

CONCORDIA UNIVERSITY
 Gina Cody School of Engineering and Computer Science
 Department of Building, Civil and Environmental Engineering
 BLDG 341 – BUILDING ENGINEERING SYSTEMS

Assignment 5 (due Dec 2, noon on Moodle)

- Make scan of your work or work on this file directly. Upload your work as a PDF to Moodle

1. During the period of maintenance, the city have to pay \$10,000 to transport the wastewater above the capacity with trucks. Alternatively, the city can also build a temporary pipe for \$6,000 to handle the same volume of wastewater with a 30% chance that it will burst and create a damage of \$4,000 (including the cost to fix the pipe and clean up). Is it advisable for the city to install this temporary pipe? Show your reasoning based purely on cost.

2. A contractor would like to purchase a truck to replace an old one. There are three models available:

Carrying capacity ('000 kg)	Price ('000 \$)
25	120
30	140
35	155

Most current jobs require a carrying capacity of 25,000 kg only. However, a higher carrying capacity might be needed in the future. The truck dealer suggested that it is possible to add an upgrade kit in the future but cannot promise a price. The following are possible cost of the upgrade kits:

Upgrade Kits	Possible Price ('000 \$)	Probability
Converting 25,000 kg to 30,000 kg	19	0.20
	23	0.50
	27	0.30
Converting 25,000 kg to 35,000 kg	32	0.25
	39	0.55
	41	0.20
Converting 30,000 kg to 35,000 kg	13	0.30
	19	0.50
	21	0.20

The contractor has to decide whether it is better to purchase a truck of bigger capacity now, or purchase a smaller truck now and order an upgrade kit only if needs arise. Here are the probability of the potential carrying capacity needs in the future:

Potential carrying capacity needs ('000 kg)	Probability
25	0.3
30	0.3
35	0.4

Please use decision tree to help the contractor to decide what is the most cost-effective purchasing option (note: all prices are present worth; no need to consider interest rate).