

## 【習作一】

鋪面網路養護管理系統(PNRMS)與美國ILLINET程式之應用(李英豪、李英明)

PSR, PSI Concept

AASHO Road Test

ESAL Concept and Calculations

- 一、請以管理鋪面「路網」之角度著手，簡單彙整出您個人研讀下列文獻之心得：(文字敘述請以三頁或三千字為限)
  - (a) 李英豪、李英明，「鋪面網路養護管理系統與美國ILLINET程式之應用」，1994年瀝青混凝土路面及材料特性研討會專輯，中華民國八十三年五月十九、二十日，中壢市，中央大學，第177-192頁。
- 二、何謂PSR, PSI, PCI？試簡述其基本定義與用途，並比較其異同處。試簡述Distress和Performance的基本定義與不同處。
- 三、A flexible highway pavement was tested and the following roughness and distress was measured.  
Slope variance = 40 (x 10<sup>6</sup>)  
Alligator cracking = 10 ft<sup>2</sup> / 1000 ft<sup>2</sup>  
Transverse cracking = 20 ft / 1000 ft<sup>2</sup>  
Mean rut depth = 0.05 in.  
Rut depth variance = 6.0 in<sup>2</sup> (x 100)  
Patching = 15 ft<sup>2</sup> / 1000 ft<sup>2</sup>  
Compute the PSI of the asphalt pavement using the various prediction models given below:
  - (a)  $PSI = 5.03 - 1.91 \log_{10} SV - 1.38 RD^2 - 0.01 \sqrt{C + P}$
  - (b)  $PSI = 5.03 - 1.91 \log_{10} SV - 1.38 RD^2$Describe the basic way in which each prediction model is estimating PSR and compare the different results obtained with each model. Evaluate the condition of the pavement.
- 四、何謂18-kip ESAL？它的用途為何？其與AASHO Road Test有何關係？該如何求得？
- 五、請試著決定下列柔性鋪面之軸重當量因子 (LEFs)：
  - (a) 當  $P_t = 2.0$ ,  $SN = 4$ ，一個14-kip單軸軸重之LEF為何？(手算)

方式)

- (b) 當  $P_t = 2.5$ ,  $SN = 6$ , 一個42-kip雙軸軸重之LEF為何?(可查表)
- (c) 假設我們決定將標準軸重由原先之單軸18-kip改為雙軸32-kip, 上述之LEFs將變為何?

六、 A flexible highway pavement is being reconstructed over the same alignment as the existing pavement. The current and projected traffic is given below:

Lanes= 4 lanes divided

Terminal PSI = 2.5

Initial 2-way ADT = 25,000

Mean Axles/Truck = 2.8

Final 2-way ADT = 40,000

Directional distribution = 50%

Average percent trucks = 17

Design life = 20 years

Assume SN equals to 5 and ADT increases linearly (i.e., having a constant simple growth rate). The axle load distribution is given in the following table:

	Loads	% Load Distribution
Single Axle	< 6 k	5
	6 - 12 k	10
	12 - 18 k	15
	18 - 24 k	5
	24 - 30 k	2
Tandem Axle	< 12 k	3
	12 - 18 k	10
	18 - 24 k	25
	24 - 30 k	20
	30 - 36 k	5

Determine the total 18-kip ESALs in the inner and outer lane over the 20-year period.

七、請利用我國高速公路年報之資料, 計算國道中山高速公路歷年之各種車型與整體之卡車因子, 並將其繪於圖中, 請比較其變動情形並探討其原因與可能產生之影響。