EBI COST ANALYSIS MATRIX 2009

This cost analysis matrix uses actual 2007 cost and animal data from a municipal animal control agency in North Carolina.

- *Note: no actual data for fractious / feral or age breakdown – those data are estimates.*
- Number of dogs euthanized: 2430 (1701 over 4 months – 70% and 729 less than 4 months – 30%) (972 fractious – 40%)
- Number of cats euthanized: 2997 (1798 over 4 months – 60% and 1199 less than 4 months – 40%) (1499 feral – 50%)
- Total dogs and cats euthanized: 5427
- Average number of animals euthanized per day: 15 (5427 / 365 days)

Assumptions:

a. fractious / feral animals (2471 40% dogs and 50% cats) are given pre-euthanasia anesthesia (ketamine/xylazine)
b. friendly cats (1498) are given IP injection of sodium pentobarbital with no pre-euthanasia anesthesia
c. friendly dogs (1215) are given IV injection of sodium pentobarbital with no pre-euthanasia anesthesia

	EBI EQUIPMENT COST	
1	Equipment cost: $670	Floor safe ($350) + table ($100) + electric clippers ($120) + restraint gate ($100)
2	Total equipment cost per animal: $0.123	$670 / (animals euthanized per year) 5427 = $0.123
	EBI LABOR COST	
3	A. # of employees required for IV: 2 B. # of employees required for IP: 1 C. # of employees required for IC: 1	NOTE: 1 employee can safely and effectively administer IP on conscious friendly cats and IC on unconscious or anesthetized animals; 2 employees are required for IV
4	A. # of IV injections (dog): 1215 B. # of IP injections (cat + puppy): 1741 C. # of IC injections (dog + cat): 2471	A. 1215 = 50% of 2430 dogs and 0 cats B. 1741 = 243 puppies (10% of dogs) + 1498 cats (50% of cats) C. 2471 = 972 dogs + 1499 cats

5	Average time to euthanize: 5 minutes average	Transport to euthanasia room + preparation (including IM injection of pre-euthanasia anesthesia as needed) + scanning for microchip + injection + verification of death + removal of carcass + record keeping. *NOTE: average time for IP (friendly cats, puppies and kittens) is typically less than 5 minutes; average time for IV is sometimes longer than 5 minutes.* *Considering an average of 15 animals per day, a typical scenario will involve multiple activities happening concurrently such as animals going under pre-euthanasia anesthesia in a quiet area while another animal is being injected.*
6	Total time to euthanize: 75 minutes	# of animals per day (15) × average time to euthanize (5 minutes)
7	Hourly labor cost per worker: $13.57	Hourly wage: $10.44 + 30% fringe: $3.13 = $13.57
8	5-minute labor cost per worker: $1.13	Hourly labor cost: $13.57 / 60 minutes = $0.226 X 5 minutes = $1.13
9	IV labor cost: $2.26	5-minute labor cost: $1.13 X 2 employees = $2.26
10	IP and IC labor cost: $1.13	5-minute labor cost: $1.13 X 1 employee = $1.13
11	Total annual IV labor cost: $2746	IV labor cost: $2.26 X 1215 = $2746
12	Total annual IP & IC labor cost: $4759	IP and IC labor cost: $1.13 X 1741 (IP) + 2471 (IC) = 4212 X $1.13 = $4759
13	Total annual labor cost for IV, IC & IP: $7505	Labor cost IP & IC + IV= $2746 + $4759 = $7505
14	Total labor cost per animal: $1.38	Total annual labor cost / # of animals euthanized: $7504 / 5427 animals = $1.38
	EBI SUPPLY COST	
15	Sodium pentobarbital cost per 250 ml bottle: $46.00	
16	Cost per ml (cc): $0.184	Cost of bottle ($46.00) ÷ 250 ml
17	Average IV dose (dog): 5 ml	50-pound dog average
18	Sodium pentobarbital cost per IV dose:	Cost per ml $0.184 X average dose: 5 ml

	$0.92	
19	Annual sodium pentobarbital IV cost: $1,118	Average IV dose (5 ml) cost: $0.92 X 1215 dogs = $1,118
20	Average IP dose per cat + puppy = 2 ml	7 pound cat and puppy average (some cats and puppies will weigh more, kittens and neonates will weigh less)
21	Sodium pentobarbital cost per IP dose: $0.368	Cost per ml $0.184 X average dose: 2 ml
22	Annual sodium pentobarbital IP cost: $641	243 puppy IP + 1498 cat IP = 1741 X $0.368 = $641
23	Average IC dose (dog) = 5 ml	50-pound dog average
24	Sodium pentobarbital cost per IC dose (dog): $0.92	Cost per ml $0.184 X average dose: 5 ml = $0.92
25	Annual sodium pentobarbital IC (dog) cost: $894	Average IC dose cost: $0.92 X 972 dogs = $894
26	Average IC dose (cat) = 1 ml	7-pound cat average (some cats will weigh more, some will weigh less)
27	Sodium pentobarbital cost per IC dose (cat): $0.184	
28	Annual sodium pentobarbital IC (cat) cost: $276	1499 (feral) cat estimate X $0.184 = $276
29	Total sodium pentobarbital cost: $2,929	Annual IV ($1,118) + IP ($641) + IC cat ($276) + IC dog ($894) = $2,929
30	Average sodium pentobarbital cost per animal: $0.54	Total sodium pentobarbital cost ($2,929) / # of animals euthanized (5427) = $0.54
31	Syringe cost per animal: $0.019	Syringe (6 ml) cost: $19 per 100 ($0.19 each) estimate 100 uses per syringe (*reusing syringes is a standard practice in EBI*)
32	Total annual syringes: 79	Total animals: 5427 EBI injections + 2471 (pre-euthanasia IM injections) = 7,898 injections total / 100 = 79 syringes
33	Annual syringe cost: $15.01	79 syringes X $0.19 = $15.01
34	Average syringe cost per animal: $0.003	$15.01 / 5427 (total animals euthanized) = $0.003
35	Needle cost: $0.01	Needle (22 ga.) cost: $10.00 per 100 (one use only)

36	Total annual needles: 7898	1 per euthanasia: 5427 + 1 per pre-euthanasia anesthesia: 2471 = 7898
37	Annual needle cost: $78.98	7898 X $0.01 = $78.98
38	Average needle cost per animal: $0.014	$78.98 / 5427 (total animals euthanized) = $0.014
39	Pre-euthanasia anesthesia cost per dog: $1.00	5:1 ratio ketamine/xylazine per 50 pound dog = $0.40 ml X 2.5 ml = $1.00
40	Annual pre-euthanasia anesthesia cost for dogs (fractious): $972	972 fractious dogs X $1.00 per dog (average weight = 50 pounds, 2.5 ml @ $0.40 per ml)
41	Pre-euthanasia anesthesia cost per cat: $0.20	5:1 ratio ketamine/xylazine per 10 pound cat = $0.40 ml X 0.5 ml = $0.20
42	Annual pre-euthanasia anesthesia cost for cats (feral): $299	1499 feral cats X $0.20 per cat (average weight = 10 pounds, 0.5 ml @ $0.40 per ml)
43	Annual total cost of pre-euthanasia anesthesia: $1271	Annual cost dogs ($972) + cats ($299) = $1271
44	Average pre-euthanasia cost per animal: $0.23	$1271 / 5427 (total animals euthanized) = $0.23
45	Total supply cost per animal: $0.787	Sodium pentobarbital per animal: $0.54 + syringe: $0.003 + needle: $0.014 + pre-euthanasia anesthesia: $0.23 = $0.787
	EBI TOTAL COST	
46	Total EBI cost per animal: $2.29	Equipment cost per animal: $0.123 + labor cost per animal: $1.38 + supply cost per animal: $0.787 = $2.29

CARBON MONOXIDE COST ANALYSIS MATRIX 2009

This cost analysis matrix uses actual 2007 cost and animal data from a municipal animal control agency in North Carolina. Although the actual agency reported best practices use of euthanasia by injection (EBI) for animals younger than 4 months of age (25% of total animals euthanized), this cost analysis assumes 100% chamber use in order to more accurately reflect the industry as a whole and to provide a more useful cost comparison to EBI. Although frequent, 100% chamber use is NOT acceptable practice.

Industry standards demand the use of EBI for animals less than 4 months of age and for animals suffering from respiratory conditions, generally poor health or severe injury.

Industry standards recommend administering 0.5 mg / pound acepromazine maleate (tranquilizer) to adult dogs 20 minutes prior to placing them in the chamber to reduce vocalization/agitation. The dose is typically 25 mg for an average 50-pound dog.

- Total number of dogs euthanized: 2430
- Total number of cats euthanized: 2997
- Total number of dogs and cats euthanized: 5427
- Average number of dogs and cats euthanized per day: 15 (365 days)
- Number of employees (operators): 2 (alternate costs for 1 operator are included)
- For purposes of this cost analysis matrix, an average dog is 50 pounds.

	CARBON MONOXIDE EQUIPMENT COST	
1	CO chamber: $10,500	Cutting Edge Fabrication, estimated usable life: 10 years
2	CO sensor: $300	Unknown brand, estimated usable life: 10 years
3	Chamber lifetime routine maintenance: $5,000	Estimated cost to maintain seals, gaskets and hardware over 10 years = $500 per year

4	Annual depreciation: $1,080	Chamber: $10,500 + sensor: $300 = $10,800 / 10 = $1,080
5	Annual depreciation + maintenance: $1,580	Equipment depreciation: $1,080 + maintenance: $500 = $1,580
6	CO equipment cost per animal: $0.29	$1,580 (annual depreciation/maintenance) / 5427 (total animals euthanized per year) = $0.29
	TRANQUILIZER COST	
7	Acepromazine tranquilizer per average dog: $1.00	Average dog: 50 pounds: 2.5 ml at $0.40 per ml = $1.00
8	Syringe / needle cost per dog: $0.013	Syringe (reused) cost: $0.003 + needle cost: $0.01 = $0.013
9	Tranquilizer cost per 50 pound dog: $1.013	$1.00 + $0.013 = $1.013
10	Number of dogs tranquilized (estimate): 1701	1701: number of estimated adult dogs euthanized by CO chamber (70% of total dogs)
11	Total annual cost of tranquilizer: $1,723.11	1701 dogs X cost per dog: $1.013 = $1,723.11
12	Tranquilizer cost per animal: $0.32	$1,723.11 / 5427 (total animals euthanized) = $0.317
	CO LABOR COST	
13	Number of employees to euthanize: 2	*Note: actual municipal animal control agency uses 2 operators (employees) to euthanize by carbon monoxide*
14	Load time: 10 minutes	Includes transport to chamber
15	Run time: 35 minutes	Employees do paperwork and watch chamber
16	Unload time: 5 minutes	Remove carcasses, clean chamber for next cycle
17	Total cycle time: 50 min	Load: 10 + run: 35 + unload: 5 = 50 minutes
18	Number of dogs or cats per cycle: 6	Dogs and cats are not mixed in a cycle

19	Number of cycles per day: 2.5	Average number of animals euthanized per day: 15 / number of animals per cycle: 6 = 2.5
20	Total time per day: 125 minutes	Load + run + unload (cycle time) = 50 minutes X 2.5 cycles = 125 minutes (2.08 hours)
21	Labor cost per minute per person: $0.226	Hourly wage: $10.44 + 30% fringe: $3.13 = $13.57 / 60 minutes = $0.226
22	Total labor cost per minute (2 operators): $0.452	$0.226 X 2 operators = $0.452
23	Total labor cost per cycle: $22.60	$0.452 X 50 minutes = $22.60
24	Labor cost per day: $56.25	$22.60 X 2.5 cycles = $56.50
25	Labor cost per animal: $3.77	$56.50 / 15 animals = $3.766
26	Alternate: labor cost per animal with 1 operator rather than 2: $1.88	$0.226 X 50 minutes = $11.30 X 2.5 cycles = $28.25 / 15 animals = $1.88 (*note: will likely take longer to load and unload but is not reflected in this matrix)*
	CO SUPPLY COST	
27	CO gas cylinder: $219.00	Includes cylinder rental plus gas
28	Annual number of cylinders: 15	Total number of cylinders used in 2007
29	Total gas cost:	$219 per cylinder X 15 cylinders = $3285
30	Gas cost per day:	Annual cost / 365 days = $9.00
31	Supply cost per animal: $0.60	$9.00 / 15 animals = $0.60
	CARBON MONOXIDE TOTAL COST	

32	CO cost per animal: $4.98	Equipment cost per animal: $0.29 + tranquilizer cost: $0.32 + labor cost per animal: $3.77 + supply cost per animal: $0.60 = $4.98
33	Alternate CO cost (1 operator): $3.09	Equipment cost per animal: $0.29 + tranquilizer cost: $0.32 + labor cost per animal: $1.88 + supply cost per animal: $0.60 = $3.09

CARBON MONOXIDE Vs EBI

34	**EBI cost per animal**	**$2.29**
35	**CO cost per animal (2 operators)**	**$4.98**
36	**CO cost per animal (2 operators) *without tranquilizer***	**$4.66**
36	**CO cost per animal (1 operator)**	**$3.09**
37	**CO cost per animal (1 operator) *without tranquilizer***	**$2.77**