Prince of Songkla University
Faculty of Engineering

Final Examination: Semester II Academic Year: 2004
Date: March 2, 2005 Time: 09.00-12.00 Hr.
Subject: 220-570 Transportation Planning and Land Use Room: R300

คำสั่งในการทำข้อสอบ

1. ข้อสอบชุดนี้มีคำถามทั้งหมด 4 ข้อ ให้ทำทุกข้อ
2. ตอบคำถามในกระดาษที่กำหนดให้
3. อนุญาตให้นำเอกสาร ตำรา และอุปกรณ์การคำนวณเข้าห้องสอบได้
4. คำถามทุกข้อมีคะแนนเท่ากัน

1. Three transportation projects have been proposed to increase the safety in and around a residential neighborhood. Each project consists of upgrading existing street signing to highly retroreflective sheeting to increase visibility. The table below shows the initial construction casts, annual operating costs, the useful life of the sheeting, and the salvage values for each alternative. Assume that the discount rate is 10 percent. Calculate the present worth for each alternative and determine the preferred project based on the economic criteria.

Alternative	Initial Construction Costs (Baht)	Annual Operating Costs (Baht)	Useful Life (Years)	Salvage Value (Baht)
I	500,000	100,000	10	125,000
II	600,000	80,000	10	150,000
III	250,000	125,000	5	25,000

2. Data collected at a parking lot indicate that a total of 200 cars park between 8 a.m. and 6 p.m. Ten percent of these cars are parked for an average of 2 hours, 40 percent for an average of 4 hours, and the remaining cars are parked for an average of 10 hours.

   If 15 percent of the parking bays are vacant on average (between 8 a.m. and 6 p.m.) at the parking lot, determine the number of parking bays in the parking lot. Assume an efficiency factor of 0.875

   The owner of the parking lot is planning an expansion of her lot to provide adequate demand. If she has estimated that parking demand for all categories will increase by 5 percent a year, determine the number of additional parking bays that will be required in year 10 in the future.

3. A new carpool lane has replaced one lane of an existing six-lane highway. During peak hours the lane is restricted to cars carrying three or more passengers. After five months of operation, the carpool lane handles 800 autos/hour, whereas the existing lanes are operating at capacity levels of 1500 veh/h/lane at an occupancy rate of 1.2. How would you determine if the new carpool lane is successful or if the lane should be open to all traffic?

4. The data in the table below have been developed for four alternative transportation planes for a high-speed transit line that will connect a major airport with the downtown area of a large city. Prepare an evaluation report for these proposals by considering the cost effectiveness of each attribute. Show your results in graphical form and comment on each proposal.

Measure of Effectiveness	Rail Alternatives				
	Existing Service	Pane A	Plan B	Plan C	Plan D
Persons displaced	0	264	3200	3200	3200
Businesses displaced	0	23	275	275	275
Average door-to-door trip speed (km/h)	10.2	38	45	46	48
Annual Passengers (millions)	118.6	124.4	118.6	124.4	127.0
Annual cost (millions)	-	16.4	20.2	23.8	22.7