

Problem

The trash removal corporation Waste Management hires you as a consultant. Since the large expansion of their recycling program, they want you to reevaluate some aspects of their residential and commercial trash removal services.

Residential Service



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Waste Management currently offers three residential bin sizes; 96 gallons, 64 gallons and 32 gallons³. The company can buy these plastic bins for \$32, \$23 and \$19, respectively. Assuming that the customer service fees for 96 bin service is x dollars per month, the 64 bin is y dollars per month and the 32 bin is z per month, then the customers of Orange County will order

75000 - 800 x - 150 y bins of size 96,
20000 + 100 x - 300 y - 50 z bins of size 64
and 12000 + 30 y - 250 z bins of size 32.

1. What prices should be set to maximize profit?
2. Waste Management currently charges \$37 per month for the 96 bin, \$30 per month for the 64 bin and \$17 per month for the 32 one.⁴ If they were to increase prices too quickly or too often, then they would lose most of their customers to their competitors. If the prices can only be adjusted once each year in small increments, then how should each bin be priced for next year?
3. If we continue to increase our price in the same manner, what will the company charge for each bin in 3 years?

¹"Waste Management - Home Page", accessed 16 Apr. 2008; available from <http://www.wm.com/index.asp>

²"City of Diamond Bar : Trash Service", accessed 16 Apr. 2008; available from <http://www.ci.diamond-bar.ca.us/Index.aspx?page=488>

³Waste Management Representative. Discussion with Mr Beecher. 9 Apr. 2008

⁴ibid

Commercial Service



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Many of the 400 gallon dumpsters for small businesses are starting to weather and need to be replaced. The company decides to open a division to make their own dumpsters. They would like to build a rectangular based dumpster with a top that meets the front with an angle of 100° , so that the customers can easily throw their trash inside. It must also be strong enough to hold one week's worth of garbage. Your research assistant determines that the cost for the sides, back and front are to be made from 12-gauge (0.1046 inch thick) steel sheets, which cost \$0.80 per square foot (including any required cuts or bends). The base is to be made from 10-gauge (0.1345 inch thick) steel sheets, which costs \$0.90 per square foot. The plastic lids will cost approximately \$50.00 each, regardless of dimensions. Welding costs approximately \$2 per foot for material and labor combined.

1. Assuming the thickness of the steel is negligible to the dimensions and the welding costs, what should the dimensions of the dumpster be to minimize the construction costs?
2. What is the cost of the dumpster?
3. Your research assistant tells you the welding costs came from the Ironworkers Local Union, but that if you looked for a non-union contract, you could find a cheaper deal. How does the welding costs affect the total container cost? Be specific in your write up to the company.

⁵"Waste Management of Orange County - Temporary", accessed 16 Apr. 2008; available from <http://www.wmorangecounty.com/services/temporary.asp>