



Alaska Department of Transportation & Public Facilities

Southcoast Region - Sand Seal & IRI

Robert Trousil, PE

November 6, 2023

Keep Alaska Moving through service and infrastructure

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES



PROJECT LOCATION: JUNEAU
M&O STATION: JUNEAU

PROPOSED HIGHWAY PROJECT

JNU EXPERIMENTAL PREVENT. MNTNC USING SAND SEAL TECH, GLCR HWY

SAND SEAL APPLICATION
SFHWY00360/0003269

*Design Functional Class: Urban Collector Design Speed: 40 MPH AADT: 2648

Project Engineer/Manager: Travis Eckhoff
Construction Project Engineer: Andrew Hills
Design Engineer: Rachelle Martens

Existing Conditions

- Surface: **SuperPave Type B, 2009**
- Binder Grade: **64-28**
- Ave IRI: **96.34**
- Ave Rut Depth, inches: **0.28**
- Ave Crack %: **0.56**
- Lane width, ft: **12**



Limitations

- Do not apply sand seal after September 15
- Sand seal shall only be applied when the existing pavement has been dry for at least 4 hours
- There is no rain forecasted within the curing period
- Pavement surface temperature is a minimum of 50°F



ESTIMATE OF QUANTITIES

ITEM NUMBER	PAY ITEM	PAY UNIT	QUANTITY
404.2001.0000	EMULSIFIED ASPHALT SAND SEAL	SQUARE YARD	6,933
642.0001.0000	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQUIRED
643.0002.0000	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQUIRED
643.0023.0000	TRAFFIC PRICE ADJUSTMENT	CONTINGENT SUM	ALL REQUIRED
658.0001.0000	EROSION, SEDIMENT, AND POLLUTION CONTROL WITHOUT CGP COVERAGE	LUMP SUM	ALL REQUIRED
658.0002.0000	ESCP CHANGES BY DIRECTIVE	CONTINGENT SUM	ALL REQUIRED

BASIS OF ESTIMATE

ITEM NUMBER	PAY ITEM	ESTIMATING FACTOR	ESTIMATED QUANTITY
404.2001.0000	EMULSIFIED ASPHALT SAND SEAL	-	6,933 SY
	EMULSIFIED ASPHALT	0.15 GAL/SY	1,040 GALLONS
	SAND	0.8 LBS/SY	5,546 LBS

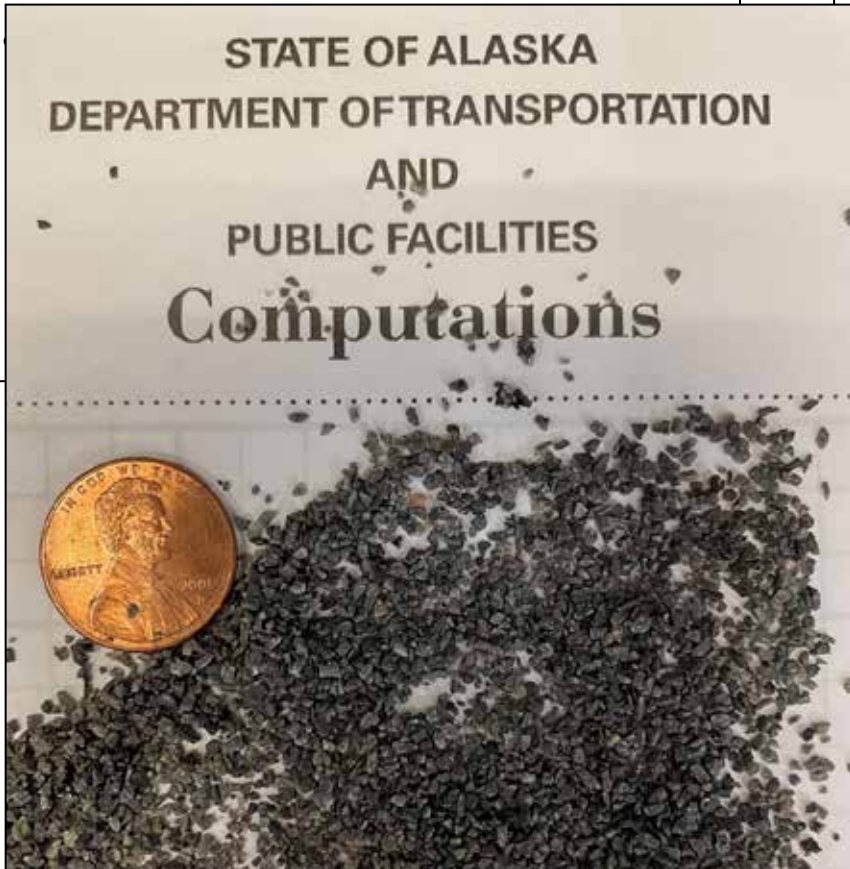
Material Specifications: Emulsified Asphalt

- GSB 88
- Emulsion concentrate diluted 1:1 with hot water by volume

Material Specifications: Sand Aggregate

- Dry, clean, angular, dust-free min Mohs hardness: 7
- Gradation Requirements:

Sieve	Percent Passing by Weight
No. 8	100
No. 16	90 - 100
No. 40	0 - 20
No. 100	0 - 2





Emulsion temperature in Tank: ~135 degrees F
Emulsion temperature, treated surface: ~90 degrees F
Temperature of pavement surface: ~76 degrees F

Twin Lakes Sand Seal

Cost Summary

Item	Quantity	Unit	Unit Price	Cost	Cost per SY	Cost per Lane-Mile ⁽²⁾	10 Lane-Mile Project	
							Est Total Cost	Est Cost per Lane-Mile
Emulsified Asphalt Sand Seal	6933	SY	12.50	86,663	12.50	73,319	733,185	73,319
Mobilization/Demobilization	1	LS	30,000	30,000	4.33	25,381	65,000	6,500
Survey	1	LS	10,000	10,000	1.44	8,460	18,000	1,800
Traffic Maintenance	1	LS	30,000	30,000	4.33	25,381	75,000	7,500
SWPPP	1	LS	22,000	22,000	3.17	18,613	22,000	2,200
Construction Inpsection	--	--	40,000	40,000	5.77	33,841	100,000	10,000
Design/Environmental/ROW ⁽¹⁾	--	--	70,000	70,000	10.10	59,222	90,000	9,000
Total:				288,663	41.64	244,215	1,103,185	110,319

Notes:

(1) these are fixed cost that remain largely the same due to economy of scale.

(2) Lane miles for this project = 1.182



Twin Lakes Sand Seal

Cost Summary

Item	Quantity	Unit	Unit Price	Cost	Cost per SY	Cost per Lane-Mile ⁽²⁾	10 Lane-Mile Project	
							Est Total Cost	Est Cost per Lane-Mile
Emulsified Asphalt Sand Seal	6933	SY	12.50	86,663	12.50	73,319	733,185	73,319
Mobilization/Demobilization	1	LS	30,000	30,000	4.33	25,381	65,000	6,500
Survey	1	LS	10,000	10,000	1.44	8,460	18,000	1,800
Traffic Maintenance	1	LS	30,000	30,000	4.33	25,381	75,000	7,500
SWPPP	1	LS	22,000	22,000	3.17	18,613	22,000	2,200
Construction Inspection	--	--	40,000	40,000	5.77	33,841	100,000	10,000
Design/Environmental/ROW ⁽¹⁾	--	--	70,000	70,000	10.10	59,222	90,000	9,000
Total:				288,663	41.64	244,215	1,103,185	110,319

Notes:

(1) these are fixed cost that remain largely the same due to economy of scale.

(2) Lane miles for this project = 1.182





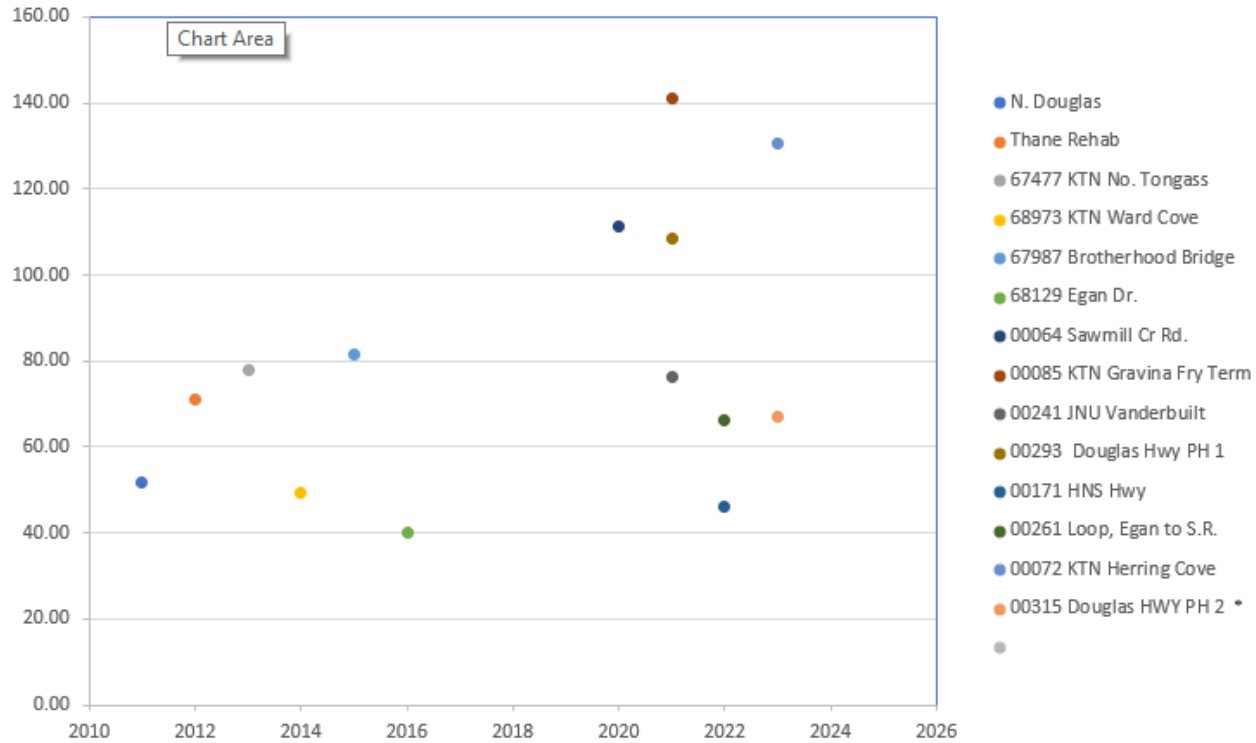
Keep Alaska Moving through service and infrastructure

***Southcoast Region
IRI Smoothness
Analysis***

2011 - 2023

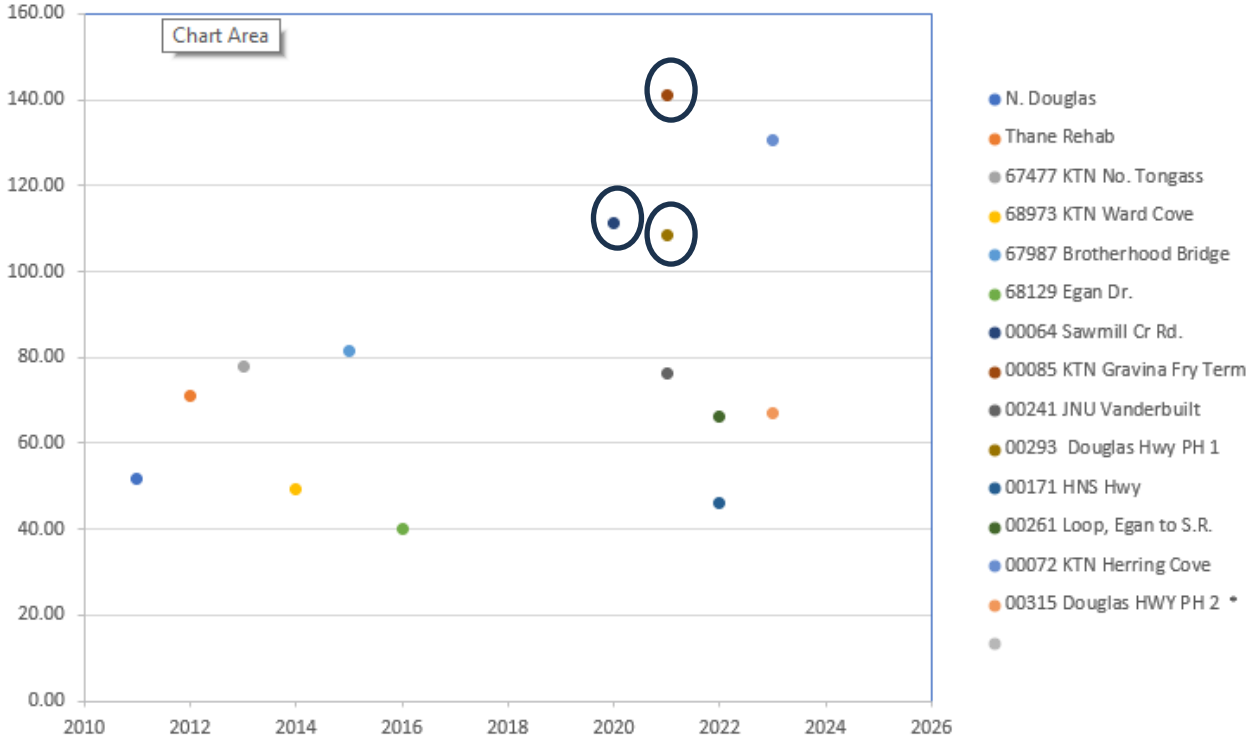
Southcoast Region IRI Smoothness Trends

IRI Historical Data Comparison



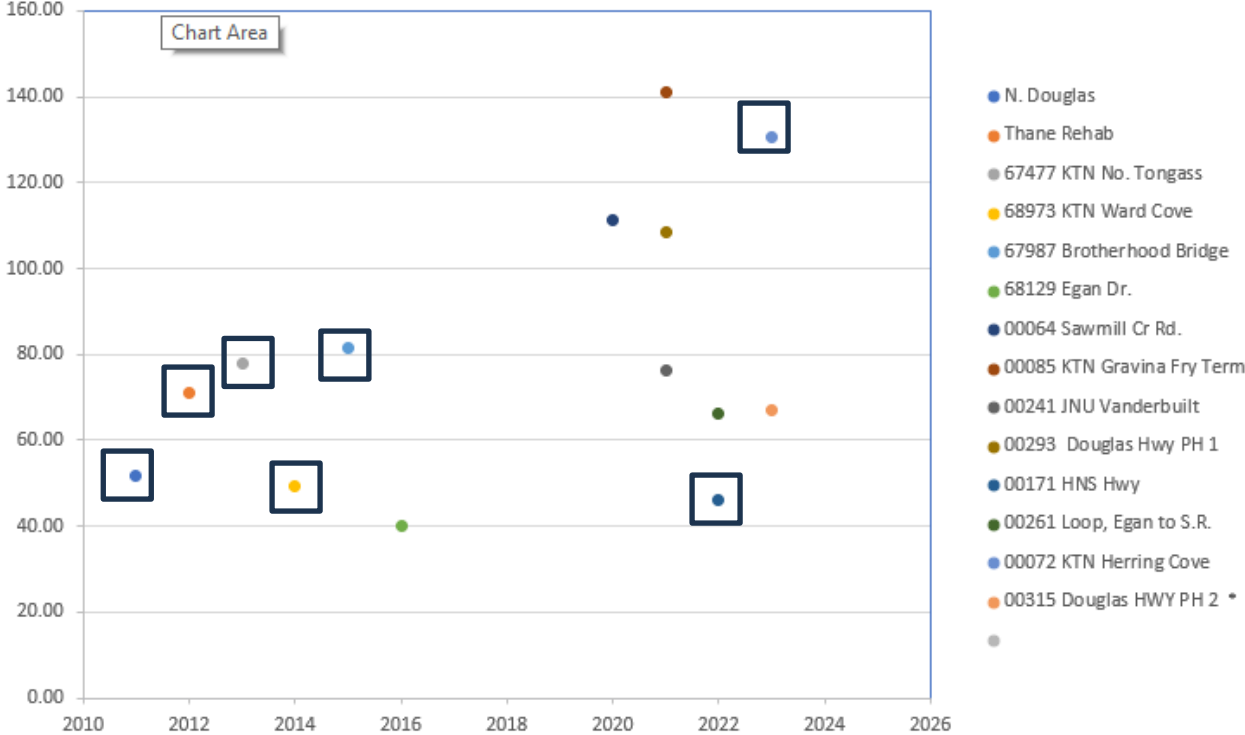
Southcoast Region IRI Smoothness Trends Curb & Gutter

IRI Historical Data Comparison



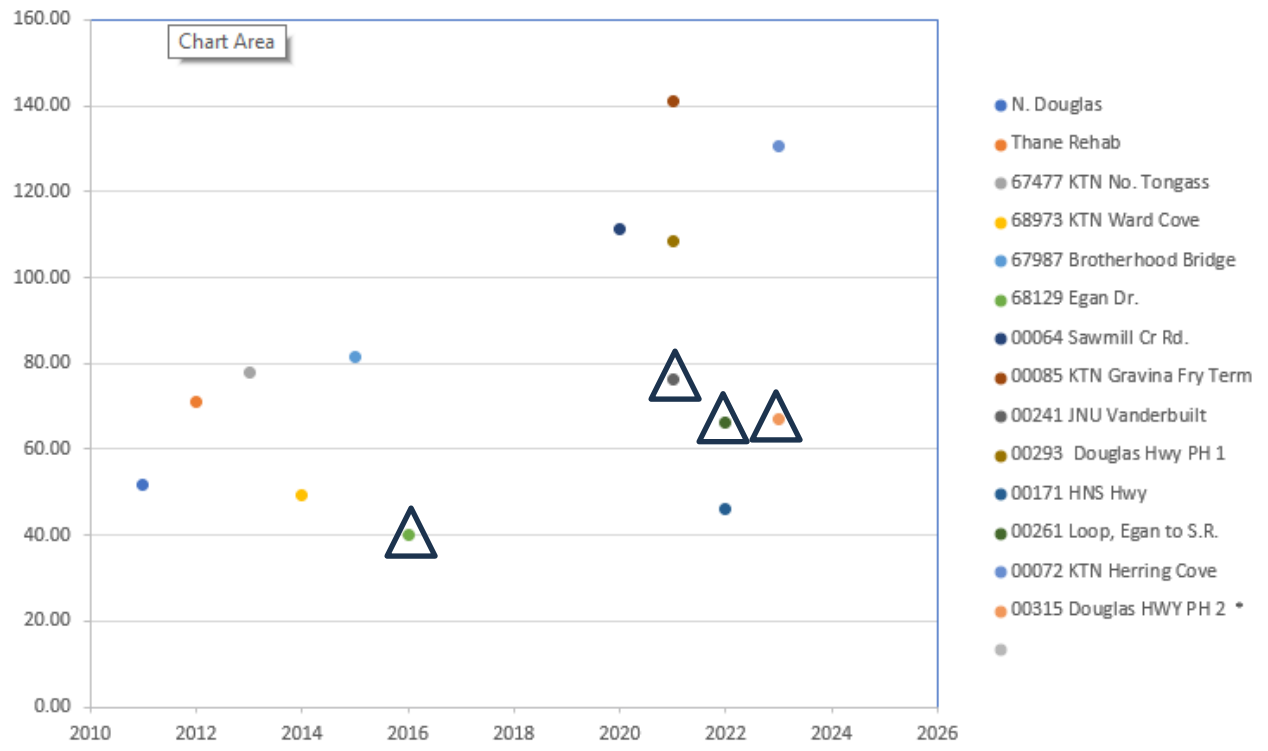
Southcoast Region IRI Smoothness Trends Reconstruct

IRI Historical Data Comparison



Southcoast Region IRI Smoothness Trends Mill & Fill

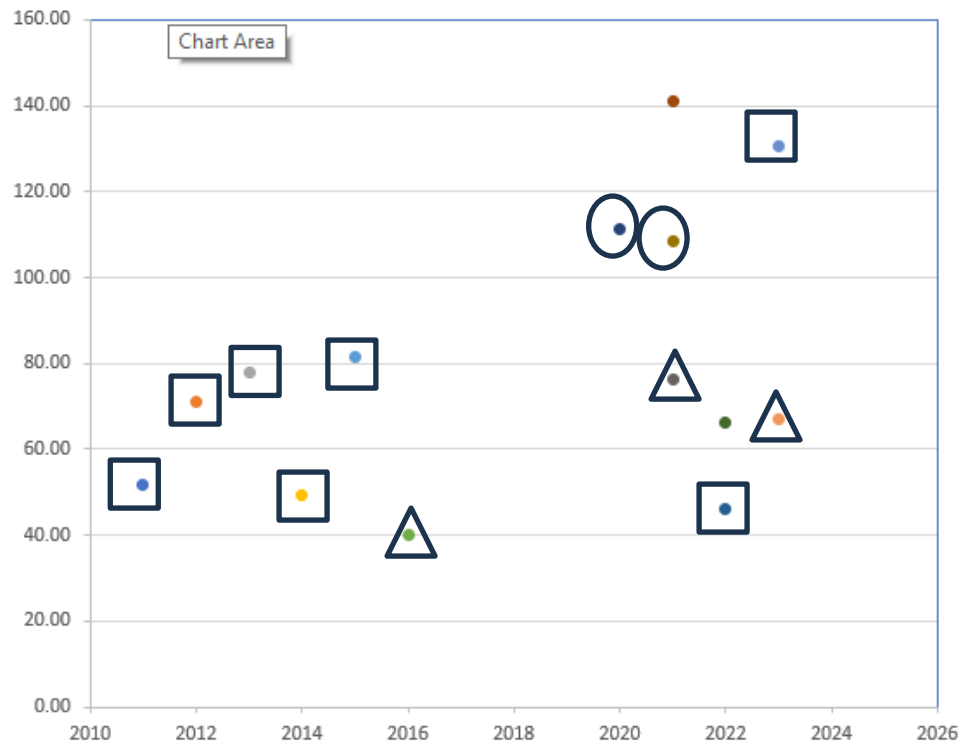
IRI Historical Data Comparison



Southcoast Region IRI Smoothness Trends

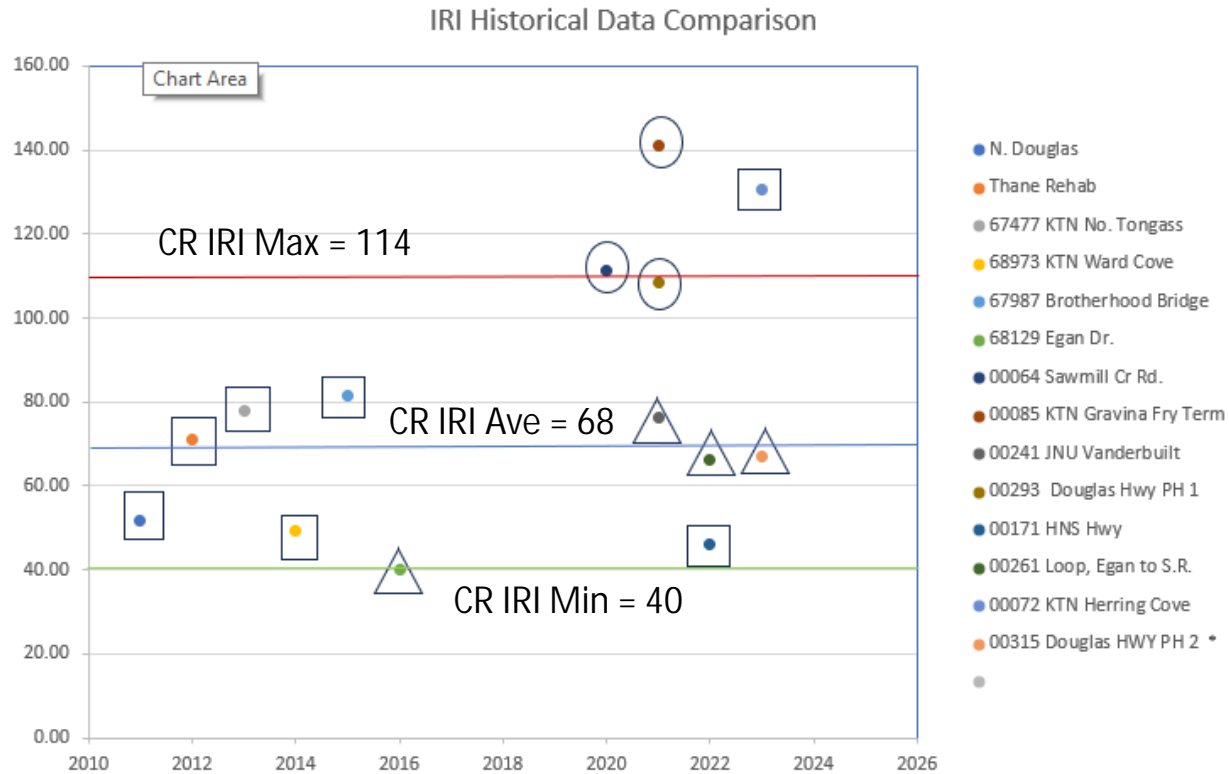
IRI Historical Data Comparison

- Reconstruct
- Curb & Gutter
- △ Mill & Fill



- N. Douglas
- Thane Rehab
- 67477 KTN No. Tongass
- 68973 KTN Ward Cove
- 67987 Brotherhood Bridge
- 68129 Egan Dr.
- 00064 Sawmill Cr Rd.
- 00085 KTN Gravina Fry Term
- 00241 JNU Vanderbuilt
- 00293 Douglas Hwy PH 1
- 00171 HNS Hwy
- 00261 Loop, Egan to S.R.
- 00072 KTN Herring Cove
- 00315 Douglas HWY PH 2
-

Southcoast Region IRI Smoothness Trends



Southcoast Region IRI Smoothness Trends Summary

- Curb and Gutter tend to have higher (rougher) post construction smoothness values. These projects tend to be shorter and have more appurtenances in the roadway.
- Other factors can impact ride quality: 1) Size/Length of project, 2) Method used to determine smoothness, 3) Type of Project, 4) Construction Quality, 5) Workforce availability, 6) Weather.
- Recently, the types of project in SR have been Curb & Gutter, with one reconstruct, potentially skewing the trend.
- IRI trend appears to be moving towards rougher post construction roads.



Brett Nelson, Alaska DOT&PF

Keep Alaska Moving through service and infrastructure