

Math for Burying Mattresses



What does it really cost to landfill a mattress?

The answer is \$20.60 per mattress.

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Check out the assumptions. Check out the math. Your numbers may vary.

1. There is \$5 in extra equipment and labor costs for each mattress.

Why?

- Mattresses can't be buried on an outside landfill slope because they become drainage conduits for leachate; causing side slope leachate seeps. Therefore mattresses must be moved to the interior of the landfill. This is extra time and money.
- Mattresses surfaces are smooth, even 'steep', so daily cover slides off. Therefore mattresses that are on the surface at the end of the day need additional earthen landfill cover to achieve the required 6 inches of daily cover. This is extra time and money.
- Mattress don't compact well, so they leave air pockets that can aid in the spreading of underground fires, thus costing more in equipment and labor to stop a landfill fire.
- Mattress springs become entangled in the landfill equipment and must be cut and pulled free of the equipment, or the equipment will be damaged, or the equipment will not work properly which could even reduce compaction. Cutting and pulling springs, often entrapped with garbage, from equipment is a nasty job. This nasty job significantly increases the chances that a worker will be injured in the process. This is extra labor and downtime which costs money.

So what is the extra equipment and labor costs to manage mattresses in the landfill? Ten minutes a mattress? Five minutes a mattress? A study done by a major US solid waste entity looked into this question and determined it was 3 minutes a mattress. If we use a combined equipment and labor rate of \$100/hour, then 1 minute of addition effort cost \$1.66 ($\$100/\text{hour} \div 1 \text{ hour}/60 \text{ minutes} = \$1.66/\text{minute}$). So an extra 3minutes equal \$5, which means it costs five additional dollars to handle a mattress.

2. There is \$17.85 net loss in landfill airspace revenue.

How so?

The landfill financial model has a peculiarity. Landfills account for their revenue by weight, e.g. \$60/ton, but their expenses are by volume e.g. licensed airspace for waste. This means landfills want to tightly compact waste to minimize consuming landfill air space. Landfills are getting better at waste compaction, but mattresses still don't compact well. In fact compaction rates continue to rise, with landfills reaching 1,500 to 2,000 pounds per cubic yard .

The point is; regular trash compacts well thereby minimizing the consumption of landfill airspace while mattresses do not compact well, thereby consuming far more space for their weight.

However the direct revenue a landfill receives for 1 ton of household trash or 1 ton of mattresses are the same. (See Table 1)

Weight revenue for household trash and mattresses		Table 1
Material	Disposal Fee	Revenue
1 ton (2,000 lb) of Household trash	\$60/ton (\$.03/lb)	\$60/2,000lb
75 lb of Household trash	\$60/ton (\$.03/lb)	\$2.25/ 75lb
1 ton (2,000 lb) of Mattresses	\$60/ton (\$.03/lb)	\$60/2,000lb
75 lb of Mattress	\$60/ton (\$.03/lb)	\$2.25/75lb

Even though the direct weight revenue received for equal weights of trash or mattresses are the same; the landfill gets far more revenue out of a cubic yard of landfill airspace consumed by trash than mattresses. How much revenue does a landfill get from a cubic yard of compacted household trash? (See table 2)

Volume "revenue" for household trash and revenue			Table 2
Material Weight	Revenue/lb	Compaction	Revenue received for cy of landfill airspace
1 ton (2,000lb) of Household trash	\$60/2,000lb	1,750lb/cy	\$52.50/cy
75 lb of Household trash	\$2.25/ 75lb	1,750lb/cy	\$52.50/cy

Obviously mattresses take up a disproportion amount of air space for their weight as compared to household trash, but how much? A study by [Gregory Conigliaro and Paul Careau on behalf of Conigliaro Industries, Inc](#) concluded that mattresses can be compressed by 66% in a landfill. *(By the way, King County Washington and others site this study.)* So what is the value of the space consumed by one mattress in a landfill? (See Table 3)

Value of landfill airspace consumed by a mattress					Table 3
Typical Mattress	Volume of 1 queen mattress w/o compaction	Compaction rate @ 66%	Airspace used by 1 mattress	Value of 1 cy of landfill airspace	Value of airspace used by mattress
1 queen mattress 60" x 80" x 10" or ~1 cy	1cy	.66 cy	.34 cy	\$52.50/cy	\$17.85

What then is the net cost to landfill 1 queen mattress? (See Table 4)

Net cost to landfill a mattress				Table 4
Mattress type	Value of landfill airspace	Value of extra handling	Offsetting weight revenue for mattress disposal	Net cost
One 75lb queen mattress	\$17.85	\$5.00	-\$2.25	\$20.60

What does it cost your landfill to dispose of a mattress?

You can know by adjusting the assumptions for your landfill by knowing:

1. The fully burdened hourly rate for landfill compactor and labor.
2. The landfill's tipping fee.
3. The landfill's compaction rate.