

memorandum

Date: April 14, 2010

To: **Mr. Pat Allen**
Northern Aggregate, Inc.

From: Allan Tilton, PE
Tony Henderson, EIT

Copy: Ms. Cathy McKeon
Rau and Associates

Project: MEX047

Subject: Errata for *Updated Supplemental Traffic Impact Analysis for the Harris Quarry*



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Whitlock & Weinberger Transportation, Inc. (W-Trans) completed the *Updated Supplemental Traffic Impact Analysis for the Harris Quarry* in the County of Mendocino on January 27, 2010. Since that time, some minor typographical errors have been discovered in the report; note that they do not alter any conclusions or recommendations. To address these errors, the enclosed errata pages have been compiled and should be included with all copies of the report.

Errata I – Page 28, Table 17 should read: (red text indicates change)

Table 17
US 101/Black Bart Drive Project Level of Service Calculations – Peak Production

Condition	Production Period	9-10 AM		11 AM-noon		1:15-2:15 PM		4:45-5:45 PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
2010 Project	July	16.2	C	27.6	D	20.5	C	19.7	C
<i>Mitigated (turn lanes)</i>	July	13.3	B	17.3	C	14.6	B	14.3	B
	October	13.7	B	19.6	C	21.0	C	15.0	B
<i>Mitigated (turn lanes)</i>	October	12.1	B	14.7	B	15.1	C	12.5	B
2014 Project	July	17.2	C	32.4	D	23.2	C	21.8	C
<i>Mitigated (turn lanes)</i>	July	13.9	B	18.6	C	15.4	C	15.1	C
	October	14.2	B	21.7	C	20.6	C	16.2	C
<i>Mitigated (turn lanes)</i>	October	12.4	B	15.4	C	15.9	C	13.0	B
2014 Project w/Bypass	July	17.7	C	33.6	D	23.7	C	22.5	C
<i>Mitigated (turn lanes)</i>	July	14.0	B	18.9	C	15.6	C	15.1	C
	October	14.6	B	22.5	C	24.3	C	16.2	C
<i>Mitigated (turn lanes)</i>	October	12.6	B	15.7	C	16.2	C	13.0	B
2030 Project	July	23.8	C	72.6	F	42.9	E	40.5	E
<i>Mitigated (turn lanes)</i>	July	16.3	C	25.1	D	19.6	C	19.6	C
	October	17.6	C	34.4	D	40.0	E	22.6	C
<i>Mitigated (turn lanes)</i>	October	13.9	B	19.0	C	19.9	C	15.2	C
2040 Project	July	30.9	D	**	F	73.0	F	68.7	F
<i>Mitigated (turn lanes)</i>	July	18.3	C	31.4	D	23.2	C	22.4	C
	October	20.6	C	50.6	E	63.4	F	29.6	D
<i>Mitigated (turn lanes)</i>	October	15.1	C	22.1	C	23.3	C	16.9	C

Notes: Delay is in average number of seconds per vehicle; LOS = Level of Service;
Bold = deficient operation; ** = greater than 120 seconds of average delay

Errata 2 – Page 10, Table 6 should read: (red text indicates change)

**Table 6
Trip Generation Assumptions with Proposed Project**

Source	Annual Production	Percent of Annual in:	
		July	October
Material Processed			
Material Mined	200,000 cy	n/a	n/a
Increased Material Volume by Bulking	48,000 cy	n/a	n/a
Recycle Material Imported	10,000 cy	9.4%	12.2%
Total Material Processed	258,000 cy		
Material Distributed			
Aggregate Production For Sale	162,520 cy	9.4%	12.2%
Aggregate transferred to Willits for PCC	37,200 cy	10.0%	15.8%
AC Production	58,280 cy	12.0%	17.0%
Total Material Distributed	258,000 cy		

Errata 3 –Appendix C, Page I, last section should read:

Project – Annual Production

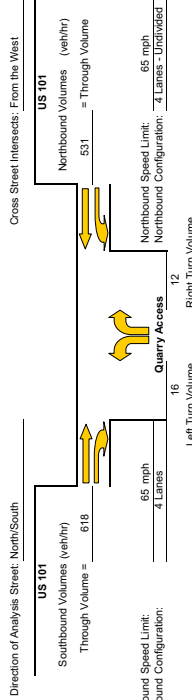
$$(Annual\ Production) \times (Bulking\ Factor) + Recycled\ Material = Adjusted\ Production$$

$$(200,000\ cubic\ yards) \times (1.24) + (10,000\ cubic\ yards) = 258,000 \frac{cubic\ yards}{year}$$

Errata 4 – The attached pages are to be added to Appendix G.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2010 July Peak Blast Permit Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 618
 Advancing Volume Va = 618
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 618
 If AV > Va then warrant is met

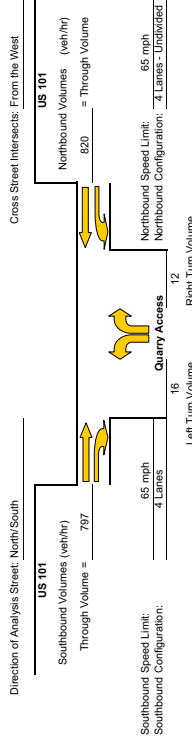
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2010 July Peak Blast Permit Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 797
 Advancing Volume Va = 797
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

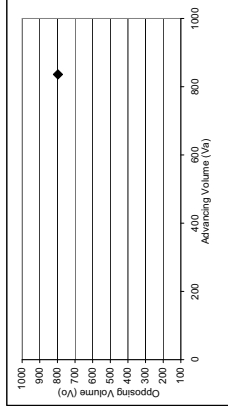
1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 797
 If AV > Va then warrant is met

Right Turn Taper Warranted: NO

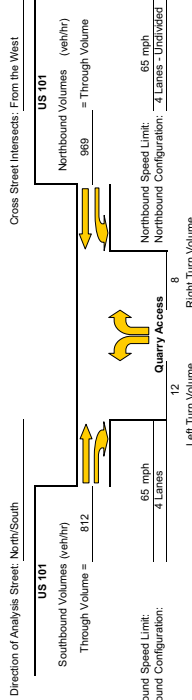
Left Turn Lane Warranted: YES



Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2010 July Peak Blast Permit Conditions - 1:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
 Left Turn Volume Threshold LTVol = 11.5 veh/hr
 Left Turn Volume Vt = 12 veh/hr
 If Vt > LTVol then warrant is met

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 812
 Advancing Volume Va = 812
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1066.66667
 Advancing Volume Va = 812
 If AV < Va then warrant is met
 No

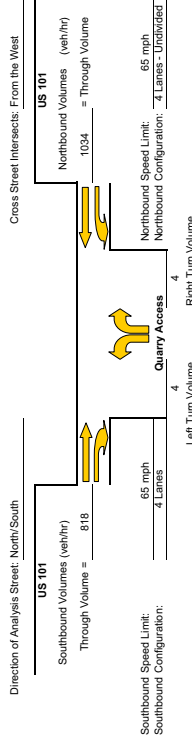
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2010 July Peak Blast Permit Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
 Left Turn Volume Threshold LTVol = 11.4 veh/hr
 Left Turn Volume Vt = 4 veh/hr
 If Vt > LTVol then warrant is met

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 818
 Advancing Volume Va = 818
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

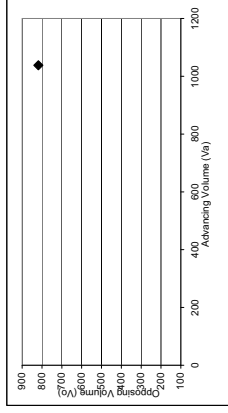
Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 818
 If AV < Va then warrant is met
 No

Right Turn Taper Warranted: NO

Left Turn Lane Warranted: NO

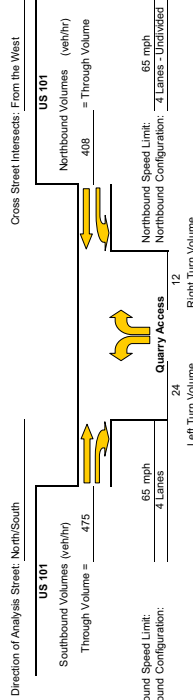


◆ Study Intersection

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2010 October Peak Base Permit Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 475
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 475
 If AV < Va then warrant is met No

Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

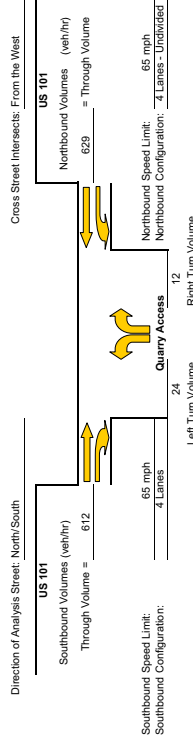
Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.

The right turn lane and taper analysis is based on work conducted by Cottel in 1981.

The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2010 October Peak Base Permit Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 612
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 612
 If AV < Va then warrant is met No

Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

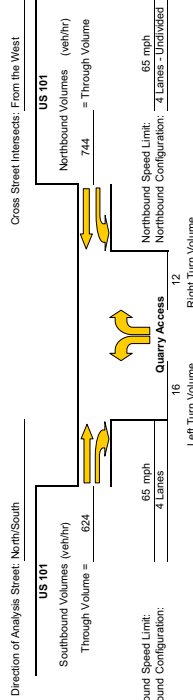
Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.

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The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2010 October Peak Base Permit Conditions - 11:52:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 624
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 624
 If AV < Va then warrant is met

Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

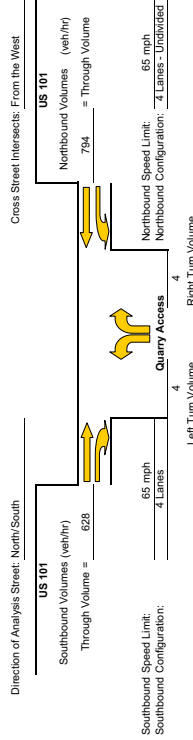
Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.

The right turn lane and taper analysis is based on work conducted by Cottel in 1981.

The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2010 October Peak Base Permit Conditions - 4:45:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 628
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

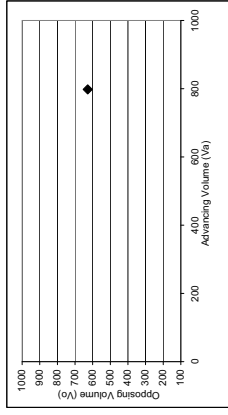
1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 628
 If AV < Va then warrant is met

Right Turn Taper Warranted: NO

Left Turn Lane Warranted: NO



◆ Study Intersection

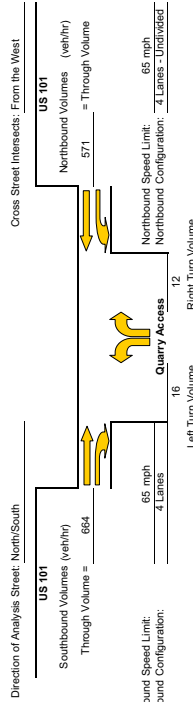
Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.

The right turn lane and taper analysis is based on work conducted by Cottel in 1981.

The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2014 (without Willits Bypass) July Peak Base Permit Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 664
 Advancing Volume Va = 664
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 664
 If AV/Va then warrant is met

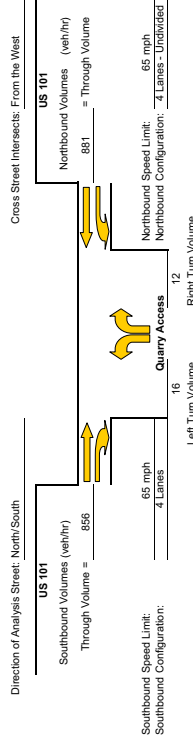
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2014 (without Willits Bypass) July Peak Base Permit Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 856
 Advancing Volume Va = 856
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 856
 If AV/Va then warrant is met

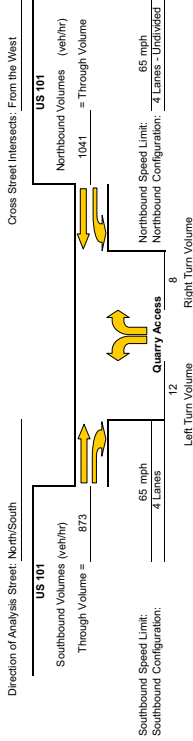
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris, Quarry Access
 Study Scenario: 2014 (without Willits Bypass) July Peak Base Permit Conditions - 1:15-2:15pm
 Direction of Analysis Street: North/South



US 101
 Southbound Volumes (veh/hr) = 873
 Through Volume = 873
 Northbound Speed Limit: 65 mph
 Northbound Configuration: 4 Lanes - Undivided

US 101
 Northbound Volumes (veh/hr) = 1041
 Through Volume = 1041
 Northbound Speed Limit: 65 mph
 Northbound Configuration: 4 Lanes - Undivided

Quarry Access
 Right Turn Volume = 8
 Left Turn Volume = 12

Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 873
 Advancing Volume Va = -
 If AV > Va then warrant is met
Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)
 1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1066.66667
 Advancing Volume Va = 873
 If AV > Va then warrant is met
Right Turn Taper Warranted: NO

Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LTVol = 10.6 veh/hr
 Left Turn Volume Vt = 12 veh/hr
 If Vt > LTVol then warrant is met

Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LTVol = 10.6 veh/hr
 Left Turn Volume Vt = 12 veh/hr
 If Vt > LTVol then warrant is met

1000
900
800
700
600
500
400
300
200
100
0

Advancing Volume (Va) 873

Opposing Volume (Vo) -

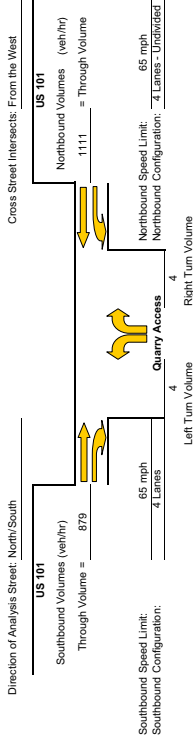
Study Intersection

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris, Quarry Access
 Study Scenario: 2014 (without Willits Bypass) July Peak Base Permit Conditions - 4:45-5:45pm
 Direction of Analysis Street: North/South



US 101
 Southbound Volumes (veh/hr) = 879
 Through Volume = 879
 Northbound Speed Limit: 65 mph
 Northbound Configuration: 4 Lanes - Undivided

US 101
 Northbound Volumes (veh/hr) = 1111
 Through Volume = 1111
 Northbound Speed Limit: 65 mph
 Northbound Configuration: 4 Lanes - Undivided

Quarry Access
 Right Turn Volume = 4
 Left Turn Volume = 4

Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 879
 Advancing Volume Va = -
 If AV > Va then warrant is met
Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)
 1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 879
 If AV > Va then warrant is met
Right Turn Taper Warranted: NO

Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LTVol = 10.5 veh/hr
 Left Turn Volume Vt = 4 veh/hr
 If Vt > LTVol then warrant is met

Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LTVol = 10.5 veh/hr
 Left Turn Volume Vt = 4 veh/hr
 If Vt > LTVol then warrant is met

1000
900
800
700
600
500
400
300
200
100
0

Advancing Volume (Va) 879

Opposing Volume (Vo) -

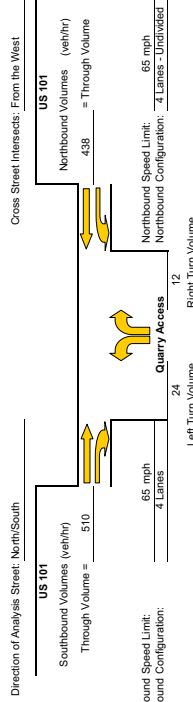
Study Intersection

Left Turn Lane Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2014 (without Willits Bypass) October Peak Base Permit Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 510
 Advancing Volume VA = 510
 If AV<VA then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume VA = 510
 If AV<VA then warrant is met

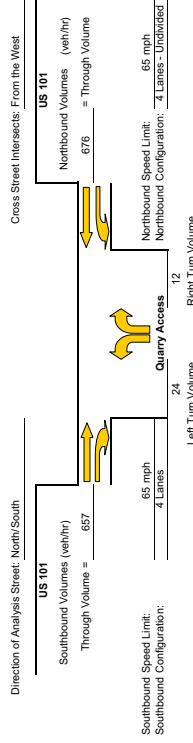
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

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 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2014 (without Willits Bypass) October Peak Base Permit Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 657
 Advancing Volume VA = 657
 If AV<VA then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume VA = 657
 If AV<VA then warrant is met

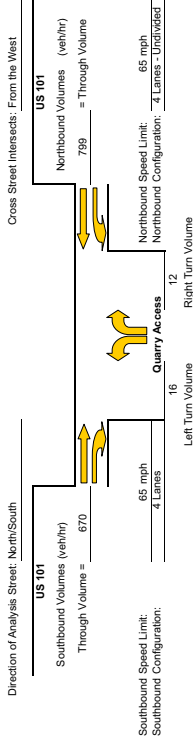
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

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 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main, Quarry Access
 Study Scenario: 2014 (without Willits Bypass) October Peak Base Permit Conditions - 11:52-1:50pm
 Direction of Analysis Street: North/South



US 101
 Southbound Volumes (veh/hr) = 670
 Through Volume = 670
 Northbound Volumes (veh/hr) = 799
 Through Volume = 799
 Northbound Speed Limit: 65 mph
 Southbound Speed Limit: 65 mph
 Southbound Configuration: 4 Lanes
 Northbound Configuration: 4 Lanes - Undivided

US 101
 Northbound Volumes (veh/hr) = 799
 Through Volume = 799
 Northbound Speed Limit: 65 mph
 Southbound Speed Limit: 65 mph
 Southbound Configuration: 4 Lanes
 Northbound Configuration: 4 Lanes - Undivided

Quarry Access
 Southbound Volumes (veh/hr) = 65
 Through Volume = 65
 Northbound Volumes (veh/hr) = 65
 Through Volume = 65
 Northbound Speed Limit: 65 mph
 Southbound Speed Limit: 65 mph
 Southbound Configuration: 4 Lanes
 Northbound Configuration: 4 Lanes - Undivided

Left Turn Volume: 16
 Right Turn Volume: 12

Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 670
 Advancing Volume Va = 670
 If AV < Va then warrant is met
Right Turn Lane Warranted: NO

Southbound Left Turn Lane Warrants
 Left Turn Volume Threshold LIVol = 13.8 veh/hr
 Left Turn Volume VI = 16 veh/hr
 If VI > LIVol then warrant is met

1. Check taper volume criteria
Thresholds not met, continue to next step

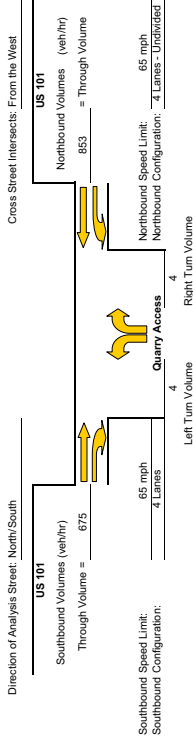
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 670
 If AV < Va then warrant is met
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main, Quarry Access
 Study Scenario: 2014 (without Willits Bypass) October Peak Base Permit Conditions - 4:45-5:45pm
 Direction of Analysis Street: North/South



US 101
 Southbound Volumes (veh/hr) = 675
 Through Volume = 675
 Northbound Volumes (veh/hr) = 863
 Through Volume = 863
 Northbound Speed Limit: 65 mph
 Southbound Speed Limit: 65 mph
 Southbound Configuration: 4 Lanes
 Northbound Configuration: 4 Lanes - Undivided

US 101
 Northbound Volumes (veh/hr) = 863
 Through Volume = 863
 Northbound Speed Limit: 65 mph
 Southbound Speed Limit: 65 mph
 Southbound Configuration: 4 Lanes
 Northbound Configuration: 4 Lanes - Undivided

Quarry Access
 Southbound Volumes (veh/hr) = 65
 Through Volume = 65
 Northbound Volumes (veh/hr) = 65
 Through Volume = 65
 Northbound Speed Limit: 65 mph
 Southbound Speed Limit: 65 mph
 Southbound Configuration: 4 Lanes
 Northbound Configuration: 4 Lanes - Undivided

Left Turn Volume: 4
 Right Turn Volume: 4

Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 675
 Advancing Volume Va = 675
 If AV < Va then warrant is met
Right Turn Lane Warranted: NO

Southbound Left Turn Lane Warrants
 Left Turn Volume Threshold LIVol = 13.7 veh/hr
 Left Turn Volume VI = 4 veh/hr
 If VI > LIVol then warrant is met

1. Check taper volume criteria
Thresholds not met, continue to next step

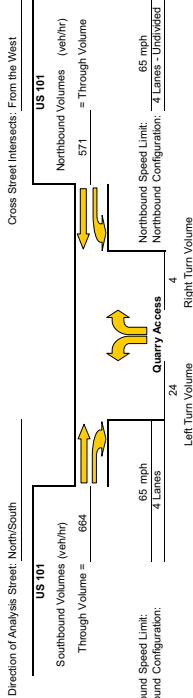
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 675
 If AV < Va then warrant is met
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) JWB Peak Base Permit Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 664
 Advancing Volume Va = 664
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 664
 If AV/Va then warrant is met

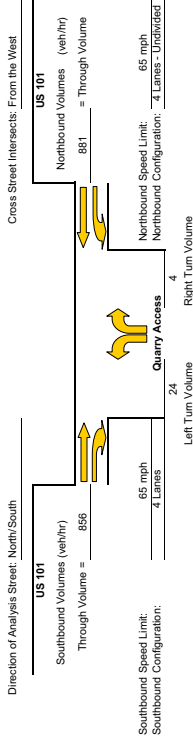
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: **YES**

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) JWB Peak Base Permit Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 856
 Advancing Volume Va = 856
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 856
 If AV/Va then warrant is met

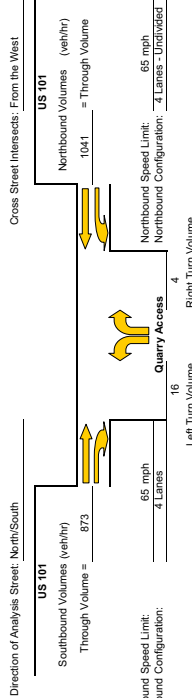
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: **YES**

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) W/P Peak Base Permit Conditions - 1:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 873
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 873
 If AV < Va then warrant is met

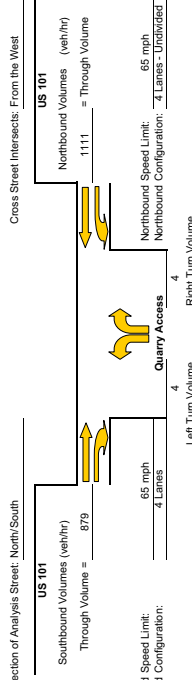
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: **YES**

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) W/P Peak Base Permit Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 879
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 879
 If AV < Va then warrant is met

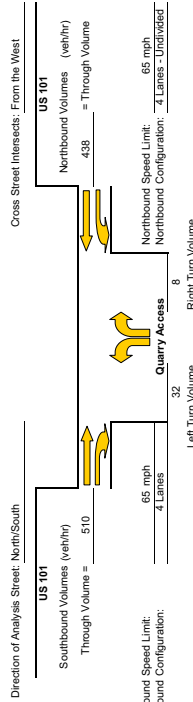
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: **NO**

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/McInis Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) October Peak Base Permit Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 510
 Advancing Volume Va = 510
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1066.66667
 Advancing Volume Va = 510
 If AV/Va then warrant is met

Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

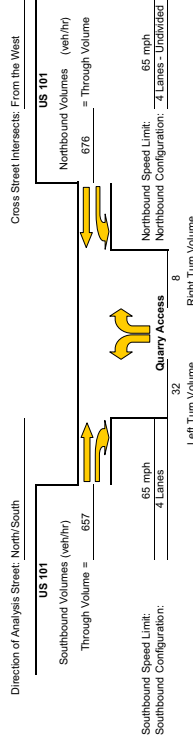
Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.

The right turn lane and taper analysis is based on work conducted by Cottel in 1981.

The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/McInis Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) October Peak Base Permit Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 657
 Advancing Volume Va = 657
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

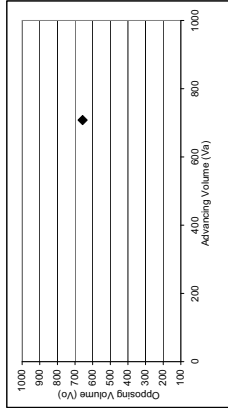
1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1066.66667
 Advancing Volume Va = 657
 If AV/Va then warrant is met

Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES



◆ Study Intersection

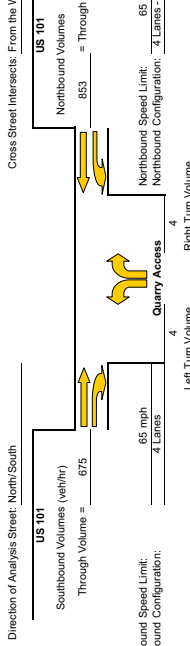
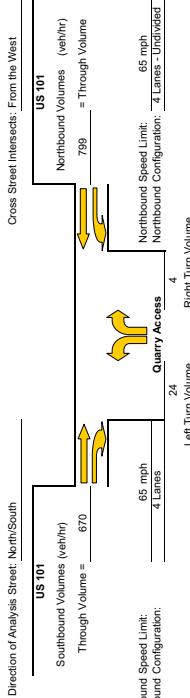
Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.

The right turn lane and taper analysis is based on work conducted by Cottel in 1981.

The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) October Peak Base Permit Conditions - 11:52:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 670
 If AV<Va then warrant is met
Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 670
 If AV<Va then warrant is met
Right Turn Taper Warranted: NO

Left Turn Volume: 24
 Right Turn Volume: 4
 Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LIVol = 13.8 veh/hr
 Left Turn Volume VI = 24 veh/hr
 If VI>LIVol then warrant is met
Left Turn Lane Warranted: YES

Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 675
 If AV<Va then warrant is met
Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 675
 If AV<Va then warrant is met
Right Turn Taper Warranted: NO

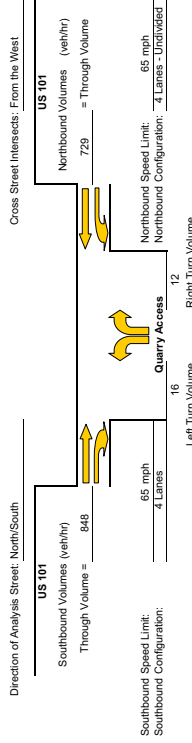
Left Turn Volume: 4
 Right Turn Volume: 4
 Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LIVol = 13.7 veh/hr
 Left Turn Volume VI = 4 veh/hr
 If VI>LIVol then warrant is met
Left Turn Lane Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains, Quarry Access
 Study Scenario: 2030 July Peak Blast Permit Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 848
 Advancing Volume Va = 848
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 848
 If AV < Va then warrant is met

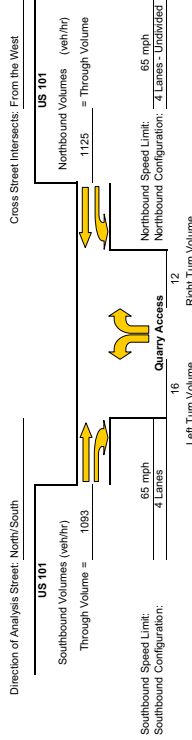
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains, Quarry Access
 Study Scenario: 2030 July Peak Blast Permit Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1093
 Advancing Volume Va = 1093
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 1093
 If AV < Va then warrant is met

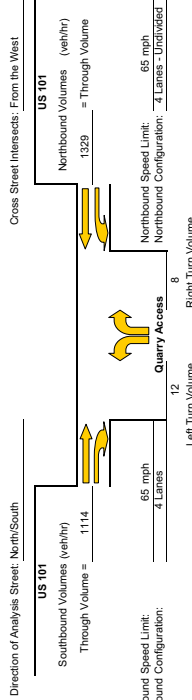
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Hiwassee Quarry Access
 Study Scenario: 2030 July Peak Blast Permit Conditions - 1:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1114
 Advancing Volume Va = 1114
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

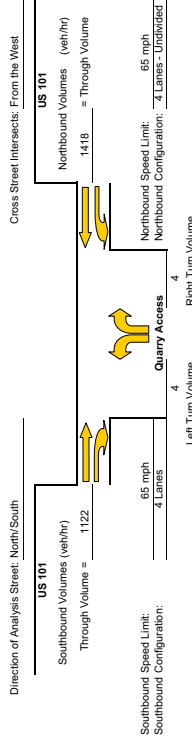
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1066.66667
 Advancing Volume Va = 1114
 If AV < Va then warrant is met Yes

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Hiwassee Quarry Access
 Study Scenario: 2030 July Peak Blast Permit Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1122
 Advancing Volume Va = 1122
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

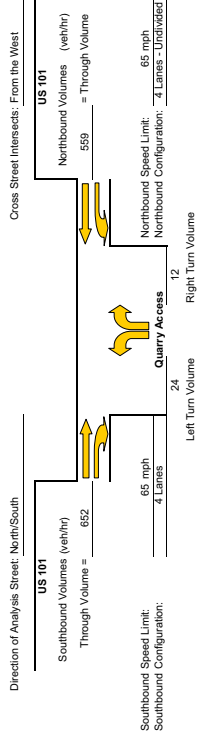
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 1122
 If AV < Va then warrant is met No

Right Turn Taper Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2030 October Peak Base Permit Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 652
 Advancing Volume Va = -
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

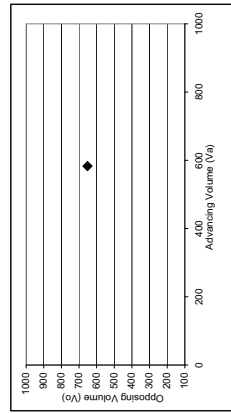
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 652
 If AV/Va then warrant is met

Right Turn Taper Warranted: NO

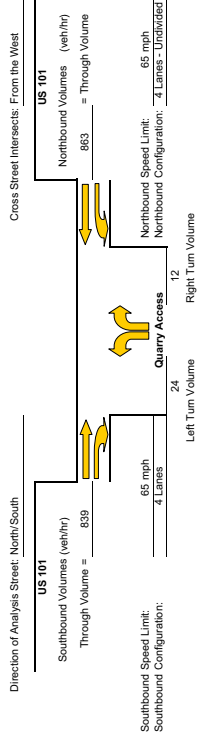
Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LIVol 14.1 veh/hr
 Left Turn Volume V = 24 veh/hr
 If V>LIVol then warrant is met

Northbound Left Turn Lane Warranted: YES



Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2030 October Peak Base Permit Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 839
 Advancing Volume Va = -
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

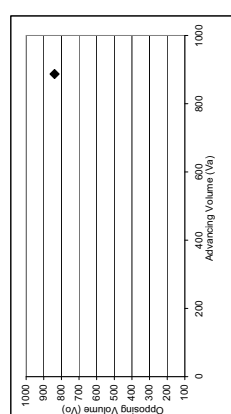
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 839
 If AV/Va then warrant is met

Right Turn Taper Warranted: NO

Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LIVol 11.1 veh/hr
 Left Turn Volume V = 24 veh/hr
 If V>LIVol then warrant is met

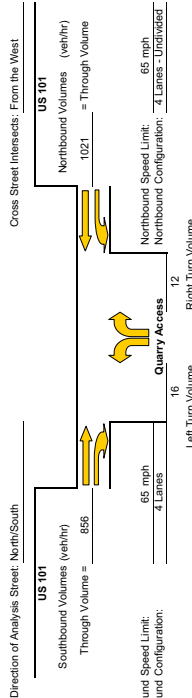
Northbound Left Turn Lane Warranted: YES



Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris Quarry Access
 Study Scenario: 2030 October Peak Base Permit Conditions - 1:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 856
 Va = -
 If AV/Va then warrant is met
Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

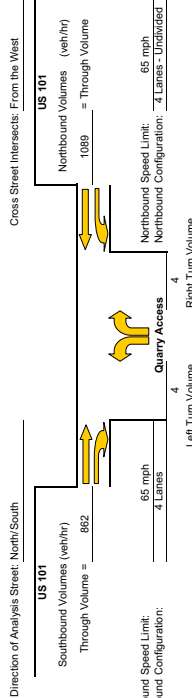
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Va = 856
 If AV/Va then warrant is met
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris Quarry Access
 Study Scenario: 2030 October Peak Base Permit Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 882
 Va = -
 If AV/Va then warrant is met
Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

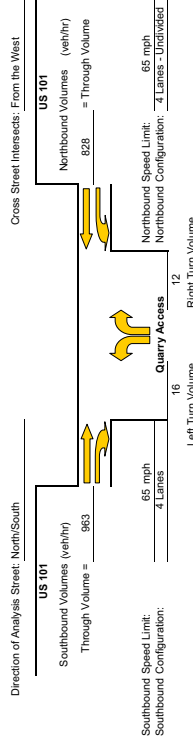
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Va = 882
 If AV/Va then warrant is met
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris, Quarry Access
 Study Scenario: 2042 July Peak Blast Permit Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 963
 Advancing Volume Va = -
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 963
 If AV > Va then warrant is met
 Yes

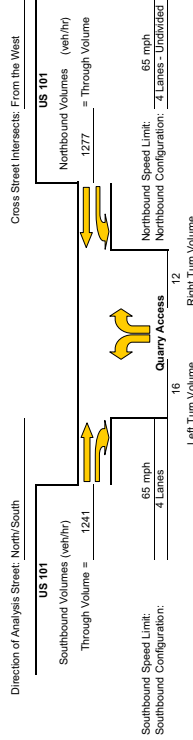
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris, Quarry Access
 Study Scenario: 2042 July Peak Blast Permit Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1241
 Advancing Volume Va = -
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 1241
 If AV > Va then warrant is met
 Yes

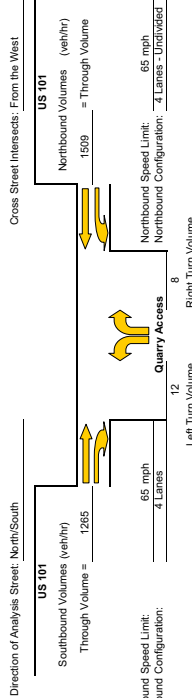
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris, Quarry Access
 Study Scenario: 2040 July Peak Blast Permit Conditions - 1:15-2:15pm



Direction of Analysis Street: North/South
 Cross Street Intersects: From the West

US 101
 Southbound Volumes (veh/hr) = 1265
 Through Volume = 1265 = Through Volume

Northbound Speed Limit: 65 mph
 Northbound Configuration: 4 Lanes - Undivided

US 101
 Northbound Volumes (veh/hr) = 1599
 Through Volume = 1599 = Through Volume

Southbound Speed Limit: 65 mph
 Southbound Configuration: 4 Lanes - Undivided

Quarry Access
 Right Turn Volume = 8
 Left Turn Volume = 12

Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
 Left Turn Volume Threshold LTVol = 6.3 veh/hr
 Left Turn Volume Vt = 12 veh/hr
 If Vt > LTVol then warrant is met

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1265
 Advancing Volume Va = -
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1066.66667
 Advancing Volume Va = 1265
 If AV < Va then warrant is met
 Yes

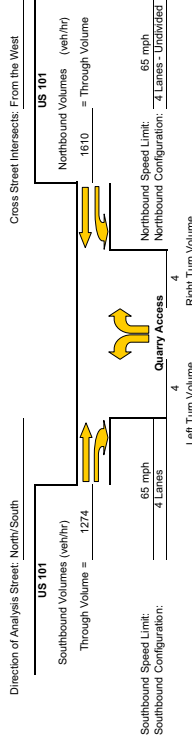
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris, Quarry Access
 Study Scenario: 2040 July Peak Blast Permit Conditions - 4:45-5:45pm



Direction of Analysis Street: North/South
 Cross Street Intersects: From the West

US 101
 Southbound Volumes (veh/hr) = 1274
 Through Volume = 1274 = Through Volume

Northbound Speed Limit: 65 mph
 Northbound Configuration: 4 Lanes - Undivided

US 101
 Northbound Volumes (veh/hr) = 1610
 Through Volume = 1610 = Through Volume

Southbound Speed Limit: 65 mph
 Southbound Configuration: 4 Lanes - Undivided

Quarry Access
 Right Turn Volume = 4
 Left Turn Volume = 4

Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
 Left Turn Volume Threshold LTVol = 6.2 veh/hr
 Left Turn Volume Vt = 4 veh/hr
 If Vt > LTVol then warrant is met

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1274
 Advancing Volume Va = -
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

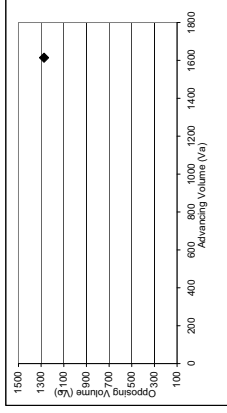
Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 1274
 If AV < Va then warrant is met
 Yes

Right Turn Taper Warranted: YES

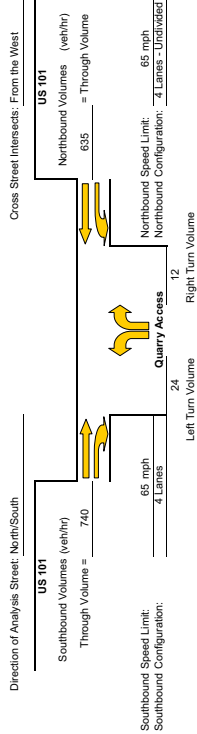
Left Turn Lane Warranted: NO



Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main, Quarry Access
 Study Scenario: 2040 October Peak Base Permit Conditions - 9:00-10:00am



Direction of Analysis Street: North/South
 Cross Street Intersects: From the West

US 101
 Southbound Volumes (veh/hr) = 740
 Through Volume = 740 = Through Volume

Northbound Volumes (veh/hr) = 655 = Through Volume

Northbound Speed Limit: 65 mph
 Northbound Configuration: 4 Lanes - Undivided

Right Turn Volume = 12
 Left Turn Volume = 24

Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 740
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 740
 If AV < Va then warrant is met

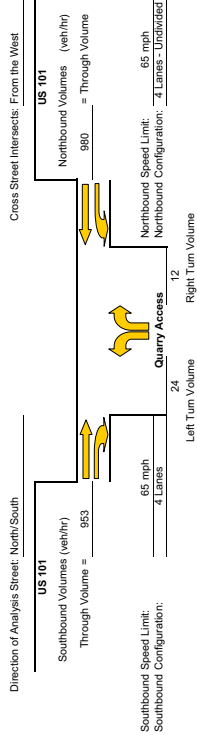
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main, Quarry Access
 Study Scenario: 2040 October Peak Base Permit Conditions - 11:00am-Noon



Direction of Analysis Street: North/South
 Cross Street Intersects: From the West

US 101
 Southbound Volumes (veh/hr) = 953
 Through Volume = 953 = Through Volume

Northbound Volumes (veh/hr) = 980 = Through Volume

Northbound Speed Limit: 65 mph
 Northbound Configuration: 4 Lanes - Undivided

Right Turn Volume = 12
 Left Turn Volume = 24

Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 953
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

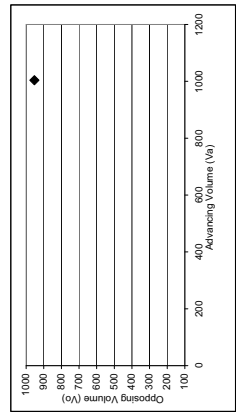
1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 953
 If AV < Va then warrant is met

Right Turn Taper Warranted: YES

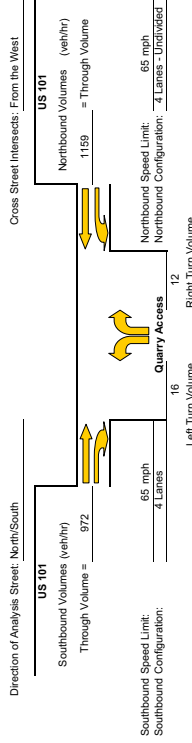
Left Turn Lane Warranted: YES



Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris Quarry Access
 Study Scenario: 2040 October Peak Base Permit Conditions - 11:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
 Left Turn Volume Threshold L/Vol = 9.3 veh/hr
 Left Turn Volume V = 16 veh/hr
 If V>L/Vol then warrant is met

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 972
 Advancing Volume Va = -
 If AV<Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

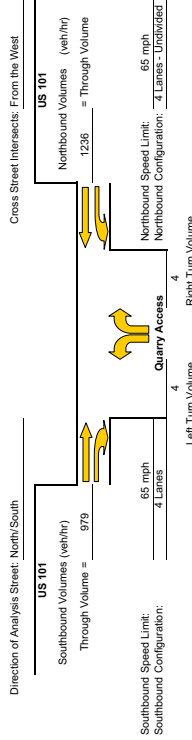
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 833.333333
 Advancing Volume Va = 972
 If AV<Va then warrant is met Yes

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris Quarry Access
 Study Scenario: 2040 October Peak Base Permit Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
 Left Turn Volume Threshold L/Vol = 9.2 veh/hr
 Left Turn Volume V = 4 veh/hr
 If V>L/Vol then warrant is met

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 979
 Advancing Volume Va = -
 If AV<Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

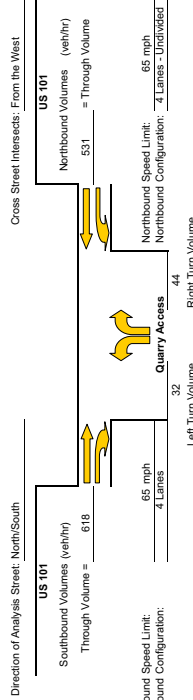
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1200
 Advancing Volume Va = 979
 If AV<Va then warrant is met No

Right Turn Taper Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris Quarry Access
 Study Scenario: 2010 July Peak Project Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1144
 Advancing Volume Va = 618
 If AV > Va then warrant is met No

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -133.33333
 Advancing Volume Va = 618
 If AV < Va then warrant is met Yes

Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

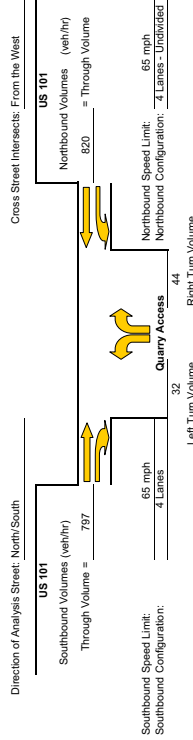
Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.

The right turn lane and taper analysis is based on work conducted by Cottel in 1981.

The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris Quarry Access
 Study Scenario: 2010 July Peak Project Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1144
 Advancing Volume Va = 797
 If AV > Va then warrant is met No

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

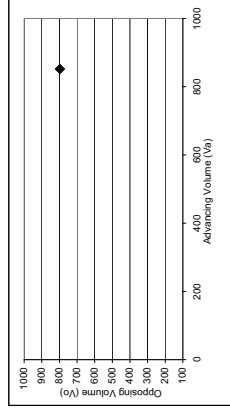
1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -133.33333
 Advancing Volume Va = 797
 If AV < Va then warrant is met Yes

Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES



◆ Study Intersection

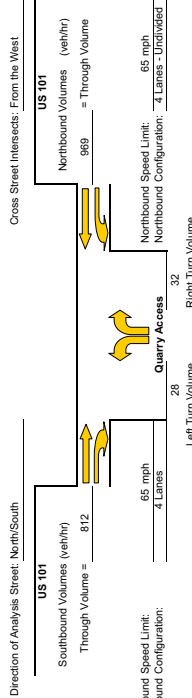
Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.

The right turn lane and taper analysis is based on work conducted by Cottel in 1981.

The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main, Quarry Access
 Study Scenario: 2010 July Peak Project Conditions - 11:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
NOT WARRANTED - Less than 40 vehicles

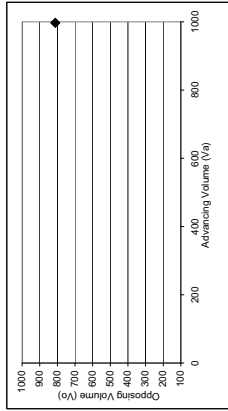
2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 812
 Advancing Volume Va = 812
 If AV < Va then warrant is met
Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)
 1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 266.666667
 Advancing Volume Va = 812
 If AV < Va then warrant is met
Right Turn Taper Warranted: YES

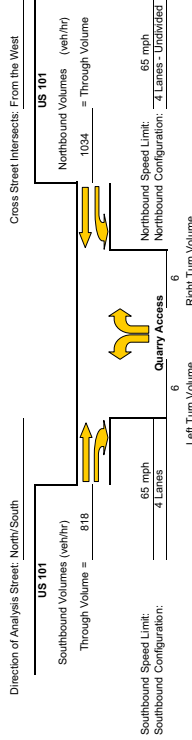
Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LIVol = 11.5 veh/hr
 Left Turn Volume V = 28 veh/hr
 If V > LIVol then warrant is met

Left Turn Lane Warranted: YES



Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main, Quarry Access
 Study Scenario: 2010 July Peak Project Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
NOT WARRANTED - Less than 40 vehicles

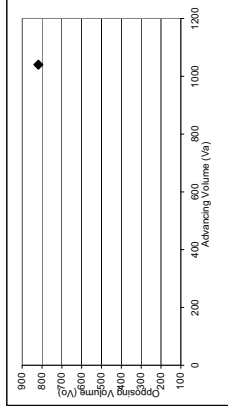
2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 818
 Advancing Volume Va = 818
 If AV < Va then warrant is met
Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)
 1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1133.33333
 Advancing Volume Va = 818
 If AV < Va then warrant is met
Right Turn Taper Warranted: NO

Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LIVol = 11.4 veh/hr
 Left Turn Volume V = 6 veh/hr
 If V > LIVol then warrant is met

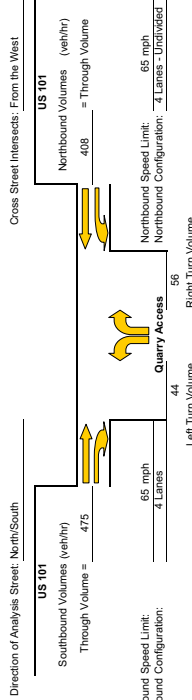
Left Turn Lane Warranted: NO



Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2010 October Peak Project Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 475
 Advancing Volume Va = 475
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

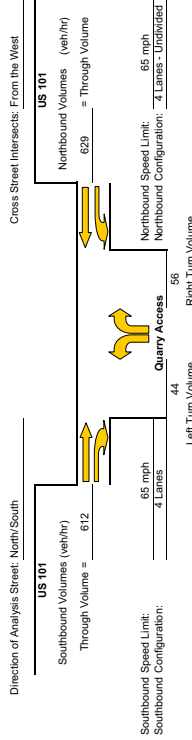
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 533.33333
 Advancing Volume Va = 475
 If AV > Va then warrant is met

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2010 October Peak Project Conditions - 11:00am-3pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 612
 Advancing Volume Va = 612
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

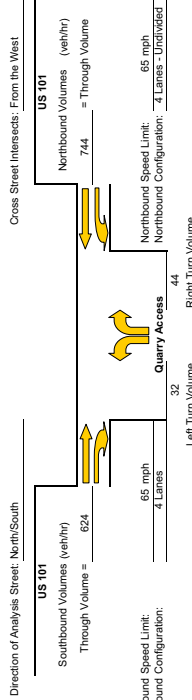
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 533.33333
 Advancing Volume Va = 612
 If AV > Va then warrant is met

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2010 October Peak Project Conditions - 1:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1144
 Advancing Volume Va = 624
 If AV > Va then warrant is met No

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

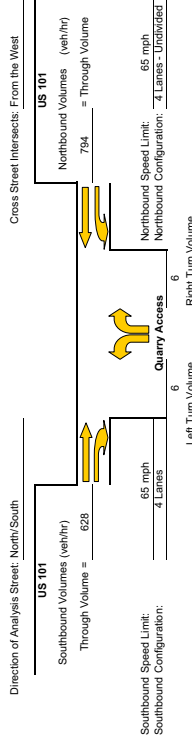
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -133.33333
 Advancing Volume Va = 624
 If AV < Va then warrant is met Yes

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2010 October Peak Project Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 628
 If AV > Va then warrant is met -

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

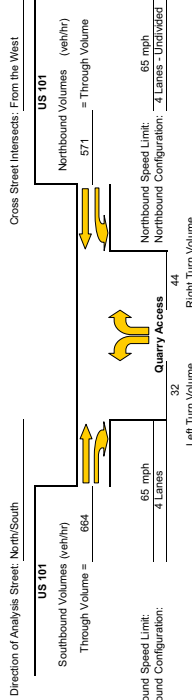
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1133.33333
 Advancing Volume Va = 628
 If AV < Va then warrant is met No

Right Turn Taper Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main, Quarry Access
 Study Scenario: 2014 (without Willits Bypass) July Peak Project Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
 Left Turn Volume Threshold L/Vol = 13.9 veh/hr
 Left Turn Volume V = 32 veh/hr
 If $V > L/Vol$ then warrant is met

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1144
 Advancing Volume V/a = 664
 If $AV < V/a$ then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -133.33333
 Advancing Volume V/a = 664
 If $AV < V/a$ then warrant is met

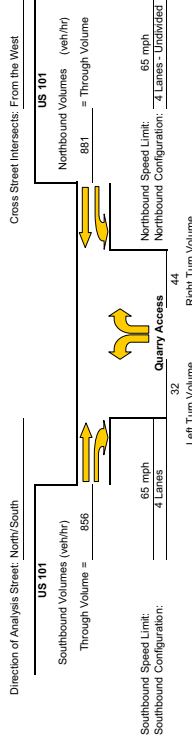
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main, Quarry Access
 Study Scenario: 2014 (without Willits Bypass) July Peak Project Conditions - 11:00am-12:00pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
 Left Turn Volume Threshold L/Vol = 10.8 veh/hr
 Left Turn Volume V = 32 veh/hr
 If $V > L/Vol$ then warrant is met

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1144
 Advancing Volume V/a = 856
 If $AV < V/a$ then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

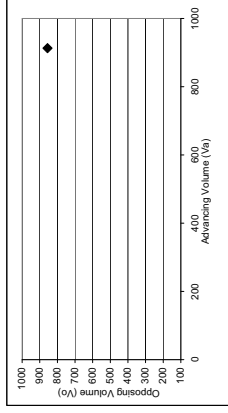
1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -133.33333
 Advancing Volume V/a = 856
 If $AV < V/a$ then warrant is met

Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

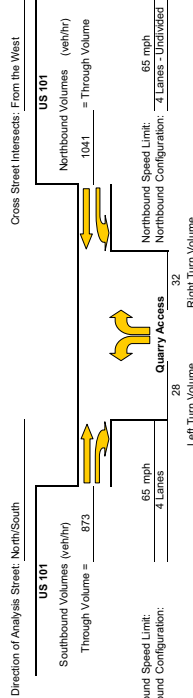


◆ Study Intersection

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2014 (without Willits Bypass) July Peak Project Conditions - 11:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 873
 Advancing Volume Va = 873
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
 Left Turn Volume Threshold LTVol = 10.6 veh/hr
 Left Turn Volume Vt = 28 veh/hr
 If Vt > LTVol then warrant is met

Thresholds not met, continue to next step

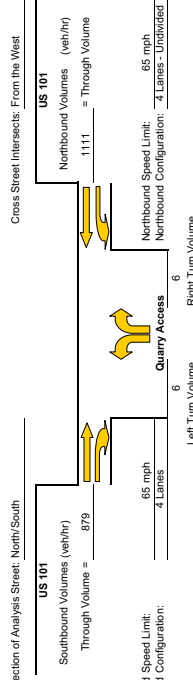
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 266.666667
 Advancing Volume Va = 873
 If AV > Va then warrant is met

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2014 (without Willits Bypass) July Peak Project Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 879
 Advancing Volume Va = 879
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
 Left Turn Volume Threshold LTVol = 10.5 veh/hr
 Left Turn Volume Vt = 6 veh/hr
 If Vt > LTVol then warrant is met

Thresholds not met, continue to next step

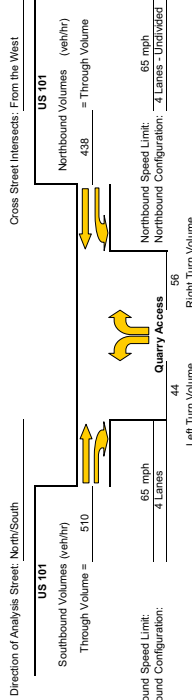
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1133.33333
 Advancing Volume Va = 879
 If AV > Va then warrant is met

Right Turn Taper Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2017 (without Willits Bypass) October Peak Project Conditions - 9:05-10:05am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 510
 Advancing Volume Va = 510
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -533.33333
 Advancing Volume Va = 510
 If AV < Va then warrant is met

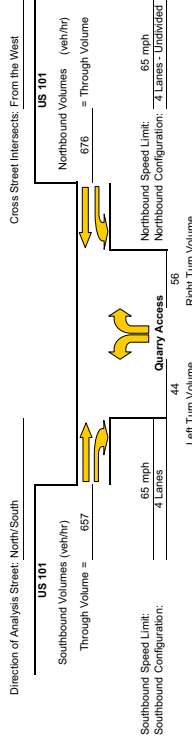
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2017 (without Willits Bypass) October Peak Project Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 657.9
 Advancing Volume Va = 657
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

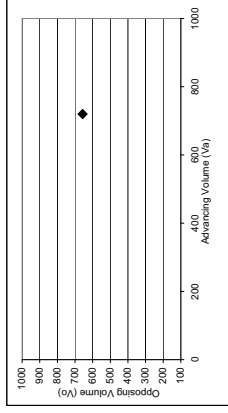
Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -533.33333
 Advancing Volume Va = 657
 If AV < Va then warrant is met

Right Turn Taper Warranted: YES

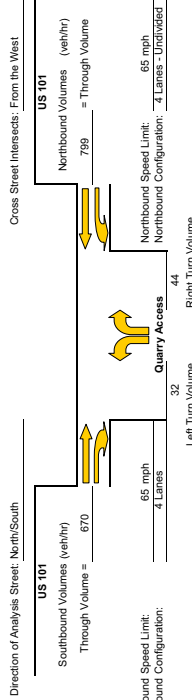
Left Turn Lane Warranted: YES



Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2014 (without Willits Bypass) October Peak Project Conditions - 11:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1144
 Advancing Volume Va = 670
 If AV > Va then warrant is met No

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

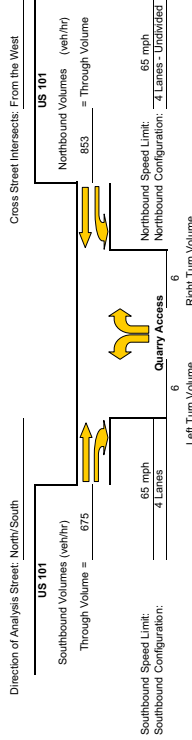
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -133.33333
 Advancing Volume Va = 670
 If AV < Va then warrant is met Yes

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2014 (without Willits Bypass) October Peak Project Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 675
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

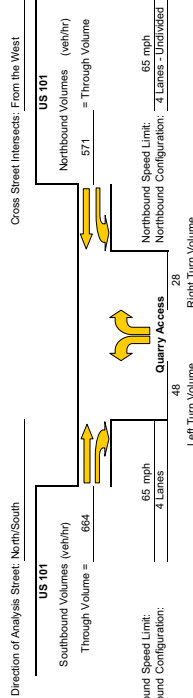
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1133.33333
 Advancing Volume Va = 675
 If AV < Va then warrant is met No

Right Turn Taper Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic Quarry Access
 Study Scenario: 2014 (with Warrants by Pass) LUT Peak Project Conditions - 9:05-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 664
 Advancing Volume Va = 664
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 400
 Advancing Volume Va = 664
 If AV/Va then warrant is met

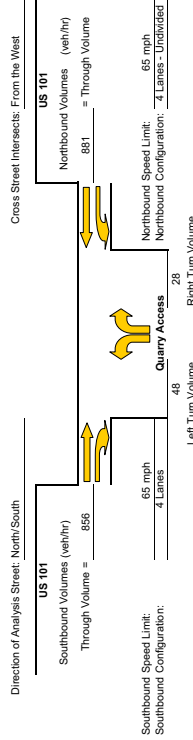
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: **YES**

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic Quarry Access
 Study Scenario: 2014 (with Warrants by Pass) LUT Peak Project Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 856
 Advancing Volume Va = 856
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 400
 Advancing Volume Va = 856
 If AV/Va then warrant is met

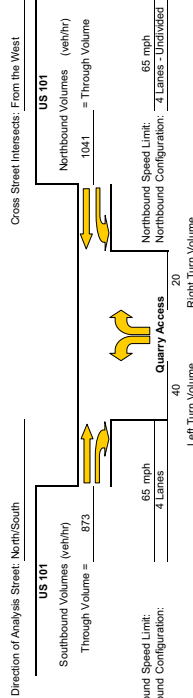
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: **YES**

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) JWB Peak Project Conditions - 1:15-2:15pm



Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold AV = 873
 Advancing Volume Va = 873
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold AV = 666.666667
 Advancing Volume Va = 873
 If AV > Va then warrant is met

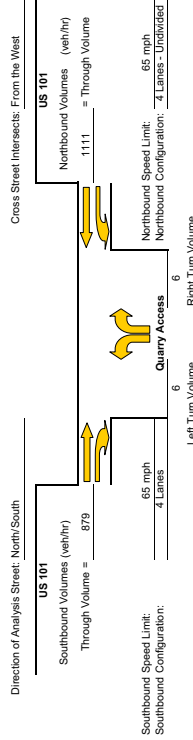
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) JWB Peak Project Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold AV = 879
 Advancing Volume Va = 879
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold AV = 1133.33333
 Advancing Volume Va = 879
 If AV > Va then warrant is met

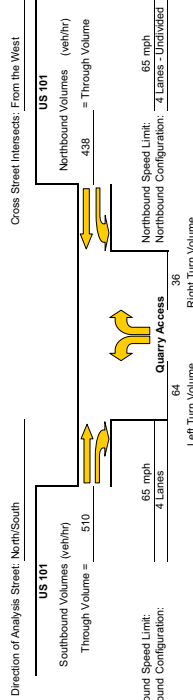
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with Warrants by-pass) October Peak Project Conditions - 9:05-10:09am



Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 510
 Advancing Volume Va = 510
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

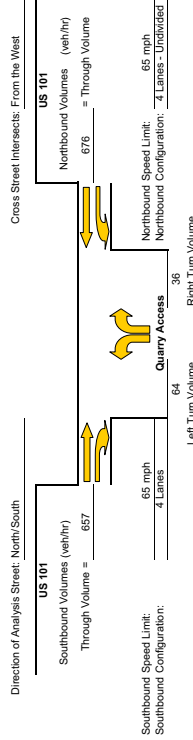
1. Check taper volume criteria
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 133.333333
 Advancing Volume Va = 510
 If AV > Va then warrant is met

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with Warrants by-pass) October Peak Project Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 657
 Advancing Volume Va = 657
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

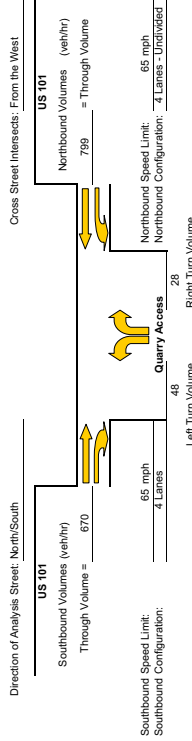
1. Check taper volume criteria
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 133.333333
 Advancing Volume Va = 657
 If AV > Va then warrant is met

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) October Peak Project Conditions - 11:15-2:15pm



Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 670
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

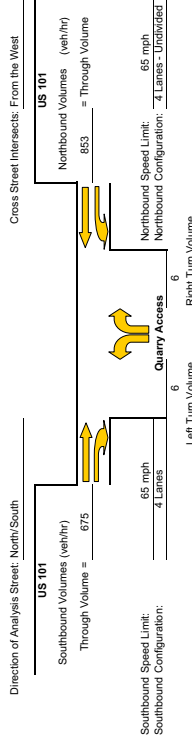
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 400
 Advancing Volume Va = 670
 If AV/Va then warrant is met Yes

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mcnic, Quarry Access
 Study Scenario: 2014 (with WHTS Bypass) October Peak Project Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume Va = 675
 If AV/Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

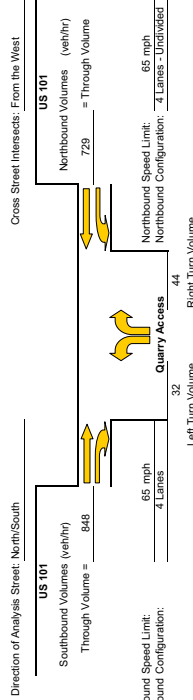
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1133.33333
 Advancing Volume Va = 675
 If AV/Va then warrant is met No

Right Turn Taper Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris Quarry Access
 Study Scenario: 2030 July Peak Project Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Left Turn Volume Threshold L/Vol = 10.9 veh/hr
 Left Turn Volume V = 32 veh/hr
 If V>L/Vol then warrant is met

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold AV = 1144
 Advancing Volume V/a = 848
 If AV<V/a then warrant is met

Right Turn Lane Warranted: **NO**

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

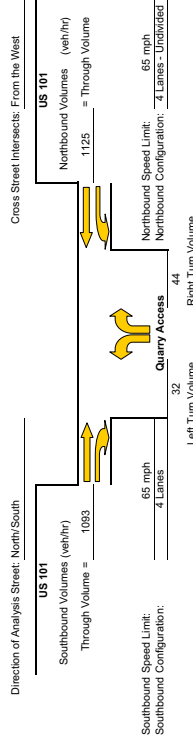
Advancing Volume Threshold AV = -133.33333
 Advancing Volume V/a = 848
 If AV<V/a then warrant is met

Right Turn Taper Warranted: **YES**

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Harris Quarry Access
 Study Scenario: 2030 July Peak Project Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Left Turn Volume Threshold L/Vol = 7.9 veh/hr
 Left Turn Volume V = 32 veh/hr
 If V>L/Vol then warrant is met

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold AV = 1144
 Advancing Volume V/a = 1093
 If AV<V/a then warrant is met

Right Turn Lane Warranted: **NO**

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

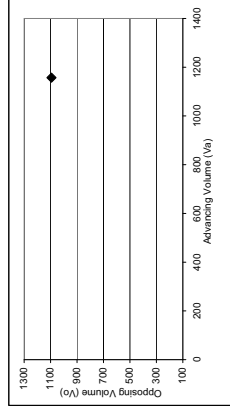
1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold AV = -133.33333
 Advancing Volume V/a = 1093
 If AV<V/a then warrant is met

Right Turn Taper Warranted: **YES**



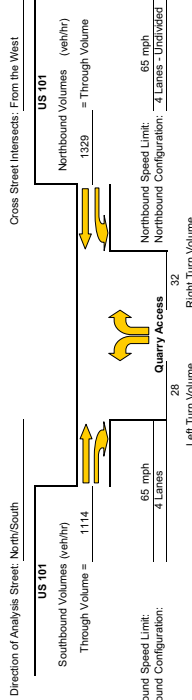
Study Intersection

Left Turn Lane Warranted: **YES**

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Hiwas, Quarry Access
 Study Scenario: 2030 July Peak Project Conditions - 11:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1114
 Advancing Volume Va = 1114
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

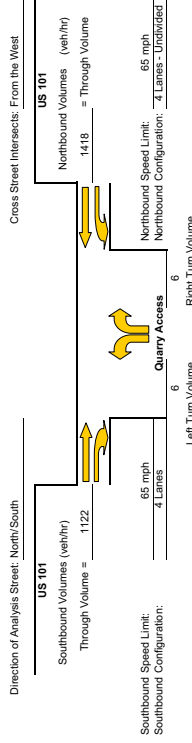
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 266.666667
 Advancing Volume Va = 1114
 If AV < Va then warrant is met Yes

Right Turn Taper Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Hiwas, Quarry Access
 Study Scenario: 2030 July Peak Project Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1122
 Advancing Volume Va = 1122
 If AV < Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

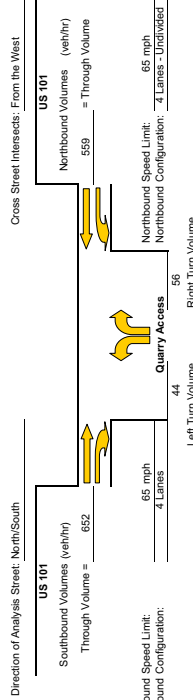
2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1133.33333
 Advancing Volume Va = 1122
 If AV < Va then warrant is met No

Right Turn Taper Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Morris Quarry Access
 Study Scenario: 2030 October Peak Project Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 975.9
 Advancing Volume Va = 652
 If AV > Va then warrant is met No

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -533.33333
 Advancing Volume Va = 652
 If AV < Va then warrant is met Yes

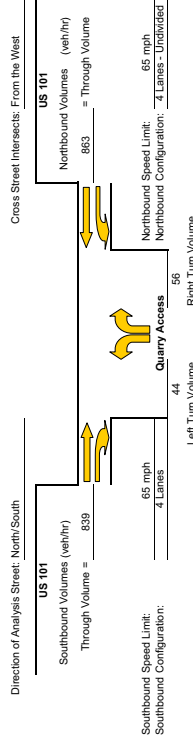
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Morris Quarry Access
 Study Scenario: 2030 October Peak Project Conditions - 11:00am-3pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 975.9
 Advancing Volume Va = 839
 If AV > Va then warrant is met No

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -533.33333
 Advancing Volume Va = 839
 If AV < Va then warrant is met Yes

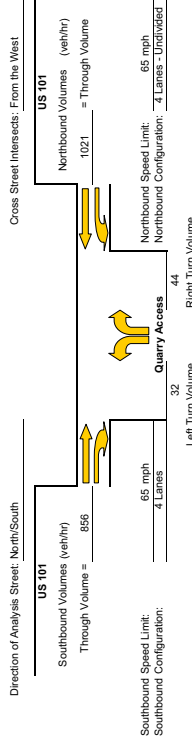
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2030 October Peak Project Conditions - 1:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1144
 Advancing Volume VA = 856
 If AV > VA then warrant is met No

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 133.33333
 Advancing Volume VA = 856
 If AV > VA then warrant is met Yes

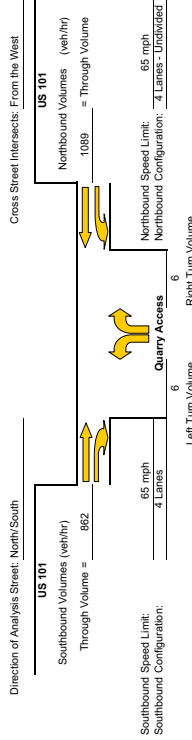
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2030 October Peak Project Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = -
 Advancing Volume VA = 882
 If AV > VA then warrant is met -

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1133.33333
 Advancing Volume VA = 882
 If AV > VA then warrant is met No

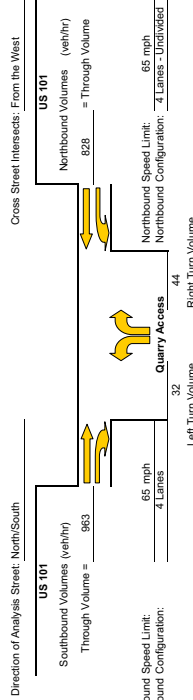
Right Turn Taper Warranted: NO

Left Turn Lane Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2042 July Peak Project Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1144
 Advancing Volume Va = 963
 If AV > Va then warrant is met No

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -133.33333
 Advancing Volume Va = 963
 If AV < Va then warrant is met Yes

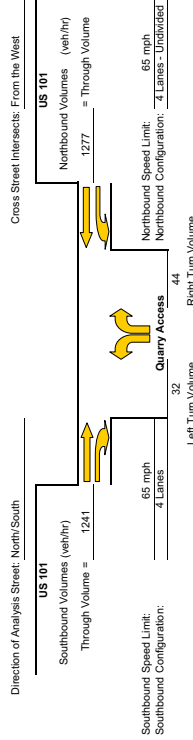
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2042 July Peak Project Conditions - 11:00am-Noon



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1144
 Advancing Volume Va = 1241
 If AV > Va then warrant is met Yes

Right Turn Lane Warranted: YES

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

N/A

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -
 Advancing Volume Va = -
 If AV < Va then warrant is met -

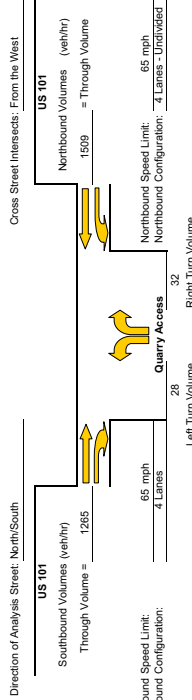
Right Turn Taper Warranted: -

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2042 July Peak Project Conditions - 11:15-2:15pm



US 101
 Southbound Volumes (veh/hr) = 1265
 Through Volume = 1265
 Northbound Volumes (veh/hr) = 1599
 Through Volume = 1599
 Northbound Speed Limit: 65 mph
 Northbound Configuration: 4 Lanes - Undivided
 Quarry Access
 Right Turn Volume = 28
 Left Turn Volume = 32

Southbound Right Turn Lane Warrants
 Left Turn Volume Threshold LTVol = 6.3 veh/hr
 Left Turn Volume Vt = 28 veh/hr
 If Vt > LTVol then warrant is met

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1265
 Advancing Volume Va = -
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 266.666667
 Advancing Volume Va = 1265
 If AV > Va then warrant is met
 Yes

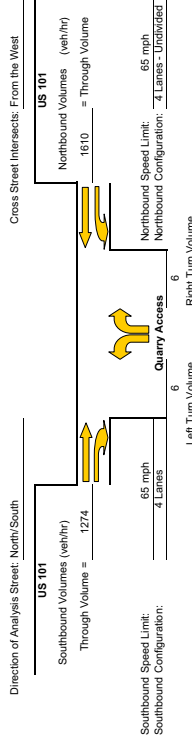
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Mtains Quarry Access
 Study Scenario: 2042 July Peak Project Conditions - 4:45-5:45pm



US 101
 Southbound Volumes (veh/hr) = 1274
 Through Volume = 1274
 Northbound Volumes (veh/hr) = 1610
 Through Volume = 1610
 Northbound Speed Limit: 65 mph
 Northbound Configuration: 4 Lanes - Undivided
 Quarry Access
 Right Turn Volume = 6
 Left Turn Volume = 6

Southbound Right Turn Lane Warrants
 Left Turn Volume Threshold LTVol = 6.2 veh/hr
 Left Turn Volume Vt = 6 veh/hr
 If Vt > LTVol then warrant is met

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1274
 Advancing Volume Va = -
 If AV > Va then warrant is met

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1133.33333
 Advancing Volume Va = 1274
 If AV > Va then warrant is met
 Yes

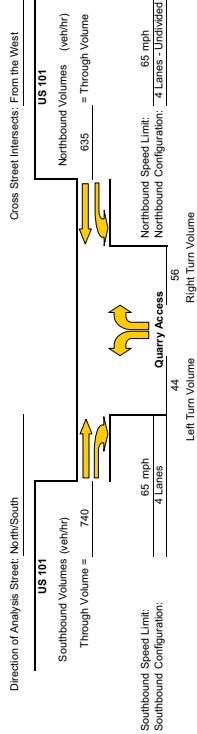
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2040 October Peak Project Conditions - 9:00-10:00am



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 975.9
 Advancing Volume Va = 740
 If AV < Va then warrant is met No
Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)
 1. Check taper volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 533.3333
 Advancing Volume Va = 740
 If AV < Va then warrant is met Yes
Right Turn Taper Warranted: YES

Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LIVol 12.6 veh/hr
 Left Turn Volume Vt = 44
 If Vt > LIVol then warrant is met

1000	
900	
800	
700	
600	
500	
400	
300	
200	
100	
0	

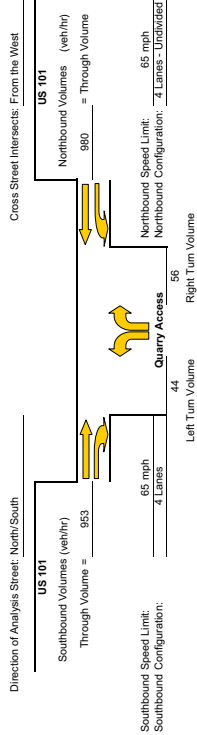
Advancing Volume (Va) 44
 Opposing Volume (Vo) 635

◆ Study Intersection
Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2040 October Peak Project Conditions - 11:00am-3pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria
Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 975.9
 Advancing Volume Va = 953
 If AV < Va then warrant is met Yes
Right Turn Lane Warranted: YES

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)
 1. Check taper volume criteria
N/A

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -
 Advancing Volume Va = -
 If AV < Va then warrant is met -
Right Turn Taper Warranted: -

Northbound Left Turn Lane Warrants
 Left Turn Volume Threshold LIVol 9.5 veh/hr
 Left Turn Volume Vt = 44
 If Vt > LIVol then warrant is met

1000	
900	
800	
700	
600	
500	
400	
300	
200	
100	
0	

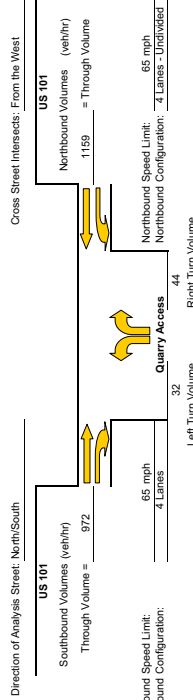
Advancing Volume (Va) 44
 Opposing Volume (Vo) 980

◆ Study Intersection
Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cottel in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2040 October Peak Project Conditions - 1:15-2:15pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 1144
 Advancing Volume Va = 972
 If AV < Va then warrant is met No

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = -133.33333
 Advancing Volume Va = 972
 If AV < Va then warrant is met Yes

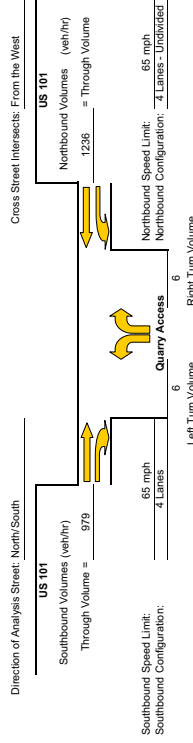
Right Turn Taper Warranted: YES

Left Turn Lane Warranted: YES

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.

Acceleration Lane Warrant Analysis - Tee Intersections

Study Intersection: US 101/Main's Quarry Access
 Study Scenario: 2040 October Peak Project Conditions - 4:45-5:45pm



Southbound Right Turn Lane Warrants
 1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
 Advancing Volume Threshold AV = 979
 Advancing Volume Va = -
 If AV < Va then warrant is met -

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants
 (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper
 Advancing Volume Threshold AV = 1133.33333
 Advancing Volume Va = 979
 If AV < Va then warrant is met No

Right Turn Taper Warranted: NO

Left Turn Lane Warranted: NO

Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, January 1997.
 The right turn lane and taper analysis is based on work conducted by Cattell in 1981.
 The left turn lane analysis is based on work conducted by M.D. Hamelink in 1987, and modified by Kikuchi and Chakraborty in 1991.