

Bag Bans: Wrong Way To Control Litter

BAG BANS CREATE A LARGER NEGATIVE ENVIRONMENTAL IMPACT, COST A FORTUNE, AND HAVE A NEGLIGIBLE IMPACT ON LITTER

By Anthony van Leeuwen, 10 September 2013

Bag Bans provide a sense of accomplishment to public officials who believe that they have taken a giant step forward to making their community more attractive. Certainly, as time goes on, they see fewer plastic carryout bags in the environment bolstering that sense of accomplishment.

But like the proverbial ostrich, these officials have buried their head in the sand and failed to see that they took a step backward instead of forward. You see, these officials should have taken the time to understand that plastic bags make up only 0.6% of all litter, and that a bag ban would still leave the remaining 99.4% of litter waiting to be picked up! (Stein, 2012)

More importantly, had these officials done a cost benefit analysis and implemented one or more of the [recommendations](#) in this paper, they could have avoided the environmental and economic damage done to their communities and to their citizens by a bag ban! The impacts that could have been avoided are as follows:

- A [Greater Negative Environmental Impact](#) - due to changing carryout bag usage
- A [Greater Landfill Impact](#) - due to higher volume of material deposited Post Ban
- A [Greater Financial Cost To Local Jurisdictions](#) - to implement and administer the bag ban
- A [Greater Financial Cost to Residents](#) - due to out-of-pocket costs and the value of one's personal time

The above impacts could have been avoided by using traditional solutions to clean up litter. For example, by hiring people to clean up litter, not only would the 0.6% of plastic bag litter be cleaned up, but the other 99.4% of all litter could have been cleaned up too and at a far smaller financial outlay to the local jurisdictions. Not only would jobs have been created for the unemployed but a cleaner and more beautiful city would be the result.

Greater Negative Environmental Impact

The environmental impact for Santa Barbara and Ventura Counties is documented in the Beacon Single-Use Carryout Bag Ordinance Final Environmental Impact Report and summarized in Table 1 below. (BEACON, 2013)

Table 1 contains columns for Line number, Environmental Impact parameter, Units, Pre Ban value, Post Ban value, and the Delta or difference between Pre Ban and Post Ban values. Some environmental impact parameters are shown as Not Calculated (N/C) because they were not provided in the Chapter 4

of the BEACON EIR. All numeric values shown in Table 1 are directly from the BEACON EIR. (BEACON, 2013)

Table 1 shows that five (5) parameters that have a greater value Post Ban and that three (3) parameters have a lower value. For an overall higher Post Ban environmental impact!

Table 1. Environmental Impacts from BEACON EIR

Line	Environmental Impact	Units	Pre Ban	Post Ban	Delta
1	Ozone Emissions	kg	15,140	6,944	(8196)
2	Atmospheric Acidification	kg	713,534	469,227	(244,307)
3	Green House Gas Emissions:				
4	Per Year	Metric Tons	17,553	28,472	10919
5	Per Person	Metric Tons	0.0142	0.0230	0.0088
6	Water Consumption (Ecobilan Data)	Million gallons/year	14.23	N/C	N/C
7	Water Consumption (Boustead Data)	Million gallons/year	25.45	N/C	N/C
8	Water Consumption (Wash Reusable Bags)	Million gallons/year	0	153.3	153.3
9	Waste Water Generation (Ecobilan Data)	Million gallons/year	13.52	N/C	N/C
10	Solid Waste (Ecobilan Data)	Short tons	4,733	2137	(2596)
11	Solid Waste (Boustead Data)	Short tons	3000	4814	1814
12	Energy - Ecobilan	Million KWh/Day	N/C	N/C	N/C
14	Energy - Boustead	Million KWh/Day	N/C	N/C	N/C
15	Energy Consumption (Wash Reusable Bags)	Million KWh/Year	0	9.94	9.94

While some of the missing information was located in Appendix E of the BEACON EIR, the information was not included in Table 1, because of other discrepancies that were discovered. In fact, in Appendix A the author recreated the spreadsheet to calculate the missing environmental parameters and to correct several numeric values. These discrepancies were found after the public comment period and therefore not included in the authors public comments in the Final BEACON EIR. The BEACON EIR and EIRs from the Counties of San Mateo and Los Angeles and the City of Los Angeles were consulted to develop Appendix A. This data is shown in Table 2, titled “Corrected Table of Environmental Impacts”.

Table 2. Corrected Table of Environmental Impacts

Line	Environmental Impact	Units	Pre Ban	Post Ban	Delta
1	Ozone Emissions	kg	15,140	6,944	(8196)
2	Atmospheric Acidification	kg	713,534	469,227	(244,307)
3	Green House Gas Emissions:				
4	Per Year	Metric Tons	17,553	28,472	10919
5	Per Person	Metric Tons	0.0142	0.0230	0.0088
6	Water Consumption (Ecobilan Data)	Million gallons/year	14.23	22.47	8.24
7	Water Consumption (Boustead Data)	Million gallons/year	25.45	199.53	174.08
8	Water Consumption (Wash Reusable Bags)	Million gallons/year	0	153.3	153.3
9	Waste Water Generation (Ecobilan Data)	Million gallons/year	13.52	17.41	3.89
10	Solid Waste (Ecobilan Data) w/recycling	Short tons	4,730.39	1442.46	(3287.93)
11	Solid Waste (Boustead Data)	Short tons	2902.34	4716.31	1813.97
12	Energy - Ecobilan	Million KWh/Day	0.22	0.12	(0.10)
14	Energy - Boustead	Million KWh/Day	0.25	0.40	0.15
15	Energy Consumption (Wash Reusable Bags)	Million KWh/Year	0	9.94	9.94
16	Eutrophication - Ecobilan	Kg Phosphate/Year	204.4	880.05	675.65

Table 2 is similar to Table 1 and includes the omitted information. In some cases the values are slightly different due to several corrections that were made. One environmental parameter not calculated in the BEACON EIR is Eutrophication. Eutrophication is the pollution of water by nitrates and phosphates which causes algae blooms. This parameter was added in Line 16 of Table 2.

Note that the Delta column shows a total of ten (10) environmental parameters that are greater and four (4) that are smaller Post Ban. It should be noted that these impacts occur both inside and outside the study area and are measured over the complete life cycle of carryout bags. These impacts will last as long as a plastic bag ban is in place. It should also be noted, that the values Pre Ban are much lower overall than the values Post Ban!

Greater Landfill Impact

The BEACON EIR evaluates the generation of solid waste from carryout bags using Ecobilan and Boustead methodologies. It should be noted that Ecobilan methodology predicts a decrease of 3,287.93 tons and Boustead predicts an increase of 1814 tons. It should be noted that only the Ecobilan methodology includes solid waste from reusable bags, while Boustead does not. The value of solid waste attributed to reusable bags calculated in Ecobilan data in the BEACON EIR is wrong as asserted by the author. (BEACON, 2013, p. 8-25) The BEACON EIR shows only 150 lbs. or about 353 reusable bags of solid waste for the two county area per year. It would take more than 20,000 years to dispose of the more than 8 million reusable bags. Therefore, neither the Ecobilan and Boustead methodologies predict reasonable values for quantities of material going to the landfill.

In a paper titled “FACT SHEET – LANDFILL IMPACTS” the author calculates the amount of material going to the landfill Pre Ban and Post Ban. This data is summarized in Table 3 below and shows that the amount of material going to the landfill Post Ban is more than four times as much.

Table 3. Independent Analysis of Landfill Impacts

	Quantity	Weight per bag (lbs.)	Weight (lbs.)	Weight (tons)
Pre-Ban				
Plastic Carryout Bags	639,152,405	0.01213	7,752,918.68	3,876.46
Post Ban				
Plastic Carryout Bags	32,912,070	0.01213	399,223.41	199.61
Reusable Bags	8,228,018	0.42500	3,496,907.84	1,748.45
Paper Bags	156,003,213	0.14875	23,205,477.97	11,602.74
Replacement Bags	263,296,562	0.01213	3,193,787.30	1,596.89
Other Plastic (Ventura County)	14,507,641	0.140708	2,041,341.09	1,020.67
Total Post Ban				16,168.37
Post Ban /Pre Ban Ratio				4.17

In Table 3, the weight of material is calculated from the quantities of plastic, paper, and reusable bags, adjusted for recycling and multiplied by the average weight of each bag to produce the total contribution of each bag to the landfill. For further information, the reader is referred to the author’s original article. (van Leeuwen, Fact Sheet - Landfill Impacts LASBVTA, 2013)

Greater Financial Cost to Local Jurisdictions

The Local Jurisdiction incurs a onetime implementation cost and also annual recurring costs to administer the ordinance. Onetime implementation costs include all those costs to roll out a new program, including educating local businesses and the public about the ordinance and may include promotions such as reusable bag giveaways. Recurring annual costs include the cost of staff time to collect and analyze retailer reports, prepare reports for the city council or board of supervisors, make store inspections, and handle complaints by citizens and investigate reported allegations of non-compliance by retail stores. Collectively the local jurisdictions in Santa Barbara and Ventura Counties are estimated to spend more than a million dollars or two to implement bag bans and hundreds of thousands of taxpayer dollars to administer the ordinances on an annual basis.

In addition, under the Federal Clean Water Act, many communities are required to install trash capture devices in storm drain inlets, catch basins, and outfalls to trap trash, including plastic bags, to prevent trash from entering creeks and rivers and making its way to the ocean. Communities are already spending hundreds of thousands of dollars to do this. By doing this, communities will prevent plastic debris from reaching the ocean and coastal areas and causing harm to wildlife.

Greater Financial Cost to Residents

In a previous article titled *“Plastic Bag Alternatives Much More Costly to Consumers”* the authors analyze the annual cost per household of different bag alternatives. Not only are out of pocket costs estimated but also the value of one’s personal time to handle bags and wash reusable bags is estimated and monetized at \$12 per hour or about half of the California Average Labor Rate. (van Leeuwen & Williams, *Plastic Bag Alternatives Much More Costly to Consumers*, 2013) These costs are summarized in Table 4 below:

Table 4, Cost of Different Bag Alternatives

Bag Type	Option	Annual Cost
plastic	Store Provided	\$ 20.80
plastic	Self-Purchased	\$ 45.80
Paper	Store Provided at 10-cents each	\$ 78.00
Paper	Store Provided at 25-cents each	\$ 195.00
Reusable	Durable Machine Washable Bags	\$ 262.00
Reusable	Cheap Hand Washable Bags	\$ 300.00

As can be seen from Table 4, above, the cost of store provided plastic bags is much lower than self-purchased plastic bags, store provided paper bags, or reusable bags.

In a follow on article titled “What Will A Plastic Carryout Bag Ban Cost Your Community?” the author calculates the cost of carryout bags to residents of local jurisdictions in Santa Barbara and Ventura Counties Pre Ban and Post Ban. These results are summarized in Table 5.

Table 5 shows the total annual Pre Ban cost of **\$19,353,989.34** and a total annual Post Ban cost of **\$48,911,699.31** for a net increase of **\$29,557,709.97**. However, some people are already using reusable bags, and because it is doubtful and highly unlikely that retail prices will be reduced after a bag ban, therefore the **Pre Ban Total Reusable Bag Cost** of \$12.6 million (see original article) should be subtracted from the **Post Ban Total Cost** of \$48.9 million for a **Total Post Ban Net Increase of \$36.3 million**. (van Leeuwen, What Will A Plastic Carrout Bag Ban Cost Your Community, 2013)

Table 5. Cost to Residents in Santa Barbara and Ventura Counties

Area	Public Cost Pre Ban	Public Cost Post Ban	Public Cost Delta
Santa Barbara County			
Unincorporated Areas	\$ 2,083,899.77	\$ 5,266,463.52	\$ 3,182,563.75
Buelton	\$ 74,423.35	\$ 188,083.84	\$ 113,660.49
Carpenteria*	\$ 200,467.10	\$ 506,623.53	\$ 306,156.43
Goleta	\$ 458,538.45	\$ 1,158,825.41	\$ 700,286.96
Guadalupe	\$ 108,658.40	\$ 274,603.18	\$ 165,944.78
Lompoc	\$ 653,939.92	\$ 1,652,647.02	\$ 998,707.10
Santa Barbara	\$ 1,372,478.02	\$ 3,468,547.56	\$ 2,096,069.53
Santa Maria	\$ 1,535,083.02	\$ 3,879,485.41	\$ 2,344,402.39
Solvang	\$ 80,988.77	\$ 204,676.06	\$ 123,687.29
Total Santa Barbara County	\$ 6,568,476.80	\$ 16,599,955.52	\$ 10,031,478.72
Ventura County			
Unincorporated Areas	\$ 1,477,662.42	\$ 3,734,371.17	\$ 2,256,708.75
Camarillo	\$ 1,016,614.11	\$ 2,569,202.81	\$ 1,552,588.70
Fillmore	\$ 232,238.20	\$ 586,915.95	\$ 354,677.75
Moorpark	\$ 534,170.82	\$ 1,349,964.70	\$ 815,793.88
Ojai*	\$ 115,514.59	\$ 291,930.25	\$ 176,415.66
Oxnard	\$ 3,073,884.92	\$ 7,768,369.21	\$ 4,694,484.29
Port Hueneme	\$ 337,055.30	\$ 851,811.32	\$ 514,756.03
Santa Paula	\$ 458,400.71	\$ 1,158,477.32	\$ 700,076.61
Simi Valley	\$ 1,921,539.63	\$ 4,856,144.49	\$ 2,934,604.86
Thousand Oaks	\$ 1,961,100.47	\$ 4,956,123.25	\$ 2,995,022.78
Ventura	\$ 1,657,331.38	\$ 4,188,433.32	\$ 2,531,101.95
Total Ventura County	\$ 12,785,512.54	\$ 32,311,743.80	\$ 19,526,231.25
Total	\$ 19,353,989.34	\$ 48,911,699.31	\$ 29,557,709.97

Recommendations

Since plastic bag litter is only about 0.6% of all litter, officials should consider some or all of the following solutions that avoid the negative environmental and economic impacts discussed above:

- Create jobs and hire more people to clean up all litter
- Improve street sweeping in problem areas

- Require more frequent cleaning of retail parking lots
- Empty trash receptacles in public areas on weekends to prevent overflowing
- Install trash capture devices in storm drain inlets, catch basins, and outfalls
- Require residents to bag trash that could become airborne litter during hauling
- Making sure that trash and recycle trucks are fully enclosed when driving on major roadways
- Require stores to provide a paper bag to people who buy only snacks that are consumed outside the store which results in the majority of plastic bag trash
- Continue to use volunteer groups to clean up litter
- Make litter cleanup a community service for teens, adults, and lawbreakers

The above solutions are simple, effective, and will assist in maintaining a clean and beautiful community. These solution will avoid the greater negative environmental impact, the greater amount of material deposited in the landfill, the expenditure of public funds to implement and sustain a bag ban, and the increased financial cost to residents.

Conclusion

Using a bag ban to reduce plastic carryout bag litter is clearly the wrong solution to the litter problem. By using a bag ban instead of traditional methods to eliminate litter, unavoidable consequences occur including a greater negative impact to the environment, more material will go to landfills, local jurisdictions will incur one time and recurring annual costs, and residents of Santa Barbara and Ventura counties will incur annual costs of \$36.3 million. And all for cleaning up less than 0.6% of litter.

The other 99.4% of litter still needs to be cleaned up. Hiring a few unemployed people to clean up litter in the community is a far more cost effective solution to cleaning up plastic bag litter.

Public Officials, are encouraged to put the issue of bag bans to a vote of the people. Don't shove it down the throats of the people like what happened with Obama Care.

About The Author

Anthony van Leeuwen is the founder of the [Fight The Plastic Bag Ban](#) website and writes extensively on the subject. He holds a bachelors and Master's degree in Electronics Engineering and has over 40 years of experience working in the federal government.

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Appendix A - Attached

Conversions	
liters to gallons	0.26417205
Kg to short tons	0.00110231
MJ to kWh	0.27777778

2007 Recycle Rate	
plastic bags	11.90%
paper bags	36.80%

Plastic Bag Size (liters)	14
Paper Bag Size (liters)	20.48
Reusable Bag Size (liters)	37
Number of plastic bags used in participating jurisdictions per year	658,241,406
Number of plastic bags used in participating jurisdictions per day	1,803,401

9000 Liters of Groceries - # of bags	
Plastic	643
paper	439
Reusable	243

Ordinance - Assume 95% switch to paper and Reusable Bags	Per Day	Per Year
Number of Plastic bags still in (5% of existing)	90,170	32,912,070
Number of Paper Bags per day with 30% conversion	541,020	197,472,422
Number of Reusable Bags per day with 65% conversion	22,543	8,228,018

Eutrophication - Ecobilan	Existing Plastic Bag Use	Proposed Plastic bag Use (5%)	Proposed Paper Bag Use	Proposed Reusable Bag Use
Grams phosphate per 9000 liters groceries	0.2	0.2	2.35	0.55
Grams phosphate per bag	0.00031	0.00031	0.00535	0.00226
Grams phosphate per day	561.06	28.05	2,893.14	50.97
Kilograms phosphate per day	0.56	0.03	2.89	0.05
Proposed phosphate per day (Kg)	2.97			
Increase in phosphate per day (Kg)	2.41			
Increase as a result of Ordinance - Kilograms Phosphate per year	880.05			

Eutrophication was added based on other EIRs

Water Use - Ecobilan	Existing Plastic Bag Use	Proposed Plastic bag Use (5%)	Proposed Paper Bag Use	Proposed Reusable Bag Use
Liters water per 9000 liters groceries	52.6	52.6	173	137
Liters water per bag per day	0.08182	0.08182	0.39367	0.56322
Liters water per day	147,558.29	7,377.91	212,984.08	12,696.44
Gallons per day	38,980.78	1,949.04	56,264.44	3,354.05
Millions gallons per day (MGD)	0.0390	0.0019	0.0563	0.0034
Millions gallons per year	14.23	0.71	20.54	1.22
Proposed Water Use. Millions gallons per year	22.47			
Increase - Million gallons per year	8.24			

Water Use - Washing Reusable Bags	Hand Washing Reusable Bags	Machine Washing Reusable Bags
# of Reusable Bags - Machine Washed (50%)	4,114,009	4,114,009
Number of times washed per year (Monthly)	12	12
# of Bags per Wash Load		19
# Loads per Year		2,598,321
Gallons of Water per Wash Load	1	40
Total Water Use (gallons per year)	49,368,105	103,932,854
Total Water Use (gallons per year)	153,300,959	
Total Water Use Million Gallons per Year	153.30	

Energy Use - Washing Reusable Bags	Hand Washing Reusable Bags	Machine Washing Reusable Bags
# of Reusable Bags - Machine Washed (50%)	4,114,008.79	4,114,008.79
Number of times washed per year (Monthly)	12	12
# of Bags per Wash Load		19
# Loads per Year		2,598,321
Electricity Use per Wash Load (KWh)		3.825
Electricity Use (KWh) per year		9,938,579
Electricity Use (KWh) per year	9,938,579	
Millions of KWh per year	9.94	

Wastewater - Ecobilan	Existing Plastic Bag Use	Proposed Plastic bag Use (5%)	Proposed Paper Bag Use	Proposed Reusable Bag Use
Liters wastewater per 9000 liters groceries	50.00	50.00	130.7	136.614
Liters wastewater per bag per day	0.078	0.078	0.297	0.562
Liters wastewater per day	140,264.53	7,013.23	160,907.62	12,660.67
Gallons per day	37,053.97	1,852.70	42,507.30	3,344.60
Millions gallons per day	0.0371	0.0019	0.0425	0.003
Millions gallons per year	13.52	0.68	15.52	1.22
Proposed wastewater. Millions gallons per year	17.41			
Increase of wastewater per Day (MGD)	0.011			
Increase of wastewater. Millions gallons per Year	3.89			

Solid Waste - Ecobilan (w/EPA recycling)	Existing Plastic Bag Use	Proposed Plastic bag Use (5%)	Proposed Paper Bag Use	Proposed Reusable Bag Use
Kg waste per 9000 liters groceries (w/EPA recycling)	4.19	4.19	2.42	0.24
Kg waste per bag per day	0.007	0.007	0.005	0.001
Kg waste per day	11,757.09	587.85	2,974.75	22.54
Tons per day	12.96	0.65	3.28	0.02
Tons per year	4,730.39	236.52	1,196.87	9.070
Proposed waste (w/EPA recycling)	1,442.46			
Increase waste. Tons per Year	(3,287.93)			

Solid Waste - Ecobilan	Existing Plastic Bag Use	Proposed Plastic bag Use (5%)	Proposed Paper Bag Use	Proposed Reusable Bag Use
Kg waste per 9000 liters groceries (No Recycling)	4.76	4.76	3.82	0.24
Kg waste per bag per day	0.007	0.007	0.009	0.001
Kg waste per day	13,345.17	667.26	4,706.88	22.54
Tons per day	14.71	0.74	5.19	0.02
Tons per year	5,369.34	268.47	1,893.78	9.070
Proposed waste. Tons per Year	2,171.32			
Increase waste. Tons per Year. (No Recycling)	(3,198.02)			

Energy - Ecobilan	Existing Plastic Bag Use	Proposed Plastic bag Use (5%)	Proposed Paper Bag Use	Proposed Reusable Bag Use
MJ Energy per 9000 liters groceries	286.00	286.00	295.00	268.33
MJ Energy per bag per day	0.445	0.445	0.671	1.103
MJ Energy per day	802,313.12	40,115.66	363,180.94	24,867.42
KWh per day	222,864.76	11,143.24	100,883.59	6,907.62
Millions KWh per year	0.22	0.01	0.10	0.01
Proposed Energy. Millions KWh per year	0.12			
Increase in Energy. Millions KWh per year	(0.10)			
Increase in Energy. KWh per day	(103,930.31)			

Water Use - Boustead	Existing Plastic Bag Use	Proposed Plastic bag Use (5%)	Proposed Paper Bag Use
Gallons per 1000 paper bags (1500 plastic bags)	58	58	1004
Gallons of water per bag per day	0.03867	0.03867	1.00400
Gallons of water per day	69,731.51	3,486.58	543,184.42
Millions gallons per day	0.0697	0.0035	0.5432
Millions gallons per year	25.45	1.27	198.26
Proposed Water use per year	199.53		
Proposed Increase in Water use per year	174.08		
Increase water use - Millions of gallons per Day	0.48		

Solid Waste - Boustead	Existing Plastic Bag Use	Proposed Plastic bag Use (5%)	Proposed Paper Bag Use
Kg waste per 1000 paper bags (1500 plastic bags)	6.00	6.00	21.00
Kg waste per bag per day	0.004	0.004	0.021
Kg waste per day	7,213.60	360.68	11,361.43
Tons per day	7.95	0.40	12.52
Tons per year	2,902.34	145.12	4,571.19
Proposed solid waste per Year. Tons per year	4,716.31		
Increase in solid waste per Year. Tons per year	1,813.97		
Increase as a result of ordinance. Tons per day	4.97		

Energy - Boustead	Existing Plastic Bag Use	Proposed Plastic bag Use (5%)	Proposed Paper Bag Use
MJ Energy per 1000 paper bags (1500 plastic bags)	763.00	763.00	2622.00
MJ Energy per bag per day	0.509	0.509	2.622
MJ Energy per day	917,330.03	45,866.50	1,418,555.31
KWh per day	254,813.90	12,740.69	394,043.15
Millions KWh per day	0.25	0.01	0.39
Proposed Energy. Millions KWh per day	0.41		
Increase in Energy. Millions KWh per day	0.15		
Increase in KWh per day	151,969.94		

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