WHY NOT TO BAN PLASTIC CARRY OUT BAGS

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INTRODUCTION

Banning plastic carry out bags is a powerful symbolic political act that creates an image that the city, county, or state is "Green" and environmentally friendly. But that image is **FALSE** because plastic bag bans do more to harm the environment than any marginal environmental benefits produced. Proponents often ignore the science and overlook more substantive solutions in dealing with the problem of plastic bags rather than making an honest effort to look at and weigh the issues involved.[1]

Plastic bag bans have been imposed in a number of different localities based upon misinformation and faulty reasoning. In this paper we will explore the common misconceptions and faulty reasoning often cited by proponents of plastic bag bans and cited in Environmental Impact Reports (EIRs).

We also examine current efforts to recycle plastic carry out bags and the impact upon recycling programs in the event a ban takes effect. We make an alternative suggestion to improve recycling efforts from a passive to an active program.

We also end this paper with recommendations to alleviate a number of problems with plastic carry out bags, solutions that are long term and more substantive than just banning a single item.

PLASTIC BAG FALSELY GIVEN BAD RAP

The plastic carry out bag has been given a bad rap because of misinformation. With the internet the propagation of bad information or myths are almost impossible to stop. For example, the plastic carry out bag is widely believed to have caused the death of 100,000 marine mammals and a million seabirds as a result of ingesting plastic bags. However, the allegation is untrue and was based on a Canadian study that stated the deaths were a result from discarded fishing nets and fishing tackle and not plastic bags or plastic debris.[2]

In an article published in The Times of London on March 8, 2008 entitled "Series of blunders turned the plastic bag into global villain". The Times found that the allegation that plastic bags kill 100,000 animals and a million seabirds is false. The report stated:

"The central claim of campaigners is that the bags kill more than 100,000 marine mammals and one million seabirds every year. However, this figure is based on a misinterpretation of a 1987 Canadian study in Newfoundland, which found that, between 1981 and 1984, more than 100,000 marine mammals, including birds, were killed by discarded nets. The Canadian study did not mention plastic bags."

"Fifteen years later in 2002, when the Australian Government commissioned a report into the effects of plastic bags, its authors misquoted the Newfoundland study, mistakenly attributing the deaths to "plastic bags".

"The figure was latched on to by conservationists as proof that the bags were killers. For four years the "typo" remained uncorrected. It was only in 2006 that the authors altered the report by replacing plastic bags with "plastic debris". But they admitted: "The actual numbers of animals killed annually by plastic bag litter is nearly impossible to determine."

"In a postscript to the correction they admitted that the original Canadian study had referred to fishing tackle, not plastic debris, as the threat to the marine environment."

"Regardless, the erroneous claim has become the keystone of a widening campaign to demonize plastic bags."

"David Santillo, a marine biologist at Greenpeace, told The Times that bad science was undermining the [British] Government's case for banning the bags. "It's very unlikely that many animals are killed by plastic bags," he said. "The evidence shows just the opposite. We are not going to solve the problem of waste by focusing on plastic bags."

The United Nations has also identified discarded fishing nets[3] and fishing gear as a major contributor to marine litter even to the point of documenting this problem in a separate publication.[4] This document shows that discarded fishing nets and fishing gear are responsible for ghost fishing and entanglement of marine fauna and harming fragile organisms like sponges and corals.

The Environmental Protection Agency in a document titled "Marine Debris in the North Pacific" published in November 2011 also identified that "derelict fishing gear, including monofilament line, trawl nets, and gill nets" as "one of the greatest threats to marine life and sea birds." The document further identifies that marine debris entanglements have been documented for 135 species of invertebrates, fish, seabirds, sea turtles, seals, sea lions, dolphins, and whales. These species experience both injury and death.[5]

The Hawaiian monk seal is endemic to the Hawaiian Islands and inhabit the waters surrounding atolls, islands, reefs, and submerged banks are often entangled in derelict fishing gear resulting in injuries and even death.[6]

Sea Turtles found in the Pacific Ocean have also been known to get entangled in derelict fishing gear resulting in deaths, gangrenous flippers, and need for human intervention to free animals.[7]

Recently in July 2012 a National Oceanic & Atmospheric Administration (NOAA) ship and crew conducted a marine debris cleanup at the Papahanaumokuakea Marine National Monument and World Heritage Site. A total of 50 metric tons of marine debris was removed of which about half

was derelict or discarded fishing nets and fishing gear and the other half was plastic debris.[8] Some of the pictures on their website show turtles caught in fishing nets.

While plastic bags could entangle some wildlife, the real problem with entanglement is discarded fishing nets and gear and not plastic bags.

INGESTION OF PLASTIC BAGS AND PLASTIC DEBRIS

Ingestion of plastic debris by seabirds, fish, sea turtles, and other marine mammals has been well documented over the years. In addition predatory mammals such as fur seals may consume plastic debris indirectly through consumption of fish or other prey.

Ingestion of plastic debris results in internal and external wounds impairs feeding capacity due to buildup or blockage of the digestive system, decreased mobility, reduced body weight, reduced fat deposits, and reduced reproductive capacity.[9]

FIGURE 1 BIRD CARCASS SHOWING PLASTIC OBJECTS

For example, in Figure 1, you will see a photo of a bird carcass that has swallowed plastic objects.[10]

Notice that this bird swallowed a lot of bottle caps and shards of plastic and other plastic debris including rocks but no plastic bags are visible. It should be obvious from this picture that the problem with plastics extends beyond plastic bags and includes all sorts of plastic debris that floats in the ocean or exists as litter on land.

Sea turtles are said to readily ingest plastic bags and other plastic debris that appear similar to gelatinous prey. Whales and other marine mammals have also been known to ingest plastic bags.

Ingestion of plastic debris is generally thought to occur because the marine debris is mistaken for prey. Plastic debris is also known to be passed to the chicks in regurgitated food from their parents.[11]

But perhaps the fact that that many birds swallow rocks to aid digestion (see rocks in Figure 1) may explain why they swallow plastic objects.

> *"Humans and other mammals have a mouth with teeth to grind up food. Birds, on the other hand, have a gizzard. It is a muscular organ that contracts to grind up food. Birds eat sand and other grit to help the gizzard grind up food."*[12]

Then you have a video of a sea gull swallowing a plastic bag[13] that moments earlier had held fast food, and after the food was eaten by the sea gull the bag was eaten and swallowed. It is well known that plastic bags and film that wrap food items will attract animals that because of the smell will eat the food waste and sometimes including the plastic film wrapper.[14]

Sea gulls are known scavengers. According to Ventura school teachers, sea gulls know when it is nutrition break and when lunch time occurs, so they can pounce on the trash once kids go back inside. Custodians have to immediately remove trash from trash cans to prevent feeding frenzies by sea gulls. At one lucky Ventura school, a nearby flock of crows keeps the sea gulls at bay.

The examples and the discussion above demonstrate that the problem of harm to wildlife extends beyond plastic bags to plastic debris of all sorts. **Banning plastic carry out bags will not prevent further harm to birds and animals. Only a comprehensive solution to keep plastic debris and litter out of the ocean and out of the environment can prevent harm to wildlife.** Although harm to animal life due to the unintended consequences of plastic litter is tragic, harm to wildlife occurs in many areas that have nothing to do with plastic litter.

For example, the U.S. Fish and Wildlife Service currently issues permits to kill bald eagles, the national bird of the United States! Current law allows permitting for "programmatic" killing of bald eagles that is incidental to an otherwise lawful activity, such as mortalities caused by collisions with rotating wind turbines. Without a permit, the killing of a bald eagle is a federal crime.[15] Another example is the killing of golden eagles at California's Altamont Pass:

> *"Last June, the Los Angeles Times reported that about 70 golden eagles are being killed per year by the wind turbines at Altamont Pass, about 20 miles east of Oakland, Calif. A 2008 study funded by the Alameda County Community Development Agency estimated that about 2,400 raptors, including burrowing owls, American kestrels, and red-tailed hawks—as well as about 7,500 other birds, nearly all of which are protected under the Migratory Bird Treaty Act—are being killed every year by the turbines at Altamont."*[16]

For example, in Ventura County during the last fiscal year (2010-2011) a total of 2812 dead animals were impounded by the animal shelter.[17] Most of these are a result of tragically being hit by a moving vehicle yet we don't ban automobiles and trucks. The U.S. Fish and Wildlife Service reports that millions of birds are killed annually by a variety of means, e.g. by flying into windows, struck by wind turbine blades, cars, airplanes, etc.[18] Yet we do not ban any of these.

Fumigation and Pest control companies kill millions of termites, ants, other insects and rodents each year.

Therefore harm to wildlife is not a valid reason to ban the plastic carry out bag.

THE PACIFIC GARBAGE PATCH MYTH

The Pacific Garbage Patch is often stated to be twice the size of Texas and it is neither a patch nor a huge mass of plastic debris floating in the ocean. Angel White, an assistant professor of oceanography at Oregon State University states that the patch is more of an ocean of plastic soup consisting of small bits of plastic floating just beneath the surface.[19] **In other words, the garbage patch consists of small bits of plastic that float beneath the surface and does not consist of millions of plastic carry out bags, as proponents of plastic bag bans would have you believe.**

Quoting from an article entitled "Oceanic Plastic Trash Troubling Enough without Exaggeration" published in 2011:[20]

> *"Angel White, an assistant professor of oceanography at Oregon State, says claims that the patch has been growing tenfold each decade since the 1950s and that the oceans are filled with more plastic than plankton are "grossly exaggerated."*
>
> *"There is no doubt that the amount of plastic in the world's oceans is troubling, but this kind of exaggeration undermines the credibility of scientists," White said Tuesday.*
>
> *"If you look at the actual area of the plastic itself, rather than the entire North Pacific Gyre in which it cycles, the "cohesive" plastic patch is actually less than one percent of the geographic size of Texas, White says."*
>
> *"The amount of plastic out there isn't trivial," White said. "But using the highest concentrations ever reported by scientists produces a patch that is a small fraction of the state of Texas, not twice the size."*
>
> *"One recent claim that the Great Pacific Garbage Patch is as deep as the Golden Gate Bridge is tall is completely unfounded, White said."*
>
> *"If there is a takeaway message, it's that we should consider it good news that the garbage patch doesn't seem to be as bad as advertised," White said, "but since it would be prohibitively costly to remove the plastic, we need to focus our efforts on preventing more trash from fouling our oceans in the first place."*

Most of us can agree with Angel White that our focus needs to be on preventing more trash from fouling our oceans, rivers, roadways, wilderness areas and our communities and preserving our natural resources for future generations. **We do this not by banning a single product but by effective and comprehensive litter control and removal programs as we shall see below.**

PLASTIC BAGS ARE MADE FROM OIL MYTH

Domestically produced plastic bags are **not** made out of oil. About 72.5% of plastic bags used are made in the United States. Plastic bags are made out of polyethylene. Ethylene is made from ethane which is a waste by-product from refining natural gas[21] and oil[22].

Ethane must be removed from the natural gas in order to lower the BTU value of the natural gas to an acceptable level before it is delivered to homes and businesses for fuel. Ethane burns too hot if allowed to remain in natural gas and if not used to make plastic (ethylene) it will have to be burned off, resulting in greenhouse gas emissions.[23] By converting ethane into plastic greenhouse gas emissions are reduced.

"Using the ethane to make plastic does not in any way reduce the amount of fuel available for transportation or power generation or increase our energy imports."[24]

PLASTIC CARRY OUT BAG DEMONIZED BY BAN PROPONENTS

Proponents of banning the plastic carry out bag have demonized it by calling it a "single-use" plastic bag as part of a propaganda campaign. The real "single-use" bag is the plastic trash bag. Once the trash bag is used for its primary purpose to hold trash, it is never reused for any other purpose. The plastic carry out bag, on the other hand, once used for its primary purpose to carry purchases home, has a large number of secondary uses. Hence, this bag is really a multi-use bag. The reusable bag is also a multiuse bag but more durable. To call the plastic carry out bag a "single-use bag" is intellectually dishonest.

Table 1. Graphical Representation of Bag Types

Bag Type	Primary Use	Secondary Use	Bag Type
Black Trash Bag	Trash	None	Single-Use Bag
Kitchen Trash Bag	Trash	None	Single-Use Bag
Plastic Carry Out Bag	Carry Purchases Home	Waste bin liners Dog or cat litter Reuse for shopping Lunch bags Storage of household items General carry bags (i.e. gym or sports gear, picnic supplies, hold toys, wet clothes) Other uses	Multi-Use Bag

THE PLASTIC CARRY OUT BAG AS A NUISANCE

Litter is a nuisance. It doesn't matter what type of item it is, it is a nuisance. There is no magic bullet and no litter prevention or education program that will eliminate litter. It takes work to clean up litter. The plastic carry out bag has been much maligned because of its light weight and its ability to be carried by the wind until it catches on a fence, plant, shrub, bush, tree, rock outcropping, etc. These characteristics are often cited as a negative attribute and a reason to ban the bag; however, these same characteristics can also be considered in a positive light. Of all the types of plastic litter that floats in water and could find its way to the ocean the plastic carry out bag has lowest probability of reaching the ocean and the greatest opportunity of being removed from the environment through litter cleanup efforts.

LITTER

THE PLASTIC CARRY OUT BAG AS LITTER

The California 2008 Statewide Waste Characterization Study[25] identified that Plastic Grocery and Other Merchandise Bags make up only 0.3% of the total waste stream. Of which only 0.13% are grocery store bags. A California 2006 Action Plan[26] identified that bags comprise 3.8% of beach litter. Similarly a study to "Reduce and Prevent Ocean Litter" identified that plastic bags of all types make up about 8% of all litter[27]. Of all marine debris, 80% comes from land-based sources and is conveyed to the oceans via urban runoff through storm drains according to the Plastic Debris Rivers to Sea website[28].

A document called "Municipal Best Management Practices for Controlling Trash and Debris in Storm Water and Urban Runoff" identifies the **Total Maximum Daily Loads** program to reduce the amount of litter by 10% per year for 10 years.[29] The document further describes that Full Capture Devices commonly called "trash screens" or "trash excluders" or "rubbish traps" that must be installed on storm drains to capture litter larger than 5 mm. **These devices are being installed in Ventura County storm drains, and will prevent plastic bags, other plastic debris, and litter from being released into the riverbed and out into the ocean.**

PLASTIC CARRY OUT BAGS IN STORM DRAIN TRAPS

Another reason often cited for banning the plastic carry out bag is that storm drain rubbish traps contain a large proportion of plastic bags and must be cleaned out on a regular basis. This is good news! Storm drain traps are designed to keep plastic carry out bags and other plastic debris and other litter from flowing into the river and out into the ocean. **Storm drain rubbish traps or trash excluders are part of a comprehensive solution to keep plastic bags and plastic debris out of the river and ocean. The fact that storm drain rubbish traps contain a large proportion of plastic bags and other plastic debris and that storm drain traps must be cleaned out on a regular basis is not a valid reason to ban the plastic carry out bag.**

PLASTIC CARRY OUT BAGS DO NOT CAUSE FLOODING

Proponents of the Plastic Carry Out Bag Ban often cite that plastic bags trapped in storm drains can cause major flooding. Most often cited is the severe flooding in Bangladesh that put most of the country underwater. A careful examination of the issue will show that other factors are responsible.

Bangladesh is small country with 75% of the country less than 30 feet above sea level and 80% of the country is a giant flood plain or delta. Bangladesh is called a land of rivers as it has about 700 rivers including tributaries.[30] In addition, Bangladesh has five (5) major river systems flowing through the country[31] that are considered among the world's largest.[32] The catchment basin for the Bengali rivers is located in neighboring countries and is half the size of the Mississippi River catch basin with four times the annual rainfall. During the annual monsoon season from June to September the country is at risk of flooding because the volume of water transported by the river system increases by a factor of 20 to 140,000 cubic meters per second[33] [4,944,053 cubic feet per second or 113.5 acre feet per second]. During the normal monsoon season only about 18% of the country is flooded bringing with it fresh deposits of rich silt to replenish the fertile but overworked soil.[34] The volume of silt carried by the rivers into the Bay of Bengal each year is approximately 2.4 billion tons and builds new land along the sea front.[35] Thus, this great river system is not only the country's principal resource and it is also its greatest hazard.

The population of Bangladesh has been estimated to be between 158 and 170 million people. The nation is considered the world's 8th most populous nation[36] and 11th in population density.[37] While Bangladesh boast of being the world's fourth largest clothing exporter it also is one world's largest producers of rice, potatoes, mangos, pineapple, onions, bananas, jute and tea.[38] Most of Bangladesh's population continues to live on subsistence farming in rural villages[39] with health and education levels remaining relatively low.[40]

About three decades ago, polyethylene shopping bags were introduced in Bangladesh and rapidly replaced the traditional cloth jute bag. Environmental groups estimated that 9 million plastic bags were dumped daily in the city with only about 10% being dumped into rubbish bins. Over time these castaway plastic bags ended up clogging up drains and sewers.[41]

In 1989 a catastrophic flood occurred that inundated two-thirds of the country. Again in 1998 a catastrophic flood occurred that inundated about three-quarters of the country. A combination of heavy rainfall within and outside the country and synchronization of peak flows of the major rivers contributed to the flooding. Both floods caused severe damage and loss of life. Environmentalists and urban planners blamed plastic bags for exacerbating the flooding in 1989 and 1998. The flooding was blamed upon plastic carry out bags that had blocked drains and sewers.[42]

In 2002 plastic carry out bags were banned. But cities still flooded year after year with water covering roadways and coming into houses.[43] Despite an awareness program warning of a steep fine and six months of imprisonment, after about a year the plastic bags began to flood the market again due to a lack of enforcement.[44]

In many areas of Bangladesh people live in slum like conditions. Trash is deposited in makeshift dumps, along the road and in drainage ditches. Drainage ditches and canals are filled with trash. Less than 50% of all waste in urban areas is collected and disposed of in landfills.[45]

While plastic bags may have been a contributing factor to acerbate flooding the following are some observations:

1. Less than 50% or urban waste is collected and disposed of.
2. Trash is dumped in open areas, streets, and makeshift dumps.
3. Low-lying areas, drains and canals are clogged with waste including plastic bags.
4. Storm sewer systems are substandard and are not maintained.
5. Flooding is an annual problem and is not caused by plastic bags.

Comparing the flooding problems in Bangladesh or other Asian countries as a result of monsoon rains and a substandard and unmaintained infrastructure is simply not applicable to the situation in this country.

In both Ventura and Santa Barbara Counties a substantial investment in infrastructure over many years has been made. Flood Control facilities are up to standard. 100% of trash is collected and disposed in well regulated landfills. Storm drains and/or flood control facilities are maintained on a regular schedule and trash is removed and disposed of. While in theory, a trash excluder or rubbish trap on a storm drain could become clogged by mostly plastic bags and result in flooding; such occurrences, if they occur are very infrequent and rare. It should be noted that Southern California is known for sunshine and that our rainfall totals in most years are below normal. Hence, flooding as a direct result of plastic bags is not a major concern and not a reason why plastic carry out bags should be banned.

PLASTIC CARRY OUT BAGS FLY OUT OF TRUCKS

Plastic bags as litter are <u>infrequently</u> seen in residential neighborhoods, but mostly along major roadways and freeways where trucks travel. The "California Department of Transportation Litter Abatement Plan" states:

> *"The most common means of litter on the highway results from trash and debris blowing from improperly covered or uncovered truckloads."*[46]

Similarly, the document "Litter in America, 2009 National Litter Research Findings and Recommendations" states:

> *"Trash and recycling collection vehicles have been found to be a source of litter. When improperly secured during collection and delivery to disposal facilities, these vehicles can contribute to the litter problem, particularly of smaller items. Developing a program in partnership with hauling stakeholders can help to reduce roadside litter."*[47]

The City of Los Angeles in their report to the Board of Supervisors titled "An Overview of Carryout Bags in Los Angeles County" stated:

> *"Communities within close proximity to landfills and other solid waste processing facilities are especially impacted as plastic carryout bags escape from trash trucks while traveling or emptying their loads. Although trucks and facilities are required to provide cover and fences, carryout bags manage to escape despite Best Management Practices (BMPs) including using roving patrols to pickup littered bags. …"*[48]

Similarly, the city of Pasadena in their study in preparation for a ban on plastic carry out bags makes the following anecdotal statement:

> *"The Arroyo Seco stream is especially vulnerable to plastic bags escaping from trash trucks traveling along the freeways bordering and crossing the Arroyo Seco en route to the Scholl Canyon Landfill."* [49]

Unfortunately, neither Los Angeles County nor the City of Pasadena identified what if any mitigation measures were taken to work with the trash haulers to modify the trucks to ensure no litter can become airborne and escape. **Doing so would have solved the problem with both plastic bags and other litter and negated the need for a ban on plastic carry out bags!**

The point is that Ventura County and the incorporated cities need to work with haulers to ensure that all loads are properly covered, including the trash and recycle trucks. If trucks need to be modified so be it. **Plastic carry out bags escaping from trucks is not a valid reason to ban the plastic carry out bag. Best Management Practices require that trucks be modified. Costs to modify trucks can be amortized and passed on to rate payers.**

PLASTIC BAGS FLY OUT OF TRASH RECEPTACLES

Uncovered trash receptacles in public areas are also a source of wind-blown plastic bags. The established solution is to ensure that public trash cans have covers and that trash is collected and disposed on a regular schedule. In addition, educate the public to tie the bag in a knot to prevent it from becoming windblown litter when disposing of an empty carry out bag.

LITTER REMOVAL COSTS

City, county, and state government spend millions of dollars every year to clean up litter. Since plastic carry out bags represent such a small percentage of the total litter stream, banning the plastic carry out bag will not result in an appreciable reduction in litter and therefore litter cleanup budgets cannot be reduced; hence, there will be No monetary savings. **Therefore, the argument that litter removal costs money is not a valid reason to ban the plastic carry out bag. The public pays taxes to have litter removed and disposed of.**

PLASTIC BAGS IN LANDFILLS

PLASTIC BAGS DO NOT DECOMPOSE IN LANDFILLS

Another reason often cited is that plastic carry out bags take hundreds of years or even thousands of years to decompose:

> *"For sanitary reasons, modern landfills are lined on the bottom with clay and plastic to keep waste from escaping into the soil and are covered daily with a layer of earth to reduce odor. The landfill, then, acts like a trash tomb—the garbage within receives little air, water, or sunlight. This means that even readily degradable waste objects, including paper and food scraps, are more likely to mummify than decompose."*[50]

A study of landfills sponsored by the University of Arizona found that the tightly compacted contents of landfills create low-oxygen environments that inhibit decomposition. The details of the study were published in the book, Rubbish: The Archaeology of Garbage (2001), which explains that:[51]

- "the dynamics of a landfill are very nearly the opposite of what most people think."
- landfills "are not vast composters; rather, they are vast mummifiers."
- "almost all the organic material" from the 1950s in a Phoenix landfill "remained readily identifiable: Pages from coloring books were still clearly that, onion parings were onion parings, carrot tops were carrot tops."
- "much of the organic material in an ancient Roman landfill that was twenty centuries old had not fully decomposed."

Because plastic bags do not decompose it means that they do not produce greenhouse gases during the decomposition process like paper bags will. **Hence, the fact that plastic carry out bags do not decompose in a landfill is not a valid reason to ban the plastic carry out bag.**

PLASTIC BAGS TAKE SPACE IN LANDFILLS

Another reason often cited is that plastic carry out bags take space in landfills. However, the proportion of plastic bags compared to other debris is so small that it is negligible. Nevertheless, plastic carry out bags not used to hold trash do not belong in a landfill and should be recycled instead.

Plastic Carry Out bags that are reused as bin liners for small trash cans produce a greater benefit to the environment because they avoid the production of bin liners they replace.[52] In addition, the HDPE plastic carry out bag is thinner than the plastic bin liners and consist of fewer grams of plastic that end up in the landfill.

If plastic bags are banned and a shift to Paper bags occurs, paper bags when landfilled take up more space than plastic bags. Also, because the weight of paper bags is more than plastic bags, the cost of landfill fees will be higher.

The fact that plastic bags take space in landfills is so small that it is not a valid reason to ban plastic carry out bags.

RECYCLE AND KEEP PLASTIC BAGS OUT OF THE LANDFILL

Current state law (AB 2449 and SB 1219) require that retail stores have a recycling container in or outside each store allowing consumers to recycle plastic carry out bags, produce bags, and other plastic film and wraps if they issue plastic bags at checkout. See the section that follows titled "California Plastic Bag Recycling Program" for more information about the in store recycling program. Grocery stores and other retail stores also recycle cardboard boxes and have done so for many years. Cardboard is baled in a baling machine and plastic carry out bags are bagged in large plastic bags and could be baled as well. After the truck delivers pallets of groceries to the store, the empty truck is loaded with the cardboard and plastic bags to be transported back the retail chain's distribution center for subsequent recycling.

So what are recycled plastic bags and recycled wraps and film used for? The following quote from the wiseGEEK website: [53]

> *"The majority of recycled plastic bags are turned into composite lumber. Composite lumber is generally comprised of two equal substances: sawdust and plastic bags."*
>
> *"The lumber made from these two recycled substances is used for a variety of items. Wooden structures like door frames, window frames, and outdoor decks are just a few of the construction projects that use lumber made from recycled plastic bags. Recycled plastic bags are also used to make post-consumer resin. This resin is utilized in the production of new plastic bags, crates, pipes, pallets, and containers."*
>
> *"Recycling plastic bags helps the environment in several ways. Since plastic bags are not biodegradable, they slowly deteriorate into small toxic bits, contaminating water and soil. Ensuring that all plastic bags are recycled helps to alleviate this problem."*

Recycling plastic carry out bags, produce bags, and other plastic film and wraps is the best way to keep plastic out of the environment and out of the landfill.

NOT ALL PLASTIC CARRY OUT BAGS ARE EQUAL

The grocery store bag is made from High Density Poly Ethylene (HDPE) with resin number 2. The resin number is the number inside the triangle. Standard HDPE grocery store bags weigh about 5.5 grams or 0.01213 lbs. Bags from retail stores such as Target Inc. are made from Low Density Poly Ethylene (LDPE) with resin number 4. Using a small digital postal scale the weight of bags from different retail stores was recorded using the grams setting. Due to limitations of my digital scale, multiple bags were weighed to get a more accurate per bag weight. The weight in pounds is calculated using an online conversion calculator. The Standard HDPE Bag is also listed. The LDPE bag from Target weighed 9.3 grams or 0.02050 lbs.

Table 2. Weight And Resin Variations In Plastic Carry Out Bags

Retail Store	Resin Type	Weight (grams)	Calculated Weight (pounds)
Albertson's	HDPE	6*	0.01323
Cirkle K	HDPE	5.0	0.00882
CVS	HDPE	4*	0.00882
JoAnns	HDPE	6.5	0.01433
Ralph's Market	HDPE	5.7	0.01257
Smart & Final	HDPE	5.86	0.01292
Standard HDPE Bag	HDPE	5.5	0.01213
Vons Market	HDPE	4.57	0.01008
Wal-Mart	HDPE	6.5	0.01323
Target	LDPE	9.3	0.02050
Dry Cleaning Bag	LDPE	36.0	0.07937
* Denotes weight based upon single bag			

The purpose of Table 2 is to demonstrate that not all carry out bags are made from the same plastic resin or material and that weights vary depending upon store. The reason this is important is that two different types of plastic resins are used in most common plastic carry out bags. In addition, the weight of plastic bags will vary from store to store depending on bag size and resin type.

19 BILLION PLASTIC CARRY OUT BAGS PER YEAR MYTH

Proponents of banning the plastic carry out bag have repeatedly stated that California reportedly uses 19 billion plastic carry out bags per year and that the United States reportedly uses 102 billion plastic carry out bags per year. That means California uses 16% of the nation's plastic carry out bags.

In 2011 the population of California was estimated at 37,691,912 people and the United States at 311,591,917 people. That means California has 12 % of the population of the United States while at the same time using 16% of the nation's plastic carry out bags! This should make you suspicious!

In Table 3 and table 4 the quantity of plastic carry out bags per capita and per household are calculated for both California and the USA. In Table 3 we also calculate the number of bags that a typical family of four would use per year and per week. In Table 4 we calculate the number of bags used by a household per year and per week. A California household consists of 2.89 persons and a USA household 2.59 persons. Note that there is a 35% discrepancy in the quantity of bags used per capita and 42% discrepancy on a per household basis between both the California and USA bag quantities.

Table 3. Plastic Carry out Bags Per Capita

Jurisdiction	Bags Per Year	Population (2011)	Bags Per Capita	Bags per Family of Four	
				Per Year	**Per Week**
California	19,000,000,000	37,691,912	504	1512	39
USA	102,000,000,000	311,591,917	327	1308	25

Table 4. Plastic Carry Out Bags Per Household

Jurisdiction	Bags Per Year	Households (2010)	Bags Per Household	Bags per Household	
				Per Year	**Per Week**
California	19,000,000,000	12,392,852	1533	1533	29
USA	102,000,000,000	114,235,996	892	892	17

The discrepancy between the California and USA numbers is large enough to call both numbers into question. The question is where do these numbers come from?

The California number of plastic carry out bags per year is calculated from the **estimated weight** of "plastic carry out bags and other merchandise bags" that are disposed of by Californians and reported in the California 2008 Statewide Waste Characterization Study.[54] Similarly, the USA number of plastic carry out bags per year is calculated from the **estimated weight** of Plastic Packaging Bags and Sacks reported in the Environmental Protection Agency report titled

"Municipal Solid Waste Generation, Recycling, and Disposal in the United States.[55] Note that both figures are calculated from estimates of weight of materials disposed in California and the nation. This by itself should lead you to question the numbers since these numbers do not reflect actual weighed quantities but estimates derived from sampling of the waste stream.

The number of bags used per year is calculated from the **estimated weight** divided by the weight of a grocery store HDPE plastic carry out bag weighing 5.5 grams or 0.01213 pounds. Since grocery store HDPE plastic carry out bags may not weigh the same as other plastic merchandise bags the result of the calculations are questionable. The only thing we can say about this method is that it represents a consistent methodology. So let's calculate updated quantities of carry out bags based upon more recent estimated weights using the same methodology.

In Table 5 we calculate the quantity of plastic carry out bags from the estimated weights. The California 2008 Statewide Waste Characterization Study identified the breakdown of the Overall estimated weight into Residential and Commercial categories. Hence we calculated the quantity of plastic carry out bags for the overall, residential and commercial categories. In addition, the study identified that 44% of the estimated weight were bags from grocery stores, so we added a grocery store category and calculated the estimated weight from the Overall weight.

Table 5. Plastic Carry Out Bag Calculations

Jurisdiction	Category	Estimated Weight (tons)	Weight Per Bag	Quantity	Population (2011)	Bags Per Capita
California[56]	Overall	123,405	0.01213 lbs.	20,347,073,372	37,691,912	540
	Residential	77,736	0.01213 lbs.	12,817,147,568	37,691,912	340
	Commercial	45,669	0.01213 lbs.	7,529,925,804		
	Grocery Store	54,298	0.01213 lbs.	8,952,679,307	37,691,912	238
USA[57]	Overall	770,000	0.01213 lbs.	126,958,000,000	311,591,917	407

In Table 5 we made no effort to adjust the numbers for recycling or to adjust the population for jurisdictions that have instituted plastic bag bans. To do that would increase the discrepancy between state and national numbers.

In Table 5 we observe that California's commercial sector uses 37% of all bags and the residential sector uses 63%. In other words, the commercial sector uses 2 plastic carry out bags for every 3 plastic carry out bags used by the residential sector. While the commercial sector purchases a lot of material for self-use and or resale to the public it is highly doubtful that they would dispose of 2 plastic carry out bags for every 3 plastic carry out bags used in the residential sector. Bottom line is that the weight estimates are questionable and more than likely overstated.

In Table 5, the Grocery Store category shows 238 bags per capita per year. A family of four would use 952 plastic grocery store bags per year or 18 per week on average. A family of three would use 714 bags per year or 14 bags per week. This seems to be about what I see in my own family.

As can be seen in Table 5, a 25% discrepancy between state and national numbers still exists.

If we calculate the quantity of plastic carry out bags from the purchased quantity in tons reported by merchants who were subject to AB 2446 we see a different picture.

Table 6. Quantity Of Bags Purchased[58]

Year	Bags Purchased (tons)	Weight Per Bag	Bags Purchase
2007 (1 Jul to 31 Dec)	24,600	0.01213 lbs.	4,056,059,357
2008	54,000	0.01213 lbs.	8,903,544,930
2009	53,000	0.01213 lbs.	8,738,664,468
2010	39,570	0.01213 lbs.	6,524,319,868
2011	31,258	0.01213 lbs.	5,153,833,471

What Table 6 clearly demonstrates is that the 19 or 20 billion number of plastic carry out bags used by Californians could not be correct. Also, the quantity of the plastic carry out bags shown in Table 5 used by commercial sector is questionable since it is about the same as the bags purchased? The number of bags purchased corresponds more closely to the Grocery Store category in table 5.

What this means is that state and national estimates for quantity of plastic carry out bags used as calculated are essentially meaningless because: (1) Estimated weight of plastic carry out bags in the waste stream is based upon sampling; (2) Calculations using the bag weight of the HDPE grocery store bag is good only for the 44% of grocery bags and not for the 56% of the "other merchandise bags" category. While the methodology is consistent; results are questionable.

As can be seen from the preceding analysis, plastic carry out bag use of either 19 or 20 billion bags are more than likely overstated due to faulty methodology and analysis by state and federal officials.

LOW RECYCLE RATE FOR PLASTIC BAGS

Another reason often cited for banning the plastic carry out bag is the low recycling rate. The truth is that no one knows the true recycling rate for plastic carry out bags!

The California recycling rate for plastic carry out bags is 3% for 2009. California calculates the recycling rate based upon the tons of plastic carry out bags recovered per year and the number of tons purchased per year.[59] However that number is misleading, because large grocery chains buy tons of plastic bags that sit in the warehouse and doled out to stores as needed. In other words, the recovery rate is not correctly calculated against the actual quantity of bags distributed at the checkout counter.[60]

The Environmental Protection Agency (EPA) in their report titled "Municipal Solid Waste Generation, Recycling, and Disposal in the United States" includes a category of waste called "Bags, sacks, & wraps" which includes two subcategory of HDPE and LDPE/LLDPE. In 2010, the HDPE bags were recycled at a rate of 4.3% and LDPE/LLDPE plastics at 17.6%. The LDPE/LLDPE plastic includes LDPE bags such as the LDPE plastic carry out bags used by Target[61] and also includes other plastic items such as bread bags, dry cleaning bags, toilet paper wrap, etc. So the exact recovery rate for plastic carry out bags cannot be estimated.

Despite the fact that good recycling rate numbers are not available, the recovery rate is believed to be low. The most common number you bantered about is 5% all the way up to 15% depending upon data source. While recycling rates in California are said to be low, recycling of plastic carry out bags in Canada[62] is very popular achieving the following rates:

- Province of British Columbia - 32%
- Province of Alberta – 32%
- Province of Ontario – 36%
- Province of Nova Scotia – 50%
- Province of Prince Edward Island – 57%

While the Canadian recycling rates are impressive, how they are calculated was not investigated. **In any case, there are NO comprehensive studies to indicate why the recycling rate is so low and what people do with the bags they obtain and bring home.**

Because of their inherent usefulness in carrying and containing stuff, plastic carryout bags are reused for many different secondary purposes. Some common secondary uses include:[63]

- Waste bags or waste bin liners
- Dog or cat litter
- Reuse for shopping
- Lunch bags
- Storage of household items
- General carry bags (i.e. gym or sports gear, picnic supplies, hold toys, wet clothes)
- Other uses

90% of people will reuse carry out bags for other purposes. Doing a simple Google search on "uses for plastic carry out bags" will generate hundreds of listing of articles and videos where people identify how they use plastic carry out bags. Many people also consume thousands of plastic carry out bags in variety of craft projects to make totes, mats for the homeless, place mats, and even items for sale, etc.

Most people have a stash of plastic bags in their homes and follow the 3 R's (Reduce, Reuse, and Recycle) and reuse the bags in variety of ways and/or recycle them.

Soda cans and plastic bottles enjoy a very high recycling or recovery rate. This is because there is no secondary reuse for these items with a few isolated exceptions. However, plastic carry out bags have a large number of secondary uses which result in lower recycling rates. **Hence, plastic carry out bags <u>should</u> have a lower recycling rate!**

It also estimated that 60%[64] to 76%[65] of carry out bags taken home are reused. It is estimated that 40.3% of plastic carry out bags are used as waste bin liners[66] and ultimately are disposed of in the trash. It is believed that the remaining 19.7% to 35.7% that are reused will eventually be disposed of and landfilled. **In the absence of additional detailed studies this would suggest that the maximum recycling recovery rate should be between 24% and 60%.**

CALIFORNIA PLASTIC BAG RECYCLING PROGRAM

Current state law (AB 2449) requires that retail stores that distribute plastic carry out bags have a recycling container in or outside each store allowing customers to recycle plastic carry out bags and that the store have reusable bags to sell to customers. In addition AB 2449 prevents local governments from imposing a tax or fee on each bag distributed. AB 2449 expires 1 January 2013 but was extended by SB 1219 to 1 January 2020 and removes the prohibition by local governments from imposing a tax or fee for each plastic bag distributed. Stores that do not issue plastic carry out bags may participate in the recycling program on a voluntary basis.

In extending AB 2449 via SB 1219 legislators noted that the program enjoyed "modest success" in recovery of plastic carry out bags but pointed out that the recovery of plastic shrink wrap and film increased "more dramatically" and avoided sending this material to the landfill.

Table 7. Plastic Carry Out Bag And Film Recycling

Year	Carry Out Bags Purchased (tons)	Carry Out Bags Recycled (tons)	Other Plastic Bags and Plastic Film (tons)	Carry Out Bag Recycle Rate
2007 (1 Jul to 31 Dec)	24,600	470	6,351	1.9%
2008	54,000	1,094	15,328	2.0%
2009	53,000	1,520	17,589	2.9%
2010	39,570	213.9	849.4	0.5%
2011	31,258	219.6	796.9	0.7%
NOTE: Data for 2010 and 2011 is preliminary and obtained via Email from CalRecycle				

While retail stores have to provide the recycle bins, recycling on the part of the customer is largely voluntary. There is little active involvement on the part of grocery stores to increase the recovery rate of plastic bags they distribute.

The main problem for consumers with this approach is the inconvenience. Most people simply forget to take bags to be recycled when they visit the grocery store. Certainly, when they do remember, making a special trip to store to deposit the bags in the recycling container is simply not worth the cost of gas.

OTHER PLASTIC PRODUCTS THAT CAN BE RECYCLED WITH CARRY OUT BAGS

Most consumers are conscientious about recycling but are not very knowledgeable about the "At-Store Carry-Out Bag Recycling Program". As a result, they do not know that *"retailers accept plastic bags and plastic shrink wrap for recycling. These include dry-cleaning bags, bread bags and shrink wraps from paper towels, bathroom tissue, napkins, diapers and newspaper bags."*[67]

Therefore these consumers deposit plastic carry out bags along with other types of plastic bags and film into the curbside recycle bin. Unfortunately this material cannot be recycled in curbside recycle bin and will end up in the landfill just as if you had placed it in the trash bin. City of Ventura

officials, to their credit state, that the cost of separating the plastic carry out bags from other recycled material versus the value of the recycled material makes it uneconomical to recycle plastic carry out bags. In addition, they state that the plastic carry out bags get stuck in the sorting equipment. Pictures on the website for Gold Coast Recycling and Transfer Station show a truck load of what look like plastic bags and plastic film (material that has been picked through) ready to dump in the Tolland landfill. [68]

WEAKNESS OF CALIFORNIA'S AB 2449/SB 1219

The inherent weakness of AB 2449/SB 1219 is that only stores that distribute plastic carry out bags are required to establish an in-store recycling programs; other stores may do so on a voluntary basis. That means Big Box Stores that do not distribute plastic carry out bags do not have to establish recycling programs. These stores can sell and make a profit from products containing plastic shrink wrap and plastic film, and the cost of recycling that material is then borne by retailers who do distribute plastic carry out bags (i.e. grocery stores). Hence, there is little incentive for grocery stores and other retail establishments to continue with the recycling program once plastic carry out bags are banned! **This means that there will be no recycling capability for plastic bags, plastic film and shrink wraps.**

CONSEQUENCES OF A PLASTIC CARRY OUT BAG BAN

In 2009, according the CalRecycle report titled "2009 Statewide Recycling Rate for Plastic Carryout Bags" the amount of "other" plastic consisting of plastic film, shrink wraps, produce bags, bread bags, dry cleaning bags, etc., is about 10 times the weight of plastic carry out bags recycled.[69] See also Table 7 above.

In the event a ban on plastic carry out bags is implemented in Ventura and Ventura County, retail stores will more and likely terminate the recycling programs established under AB 2449/ SB 1219.

In San Francisco the plastic carry out bag ban has led grocery stores to shut down their plastic bag recycling programs.[70]

As consumers no longer have the option to recycle plastic bags and plastic film at the retail store and using the curbside recycling bin is not an option, then all of this material will end up at the landfill rather than be recycled. Eventually, as more communities ban plastic carry out bags, the amount of plastic bags and film dries up in the recycling chain and the plastic recycling industry will disappear.

A ban on plastic carry out bags if implemented, will have a chilling effect on retailer recycling programs established by AB 2449 and SB 1219 and consumers will lose access to facilities for recycling plastic bags and plastic shrink wraps and film and this will result in more plastic going to the landfill instead of being recycled.

Not only do plastic bag bans result in lower employment at plastic bag factories but also will hurt employment in the recycling industry.

PLASTIC BAG BANS MAY NOT WORK

Even though plastic carry out bag bans and taxes may have had good intentions, unintended consequences of the bans and taxes are discussed as follows:

SAN FRANCISCO BAG BAN

In San Francisco, plastic bags as a proportion of the total litter stream increased from 6.0% in 2007 when the ban was initiated to 6.4% in 2008 as documented in the "The City of San Francisco Streets Litter Re-Audit 2008".[71]

"San Francisco's ban on plastic grocery bags caused shoppers to switch to paper bags, which require 70 percent more energy to manufacture, produce 50 percent more greenhouse gas emissions and create five times more waste than plastic bags."[72]

Little use of reusable bags was observed. Plastic was replaced by paper and the return of double bagging was observed which may actually increase environmental impacts.[73] In 2012, the ban was and extended the ban to all retailers and modified to include a charge for paper bags.

In San Francisco the plastic carry out bag ban has led grocery stores to shut down their plastic bag recycling programs.[74] [NOTE: curbside recycling bins do not accept plastic produce bags, dry cleaning bags, bread bags, product shrink wrap, and plastic film. Therefore this material will go to the landfill!]

AUSTRALIA BAG BAN

Similarly in Australia plastic bags which comprised 4% of litter in 2010 went up to 12% in 2011. Although the quantity of the thin HDPE carry out bags was reduced heavier plastic bags intended for reuse were discarded instead.[75]

IRELANDS PLASTIC BAG TAX

The Republic of Ireland instituted at plastic bag tax of € 0.17 in 2002 at checkout. The tax had to be raised to € 0.22 later. Monies raised were used to combat litter. Within weeks plastic carry out bag usage dropped 94%.[76] The reason Ireland instituted the bag tax was to reduce usage because of overestimated concern that plastic bags comprised 5% of the litter stream and that visual pollution was hurting tourism.[77] The actual litter rate for plastic shopping bags was 0.75% based upon Irelands 2002 Litter Audit.[78] In a 2011 report the category for Shopping Bags was 0.24% a decrease of one-half of one percent.[79]

Consumers replaced those bags by buying plastic trash bags for trash can liners, lunch carriers, pooper scoopers, baby diaper disposal and many other things. The plastic trash bags contained 76% more plastic resin than the plastic carry out bags which they replaced. As a result, an increase in the amount of plastic that went into landfills. Since Ireland imports all plastic bags, the number of tons of plastic bag imports increased by 20.1% over the total imports in 2002 when the bag tax was implemented. This is shown in Figure 2.

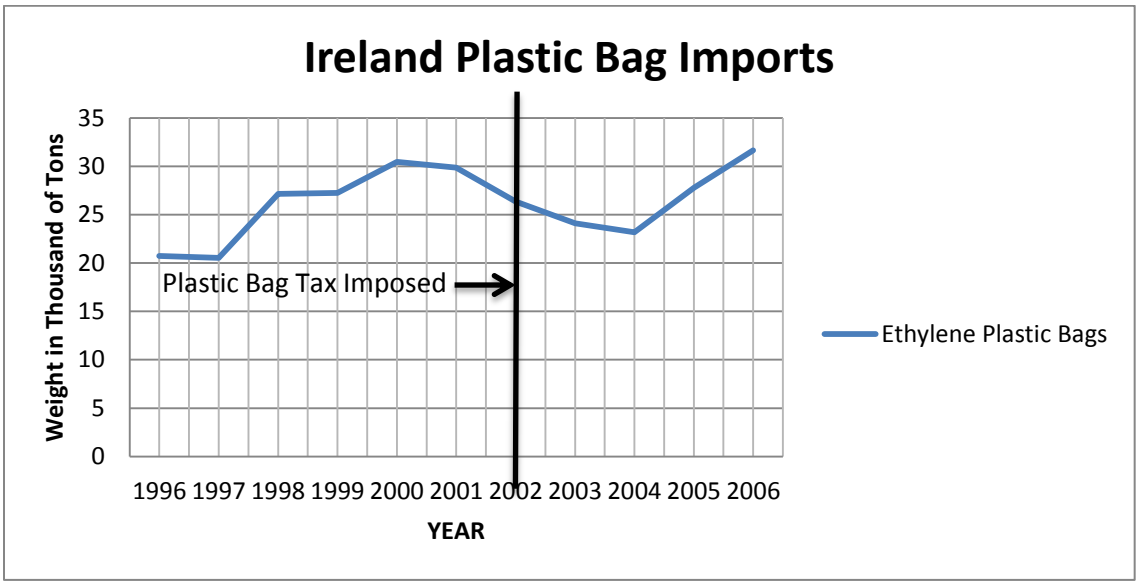


Figure 2. Republic Of Ireland Plastic Bag Imports[80]

In other words, Ireland was successful in removing plastic carry out bags from stores, but those bags would have been reused and were replaced by plastic trash bags. Plastic trash bags sales increased by 77%. Since the new trash bags had 3 times the amount of plastic resin more plastic went to the landfill. The decrease in the amount of shopping bag litter was less than 0.5% and barely visible. In other words, the pain was greater than the gain and essentially failed.

REUSABLE SHOPPING BAGS NOT THE ANSWER

The proposed ordinance to ban plastic carry out bags and to charge a fee for a paper carry out bag in order to coerce consumers to switch to reusable bags is simply not a very good idea! Although the reusable bag is touted as friendly to the environment; the truth is just the opposite. The Life Cycle Assessment (LCA) for the reusable carry out bag is incomplete.[81] The LCA fails to address the use of water, energy, and generation of greenhouse gases as a result of the consumer washing the reusable bag on a recurring basis in order to maintain them in a sanitary condition.

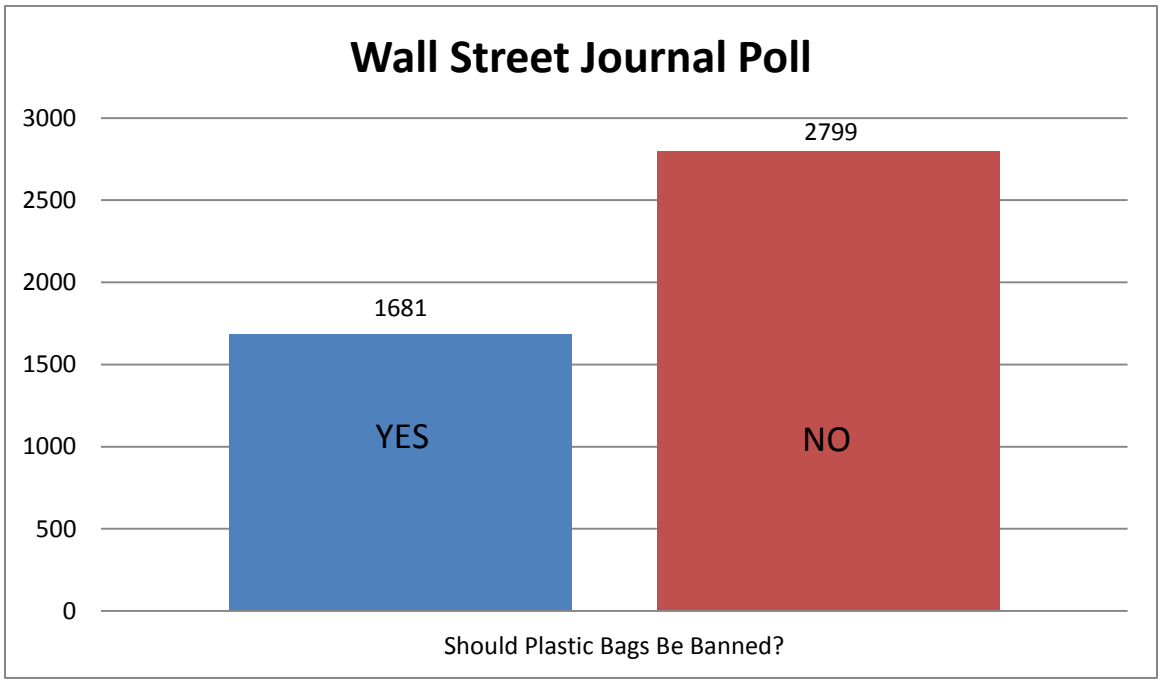
The reusable bag presents health issues related to cross contamination of food items, and the reusable bag can serve as a carrier for contagious viruses. To mitigate these health issues, the bag must be washed on a regular basis. Some people dismiss these concerns and say common sense tells you to wash the bag when it is visibly dirty. However, bacteria and viruses cannot be seen with the naked eye. Therefore, adopting a regular schedule to wash the bags as a precaution is warranted. Hand washing or machine washing the reusable bag with soap and bleach will kill 99.9% of all bacteria and viruses.

Simply put, sanitary plastic and paper bags are available off-the-shelf! Using water and energy resources to wash reusable bags in order to sanitize them on a recurring basis is a waste of water and energy that all households will have to pay for.

There is a study by the Property and Environment Research Center (PERC) that reported deaths and emergency room visits increased by 50-100% after San Francisco implemented their plastic bag ban.[82] **One has to ask what human life and suffering is worth compared to a few plastic bags?**

PLASTIC BAGS BANS NOT SUPPORTED BY THE PUBLIC

In a Wall Street Journal[83] article presenting both sides of the plastic carry out bag ban, a question of the day: "Should plastic grocery bags be banned?" clearly demonstrates a lack of public support.



POTENTIAL SOLUTIONS TO THE PLASTIC BAG PROBLEM

As we can see from the problems described in this paper, the problem with harm to wildlife extends beyond the problem of plastic bags to plastic litter of all types. Banning a single product, no matter how much of a nuisance it is will not solve the problem. So how do we solve the problem? What steps should we take? Here are some recommendations:

1. Install trash excluders or trash capture devices on all storm drains. This will prevent plastic bags and other plastic litter from entering the river bed and out to the ocean. Remember that 80% of plastic debris in the ocean comes from land based sources via the storm drain.
2. Work with trash haulers, other trucking companies and gardeners (pickup truck) to ensure that loads are properly secured and litter cannot fly out of the truck when traveling down the highway and freeway. If trucks need to be modified, so be it.
3. Ensure that all public trash receptacles are promptly emptied and have covers to prevent wind-blown debris.

4. Educate the public that when disposing of an empty plastic carry out bag, tie it in a knot to prevent it from becoming wind-blown litter.
5. Improve Street Sweeping efforts by enforcing No Parking one day per week for street sweepers to clean streets.
6. Pass an ordinance that requires retail stores who are subject to AB 2449/SB1219 and who already have a recycling program in place to require that they achieve a recovery rate based upon annual targets (40% first year, 60 % second year, and 75% third and following years) of the amount of plastic bags they distribute by weight. This would put the onus on the store to collect bags and get them recycled by offering a variety of incentives:
    a. They could offer people a dollar off if you bring the plastic bags back.
    b. They could offer a free donut or cup of coffee for people who bring in say 30 plastics bags for recycling. (This to encourage people to pick up bags alongside the road.)
    c. They could support bag collection fund raisers by donating to different community organizations such as the boy scouts (or girl scouts, lions club, Rescue Mission, church youth groups, etc.) based upon the weight of bags collected from door-to-door or other collections efforts.
    d. If the store cannot meet the weight, they would pick up plastic bags from Gold Coast Recycling and Transfer station to make up the difference.

    NOTE: How many of the down and out would not scour the countryside to pick up plastic bags to get a free donut?

    NOTE: Obviously the costs associated would be borne by the customers of the store either through costs included in grocery prices or by a charge per plastic or paper bag.

    NOTE: If successful, this will put Ventura on the map, increase sales in Ventura stores by about 10%, provide community groups fundraising opportunities, provides incentives for people to pick up plastic bags along the roadside, once people realize bags can be donated for charitable causes they will save empty bags, vice trash them and keep them out of landfills and curbside recycling containers.

7. Work with Harrison & Sons and Gold Coast Recycling and Transfer station to put into place a method to collect plastic carry out bags and make them available to the grocery stores for pickup in their trucks for recycling. Note: This will require them to hire a few more people and more than likely require a rate increase. The goal here is to keep plastic bags out of the landfill.

The above solutions would not cost the city a cent, other than some staff time to coordinate activities among participants.

SUMMARY

Banning plastic carry out bags is a powerful symbolic act that creates a **false** image that the city, county, or state is "Green" and environmentally friendly. Plastic bag bans do more to harm the environment than any marginal environmental benefits produced. Proponents often ignore the science and overlook more substantive solutions in dealing with the problem of plastic bags rather than making an honest effort to look at and weigh each of the issues involved.[84]

The plastic bag has been falsely given a bad rap for entangling and killing marine life, when the real culprit is discarded fishing nets and gear. Also ingestion of plastic bags and plastic debris is a real problem for marine life that requires comprehensive solutions to prevent plastic bags **and other plastic debris** from flowing to the ocean. Banning a single item like plastic carry out bags will not prevent harm to marine life caused by plastic. Since 80% of plastic debris originates from land and is conveyed to the ocean via storm drains, it is imperative that **trash excluders be installed** on all storm drains and in storm drain catch basins. This is currently required by the Clean Water Act to reduce trash that is conveyed to the ocean.

In addition, the State of California in their documentation has identified that uncovered or improperly covered truck loads are responsible for a majority of litter along the state's highways and roads. In particular, trash and recycle trucks. These vehicles need to be modified to ensure the entire load is covered when driving down the highway. In addition, the county and city should ensure that all public trash receptacles are covered to prevent litter from becoming airborne.

Because plastic carry out bags are such a small part of the total litter stream, litter removal budgets cannot be reduced, therefore there will be no cost savings. In other words, cost to remove litter is not a valid reason to ban plastic carry out bags.

Banning plastic carry out bags will cause a shift to paper bags. Which are less environmentally friendly than plastic bags and will require more space in landfills, and because they weigh more will increase landfill costs?

We also identify that not all plastic carry out bags weigh the same and are not made from the same plastic resin type. We explore the myth that Californians use 19 billion plastic carry out bags and show how that number was calculated from estimates of the weight of plastic carry out bags disposed by consumers. We looked at how national number and California numbers demonstrate how misleading the numbers really are. We then do the calculation ourselves from the latest estimates of bags disposed at the state and national levels. Again the discrepancy is so large as to call into question the validity of the numbers.

We then demonstrate that recycle rates for plastic bags cannot be accurately calculated at both the state and national levels. We also show that Canada claims recycling rates of plastic carry out bags as high as 57%. We identify that 90% of people will reuse plastic carry out bags for various secondary purposes. We identify that 40.3% of plastic carry out bags taken home are used to bag waste that goes to the landfill. When people have to replace these bags by standard plastic trash bags with a higher plastic content, more plastic goes to the landfill.

We also identify the weaknesses of California's AB 2449/SB 1219 and that in the event of a ban on plastic carry out bags, the in store recycling program will die and remove the ability for consumers to recycle produce bags, bread bags, and other plastic wrap and film since these products are not accepted by curbside recycling bins.

In addition, we comment on the failures of the San Francisco bag ban, the Australia bag ban, and Irelands Plastic bag tax.

We also identify that reusable bags are not the answer due to health issues that require bags be washed on a regular basis. Having consumers wash bags and consume water and energy when sanitary plastic or paper bags are available off-the-shelf is a waste of water and energy resources.

In the last segment of the paper we talk about some creative and practical solutions are available that can solve a lot of the problems with plastic carry out bags short of banning the bag.

The public supports an aggressive recycling program and desires to see more and more material being recycled. The status quo is simply unacceptable and so is a bag ban.

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