Cigarette Litter Prevention at the Virginia Beach Oceanfront

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Executive Summary

A city based on tourism, military installations, agriculture, and home to the first landing of Jamestown colonists, Virginia Beach boasts 28 miles of coastline along the Chesapeake Bay and Atlantic Ocean. Comparable to other beaches worldwide, the utter volume of visitors has taken its toll on the city, resulting in unsightly destruction and pollution. It is not unusual to read or hear about marine animals dying from eating or being trapped by waste that is deposited into oceans, or how oil spills are harmful to marine mammals, birds, and fish; yet somehow, it *is* uncommon to come upon the mentioning of butt litter, the most frequently littered item on Earth. Cigarette butts are strewn about the Virginia Beach boardwalk, resort strip, and the beach. In 2014, Clean Virginia Waterways collected more than 47,600 butts along streams, rivers, bays, and coastlines (CVW, 2015). With no smoking restrictions on the beach (or boardwalk,) tourists and local beachgoers alike frequently discard their butts on the sand and face no known consequences. Small but mighty, both smoked and unsmoked butts have severe impacts on waterways, economies, air quality, and public health. An economic analysis found that cities the size of San Francisco spend, on average, between $500,000 and $6 million annually to keep their beaches, streets, and parks clear of cigarette litter (Schneider et al., 2011).

This paper examines strategies to:

- Drastically reduce butt litter within the city
    - Disposable/pocket ashtrays, additional butt/ash receptacles
- Increase community awareness on the economic impacts of litter
    - Organized cleanups, advertisements/marketing, partnerships with local NGOs
- Enhance citations and alternative penalties for those who discard of their butts on the sand

Additionally, this paper aims to discuss the potential implementation of a beach-wide smoking ban.

Cigarette Litter Prevention at the Virginia Beach Oceanfront

The United States travel and tourism industry generated over $1.6 trillion in economic output in 2017, supporting 7.8 million jobs and accounting for 2.6 percent of the country's GDP (United States Bureau of Economic Analysis, 2018). As one of the largest industries and economic instruments in Virginia Beach, tourism plays a vital role in encouraging growth and funding initiatives that enhance the community. In 2016, the City of Virginia Beach generated $1.49 billion in direct travel-related expenditures – additionally, the Virginia Beach Convention Center held 325 events with $53 million in estimated attendee spending, and generated $9.8 million in both direct and indirect revenue to the city (Virginia Tourism Corporation, n.d.). Referred to as the Virginia Beach Oceanfront, a three-mile strip of hotels, restaurants, bars, arcades, and shops, runs parallel to the beach which sits on the Atlantic Ocean. Virginia Beach, like countless other cities worldwide, is facing a dirty issue – beaches, sidewalks, and parking lots are littered with cigarette butts. A non-biodegradable litter, cigarette butts make their way to waterways via wind and through storm drains.

Tourists are very sensitive to the aesthetics of natural areas; in the case of beaches, litter is one of the most important aspects for users when choosing a beach (Vaz et al., 2009). Cigarette butts degrade beach environments and have negative environmental consequences on marine life (fish, birds, and marine mammals.) The first smoking ban on a beach in the United States was established on Hanauma Bay Beach in Hawaii in 1993, and in 2003, Solana Beach, California became the first beach in the continental United States to do the same (Ariza & Leatherman, 2012). By evaluating the city's response to the issue and considering alternative methods to aid in the establishment of a smoking ban both on the sand and along the boardwalk, the mission is clear:

- Promote a healthier environment, to include air quality and marine life and ecosystems, attract more visitors, and protect the tourism revenue that the city so heavily relies on.

Discussion

"Each second [in the United States] 142 cigarette butts are flicked out of car windows, tossed onto the grass, or stubbed out on the sidewalk", said Cheryl Healton, president and chief executive of Legacy, a nonprofit public health group, based in Washington D.C. Cigarette butts are a toxic threat to the environment and to wildlife –

- Cigarette filters are made from plastic (Pauly et al., 2002), that, depending on conditions, can take 18 months to ten years to decompose; even in the process they break down into microplastics which are also hazardous to waterways
- Cigarette filters' sole purpose is to absorb the toxins from cigarettes that are too dangerous for humans to inhale – meaning the residual toxins are being polluted along with the filter and polluting the environment
- Cigarette butts also pollute waterways, ending up in streams, rivers, lakes, and oceans. Marine life may mistake them for food which can cause sever internal injuries, suffocation, starvation, and death (Bellum, 2013)
- Cigarette butts thrown out of automobile windows may be washed down drains leading to rivers and oceans

Data from the Ocean Conservancy shows that 1,030,640 cigarette butts were removed from U.S. beaches and inland waterways as part of the annual International Coastal Cleanup (ICC) in 2016 – this represents nearly 24% of the total debris of items collected and, by far, the most prevalent item found (Ocean Conservancy, 2017). Illustrated in Figure 1 is the increase of cigarette filters collected by the ICC from 1996-2007, a 180% increase over the 11 years. In 2014, Clean Virginia Waterways (CVW) was awarded a grant from Keep America Beautiful to conduct a pilot Cigarette Litter Prevention Program (CLPP) at the Virginia Beach Resort Area:

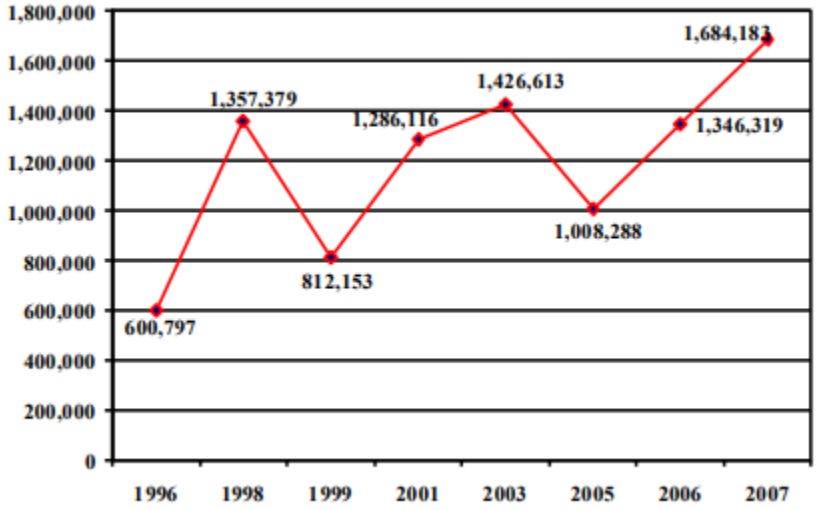
The pilot CLPP was ultimately considered a success and completed the following:

- ✓ 15 receptacles placed on the boardwalk within a nine-block span
- ✓ 31 Virginia Beach hotels and five restaurants at the Oceanfront are participating in the butt litter efforts by placing said receptacles
- ✓ More than 100,000 pocket ashtrays were distributed to beach visitors

(Beachy Clean, 2017)

Figure 1

Cigarettes and Cigarette Filters Collected in the United States by the International Coastal Cleanup, 1996-2007. Source: Ocean Conservancy 2007.



Studies conducted by Clean Virginia Waterways have shown that just one cigarette butt in approximately two gallons of water is lethal to water fleas, a tiny crustacean found in freshwater and saltwater; those tiny bits of tobacco left attached to cigarette filters carry more toxins than the filters themselves do. Littered cigarette butts present potential point sources for environmental contamination – in areas with substantial amounts of cigarette litter, environmental hazards may arise as chemical components are leached from the filters and smoked tobacco (Moerman & Potts, 2011).

Litter is the result of individual behavior. Important factors that contribute to beach littering are that users feel no sense of ownership for and the existence of previous litter. Pocket or disposable ashtrays provide a way for smokers to safely discard their butts. Vancouver, Calgary, Maui, and Madison, Wisconsin, are a few examples of cities that distribute, or have distributed, free pocket ashtrays. Keep America Beautiful is a leading national nonprofit, inspires and educates people how to improve and beautify their communities. Keep America Beautiful has four proven, field-tested strategies for reducing cigarette butt litter:

1. Review local litter laws, including cigarette butt litter, and support enforcement.

2. Educate the public using public services messages and advertising.

3. Place ash receptacles at “transition points,” places where smokers must stop smoking before proceeding.

4. Distribute pocket ashtrays or portable auto ashtrays to adult smokers.

Additional cigarette butt receptacles, enforcement by Virginia Beach Police Department, related penalties (community service, litter clean ups) in lieu of fines, and the effects on adjacent property owners and the economy must be taken into consideration when applying solutions and contemplating objectives. Additionally, education, marketing, and outreach campaigns assist in catching the attention of the public and aid in organizing voluntary beach clean ups, which can help to increase awareness about the extent of butt pollution.

Robert Dean is a 1989 founding member of Clean the Bay Day - a true Virginian tradition and an annual opportunity for families, businesses, and civic or church groups to give back to local waterways by removing litter and debris from shoreline. Speaking with Dean, he said “Changing the world begins with one cigarette butt at a time, so I’d say, especially to smokers out there, keep your butts off the beach.” Citing his inspiration for the dedicated day Dean said, “Plastic bags, fishing line, cigarette butts, and heaps of other trash were defiling our waterways.” Dean hopes to end Clean the Bay Day, wishing that people would take his advice to stop littering so that one day the annual cleanup will no longer be necessary. This project requires immediate attention and action. The consequences will continue to get worse for as long as this issue lingers.

Literature Review

Although marine litter is composed of a wide variety of waste types and there is a prevalence of plastic items, cigarette butts, an item of mixed synthetic composition, stand out due to their global occurrence and significant amounts (Araujo & Costa, 2018). The National Oceanic and Atmospheric Administration (NOAA) estimates that over the past 25 years, volunteers have collected more than 52.9 million cigarette butts from the world’s beaches (Witkowski, 2014). High concentrations of cigarette litter may establish the norm that inappropriate disposals are acceptable in given locations – there is ample evidence that people are more likely to litter in environments already containing litter (i.e. litter begets litter) (Cialdini et al., 1990).

Both smoked and un-smoked cigarettes demonstrate the potential for rapid and prolonged metal contamination of the immediate environment in which they are discarded: in a laboratory study, both released numerous heavy metals into water (Moerman & Potts, 2011). There are over 5,000 compounds present in cigarettes; among these, at least 150 are highly toxic, mainly because of their carcinogenic and mutagenic potential (Hoffmann & Hoffmann, 1998). When burned, many of the chemicals present in cigarettes produce new compounds – the compounds with the highest toxic potential are mainly concentrated in the remains of tobacco and in the filter (Slaughter et al., 2011). These compounds can contaminate the soil after leaching by rainwater and are superficially transported to aquatic environments where they can be detected.

A 2011 study done by the International Journal of Environmental Research and Public Health studied smokers' attitudes and behaviors. Two thousand smokers and nonsmokers aged 18 and older were interviewed about their smoking patterns, knowledge, and beliefs towards cigarette waste as litter. Most respondents believed that butts are harmful to the environment – however, one quarter of the respondents did not believe they are toxic, and more nonsmokers believed cigarette butts to be litter than smokers (Rath et al., 2012).

Actions to Consider

With cooperation from citizens, city officials, Virginia Beach Police Department, merchants/vendors, local NGOs, and others, the ideal results are:

- Heightened education amongst all citizens and visitors
- A dramatic reduction in butts littered in parking lots, streets, and sidewalks as a result of an increase of butt receptacles along the boardwalk and main strip at transition points where all merchants and bars/restaurants are located (Atlantic Avenue)
- Implementation of a smoking ban on the sand – at the minimum, the city should offer pocket ashtrays and place ash receptacles on the beach
- Widespread enforcement of littering laws by local law enforcement
    - Alternative fines/punishments to include community service or litter clean up in lieu of monetary fines
- Organized beach cleanups and educational seminars concerning not just cigarette butt litter, but the effects of litter and waste on marine ecosystems and animals

- Businesses can provide ash and trash receptacles at entrances, exits, picnic areas, as well as parking lots and walkways

Measurement of Success

Figure 2

Guidelines for conducting a Cigarette Litter Scan. Source: Keep America Beautiful.

Conducting a Scan

A **Cigarette Litter Scan** measures cigarette butt litter and cigar tips in a small section of the program area. For a special event, the scan is conducted in one to three approximately 10′ X 10′ areas within the special event grounds. Besides providing baseline data, a scan also helps identify where individuals are smoking and may litter cigarette butts and cigar tips. The CLPP can then place ash receptacles at strategic locations and focus on changing littering behavior.

Examples:

- For a **downtown**, cigarette butt litter and cigar tips are counted on sidewalks and gutters at each address in a **two to three-block area**.
- For a **beach, waterfront, or point of interest at a park or other recreation area**, the scan will occur in and around pedestrian access points, picnic areas, near concessions or other retail businesses, and parking lots.
- On **roadways and highways**, the scan usually occurs at targeted rest areas, scenic pull offs, intersection medians, or other off-road locations.
- For **special events**, a scan for events two days or longer usually occurs within one to three 10′ X 10′ scan areas (depending on event size) identified using fixed points in and around the event venues, e.g., food, entertainment, vendor booth, entrance and exits, etc.

A Cigarette Litter Scan, developed by Keep America Beautiful (KAB,) is a method to quantify cigarette butt and cigar litter in a target area – scans have been field-tested in downtown areas, beaches, parks, and at rest stops along roadways. Keep America Beautiful defines the scan as a "scanning methodology that involves an actual count of cigarette butt and cigar tip litter on the ground." These scans are conducted in smaller, representative sections within the larger program area. They are used for periodic follow-up scans to assess long-term program influence and sustainability. Additionally, KAB provides a Field Scan Document and allows for recordings from a preliminary scan as well as two follow up scans. It also provides space to record the location, number of butts, number of cigar tips, and number of ash receptacles in the designated location. While KAB does not specify how often these follow up scans should be conducted, this is the ideal way to measure the success of the project and assess the impact of the project.

sSWOT Analysis

STRENGTHS	WEAKNESSES
• Keep America Beautiful conducted a pilot Cigarette Litter Prevention Program in 2014, recognizing the city's need for assistance	• Bill SB1253, which would ban smoking in public parks and on public beaches was shut down by the House in 2013
OPPORTUNITIES	**THREATS**
• More than 100 cities in the U.S. have already implemented similar bans	• Smokers' rights organizations condemn public smoking bans as an infringement on citizens' rights

Final Statement

Cigarette litter, like secondhand smoke, is the result of smoker behavior but also affects nonsmokers. The tobacco industry has failed to extinguish the impact of cigarette and tobacco litter. Today, while most smokers and nonsmokers understand that cigarette litter is an environmental problem, there is still a minority of smokers who do not recognize cigarettes butts as litter or waste. The goal of this project is a drastic reduction in cigarette butt litter both on the beach and along the three-mile boardwalk, awareness of detrimental effects on humans, animals, and ecosystems, community involvement, and increased penalties for littering. With immediate action and a scheduled implementation by the end of summer, this project will allow the city to put a stop to cigarette butt litter through education, dissemination of materials, and placement of receptacles at transition points.

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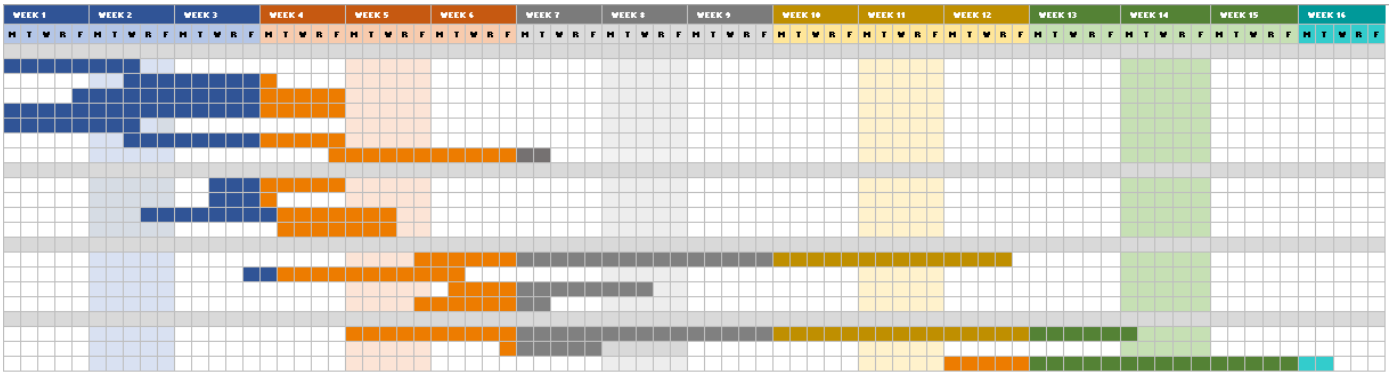
Appendix A

Gantt Chart

PROJECT TITLE	Cigarette Litter Prevention in Virginia Beach				
WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	% of TASK COMPLETE
1	Project Conception & Initiation				
1.1	Project Charter	Jackie L.	1/13/2020	1/20/2020	100%
1.1.1	Project Charter Revisions	Jackie L.	1/20/2020	1/28/2020	100%
1.2	Research	Jackie L.	1/17/2020	2/1/2020	100%
1.3	Projections	Jackie L.	1/13/2020	2/1/2020	100%
1.4	Stakeholders	Jackie L.	1/13/2020	1/20/2020	100%
1.5	Guidelines	Jackie L.	1/20/2020	2/1/2020	100%
1.6	Project Initiation	Jackie L.	2/1/2020	2/15/2020	100%
2	Project Definition & Planning				
2.1	Scope	Jackie L.	1/25/2020	2/1/2020	100%
2.2	Goal Setting	Jackie L.	1/25/2020	1/28/2020	100%
2.3	Communication Plan	Jackie L.	1/21/2020	2/5/2020	100%
2.4	Risk Management	Jackie L.	1/30/2020	2/5/2020	100%
3	Project Launch & Execution				
3.1	Status & Tracking	Jackie L.	2/7/2020	3/12/2020	100%
3.2	Advocate for community engagement	Jackie L.	1/27/2020	2/9/2020	100%
3.3	Forecasts	Jackie L.	2/9/2020	2/19/2020	100%
3.4	Finalize community engagement	Jackie L.	2/7/2020	2/15/2020	100%
4	Project Performance / Monitoring				
4.1	Project Implementation	Jackie L.	2/10/2020	3/20/2020	100%
	Project Objectives	Jackie L.	2/20/2020	2/26/2020	100%
4.2	Project Performance	Jackie L.	3/20/2020	4/1/2020	100%



Appendix B

Table 1. Smoking bans on beaches by State and Municipality, United States, 2008.

State	Municipality
California	Albany, Belmont, Calabasas, Capitola, Carmel, Carpinteria, Del Mar, El Cajon, El Segundo, Encinitas, Hayward, Hermosa Beach, Imperial Beach, Laguna Beach, Loma Linda, Los Angeles, Los Angeles County, Manhattan Beach, Monterey, Morro Bay, Novato, Oceanside, Pacific Grove, Pacifica, Palos Verdes Estates, San Diego, San Mateo County, Sand City, Santa Cruz, Santa Monica, Seal Beach, Torrance
Florida	Jupiter Island
Hawaii	Hawaii County
Iowa	Des Moines, Johnson County
Illinois	Chicago, Highland Park, Lake Forest, Wilmette
Massachusetts	Abington, Braintree, Grafton, Holliston, Sharon, Tyngsborough, Upton, Westford
Michigan	Grand Haven Township, Howell, Ottawa County
Minnesota	Battle Lake, Bloomington, Buffalo, Fergus Falls, Hennepin County, Hoffman, Ramsey County, Washington County
New Hampshire	Gilford, Windham
New Jersey	Brick Township, Dover Township, Lavallette Borough, Mount Arlington Borough, Seaside Park, Ship Bottom Borough, Surf City Borough
New York	Kingston
Puerto Rico	Puerto Rico
Rhode Island	Westerly
South Carolina	Surfside Beach
Utah	Davis County
Washington	Lake Stevens
Wisconsin	Madison

Source: Novotny et al., 2009