

# WARRANTED HOT MIX ASPHALT PAVEMENTS:

## Development, Benefits and Risks

# What Warranties Are Not

- Guarantee of defect free pavement
- Throwing away the spec book
- A way to get rid of DOT employees

# What Warranties Are

- Guarantee of good performance
- Incentive for quality construction
- Incentive for innovation

# Incentive for Good Performance

- Current Specifications  
written to push the contractor towards  
“good performance”
- Warranty Specifications  
define what good performance is





















# Assigning Risk

- “Who has control of an item?”
- Contractor?  
Then contractor assumes risk of poor performance.
- Agency?  
Then agency maintains risk of poor performance.

# DOT Responsibilities

Structure

Quantities

Time Unit Cost

Condition Survey

# Contractor Responsibilities

Materials

Mix Design

Process Control

Remediation Plans

# Industry Benefits

- Liability
- “Raises the bar”
- Improves competition with pcc
- Builder sets own specs
- No approvals required

# Agency Benefits

- People loss
- Improves probability of good performance
- Less confrontation

# Indiana Warranty

- Ride
- Rut Depth
- Friction
- Longitudinal Cracks

# Indiana Specification

$$A + B + C$$

- A - Unit Prices
- B - Time Cost
- C - 5 Year Warranty

# Warranty Data



**Image / Location Data**

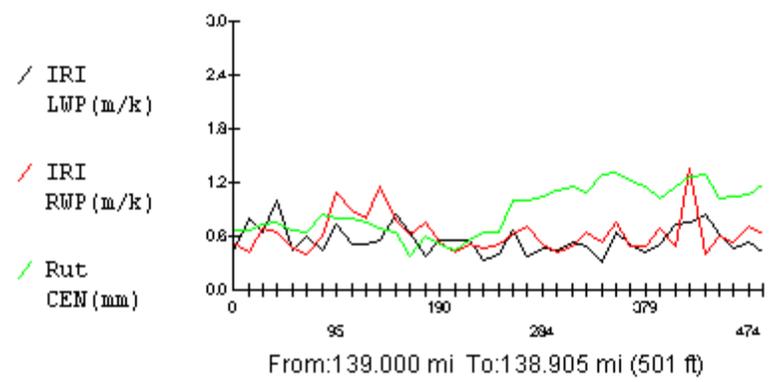
01:33:07:05 | 1 | Rec 25 | Set 101  
 Dist 5099.1 ft | 139.034 mi | Sp 0 m/h  
 Lat +41.5105934 | Lon -85.0550766  
 End-Imag 01:33:07:15 | Road-Nail69  
 Road--Fr 139.000 | Road---- 138.000  
 Len 5280.0 | SvyLenq 5440.2  
 IRI L e 34 | IRI R e 41  
 HRI e 28 | RutAvgfir 0.04

**Digitized Image Control**

Open << >> Zoom Find

Pathway Services Inc. Sensor Data Graph

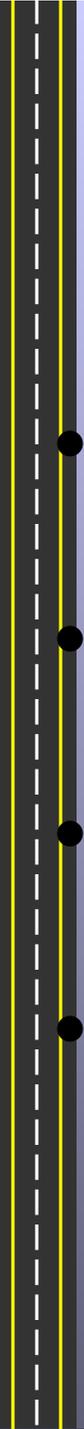
Road:I69 Co:1 D:N Ln:1



Pathway Services Inc. Road/Surface Condition Information System.

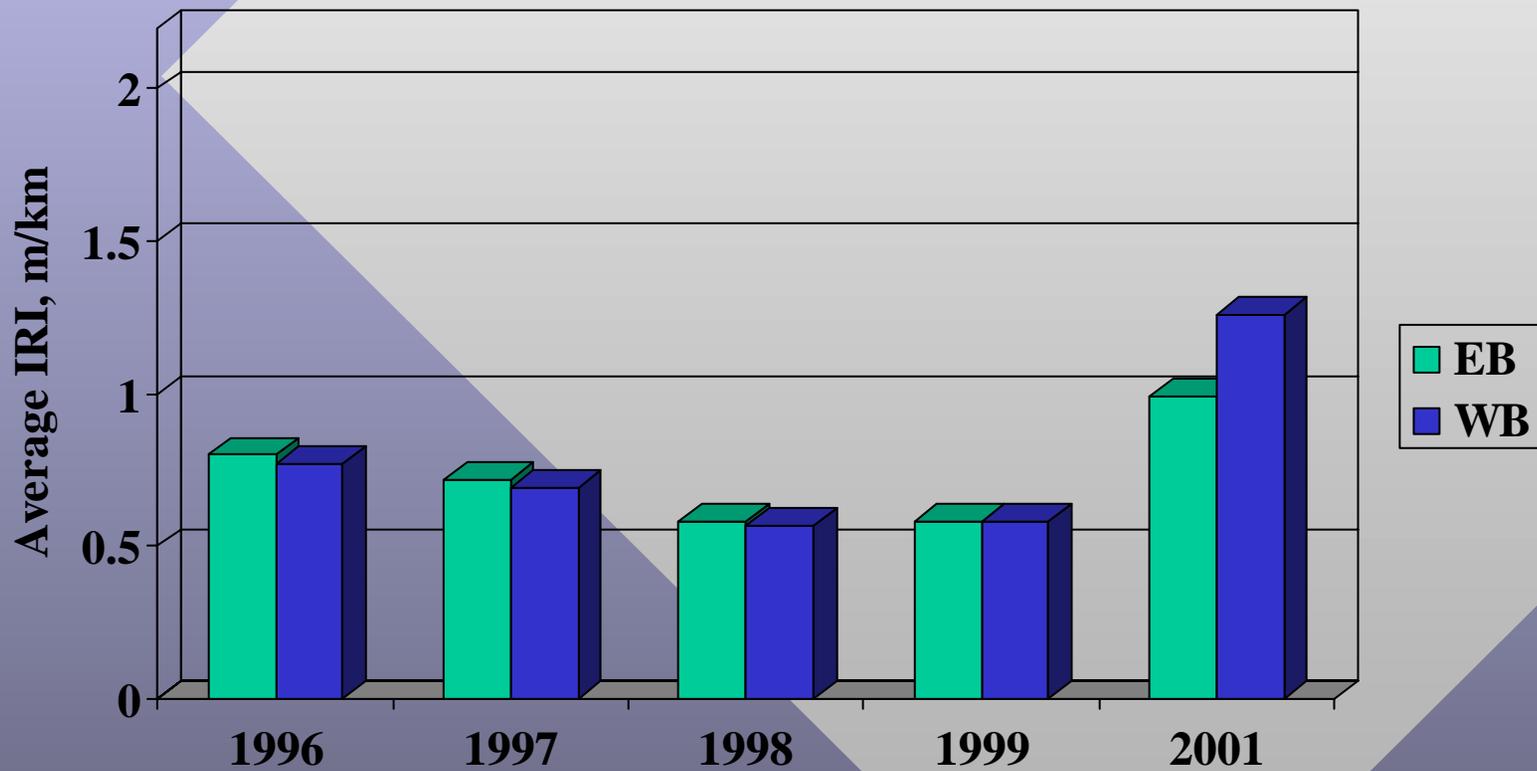
File	Edit	Options	Image	Samples	Distress	Sensor	Map	Signs/Inv	Help							
Num	Road	From(mi)	To(mi)	Dir	Len(ft)	SvyLen	P	Set	Start-Image	End-Image	SurveyDate	Time	IRI L e	IRI R e	RutAvg(in)	
26	I69	139.000	138.000	D	5280.0	5440.2	A	101	01:33:07:15	01:34:10:17	05/05/98	11:40	34	41	0.04	
27	I69	138.000	137.000	D	5280.0	5275.4	A	101	01:34:10:21	01:35:09:08	05/05/98	11:41	41	51	0.04	
28	I69	137.000	136.000	D	5280.0	5304.2	A	101	01:35:09:08	01:36:05:21	05/05/98	11:42	35	44	0.05	
29	I69	136.000	135.000	D	5280.0	5278.1	A	101	01:36:05:21	01:37:02:09	05/05/98	11:43	37	45	0.04	
30	I69	135.000	134.000	D	5280.0	5267.6	A	101	01:37:02:09	01:38:09:04	05/05/98	11:44	56	59	0.03	
31	I69	134.000	133.000	D	5280.0	5268.1	A	101	01:38:09:04	01:39:10:12	05/05/98	11:45	65	65	0.03	
32	I69	133.000	132.000	D	5280.0	5275.6	A	101	01:39:10:12	01:40:06:26	05/05/98	11:46	40	46	0.03	
33	I69	132.000	131.000	D	5280.0	5304.5	A	101	01:40:06:26	01:41:03:26	05/05/98	11:47	39	44	0.02	
34	I69	131.000	130.000	D	5280.0	5280.9	A	101	01:41:03:26	01:42:00:17	05/05/98	11:48	42	65	0.11	
35	I65	75.000	76.000	I	5280.0	5295.1	A	101	00:49:55:28	00:50:52:16	05/04/98	19:23	55	58	0.12	
36	I65	76.000	77.000	I	5280.0	5257.1	A	101	00:50:52:16	00:51:48:20	05/04/98	19:24	48	51	0.11	
37	I65	77.000	78.000	I	5280.0	5503.9	A	101	00:51:48:20	00:52:47:14	05/04/98	19:25	29	36	0.11	
38	I65	78.000	79.000	I	5280.0	5137.1	A	101	00:52:47:14	00:53:42:10	05/04/98	19:26	30	38	0.17	
39	I65	79.000	80.000	I	5280.0	5281.1	A	101	00:53:42:10	00:54:38:26	05/04/98	19:26	32	40	0.14	
40	I65	80.000	81.000	I	5280.0	5265.1	A	101	00:54:38:26	00:55:35:02	05/04/98	19:27	42	48	0.10	

# 1996 Thresholds

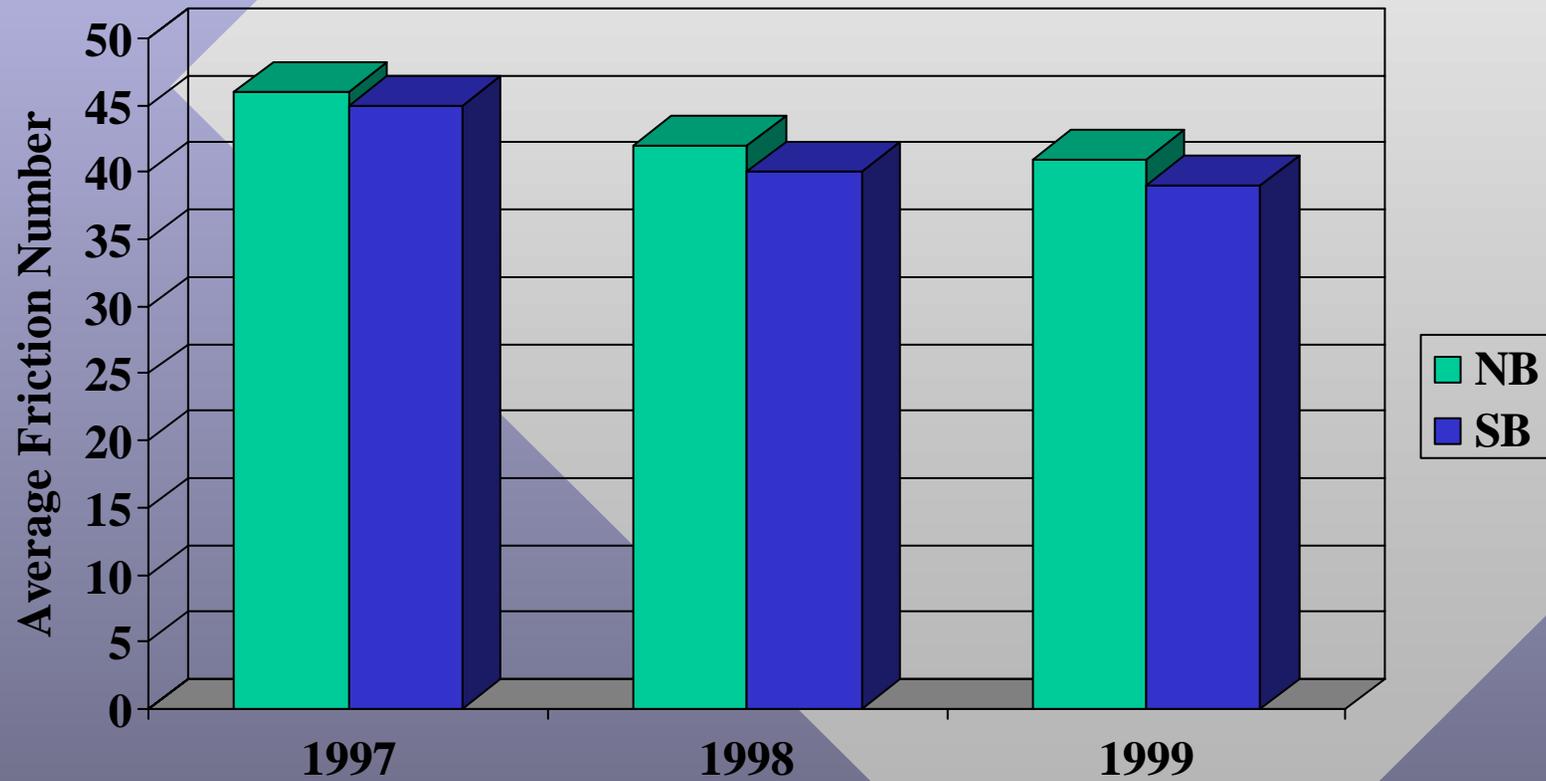


• Ride (IRI)	2.1 m/km
• Rut	9 mm
• Friction	35 / 25
• Longitudinal	0 m Level 2

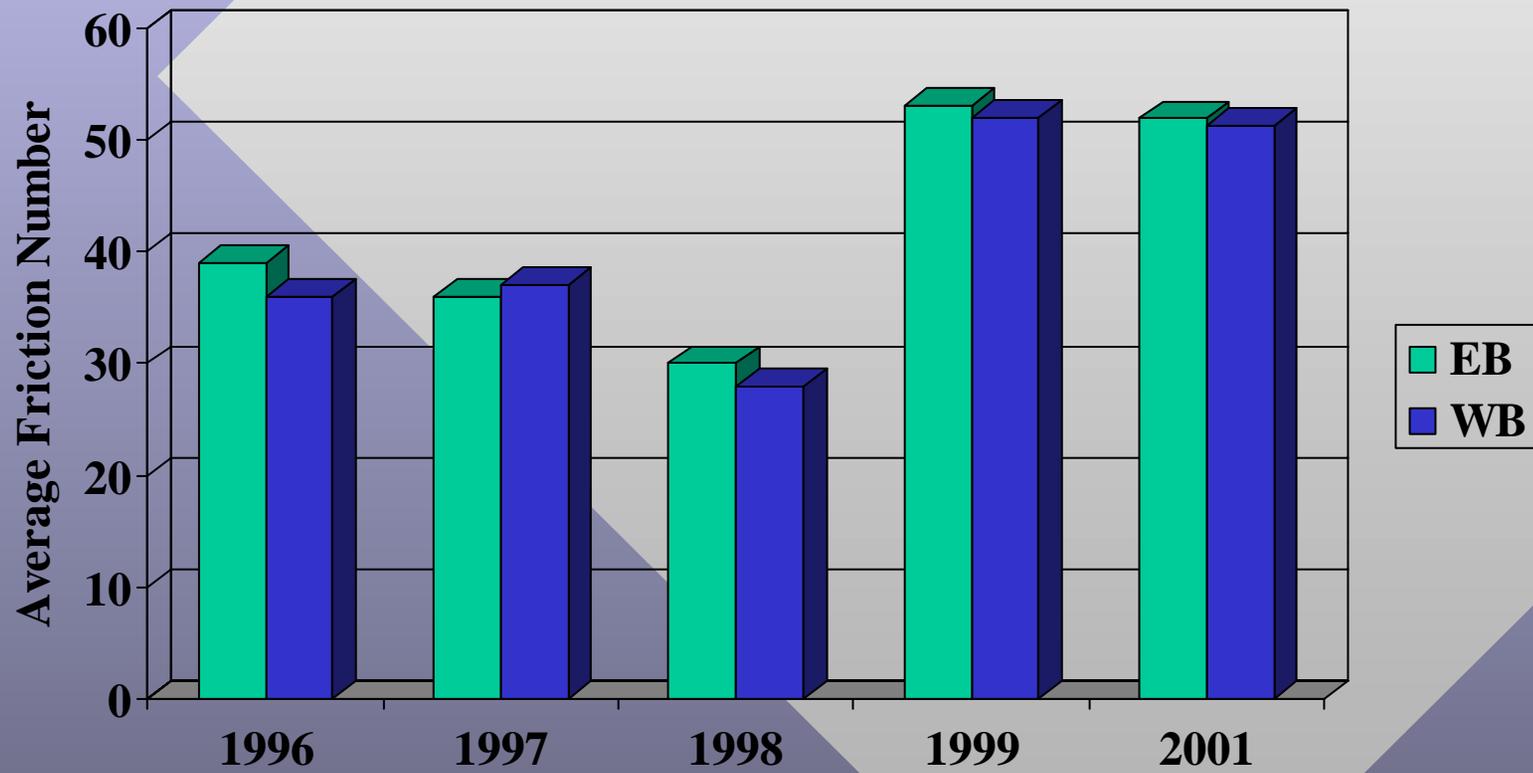
# I-70 Roughness



# I-69 Friction



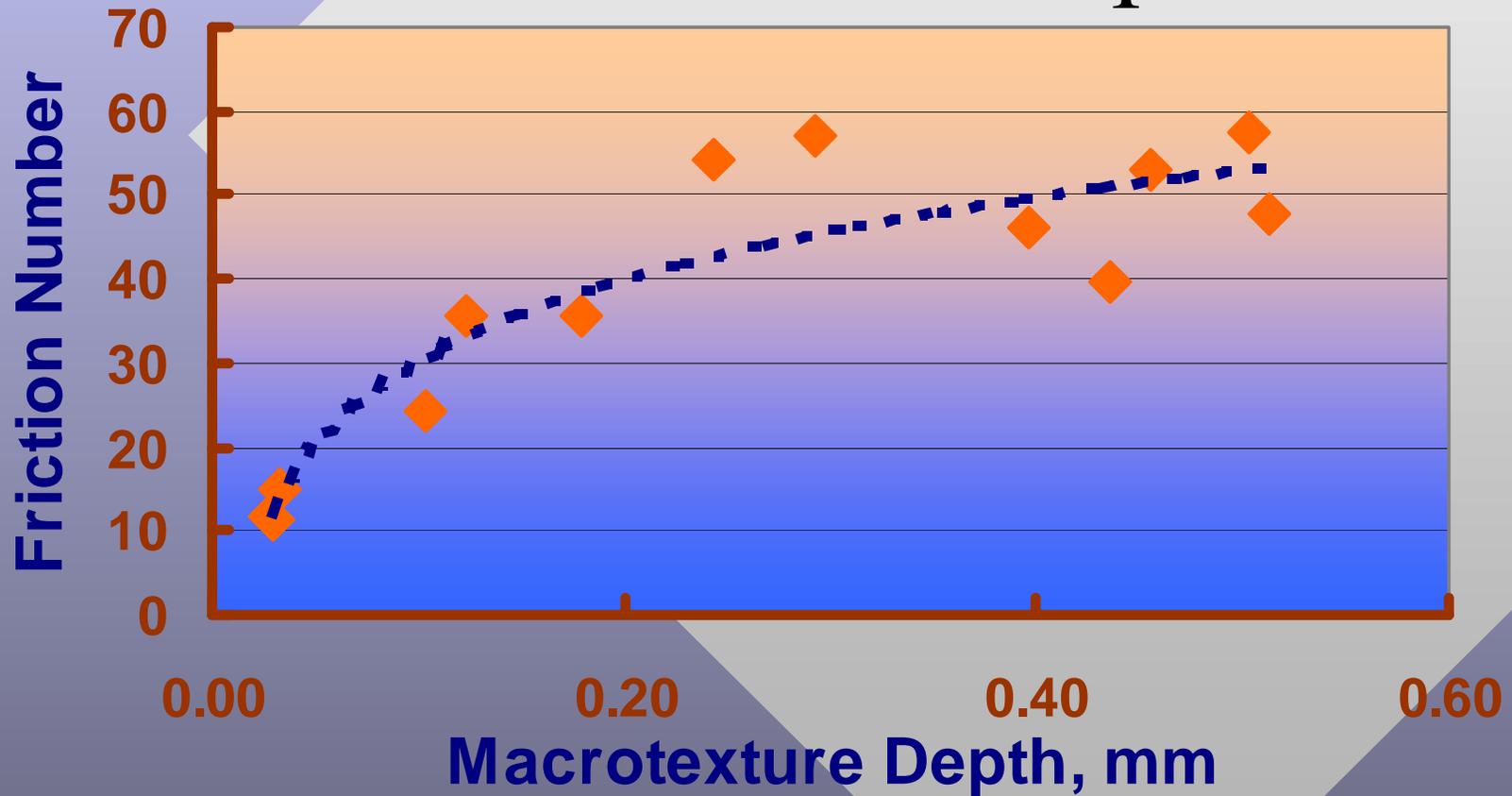
# I-70 Friction



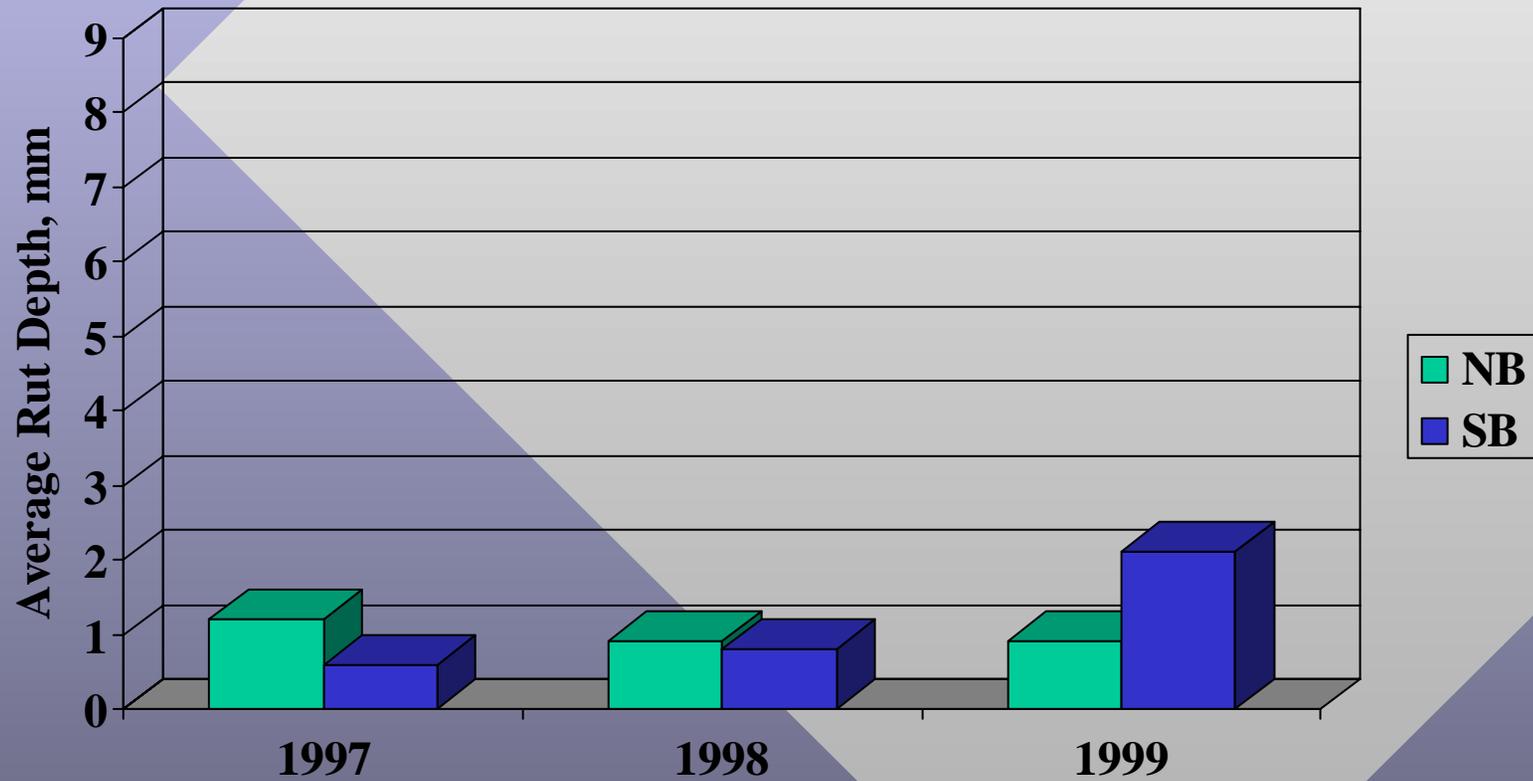


FN = 24

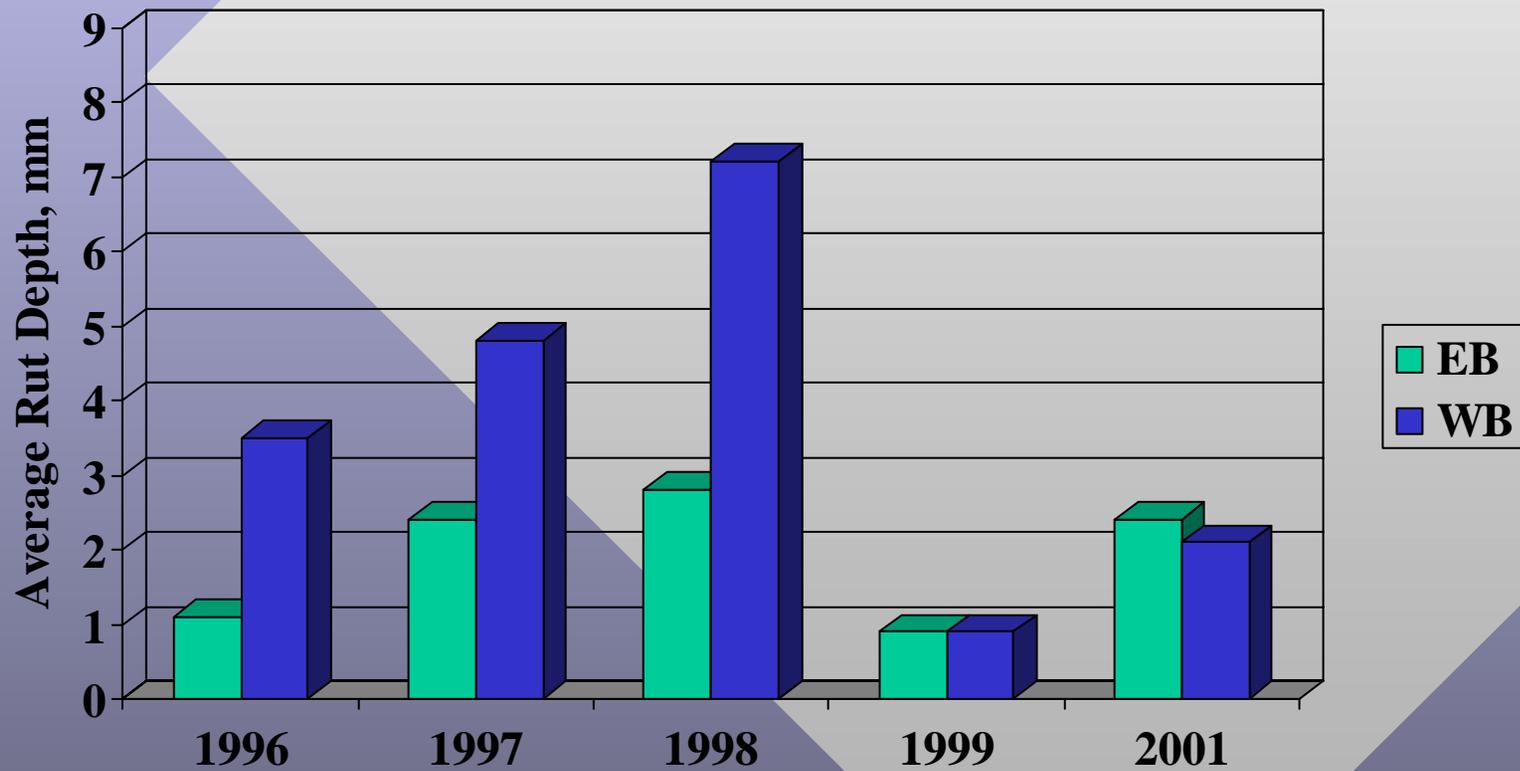
# Correlation of Friction Number to Macrotexture Depth



# I-69 Rut Depth



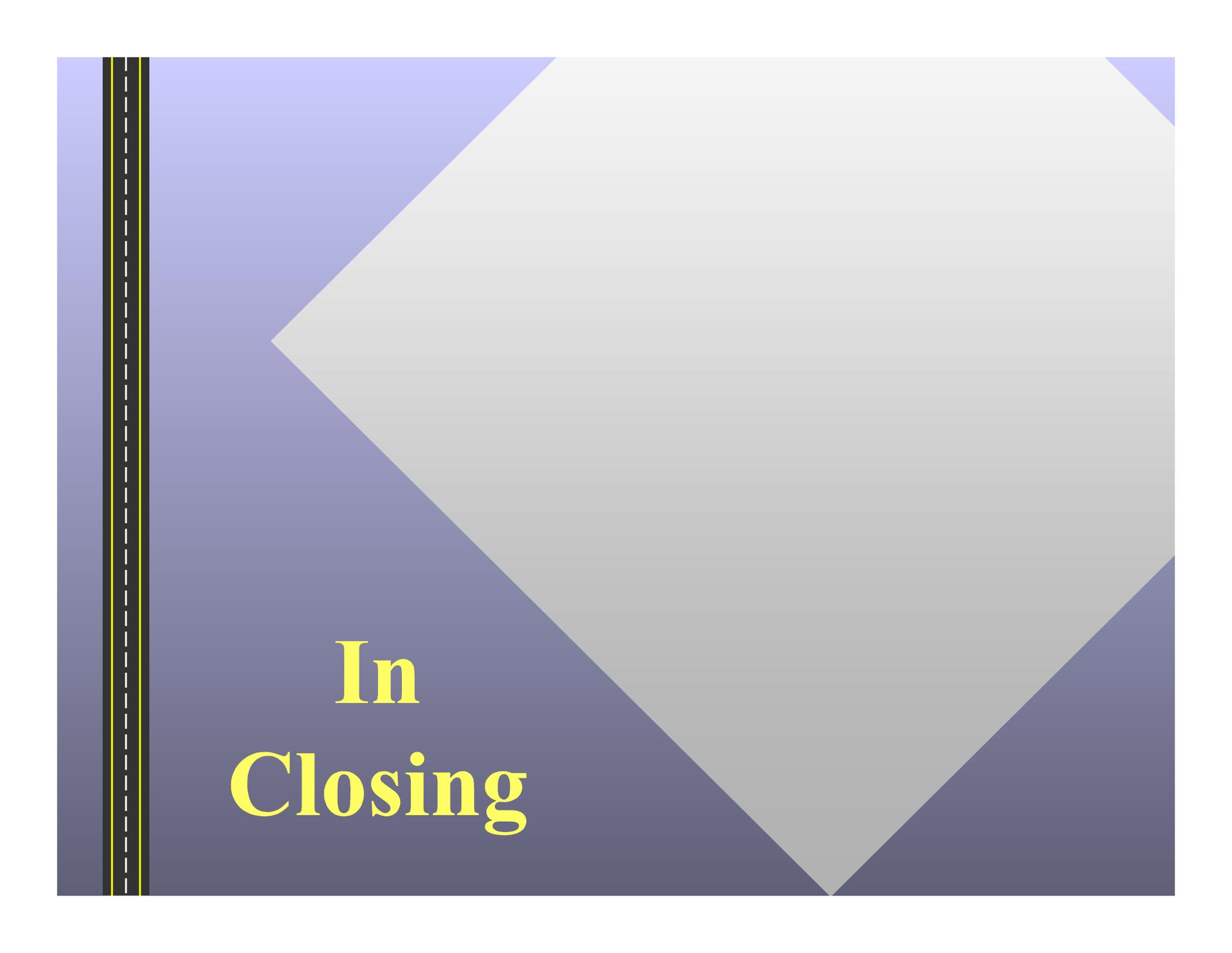
# I-70 Rut Depth





# BENEFITS

- Success = Performance
- Risk Balanced
- Innovation Rewarded
- Non-Confrontational Construction



**In  
Closing**