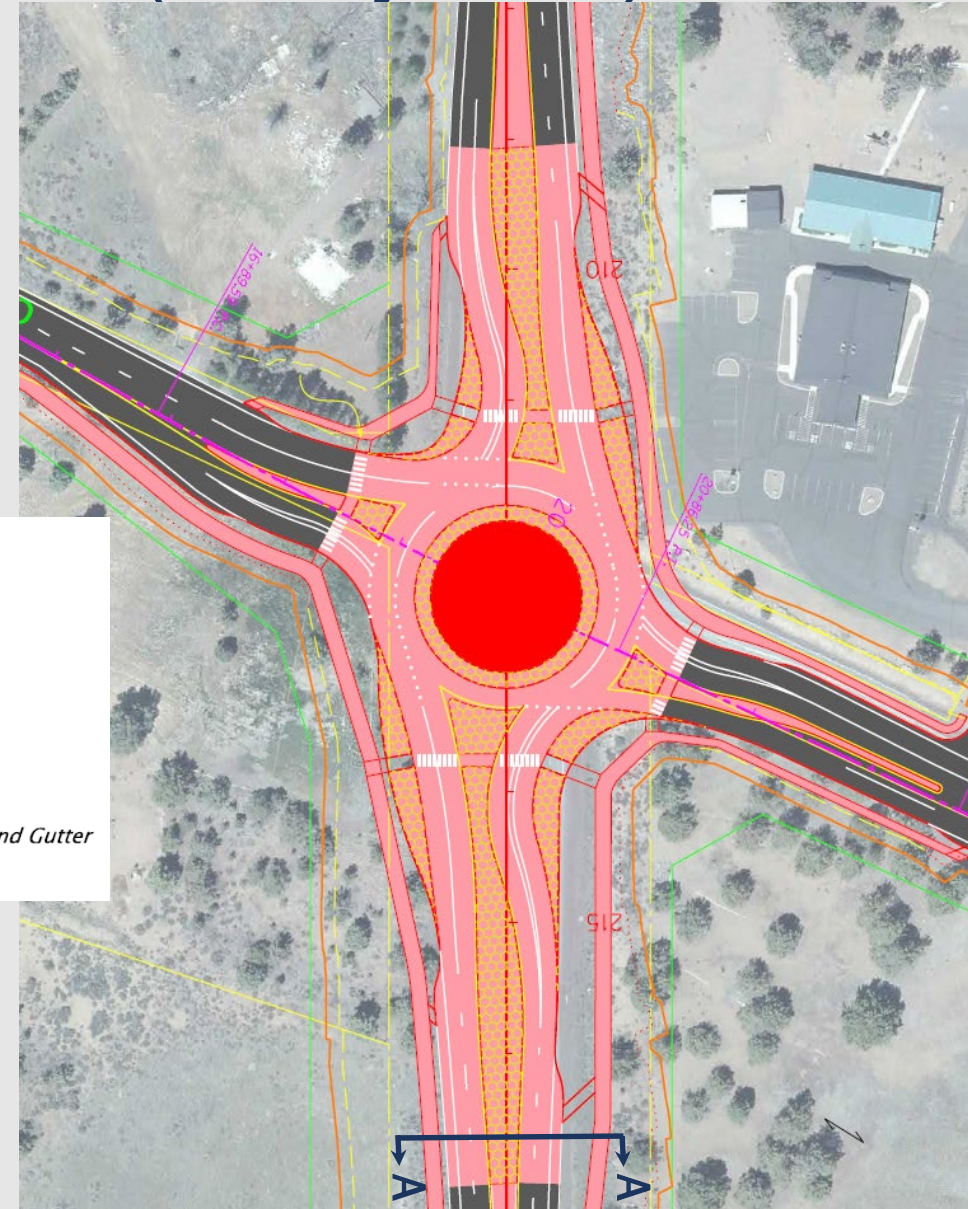
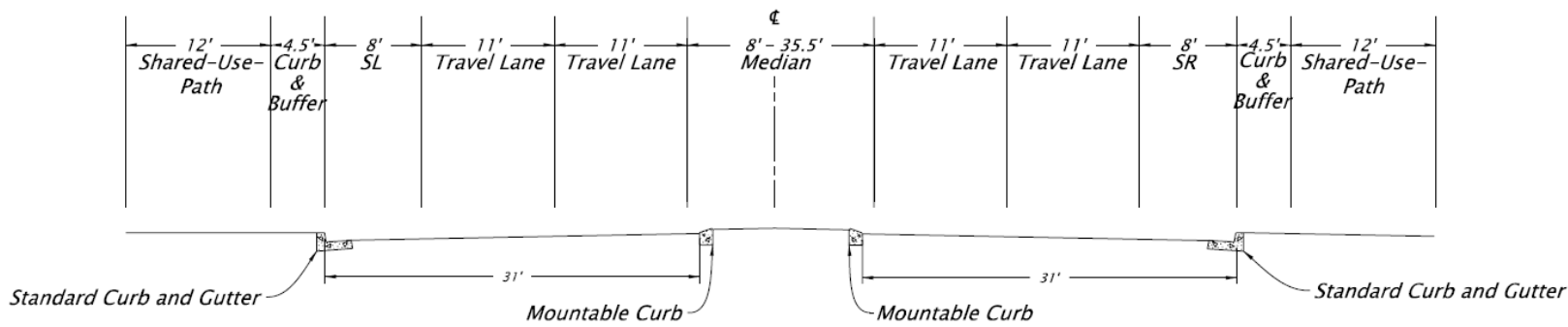


69' – 83' horizontal clearance (EP-EP)



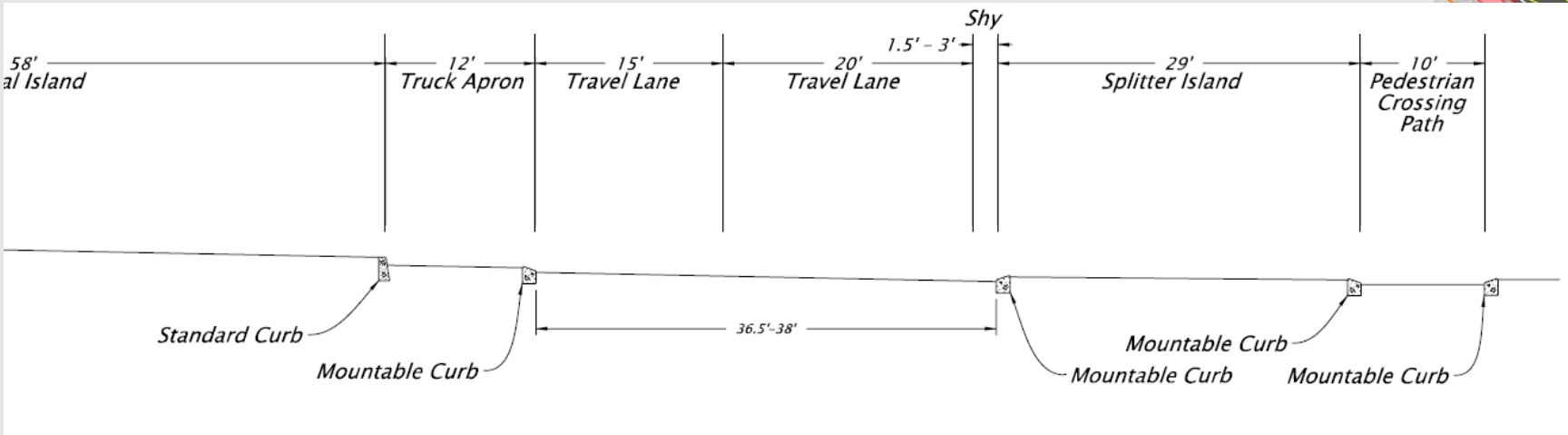
US97/US20 Bend North Corridor Proposed Roundabout Cross Section (Cooley Road)

31' horizontal clearance (Curb – Curb)

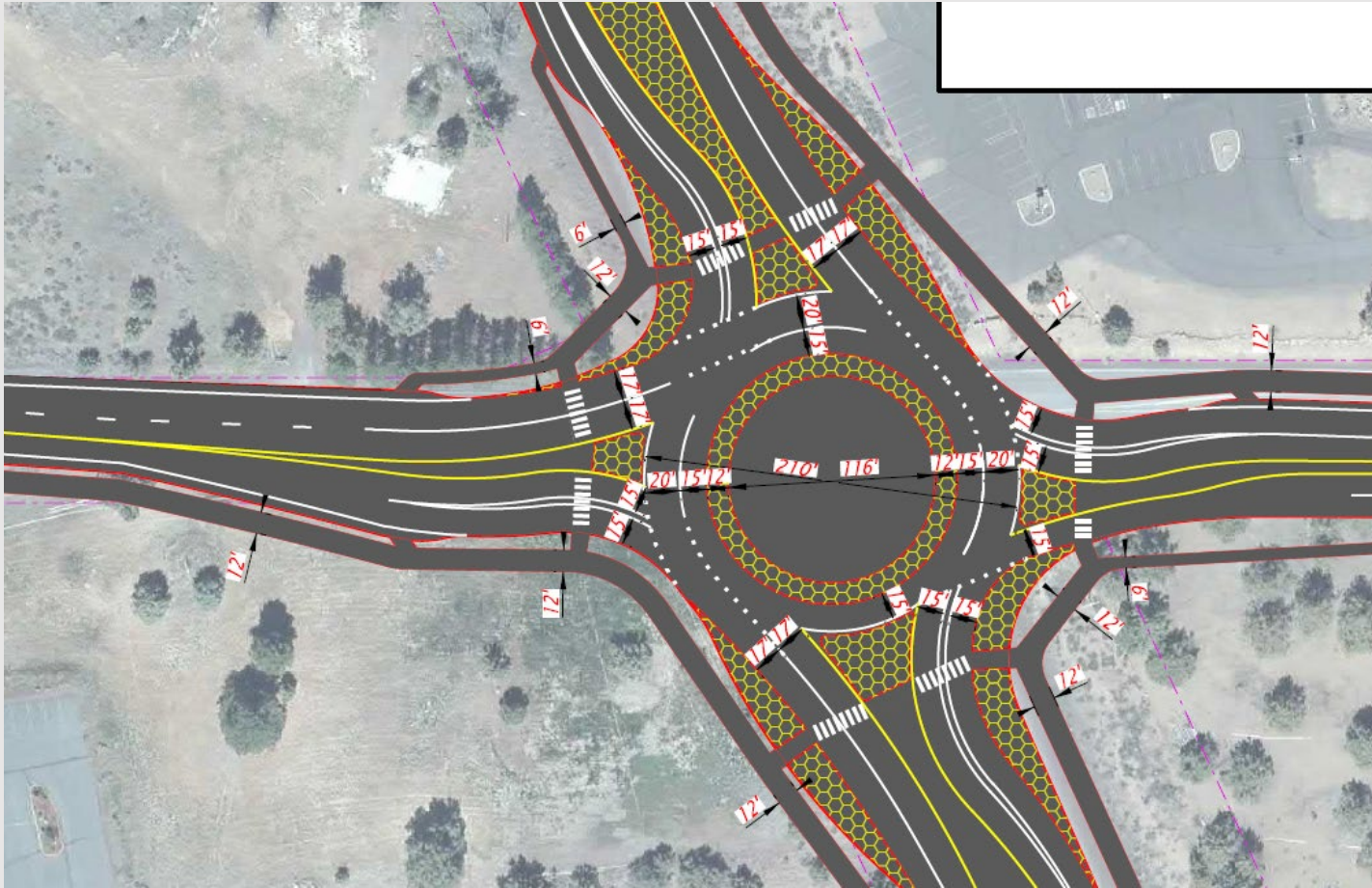


US97/US20 Bend North Corridor Proposed Roundabout Cross Section (Cooley Road)

36' - 38' horizontal clearance (travel lanes)



US97/US20 Bend North Corridor Proposed Roundabout Design (Cooley Road)



Inscribed Diameter	210 Feet
Truck Apron Diameter	140 Feet
Truck Apron Width	12 Feet
Central Island Diameter	116 Feet
Central Island Curb Height	4" low profile mountable
Circulating Roadway Cross Slope	2%
Truck Apron Cross Slope	1%
Mountable Curbs	All curbs
Narrowest Pinch Point (curb to curb)	30 feet (US20)
Travel Lane Widths	15 to 20 feet

US97/US20 Bend North Corridor

Design Vehicle & Accommodation Vehicle Summary (Cooley Road)

Design Vehicle	Accommodation Vehicles
Truck-tractor/semitrailer with 53' trailer (WB-67) <ul style="list-style-type: none"> • Overall Length: 73.5 feet • Overall Width: 8.5 feet 	<ul style="list-style-type: none"> • Palm Harbor D (14' wide man. home) • 135' Lowboy (Fixed/Moveable) • 154' Booster • 173' Wilhelm Beam Hauler • MC Tandem Triple • 180' Beam Hauler • 200' Beam Hauler

[AutoTurn Truck Diagrams](#)

[T_K21229 Misc_04](#)

- Proposed design will accommodate vehicles at least 230 feet long or 22 feet wide.

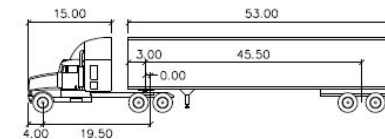
US97/US20 Bend North Corridor

Design Vehicle Turning Movements (Cooley Road)

Design Vehicle

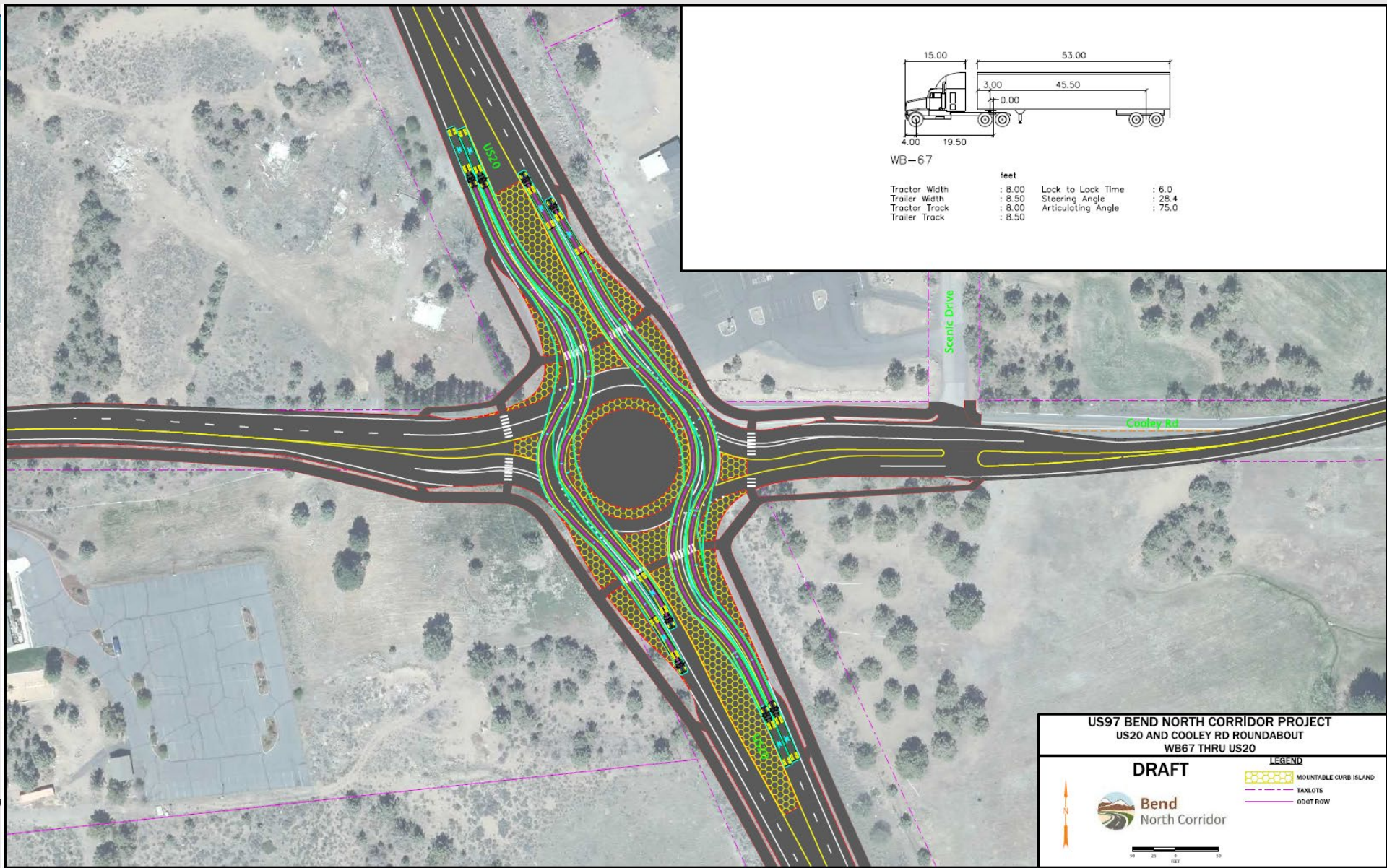
Tractor Trailer/Semitrailer
with 53 foot trailer (WB 67):

- Overall Length: 73.5 feet
- Overall Width: 8.5 feet



WB-67

feet	
Tractor Width	: 8.00
Trailer Width	: 8.50
Tractor Track	: 8.00
Trailer Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 28.4
Articulating Angle	: 75.0



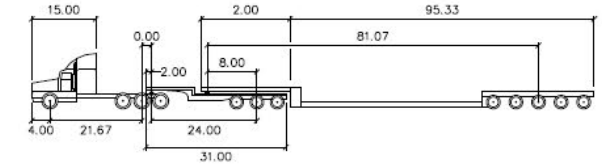
US97/US20 Bend North Corridor

Accommodation Vehicle Turning Movements (Cooley Road)

Accommodation Vehicle

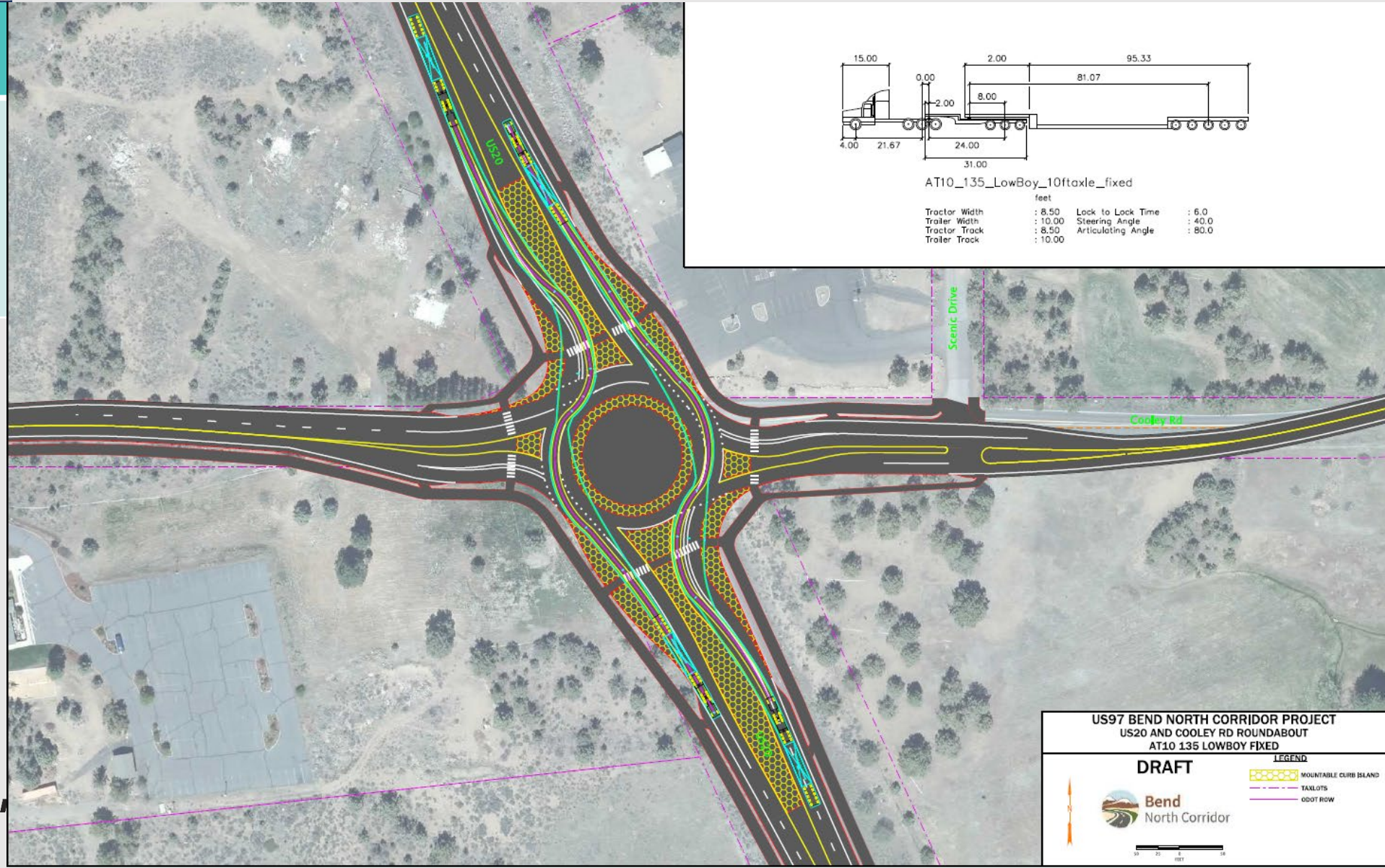
135' Low Boy

- Overall Length: 152 feet
- Overall Width: 10 feet



AT10_135_LowBoy_10ftaxle_fixed

feet	
Tractor Width	: 8.50
Trailer Width	: 10.00
Tractor Track	: 8.50
Trailer Track	: 10.00
Lock to Lock Time	: 6.0
Steering Angle	: 40.0
Articulating Angle	: 80.0

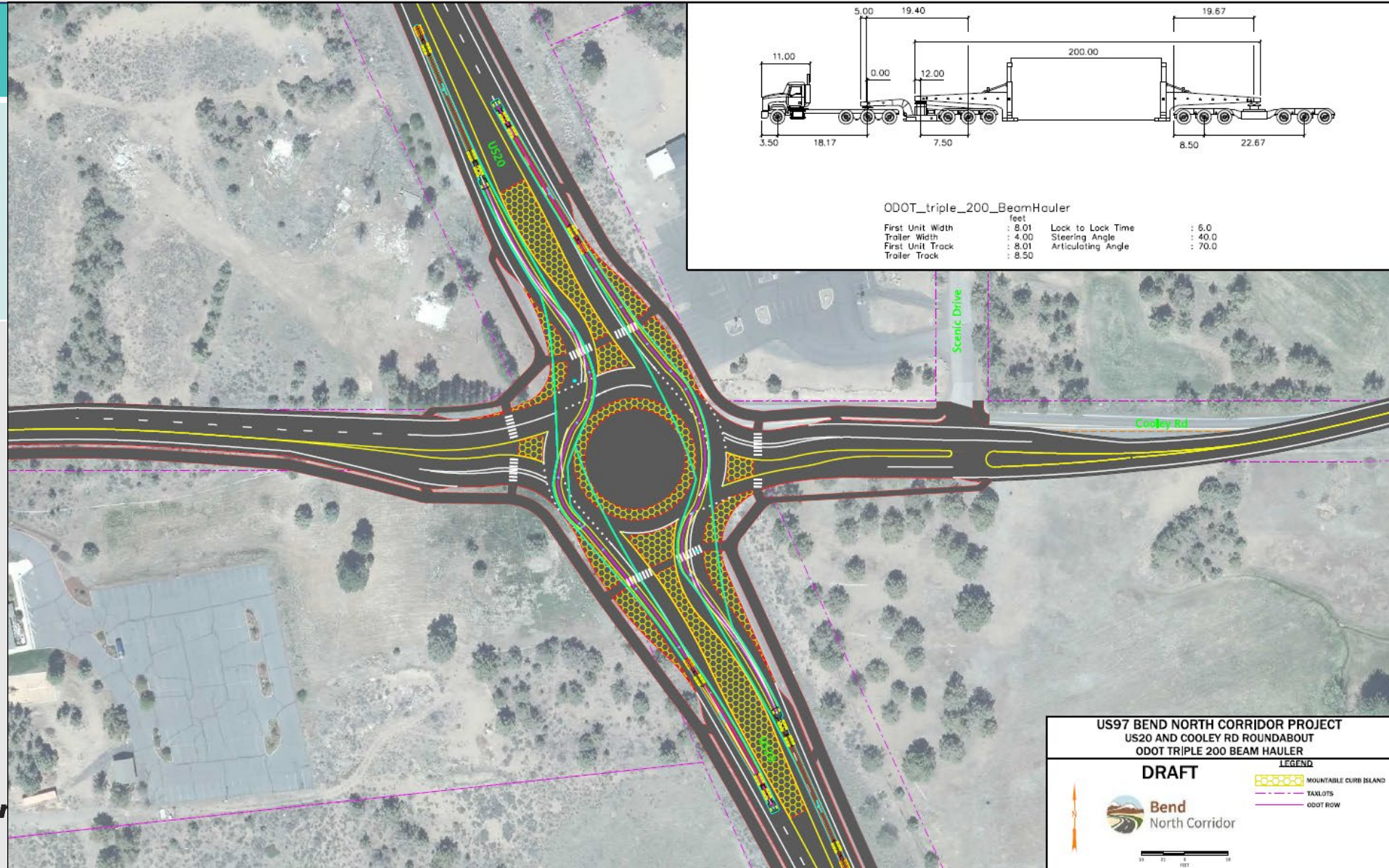
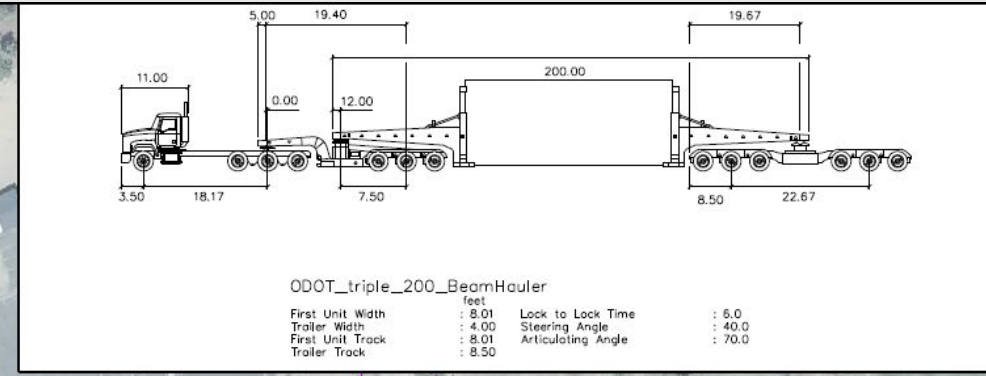


US97/US20 Bend North Corridor Accommodation Vehicle Turning Movements (Cooley Road)

Accommodation Vehicle

200' Beam Hauler

- Overall Length: 230 feet
- Overall Width: 8.5 feet



Pause for US20 @ Cooley Road Questions / Discussion

US97/US20 Bend North Corridor

Location	Signed Route No.	Hwy No.	Mile Point	ADT	% Truck Traffic
Robal Road	US20	017	17.91	22,100	18.5%

McKenzie-Bend Highway

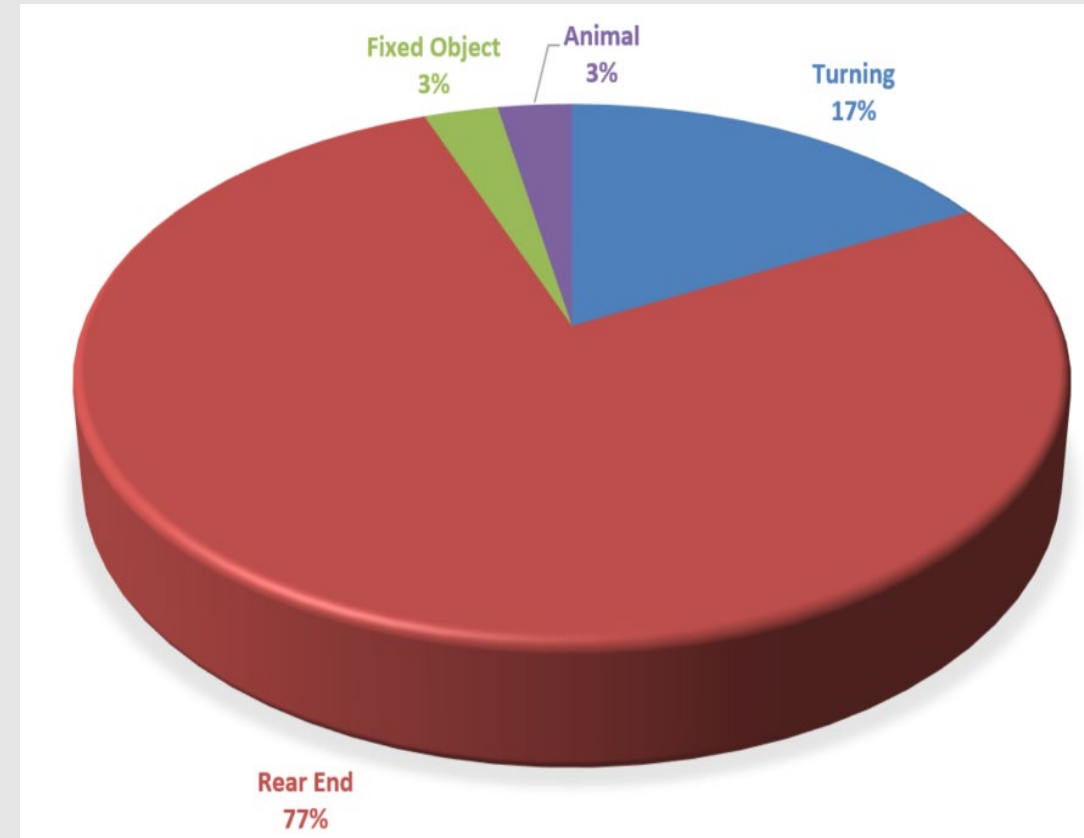
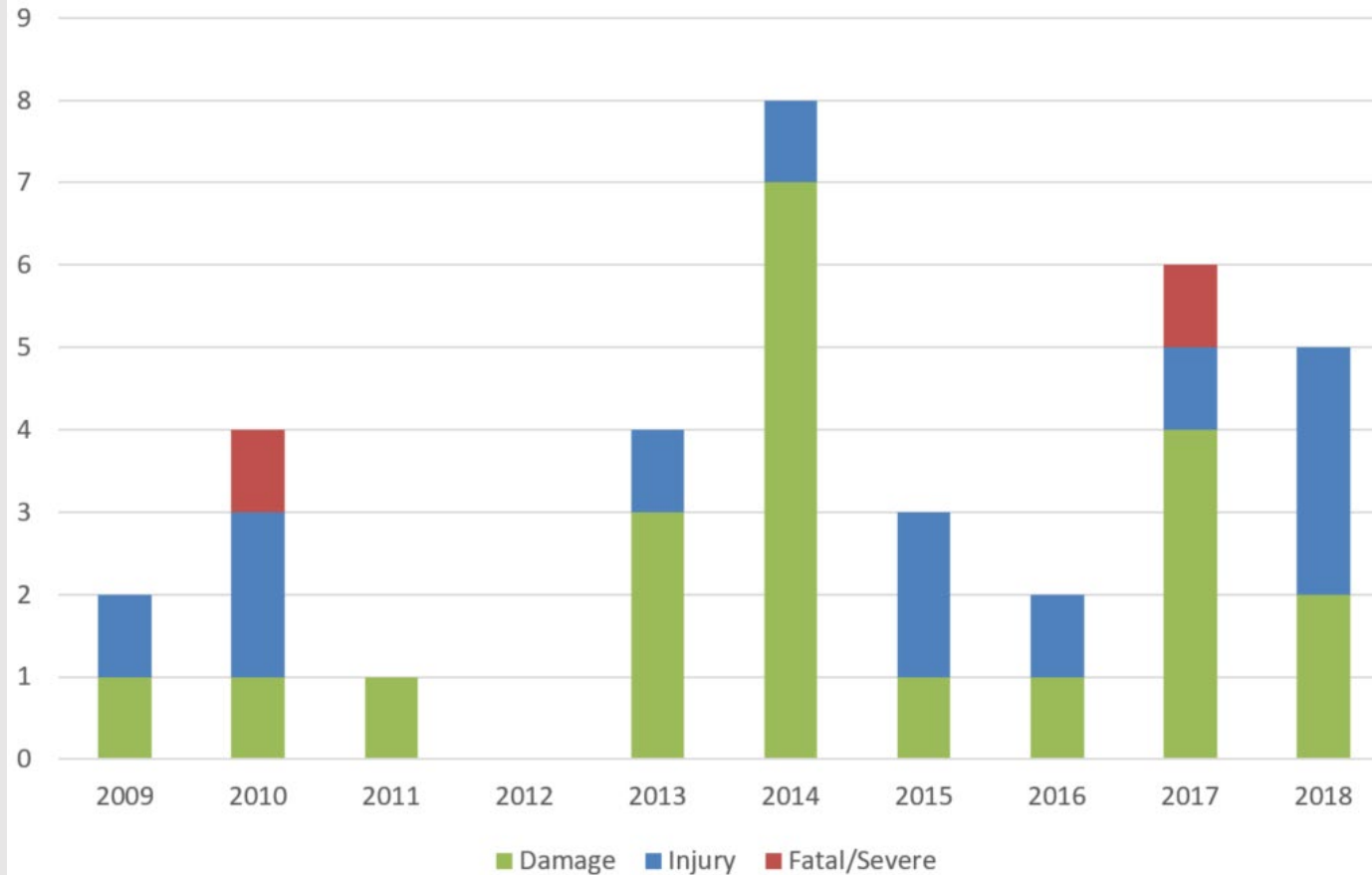
- *Urban Expressway/Arterial*
- *High Speeds*
- *Significant Turning Movements*
- *Left Turn Lane*



Robal Road

- *Minor Arterial*
- *4000 vpd/5.5% Trucks*
- *Signalized*
- *Significant Turning Movements*
- *Peak Hour Delays/Queues*

US97/US20 Bend North Corridor Issues (Robal Road)



US97/US20 Bend North Corridor

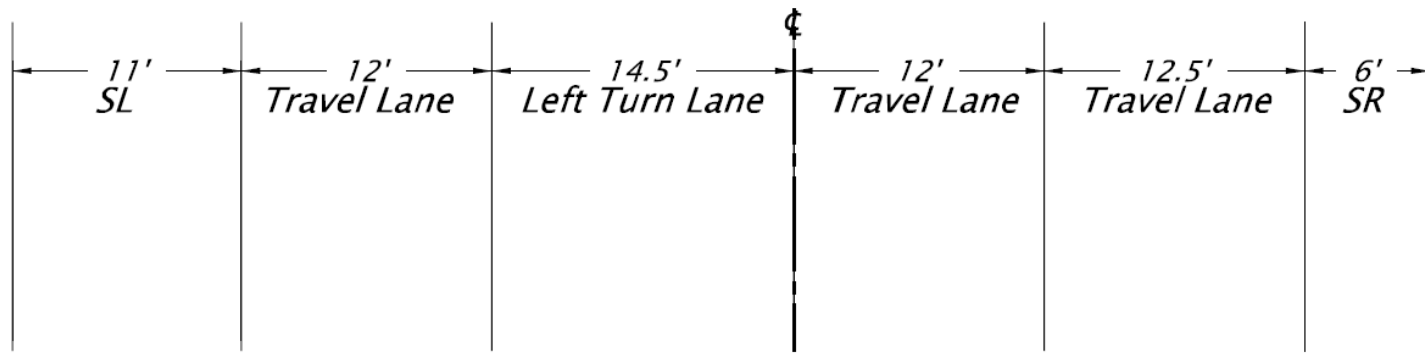
Intersection Options Considered (Robal Road)

Option	Pros	Cons	Cost
No Build (Do Nothing)	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Increased fatal & injury crashes Unacceptable delay on side streets Does not support local development. 	\$0
Multilane Roundabout	<ul style="list-style-type: none"> 78% reduction in fatal and injury crashes 48% reduction in all crashes Reduced delay on all approaches 	<ul style="list-style-type: none"> May require future slip lanes. Limited information and modeling of truck operations within roundabouts. 	\$5-10M
Traffic Signal Modifications	<ul style="list-style-type: none"> Decreased approach delays 	<ul style="list-style-type: none"> Delays still remain above standard. Increases conflict points 	\$2-5M

US97/US20 Bend North Corridor

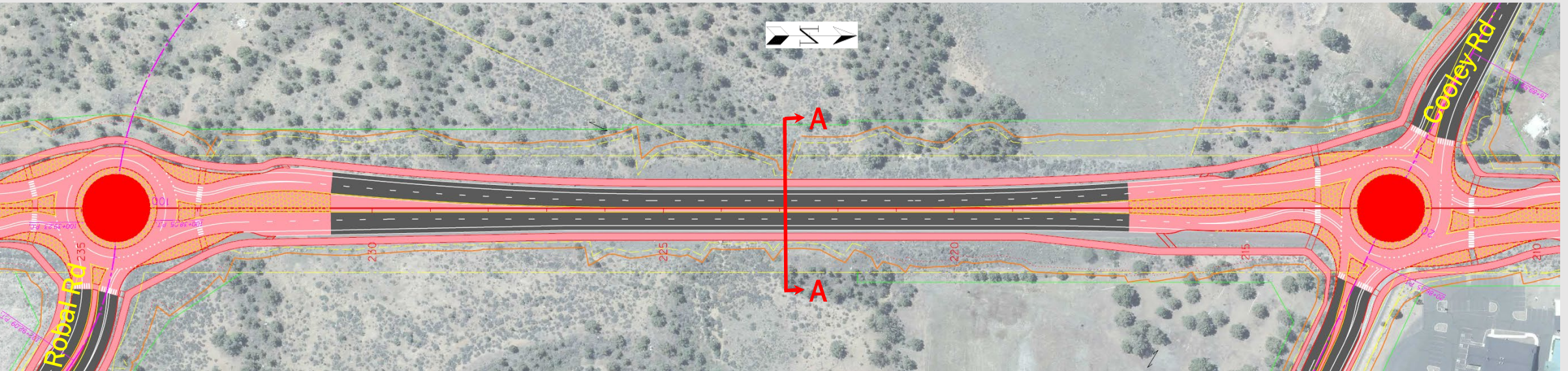
Existing Condition Cross Section (Robal Road)

68' horizontal clearance (EP-EP)

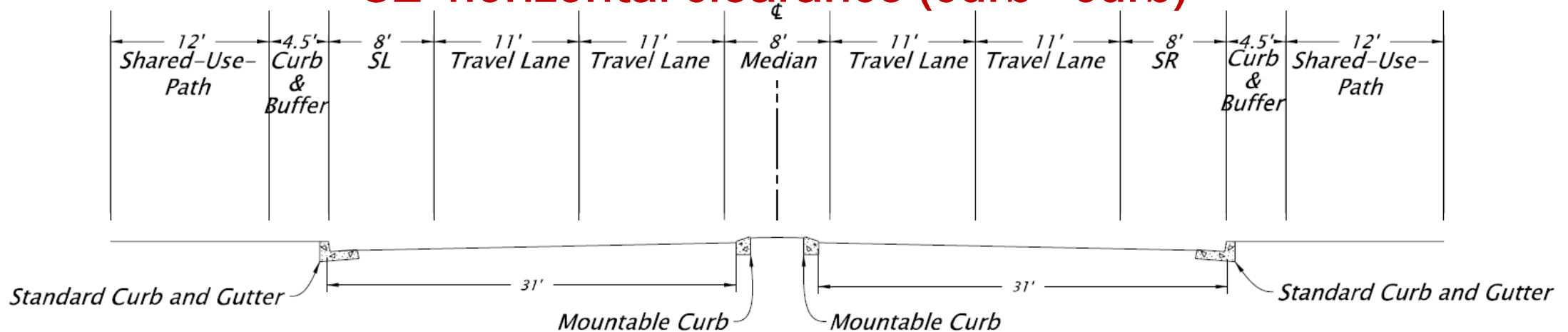


US97/US20 Bend North Corridor

Proposed Median Cross Section (Cooley to Robal)

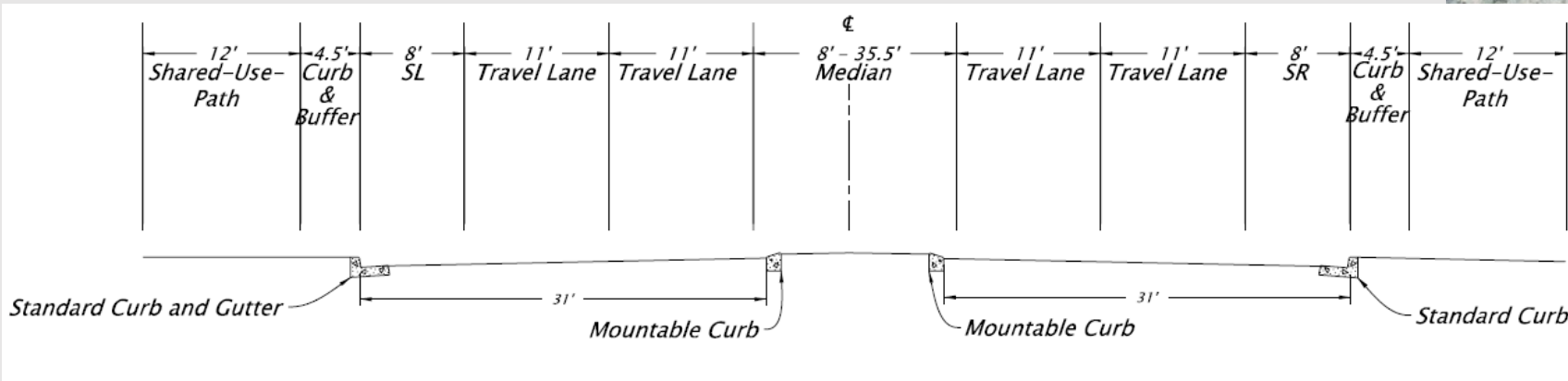
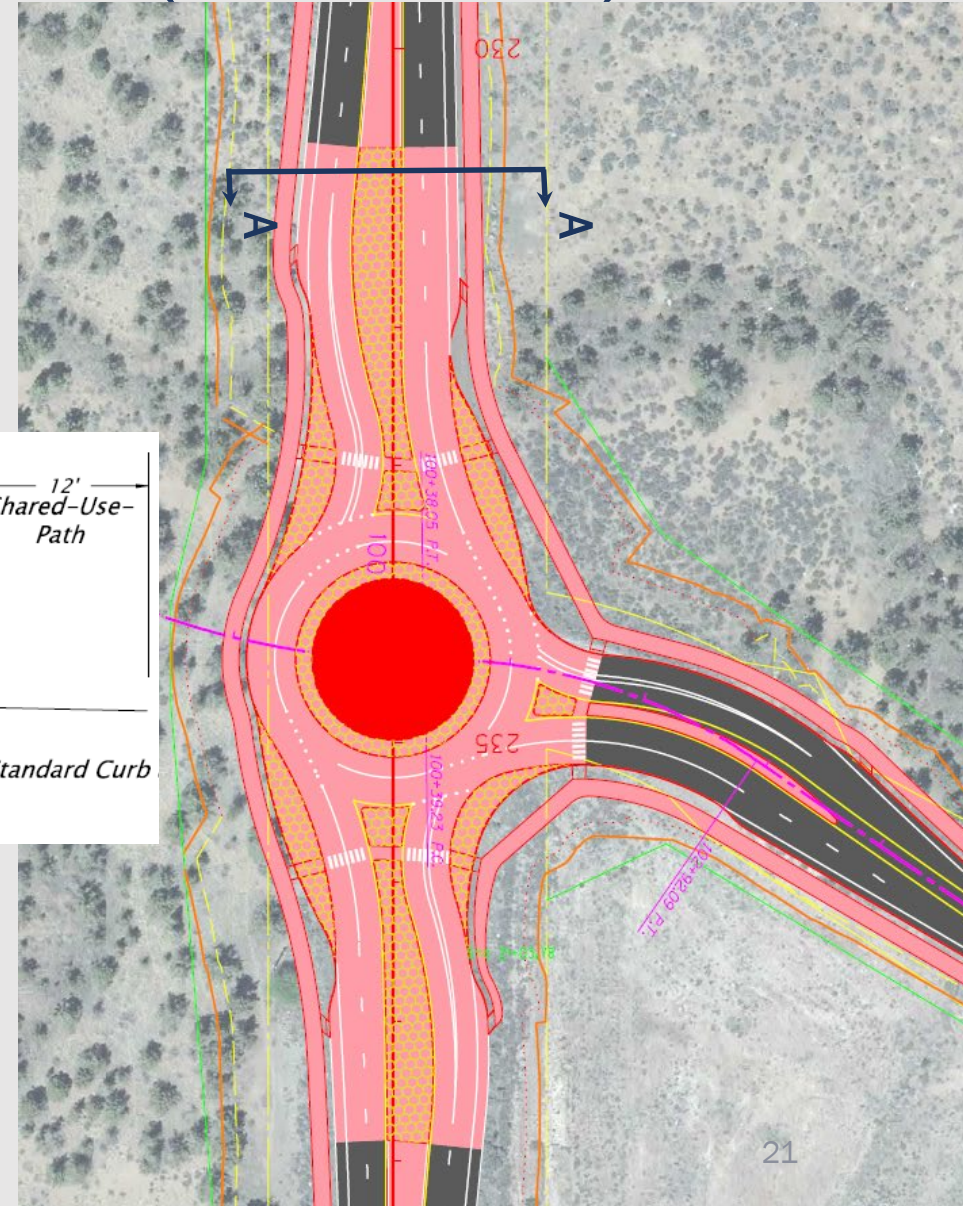


31' horizontal clearance (curb - curb)

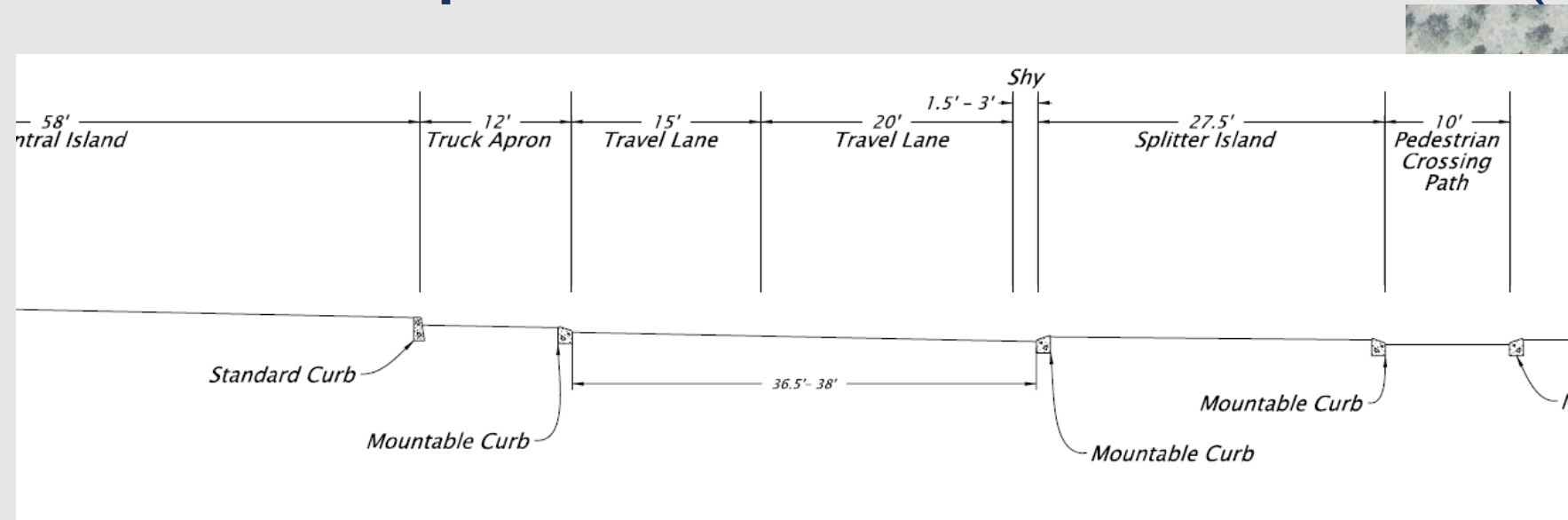


US97/US20 Bend North Corridor Proposed Roundabout Cross Section (Robal Road)

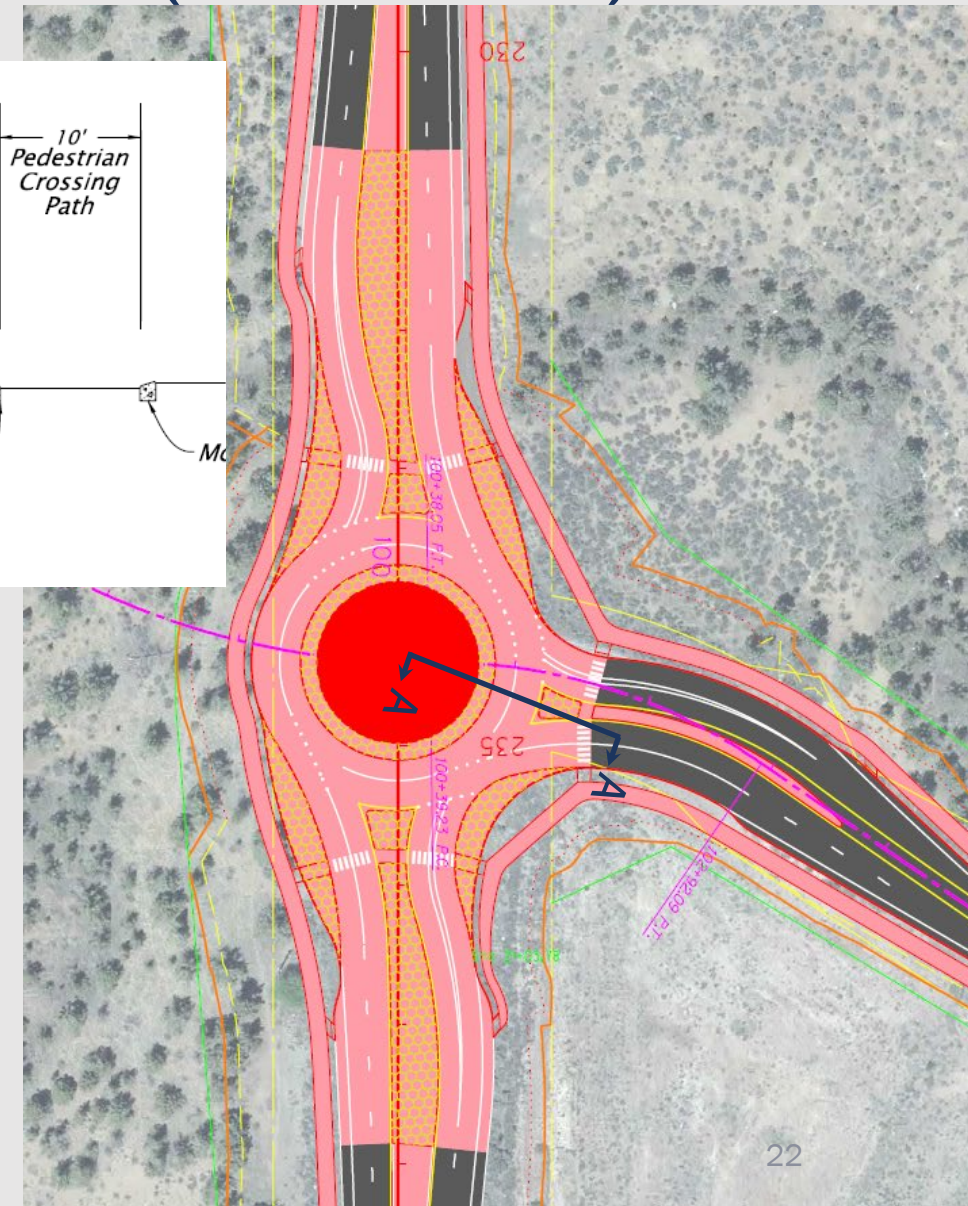
31' horizontal clearance (Curb - Curb)



US97/US20 Bend North Corridor Proposed Roundabout Cross Section (Robal Road)

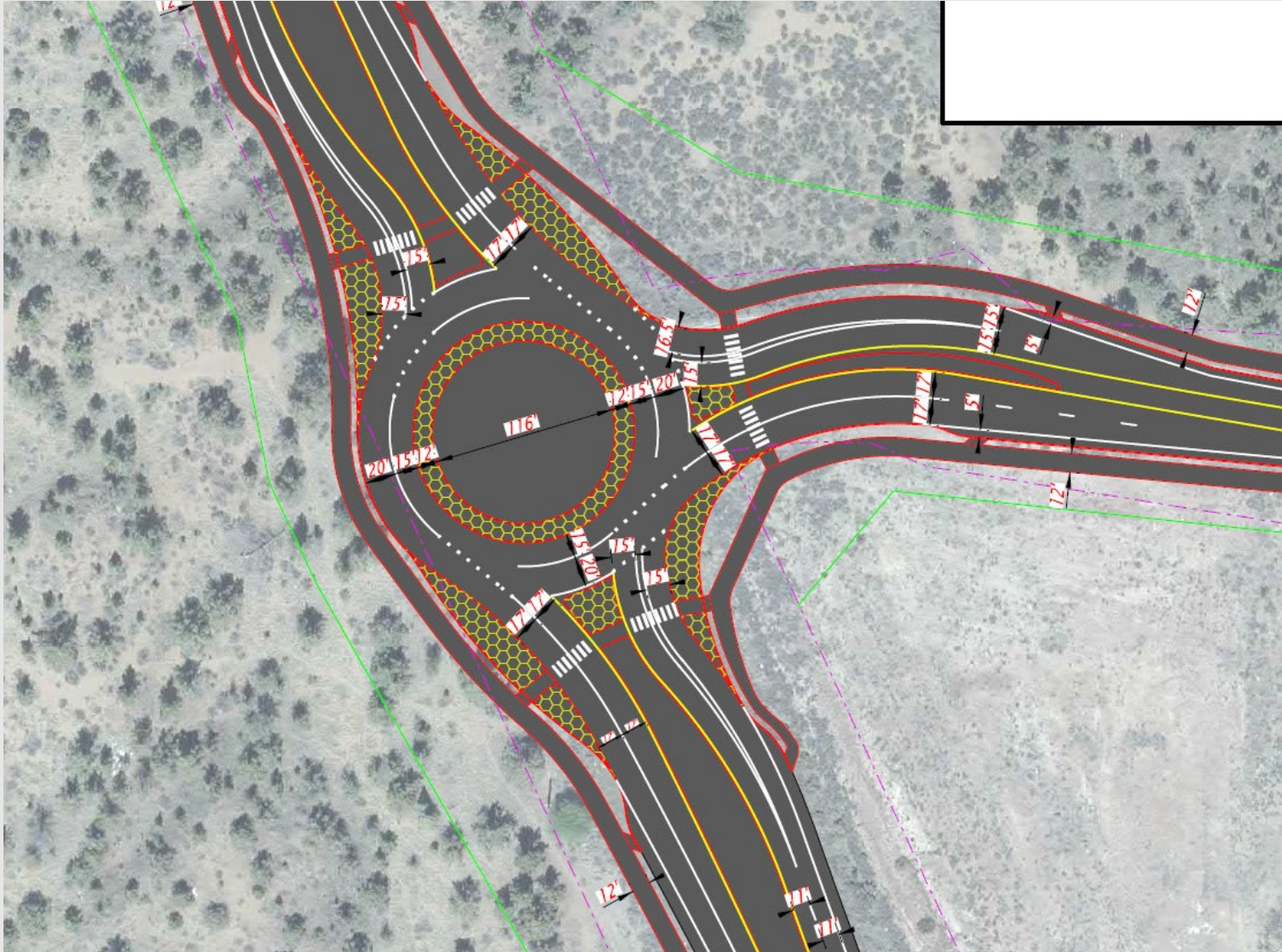


36' - 38' horizontal clearance (travel lanes)



US97/US20 Bend North Corridor

Proposed Roundabout Design (Robal Road)



Inscribed Diameter	210 Feet
Truck Apron Diameter	140 Feet
Truck Apron Width	12 Feet
Central Island Diameter	116 Feet
Central Island Curb Height	4" low profile mountable
Circulating Roadway Cross Slope	2%
Truck Apron Cross Slope	1%
Mountable Curbs	All curbs
Narrowest Pinch Point (curb to curb)	30 feet (US20)
Travel Lane Widths	15 to 20 feet

US97/US20 Bend North Corridor

Design Vehicle & Accommodation Vehicle Summary (Robal Road)

Design Vehicle	Accommodation Vehicles
Truck-tractor/semitrailer with 53' trailer (WB-67) <ul style="list-style-type: none"> • Overall Length: 73.5 feet • Overall Width: 8.5 feet 	<ul style="list-style-type: none"> • Palm Harbor D (14' wide man. home) • 135' Lowboy (Fixed/Moveable) • 154' Booster • 173' Wilhelm Beam Hauler • MC Tandem Triple • 180' Beam Hauler • 200' Beam Hauler

[AutoTurn Truck Diagrams](#)

[T_K21229 Misc_04](#)

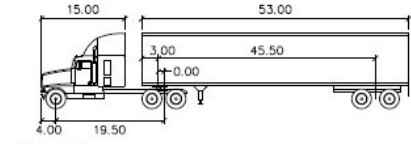
- Proposed design will accommodate vehicles at least 230 feet long or 22 feet wide.

US97/US20 Bend North Corridor

Design Vehicle Turning Movements (Robal Road)

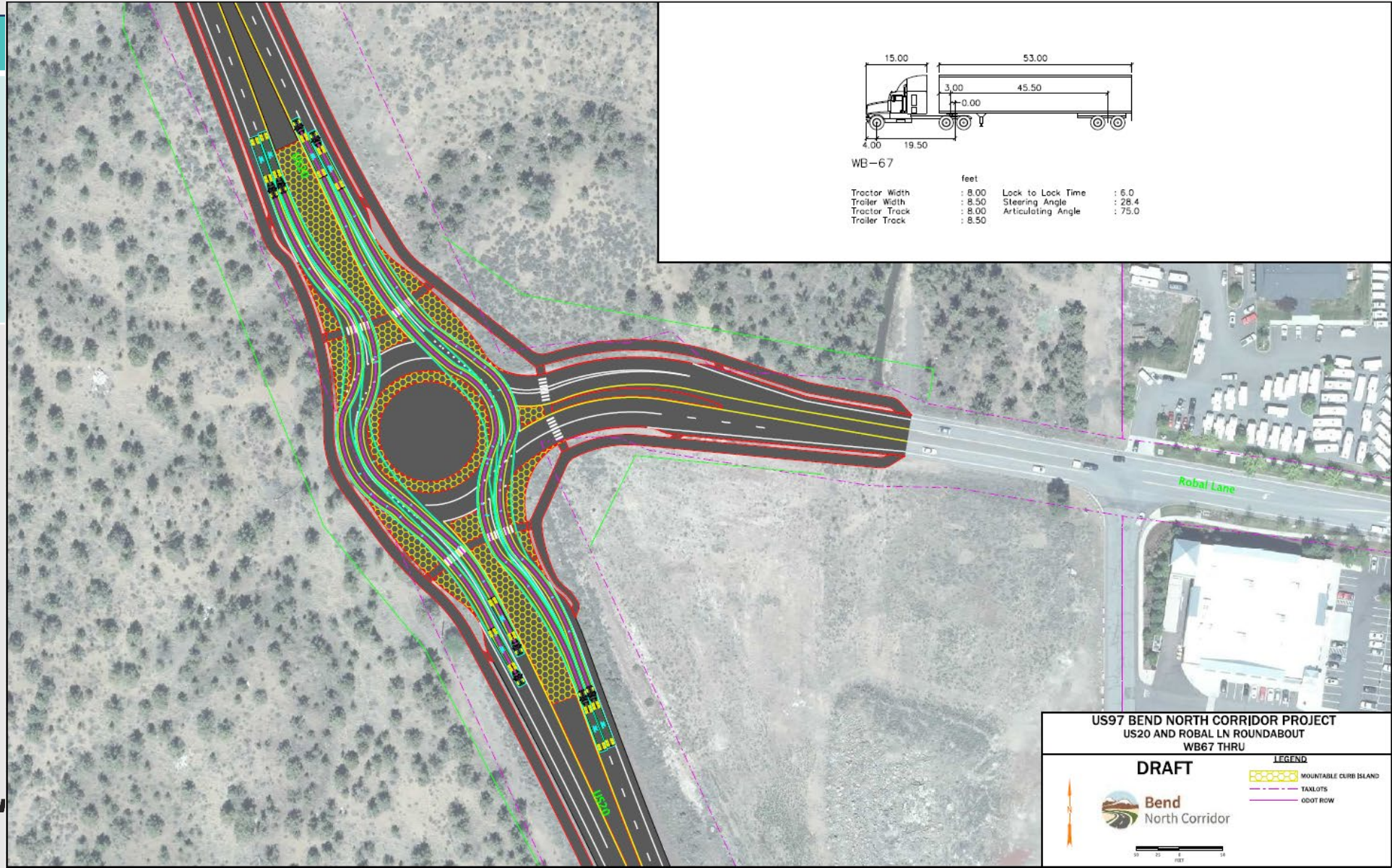
Design Vehicle

- Tractor Trailer/Semitrailer with 53 foot trailer (WB 67):
- Overall Length: 73.5 feet
 - Overall Width: 8.5 feet



WB-67

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		



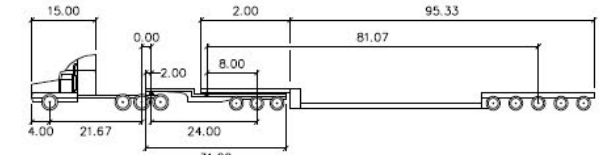
US97/US20 Bend North Corridor

Accommodation Vehicle Turning Movements (Robal Road)

Accommodation Vehicle

135' Low Boy

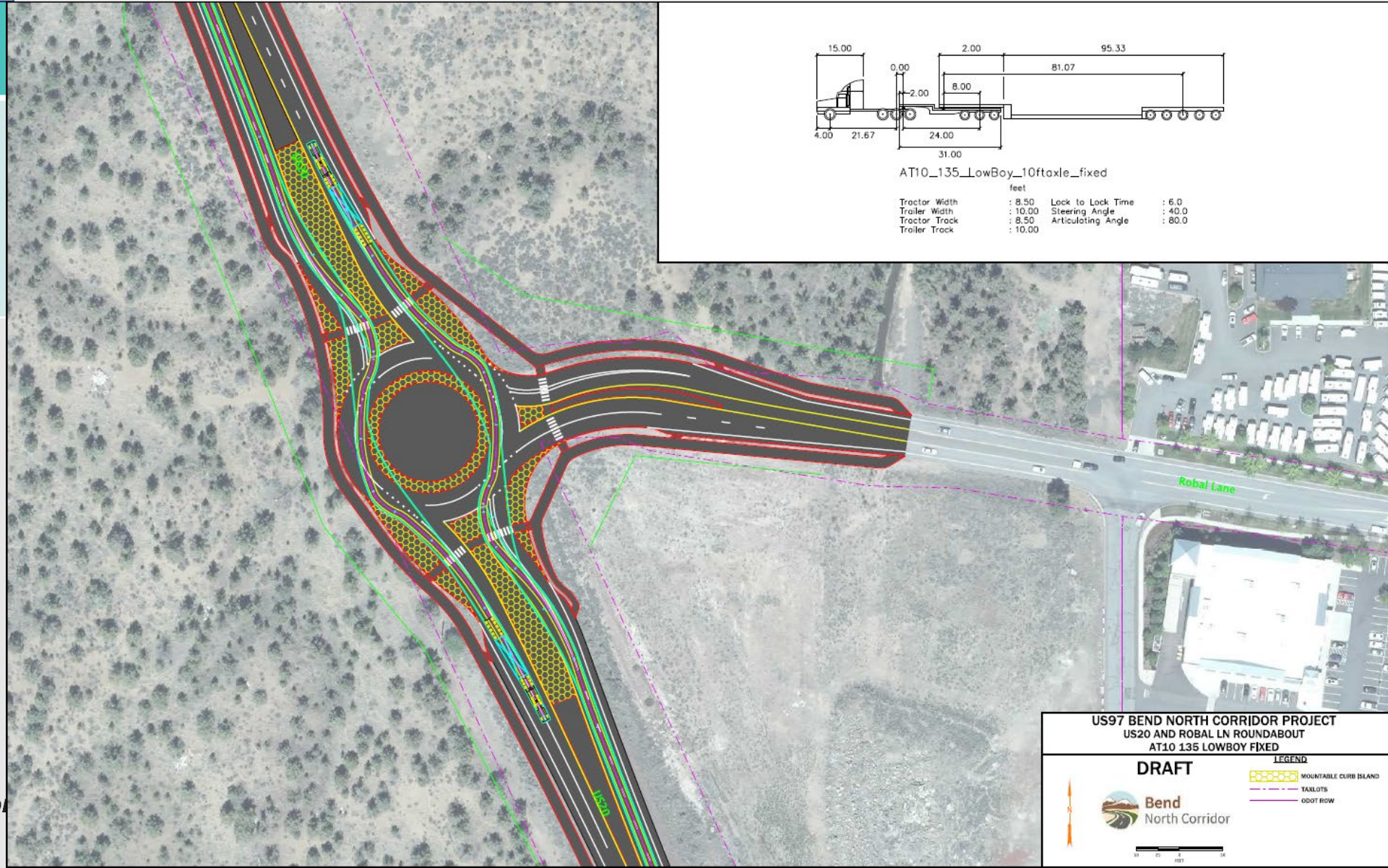
- Overall Length: 152 feet
- Overall Width: 10 feet



AT10_135_LowBoy_10ftaxle_fixed

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 10.00	Steering Angle	: 40.0
Tractor Track	: 8.50	Articulating Angle	: 80.0
Trailer Track	: 10.00		

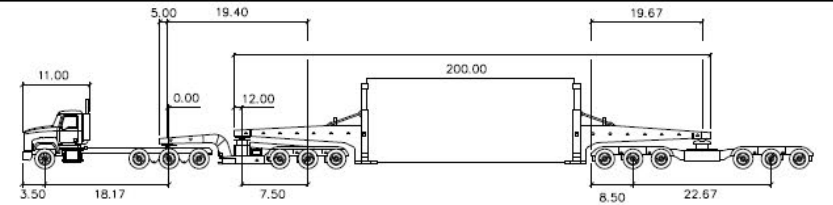


US97/US20 Bend North Corridor Accommodation Vehicle Turning Movements (Robal Road)

Accommodation Vehicle

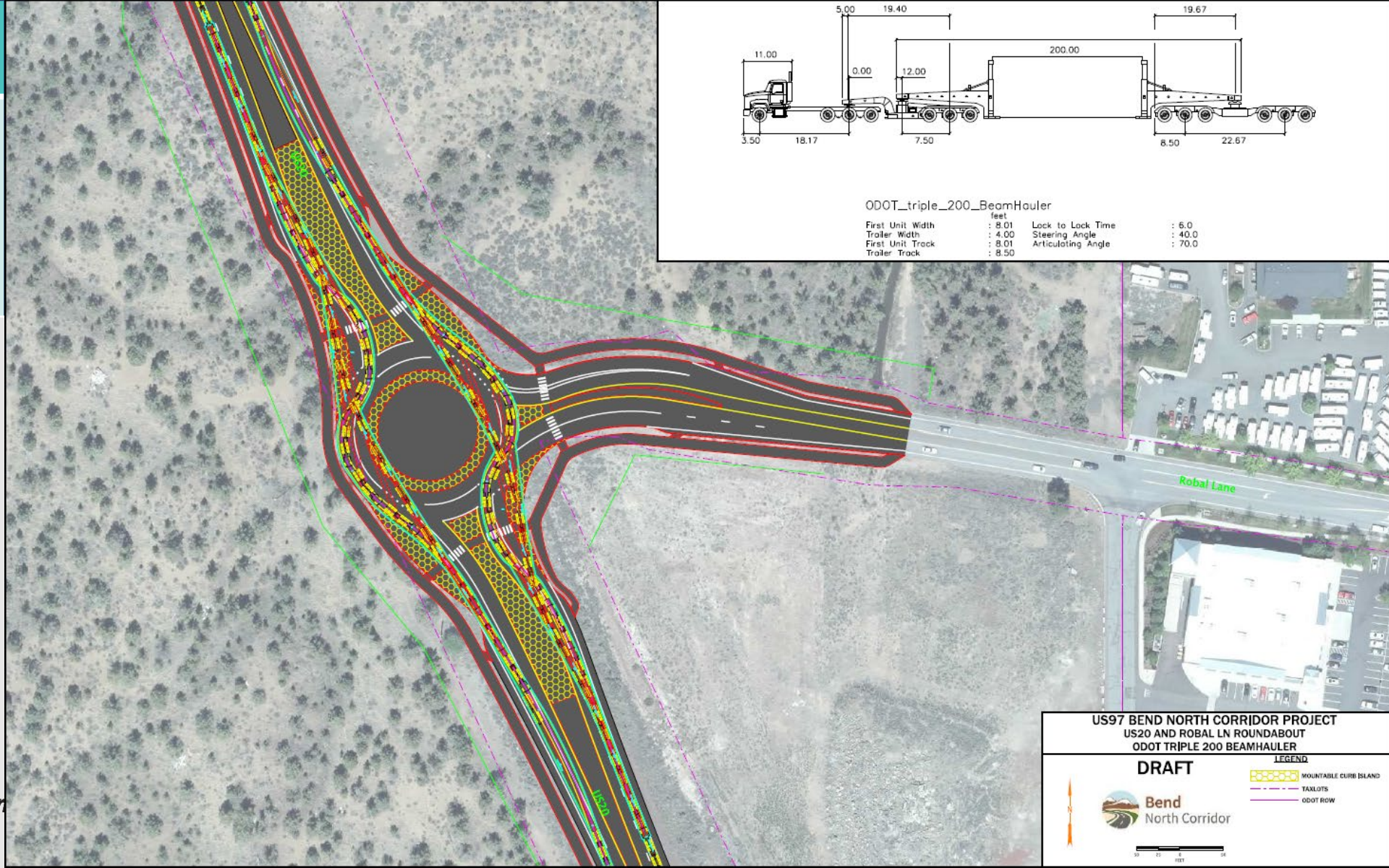
200' Beam Hauler

- Overall Length: 230 feet
- Overall Width: 8.5 feet



ODOT_triple_200_BeamHauler

feet	
First Unit Width	: 8.01
Trailer Width	: 4.00
First Unit Track	: 8.01
Trailer Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 40.0
Articulating Angle	: 70.0



Pause for US20 @ Robal Questions / Discussion

US97/US20 Bend North Corridor

Single Trip Over-Dimension Permit Summary

US20: OR126 Jct. – US97 MCTD Permit Data (9/25/2015 – 9/25/2018):

Overall Width	Number of Permits Issued
14'01" to 15'00"	6 (+2 additional trips)
15'01" to 16'00"	9 (+2 additional trips)
16'01" to 17'00"	1 (+1 additional trip)
17'01" to 18'00"	1

Overall Combination Length (overhang incl.)	Number of Permits Issued
Over 154'	5 (+16 additional trips)

Widest: 18'
(field roller)

Longest: 180'
(girders)

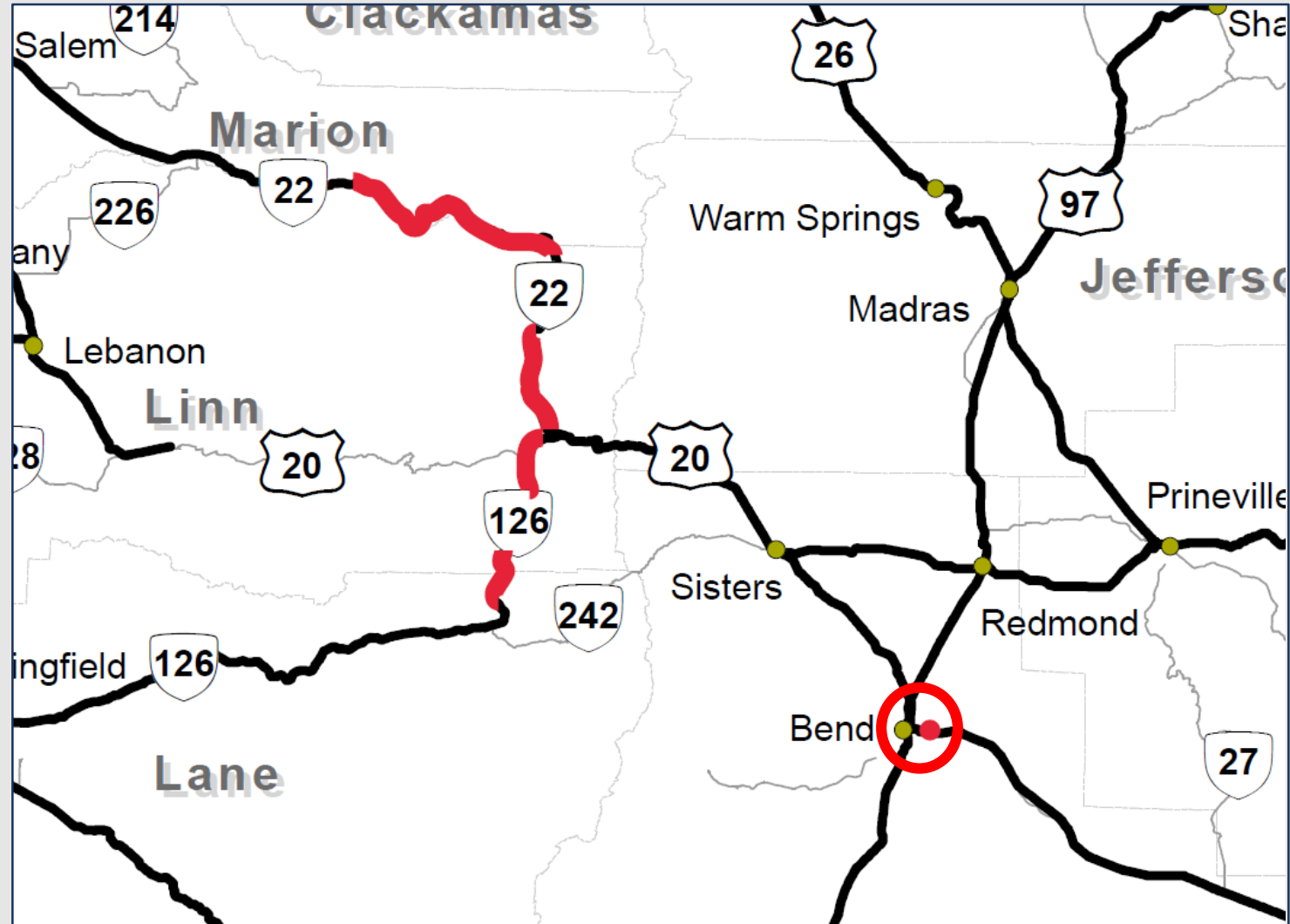
US97/US20 Bend North Corridor Pinch Point Information

OR22 Mill City – Santiam
Junction

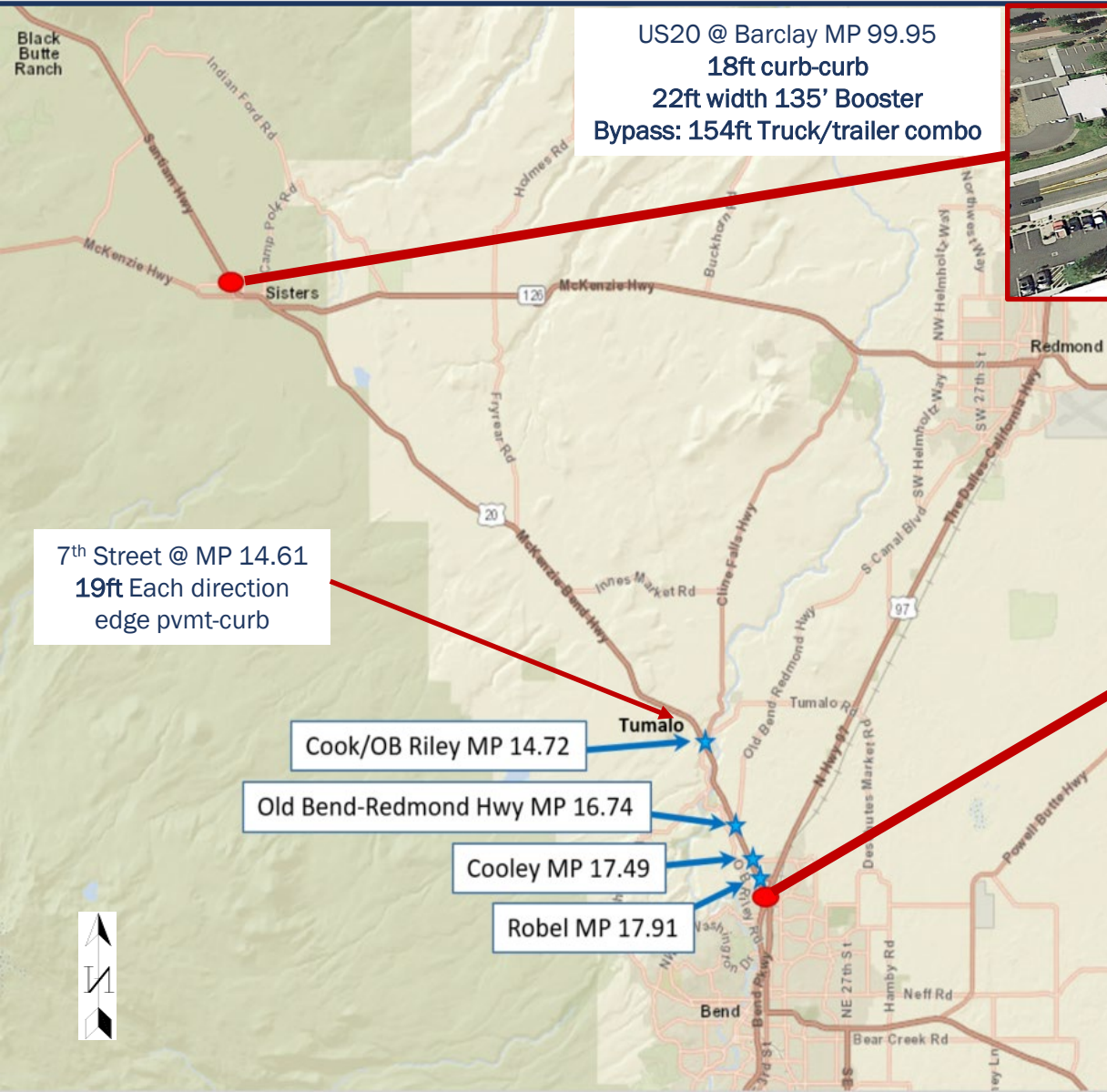
OR126 Clear Lake – Santiam
Junction

US20 at Greenwood (Bend)

The longest load that can
traverse the corridor is the 200'
Beam Hauler



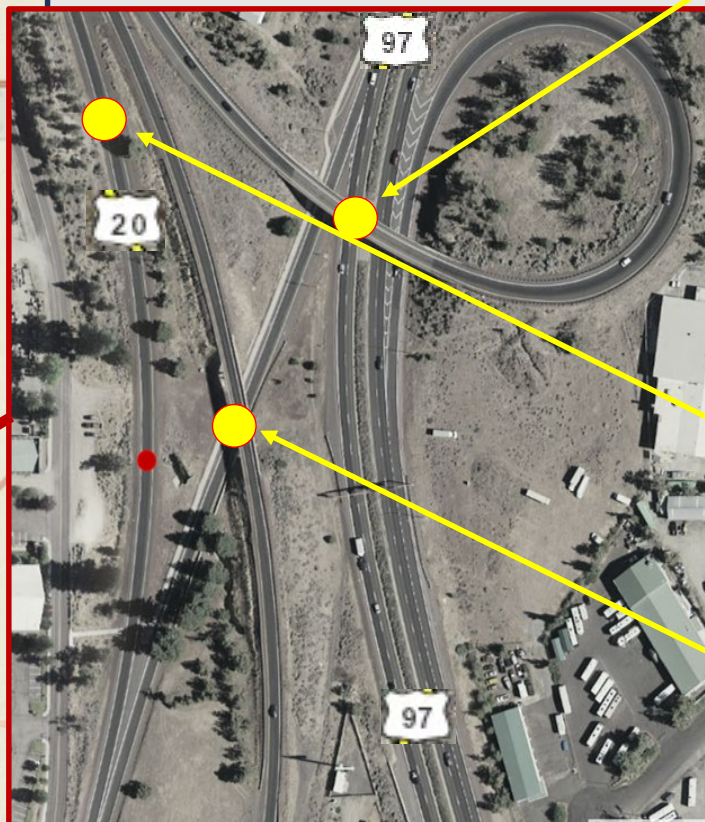
US97/US20 Bend North Corridor Pinch Point Information



US20 @ Barclay MP 99.95
18ft curb-curb
22ft width 135' Booster
Bypass: 154ft Truck/trailer combo



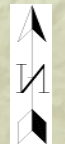
US97 Conn #2 to WB US20
MP 135.42-135.40
26ft rail-rail



EB on US20 @ MP 18.32
26ft edge pvmt-edge pvmt



US20 @ MP 18.31-18.49
Bridge over Exit 135A to WB US20
21ft rail-rail



US97/US20 Bend North Corridor

Summary of Changes

Proposed Design Feature	Existing Curb-to-Curb Width EB & WB	Proposed Curb-to-Curb Width – WB through movement	Proposed Curb-to-Curb Width – EB through Movement	Proposed Curb-to-Curb Width Reduction
Roundabout (Cooley)	69 feet	30 feet	30 feet	- 38 feet
Median (Cooley – Robal)	69 feet	31 feet	31 feet	- 38 feet
Roundabout (Robal)	68 feet	30 feet	30 feet	- 38 feet

NEXT STEPS

- Seeking a Record of Support from Stakeholder Forum per ORS 366.215, and Freight Industry for Roundabout Sizing per Directive DES-02:
 - US20/Cooley Road Roundabout
 - US20: Cooley – Robal Median Island
 - US20: Robal Road Roundabout

OR

Record of Support (Conceptual) will identify requirements to obtain final approval in Design-Build Contract.



THANK YOU