



Assessment of The Road Based On PCI and IRI Roadroid Measurement



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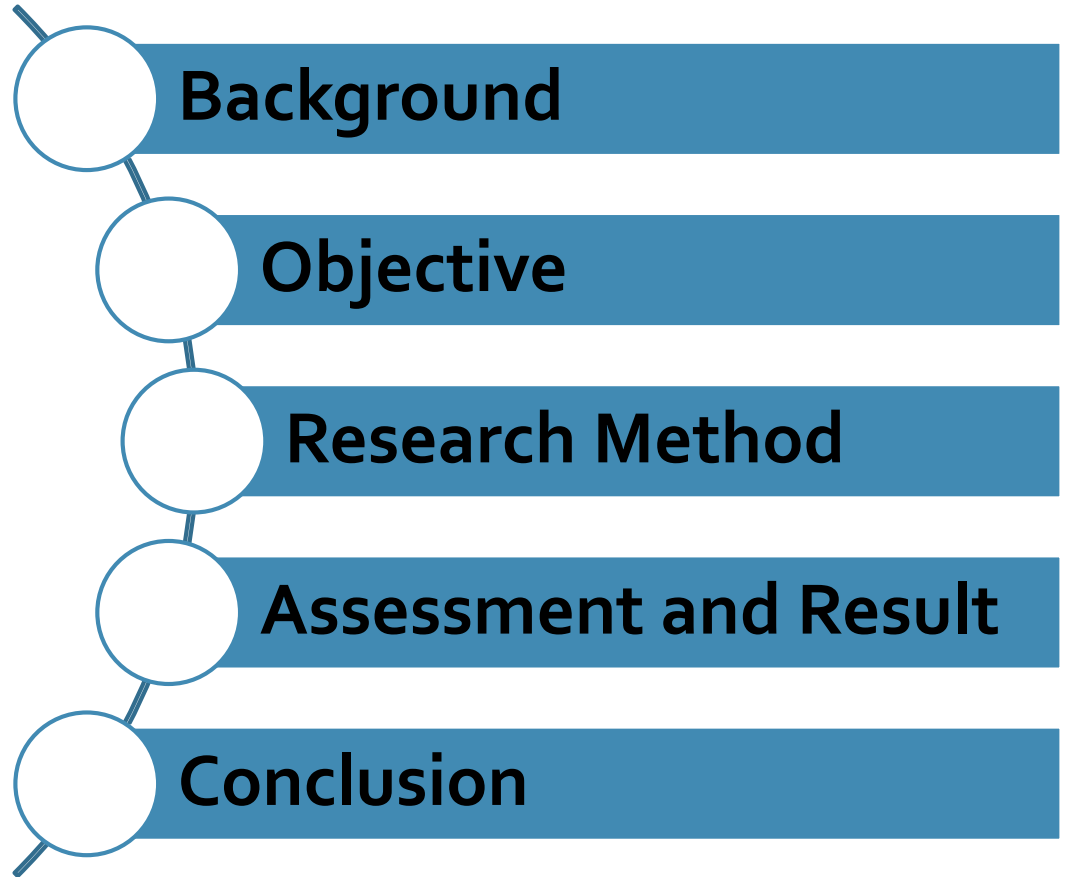
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OUTLINE



Background

- Implementation of road maintenance is part of the activities of road operations that serve as a monitor whether the road can perform both physically and its functionally
- Puddles and excessive vehicle loads are external factors accelerating damage to the road resulting in low road life and are incompatible with the age of the plan



Background

- **PCI**

(Pavement Condition Index) is an system of assessment of pavement conditions based on type, extent and extent of damage occurring and can be used as a reference in maintenance business

- **IRI Roadroid**

(International Roughness Index) is a road quality assessment that uses tools

Background

- There needs to be a comparison or correlation between the two methods
- This research is about to test the level of damage on road surface by using PCI and IRI Roadroid method and comparison between the two methods

OBJECTIVE

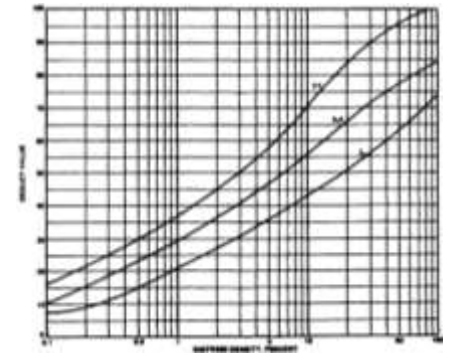
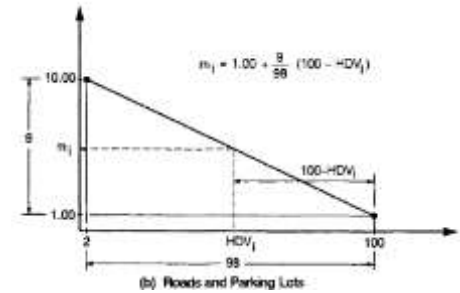
- ✓ Condition of pavement assessment on Magetan Road with PCI and IRI Roadroid assessment method
- ✓ Correlations between PCI and IRI Roadroid road assessments on the assessment of functional road conditions

Research Method

This study assessed the functional condition of the road using PCI and IRI methods. As well as seeking comparison of the two methods

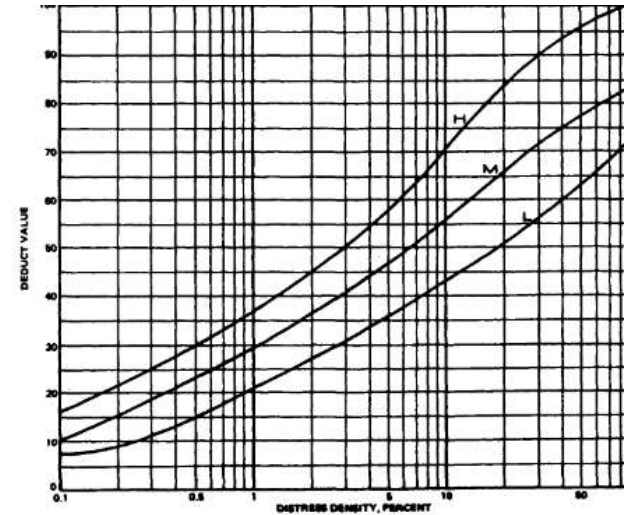
Pavement Condition Index (PCI)

1. Divide the road segment per 100 m on the road of research object,
2. Measurement of the quantity of damage types,
3. Determine the level of road damage that is low , medium, high,
4. Determining the level of damage (density),
5. Determining the deduct value, according to the DV curve reading,



Pavement Condition Index (PCI) (Cont.)

- Determining the Total Deduct Value (TDV),
- Determining Corrected Deduct Value (CDV), according to the reading of graphs of TDV and CDV relationships,
- Determining the PCI value of each segment.

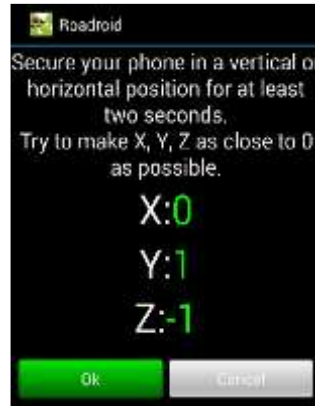


IRI ROADROID

IRI Roadroid using android smartphone, car and camera.



Installation of Holder



Setting the Smartphone Position



Upload Process of Survey Results

Correlation

The strong relationship between the variables is expressed in the correlation coefficient, the value ranges from -1 to 1 ($-1 < r < 1$). If the value of correlation coefficient -1 or 1, then the relationship between variables is perfect, while the value of correlation coefficient 0, then among these variables there is absolutely no relationship.

Correlation coefficient (r)	Interpretation of Correlation Coefficients
0,00-0,199	Very low
0,20-0,399	Low
0,40-0,599	Medium
0,60-0,799	Strong
0,80-1,000	Very Strong

(Sugiyono, 2007)

Correlation



RESULT

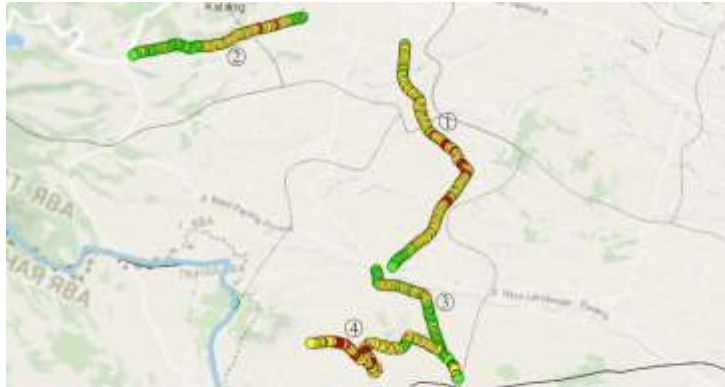
Assessment

Functional Condition of
Road Based PCI

No	Segment Name	PCI Value	PCI Condition
1	Ngariboyo-Tamanarum	70,51	Very Good
2	Bangsri-Plaosan	73,87	Very Good
3	Parang-Kalipucang	75,00	Very Good
4	Mategal-Troso	62,07	Good

Assessment

Functional Condition of Road Based IRI Roadroid



Keterangan:

- Baik
 - Sedang
 - Rusak Ringan
 - Rusak Berat
- ① Ngariboyo-Tamanarum
 - ② Bangsri-Plaosan
 - ③ Parang-Kalipucang
 - ④ Mategal-Trosoono

No	Segment Name	IRI Value	Base 10 IRI	IRI Condition
1	Ngariboyo-Tamanarum	5,81	63,67	Medium
2	Bangsri-Plaosan	4,14	74,13	Medium
3	Parang-Kalipucang	2,84	82,27	Good
4	Mategal-Trosoono	4,12	74,23	Medium

The IRI Roadroid value is then converted to a scale of 1 to 10 from a previous scale of 0 to > 12

$$\text{Base 10 IRI} = 10 - \frac{\text{Nilai IRI} \times 10}{16}$$

Descriptive Statistics

➤ Comparison of PCI and IRI Roadroid

- The value of Pearson coefficient (r) is -0.325 = low correlation level
- Coefficient of determination value (r^2) equal to $0,105$, and t_{count} of $-3,109$ with hypothesis H_0 rejected so there is difference between assessment of functional condition of road using PCI and IRI Roadroid (H_0 rejected)

Correlation Types	r Value	r^2	t count	Critical Area
Correlation of PCI with base 10 IRI	$-0,325$	$0,105$	$-3,109$	$-1,968 \leq t_{\text{count}} \leq 1,968$

➤ **Effect of IRI Roadroid Speed**

- Variations of speed Roadwood used IRI used in this study is 20 km / h and 60 km / hr
- Pearson coefficient value obtained (r) of 0.7267 = the level of correlation Strong
- The coefficient of determination is obtained, and the value of t_{cal} 1,628 after consultation with t_{table} that is - 1,968 until 1,968 thit reside in t_{table}

Correlation Types	r Value	r²	Critical Area	t Count
IRI Correlation 20 km/h with IRI 60 km/h	0.7267	0.528	-1,968 ≥ t ≤ 1,968	1.628

➤ Influence Differences Lane IRI Roadoid

- This study also calculates the correlation of the two lanes to measure IRI Roadoid
- Pearson coefficient value obtained (r) of 0.493 = the level of correlation Medium
- The coefficient of determination is obtained, and the t count -1,118 after consultation with t_{table} is -1,968 to 1,968 this is inside t_{table}

Type Correlation	r Value	r^2	Critical Area	t Count
IRI Correlation 20 km/h with IRI 60 km/h	0.493	0.243039	$-1,968 \geq t \leq 1,968$	-1.118

Discussion

- The value point r there is a negative correlation value, it can be interpreted the lower the IRI value of Roadriod then the PCI value will be higher and the lower the IRI value of Roadroid
- There are similarities between IRI Roadroid with speed 20 and 60 km/h. So it can be concluded that the use of Roadroid IRI can use speeds between 20 to 60 km/h

Discussion (Cont.)

- There is an equation between IRI Roadroid lane right and lane left. So it can be concluded that the use of Roadroid IRI can use the right lane or the left lane in sampling

CONCLUSION

- The assessment of road conditions based on the value of PCI into the category Very Good, the assessment using IRI Roadroid tool into the category Medium
- While the correlation of road assessment between PCI with IRI Roadroid resulted in low correlation

Conclusion (Cont.)

- Variations in data retrieval speeds using IRI Roadroid have no effect on the functional assessment of the road, as well as data retrieval back and forth on the same road segment

Thank You

Any Question?