

PLASTIC BAG POLICIES IN THE SAN FRANCISCO BAY AREA:
A DIFFUSION OF INNOVATION STUDY

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Geography & Environment: Resource Management and Environmental Planning

by

Hilary Clo Finck

San Francisco, California

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CERTIFICATION OF APPROVAL

I certify that I have read *Plastic Bag Policies in the San Francisco Bay Area: A Diffusion of Innovation Study* by Hilary Clo Finck, and that in my opinion this work meets the criteria for approving a thesis submitted in partial fulfillment of the requirement for the degree Master of Arts in Geography & Environment: Resource Management and Environmental Planning at San Francisco State University.

Nancy Lee Wilkinson, Ph.D.
Professor

Jason Henderson, Ph.D.
Professor

Plastic Bag Policies in the San Francisco Bay Area:

A Diffusion of Innovation Study

Hilary Clo Finck
San Francisco, California
2015

In 2007, San Francisco adopted the first plastic bag ban in the United States. Since then 55 jurisdictions in the San Francisco Bay Area have adopted similar ordinances. Using diffusion of innovation theory, this study examines the determinants of plastic bag policy adoption in the nine-county Bay Area region. The diffusion of Bay Area plastic bag policies was mainly determined by the plastic bag industry's legal challenges, subsequent judicial decisions, and the sharing of financial and informational resources between higher-level jurisdictions and their participating agencies. Ancillary drivers of policy adoption were the support from an advocacy organization and the need for jurisdictions to comply with overarching environmental policies. Demographic analysis showed that a jurisdiction's political party preference and population size had a significant relationship with the timing of adoption.

I certify that the abstract is a correct representation of the content of this thesis.

Chair, Thesis Committee

Date

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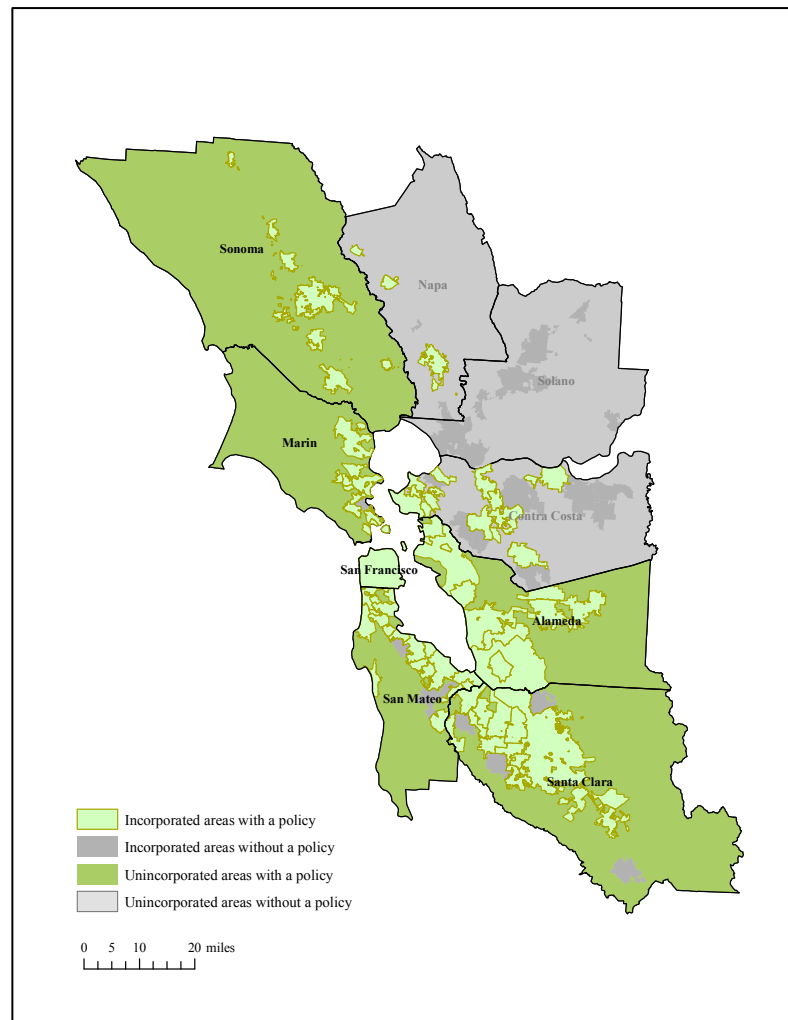
Introduction

On March third, 2007, San Francisco became the first jurisdiction in the United States to adopt legislation that banned certain retail establishments from distributing single-use plastic carryout bags. Since this policy was enacted, 55 jurisdictions in the San Francisco Bay Area, including municipalities, unincorporated areas, and entire counties have adopted similar ordinances. Nearly 80 percent of the Bay Area population now resides in a jurisdiction that has adopted a policy restricting the distribution of plastic bags (Figure 1).

This paper seeks to reveal some of the drivers behind this environmental policy diffusion by exploring several policy determinants that help explain why and how plastic bag policies spread so rapidly in the Bay Area. First, demographic characteristics such as a jurisdiction's population size, per capita income, and political party preference are correlated with the order of adoption to see if there is evidence that demographics relate to policy passage. Second, this study examines the obstacles posed by the plastic bag industry as they sued cities and counties for "insufficient environmental review" under the California Environmental Quality Act (CEQA), the judicial decisions, and the resultant policy processes. Third, this study investigates whether the need to comply with overarching environmental policies, such as solid waste diversion programs or federal/state stormwater regulations, motivated jurisdictions to adopt plastic bag policies. Finally, this study looks at how resources were shared between jurisdictions and by a political advocacy organization.

Understanding the mechanisms that influence environmental policy adoption on a regional basis can help policy professionals and advocates decide how to allocate resources when trying to implement new laws in the face of industry opposition and the methods used by local governments and advocacy organizations to promote the passage of plastic bag policies can be replicated by authorities when faced with similar challenges.

Figure 1. Plastic bag policies in the San Francisco Bay Area
(Map Credit Nathaniel Kelso)



Literature Review

Policy diffusion is commonplace. For decades scholars have decoded the phenomenon using diffusion of innovation theory. Quite simply, an innovation is a policy or program that is new to the adopters (Walker, 1969; Rogers, 2003). Diffusion is defined as the spread of an innovation across a region or neighborhood through channels over time among members of a social system (Rogers, 2003). The theory has mostly been used to explain the factors for policy adoption among American states (Berry & Berry, 1990; Grattet, Jenness, & Curry, 1998; Gray, 1973; Lutz, 1986; Matisoff, 2008; Mooney, 2001; Walker, 1969), with fewer studies looking at cities (Shipan & Volden, 2006; 2008). The theory has also been developed to explain policy adoption in public agencies and organizations (Mohr, 1969). Diffusion studies have focused on welfare, education, and civil rights policies (Gray, 1973), licensing policies (Lutz, 1986), lottery adoptions (Berry & Berry, 1990), hate crime laws (Grattet, et al., 1998), health care policies (Balla, 2001; Stream, 1999), anti-smoking regulations (Shipan & Volden, 2006; 2008), and climate change policies (Matisoff, 2008). What is missing from the literature is a study that applies the tenets of diffusion of innovation theory on a regional basis among local jurisdictions using an environmental policy as the topic, which is this study's main intention.

Consistently, research shows that policy adoption is influenced by internal and external determinants. In studying three decades of political science research, Ringquist and Garand (1999) found that a state's level of wealth and political ideology were

consistently the most important internal factors for adoption, with conservative states being less likely to be leaders in the passage of environmental laws. Diffusion studies have looked at demographic characteristics such as population size (Walker, 1969), per capita income (Gray, 1973; Matisoff, 2008; Walker, 1969), and the political leaning of an electorate (Matisoff, 2008). Grossback, Lawrence and Nicholson-Crotty (2004) found that states are more likely to adopt a policy if other states with similar ideology have passed the policy because it provides confidence that the policy lies close to its own lawmakers' and citizens' preferences. In addition, the costs associated with implementing the policy can impact the rate of adoption (Rogers, 2003). In analyzing the external determinants of policy adoption, other studies have identified impacts from obstacles presented by industry opposition to a new policy (Matisoff, 2008), information acquired from conferences and professional associations (Balla, 2001; Walker, 1969), the involvement of policy advocates (Mintrom, 1997), and the need to comply with overarching policies (Mohr, 1969). However, it is important to note that Downs and Mohr (1976) rejected a unifying diffusion of innovation theory since determinants in some studies have not been found to be important in others; overall, they conclude that different policies have different variables. Even so, determinants discussed in the literature provide guidance for new studies that seek to reveal the drivers of innovative policies.

Many diffusion studies have demonstrated a regional effect in which policy makers learn from the actions of their neighbors through an increase in information,

which helps overcome uncertainty. In turn, the number of adoptions increases which furthers the amount of available information (Berry & Berry, 1990; Mooney, 2001; Stream, 1999; Walker, 1969). Alternatively, if the policy produces negative effects, then it can mobilize the opposition and reduce support among neighbors (Mooney, 2001). Despite these regional influences, Berry & Berry (1990) concluded that it is unrealistic to think that policy makers emulate their neighbors without fully considering the political and economic environment of their own jurisdiction, therefore they called for a model that combines both internal and external determinants, using Mohr's theory of organizational innovation (1969). This theory proposes that innovation is a function of an organization's motivation, the strength of the obstacles against the innovation, and the availability of resources (information or financial) to overcome deterrents. For example, industrial opposition may create obstacles that hinder adoption if there is not sufficient motivation to pass the policy or enough resources to fund or support it. Likewise, a jurisdiction can overcome obstacles if there is motivation to adopt a policy that provides benefits to a higher-level policy or program. Furthermore, leaders can overcome obstacles if there are enough informational or financial resources to support passage. Following Berry and Berry, Matisoff (2008) applied Mohr's theory of organizational innovation to state climate change policies and found that states with carbon intensive industries created obstacles to adoption, citizen demands about environmental concerns were motivational factors, and liberal states were more likely to support government interaction with environmental programs. In addition, neighbors that shared similar

geographic, economic, and political characteristics were more likely to emulate their policies (Matisoff, 2008).

The diffusion of innovation literature has shaped the framework for this analysis of Bay Area plastic bag policy adoption. Using Mohr's theory of organizational innovation helps explain the relationship among the obstacles, motivating factors, and available resources in this policy phenomenon. In addition, correlating demographic information with the order of adoption may reveal patterns that cannot be explained using Mohr's theory. The goal is that these combined methods will provide a fuller picture of what has occurred with the diffusion of plastic bag policies in the Bay Area.

Study Area

This study focuses on the San Francisco Bay Area region (hereafter referred to as Bay Area) which comprises 101 cities within nine counties: San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Solano, Napa, Sonoma, and Marin. This region shares a defining geographical feature, the San Francisco Bay (Bay), which is a large estuary consisting of several interconnected bays. Portions of each Bay Area county make up the immediate watershed that feeds the Bay, thus the counties' waste and litter risk finding their way to the Bay. Although plastic bag policies have been adopted in other municipalities and counties in California, a diffusion study that rises to the statewide scale is beyond the design of this study.

Plastic bag laws

Technically, not all plastic bag laws are created equal. The first version of San Francisco's plastic bag ordinance banned plastic bags at commercial checkout and placed no fee on paper bags. Other iterations have included banning the thinnest plastic bags, while charging a nominal fee for paper bags and thick "reusable" plastic bags. Some policies cover more types of retail establishments than others, and some jurisdictions have adopted second versions of the ordinance to expand the scope of the program by including more stores and restaurants. For the purposes of this study, I am only using information regarding the first version of the policy that restricted the distribution of plastic bags at checkout via a total ban or fee. Since there are different levels of governance in the Bay Area, this study includes plastic bag laws created by cities, counties, and joint powers authorities (JPA), which have the same powers to pass policies as their participating agencies.

Variables Thought To Influence Diffusion Of Plastic Bag Bans

Demographics.

In part, this study is concerned with the demographic distinctions among Bay Area jurisdictions that may have influenced policy outcomes. Demographically speaking, the Bay Area's 7 million plus residents are an affluent group, with an average per capita income of \$39,418 compared to the national average of \$28,155 (U.S Census Bureau, 2015). Only fourteen of its 101 cities have a per capita income below the national average. In terms of political party preference, the region leans more Democratic than the

rest of the country; 70.43 percent of Bay Area electorate voted for the Democratic presidential candidate, Barack Obama, in the 2012 election compared with 51.01 percent of the United States electorate (Leip, 2012). Only five out of 101 Bay Area cities had Democratic margins below the national election results. Still, the Bay Area is not homogenous from one jurisdiction to the next.

The literature suggests that a jurisdiction's population size may influence policy outcomes, since larger cities and counties would have more resources available in the form of skilled staff or wealth (Walker, 1969). Therefore this study also takes population size into account when examining the order of adoption.

The plastic bag industry response.

Upon passage of earlier plastic bag ordinances, plastic bag manufacturers and distributors based in California and beyond formed a legal coalition (Coalition) that sued several Bay Area and California jurisdictions that had done, in the Coalition's opinion, insufficient environmental review under the CEQA. The Coalition argued that by banning plastic bags without putting a sufficient fee on paper bags, consumers would simply switch to paper bags, which the Coalition claimed had an even more adverse impact on the environment (Coalition v. City of Oakland, 2007; Coalition v. Town of Fairfax, 2007; Coalition v. County of Marin, 2011a).

CEQA states that projects carried out by public agencies are subject to environmental review to determine whether there will be significant impacts on the environment, and to reveal what kinds of resources the project would impact (California

Environmental Quality Act of 1970). There are several types of environmental review allowed under CEQA. An environmental impact report (EIR) is prepared when an initial study finds substantial evidence that a project will have a significant impact on the environment (ibid.). It is often a lengthy document and must analyze the significant environmental effects of a proposed project, identify alternatives, and disclose ways to reduce the environmental damage (ibid.). Alternatively, a negative declaration is prepared when an initial study finds that there is no substantial evidence that a project will have a significant effect on the environment, making an EIR unnecessary (ibid.). Finally, a categorical exemption is simply an exemption from the CEQA process because a public agency has outright decided, without an initial study, that the project has no significant effect on the environment (ibid.). Jurisdictions in the Bay Area used all of these CEQA tactics in the passage of their plastic bag bans. What is at question is whether the Coalition's legal threats impacted the way jurisdictions employed CEQA and whether such obstacles influenced the adoption process and timeline.

Overarching environmental policies.

Stormwater permits.

Urban stormwater runoff can contain pollutants such as heavy metals, pesticides, and trash, which can impair receiving water bodies. Plastic trash in particular is a nuisance—it can persist in the environment for hundreds of years and poses a threat to aquatic life through ingestion, entrapment, and entanglement (San Francisco Bay Regional Water Quality Control Board, 2009). At the International Coastal Cleanup Day

in 2009, plastic bags were the second most common litter item collected along streams and beaches (Alameda County Waste Management Authority, 2011).

Section 303(d) of the Clean Water Act (CWA) requires States to identify waters that do not attain water quality standards (San Francisco Bay Regional Water Quality Control Board, 2009). In 2009 The San Francisco Bay Regional Water Quality Control Board (SFRWB), a division of the California State Water Resources Control Board, proposed adding 26 Bay Area waterways, including the central and lower Bays, to the 303(d) list for trash impairment (*ibid.*) As a result, the SFRWB issued a new semi-regional stormwater permit, under the CWA's National Pollution Discharge Elimination System (NPDES) stormwater program. The 2009 San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (MRP), still in effect today, covers 66 municipalities and four county jurisdictions within Alameda, Contra Costa, San Mateo, Santa Clara, and Solano counties (San Francisco Bay Regional Water Quality Control Board, 2011). As part of its receiving water limitations, the permit forbids discharges that adversely affect the beneficial uses of the waters of the State, including trash or litter visible to the naked eye (*ibid.*). Therefore, Section C.10 of the MRP directly mandates that permittees reduce trash loads transmitted by their municipal separate stormwater sewers (MS4s) to receiving waters by 40 percent by 2014, 70 percent by 2017, and 100 percent by 2022 (*ibid.*).

Contra Costa County consists of two watersheds. The western watershed is managed by the SFRWB and the Central Valley Region Water Quality Control Board

(CVRWB) manages the eastern watershed (Central Valley Regional Water Quality Control Board, 2010). The CVRWB issued a similar permit for trash load reductions, of 40 percent by 2015, 70 percent by 2018, and 100 percent reductions by 2023 (ibid). Therefore, all of Contra Costa County is covered by a zero trash NPDES permit.

These are the only zero trash stormwater permits in the Bay Area. Permittees of both stormwater permits are required to submit annual reports spelling out planned and implemented actions to achieve trash reductions. In return, both water boards allow a range of trash reduction credits for jurisdictions that adopted a plastic bag ban, depending upon the scope of the policy (City of San Mateo, 2012). Therefore, this study intends to discover whether a jurisdiction's need to comply with the NPDES permit was a motivating force for the adoption of plastic bag bans.

Solid waste diversion policies.

The adoption of local solid waste diversion policies, resolutions, and goals became popular in the Bay Area around the same time plastic bag bans were diffusing. Waste diversion policies are generally characterized by a timeline of landfill diversion goals that usually, but not always, helps reach zero waste by a certain date. For example, San Francisco's resolution called for 75 percent landfill diversion by 2010 and zero waste by 2020 (City and County of San Francisco, 2002). According to the San Francisco Department of Environment, zero waste means sending nothing to the landfill or incinerator (San Francisco Department of Environment, n.d.). Waste diversion goals can

be reached through source reduction, extended producer responsibility, recycling, reuse, and composting (San Francisco Department of Environment, 2003).

Besides local policies, California Integrated Waste Management Act of 1989, Assembly Bill 939, required each city and county to achieve a landfill diversion rate of 25 percent by 1995 and 50 percent by 2000 (California Department of Resources Recycling and Recovery, 1997). This policy was updated in 2011 with AB 341, which established a statewide policy goal of 75 percent waste diversion by 2020 (Solid Waste: Diversion, 2011).

Waste characterization studies in California have documented the amount of space plastic bags take up in landfills. The California Integrated Waste Management Board's and Alameda County's waste characterization studies estimate that plastic bags comprise 0.3 percent and 0.8 percent of landfill waste, respectively (Cascadia Consulting Group, 2009; R.W. Beck, 2009). Although these totals are a small portion of a landfill's waste stream, one would assume that any measurable reduction in waste would be attractive to a jurisdiction that has adopted such stringent waste diversion goals. Since State policies are consistent throughout the Bay Area, this paper examines whether local waste diversion policies that were more stringent than State standards motivated Bay Area jurisdictions to adopt plastic bag bans.

Policy advocates.***Green Cities California.***

Policy advocacy involves intentional activity initiated by the public or an organization to affect the policy process (Gen & Wright, 2013). Advocacy organizations work to achieve positive policy outcomes and social change that align with their own specific preferences through engagement and information sharing that increases awareness and support with other advocates, decision makers, and the public (ibid.).

Green Cities California (GCC) is a coalition of twelve environmentally progressive local governments in California whose mission is to assist the implementation of environmentally sustainable policies and programs (Green Cities California, 2013). Following the plastic bag coalition's lawsuits, in 2010 the GCC prepared a Master Environmental Assessment (MEA) on single-use bags that jurisdictions could use, free of charge, to facilitate the adoption of local ordinances (ibid.). CEQA guidelines Sec. 15169 allow the use of MEAs to provide information that can be used in EIRs and initial studies. The MEA is not meant to replace an EIR or initial study because it does not reach conclusions about local environmental impacts and does not propose mitigation measures or alternatives (ICF International, 2010). However, the MEA on Single-Use and Reusable Bags provides valuable information regarding the impacts of restricting the use of single-use grocery bags, including existing regulations, life-cycle analysis, potential impacts on the environment, and the use of fees to encourage consumers to reuse bags (ibid.).

Methodology

Ordinance Collection and Organization

Copies of plastic bag ordinances were located via the Californians Against Waste webpage that provides links to local ordinances (Californians Against Waste, 2014). Additional ordinance information was found by contacting city clerks or visiting government webpages. A Microsoft Excel spreadsheet was used to organize the information by date of adoption. All Bay Area municipalities and counties were included in the spreadsheet, regardless of whether they had adopted a plastic bag ordinance.

Innovation Score

Since this study is concerned, in part, with the correlation of demographic variables to the order of policy adoption, an innovation score (Walker, 1969) is calculated for each jurisdiction in the Bay Area according to its time of adoption compared to other jurisdictions. Jurisdictions that were forced to rescind their ordinances due to lost legal cases are not included in the innovation score calculations—only jurisdictions with standing ordinances are used.

The innovation score is calculated for three different sets: the whole set, including all counties and municipalities; a counties only set; and for municipalities within the same county. This breakdown allows for an exploration of demographic variables at different scales, since policies were adopted at different scales.

The innovation score is calculated as follows:

A = the number of days between the first and last adoption

B = the time between the first adoption and each subsequent adoption

Innovation score = $1 - B/A$

The first jurisdiction to adopt has an innovation score of 1.0, the last to adopt is 0, and those that have not yet passed plastic bag policies get a score of -0.01.

Demographic Correlation

For all municipalities and counties in the Bay Area, population data are from the 2010 United States Census, and per capita income figures are from the 2009-2013 American Community Survey 5-Year Estimates. Both can be found using the US Census Bureau's American Fact Finder webpage. Per capita income data were gathered on January 26, 2015. To see if a jurisdiction's political party preference correlates with its order of adoption, this study looks at each jurisdiction's percentage of ballots cast for the Democratic candidate in the 2008 and 2012 United States Presidential contests, and the 2010 California Gubernatorial contest. These elections were selected because they occurred in all jurisdictions and fall within the range of plastic bag ban adoption dates. Election data were found via each county's Statement of the Vote document located on the Registrar of Voters webpages. Additional information was requested via email with county clerks. Demographic data on the county level is for the entire county.

Demographic data were correlated to the innovation scores of each set using the correlation function in Microsoft Excel. The strength of the relationship between the variables and the innovation score are analyzed using the Pearson product-moment correlation coefficient, or Pearson's r , which is as follows:

If $r = +.70$ to 1.0 : very strong positive

+ $.40$ to + $.69$: strong positive

+ $.30$ to + $.39$: moderate positive

+ $.20$ to + $.29$: weak positive

+ $.01$ to + $.19$: no or negligible

- $.01$ to - $.19$: no or negligible

- $.20$ to - $.29$: weak negative

- $.30$ to - $.39$: moderate negative

- $.40$ to - $.69$: strong negative

- $.70$ to - 1.0 : very strong negative

External Variables: Lawsuits, Environmental Policies, and Policy Advocates

There are several questions regarding the diffusion of plastic bag policies in the Bay Area. First, how did the Coalition's lawsuits and subsequent legal outcomes impact the timing of adoption and the types of CEQA review each jurisdiction undertook?

Second, what were the factors that motivated jurisdictions to adopt plastic bag laws in the face of industry opposition? Third, did jurisdictions share resources, such as information or funding, to overcome legal and CEQA-related obstacles?

To answer these questions this study examines the content of legal documents, judicial decisions, ordinances, CEQA documents, NPDES stormwater permits, waste diversion policies, agency memos, staff reports, and governmental meeting agendas and minutes. Legal documents and decisions were located via the plasticbaglaws.org website

or by doing internet searches such as, “Save the Plastic Bag Coalition v. Marin County”. CEQA documents were found by doing internet searches such as, “San Jose plastic bag EIR” and by searching government websites. Meeting agendas and minutes were found by searching archival information on government websites using the date of ordinance adoption as reference. City and county clerks and other government staff were contacted via email and phone for further information.

Interviews with governmental personnel were conducted via email or in person. In-person interviews were open-ended and recorded. Interviewees were identified by snowball sampling, with the first interviewee being a member of San Francisco’s Environment Commission.

Data are organized qualitatively through textual discussion and through timelines and tables that reveal the relationships of the external variables to the diffusion of plastic bag policies. Simple quantitative analysis, such as figuring percentages, is used to determine the influence of compliance with overarching policies and the impact of the MEA to adoption processes.

Results

Innovation Score

Table 1 lists the entire set of Bay Area jurisdictions (adopters and non-adopters) in order of adoption, and their innovation scores. The innovation score reflects the “innovativeness” between the first adopter and each subsequent adopter, as explained earlier. It also reflects the time elapsed between adoptions. For example, there are several

places with a substantial gap from one innovation score to the next, which indicates a lapse in adoption. San Francisco, the first adopter, has an innovation score of 1.0, while the next adopter, Fairfax has an innovation score of 0.80. Palo Alto’s innovation score is 0.74 and the next adopter, San Jose has a score of 0.51. Millbrae has a score of 0.37, while the next adopter, Unincorporated San Mateo County, has an innovation score of 0.27. From that point onward, there are no major gaps in the innovation score. The adoptions continue in a consistent sequence.

Since the entire set consists of different jurisdictional types—municipalities and counties—demographic data were not correlated with the entire set. Instead, the entire set can be broken down into “like” sets. Table 2 shows the innovation scores between municipalities of the same county. It does not include counties where all jurisdictions adopted simultaneously. Table 3 displays the innovation scores between counties only.

Table 1. Innovation Scores (IS) for the Entire Set (In Order of Adoption)

#	County	Jurisdiction	Date Adopted	IS
1	San Francisco	San Francisco	4/10/07	1.00
2	Marin	Fairfax	11/4/08	0.80
3	Santa Clara	Palo Alto	3/30/09	0.74
4	Santa Clara	San Jose	1/11/11	0.51
5	Marin	Unincorporated Marin County	1/25/11	0.51
6	Santa Clara	Unincorporated Santa Clara County	4/26/11	0.47
7	Santa Clara	Sunnyvale	12/13/11	0.39
8	Alameda	Entire Alameda County	1/25/12	0.38
9	San Mateo	Millbrae	2/14/12	0.37
10	San Mateo	Unincorporated San Mateo County	11/6/12	0.27
11	San Mateo	Pacifica	12/10/12	0.26
12	Santa Clara	Mountain View	12/11/12	0.26

13	San Mateo	South San Francisco	12/12/12	0.26
14	San Mateo	Foster City	1/7/13	0.25
15	San Mateo	Belmont	1/8/13	0.25
16	San Mateo	Colma	1/9/13	0.25
17	San Mateo	San Bruno	1/13/13	0.25
18	San Mateo	Daly City	1/14/13	0.25
19	San Mateo	Menlo Park	1/22/13	0.25
20	San Mateo	Portola Valley	1/23/13	0.25
21	San Mateo	Half Moon Bay	3/5/13	0.23
22	Santa Clara	Cupertino	3/5/13	0.23
23	San Mateo	San Carlos	3/11/13	0.23
24	Santa Clara	Los Altos	3/12/13	0.23
25	San Mateo	Brisbane	3/18/13	0.23
26	San Mateo	Burlingame	3/18/13	0.23
27	San Mateo	Redwood City	3/25/13	0.22
28	San Mateo	East Palo Alto	4/2/13	0.22
29	San Mateo	City of San Mateo	5/6/13	0.21
30	Contra Costa	Richmond	7/16/13	0.18
31	Santa Clara	Campbell	7/16/13	0.18
32	Santa Clara	Los Gatos	9/3/13	0.17
33	Contra Costa	El Cerrito	9/17/13	0.16
34	Contra Costa	San Pablo	10/8/13	0.15
35	Contra Costa	Pittsburg	10/21/13	0.15
36	Marin	Mill Valley	10/21/13	0.15
37	Santa Clara	Morgan Hill	11/6/13	0.14
38	Sonoma	Entire Sonoma County	2/19/14	0.11
39	Marin	San Rafael	3/3/14	0.10
40	Marin	Novato	3/6/14	0.10
41	Contra Costa	Walnut Creek	3/18/14	0.10
42	Marin	Sausalito	3/18/14	0.10
43	Marin	Larkspur	5/7/14	0.08
44	Marin	San Anselmo	5/27/14	0.07
45	Marin	Belvedere	6/9/14	0.07
46	Contra Costa	Martinez	6/18/14	0.06

47	Napa	Calistoga	7/15/14	0.05
48	Contra Costa	Pleasant Hill	8/4/14	0.05
49	Napa	City of Napa	8/5/14	0.05
50	Napa	St. Helena	8/12/14	0.04
51	Santa Clara	City of Santa Clara	8/19/14	0.04
52	Contra Costa	Hercules	9/9/14	0.03
53	Marin	Tiburon	10/3/14	0.03
54	Marin	Ross	10/11/14	0.02
55	Contra Costa	Lafayette	12/8/14	0.00
56	Contra Costa	Danville	12/16/14	0.00
57	Contra Costa	Contra Costa County	n/a	-0.01
58	Contra Costa	Antioch	n/a	-0.01
59	Contra Costa	Brentwood	n/a	-0.01
60	Contra Costa	Clayton	n/a	-0.01
61	Contra Costa	Concord	n/a	-0.01
62	Contra Costa	Moraga	n/a	-0.01
63	Contra Costa	Oakley	n/a	-0.01
64	Contra Costa	Orinda	n/a	-0.01
65	Contra Costa	Pinole	n/a	-0.01
66	Contra Costa	San Ramon	n/a	-0.01
67	Marin	Corte Madera	n/a	-0.01
68	San Mateo	Atherton	n/a	-0.01
69	San Mateo	Hillsborough	n/a	-0.01
70	San Mateo	Woodside	n/a	-0.01
71	Santa Clara	Gilroy	n/a	-0.01
72	Santa Clara	Los Altos Hills	n/a	-0.01
73	Santa Clara	Milpitas	n/a	-0.01
74	Santa Clara	Monte Sereno	n/a	-0.01
75	Santa Clara	Saratoga	n/a	-0.01
76	Solano	Unincorporated Solano County	n/a	-0.01
77	Solano	Benicia	n/a	-0.01
78	Solano	Dixon	n/a	-0.01
79	Solano	Fairfield	n/a	-0.01
80	Solano	Rio Vista	n/a	-0.01

81	Solano	Suisun City	n/a	-0.01
82	Solano	Vacaville	n/a	-0.01
83	Solano	Vallejo	n/a	-0.01
84	Napa	Unincorporated Napa County	n/a	-0.01
85	Napa	American Canyon	n/a	-0.01
86	Napa	Yountville	n/a	-0.01

Table 2. Innovation Scores between Municipalities of the same County

County	Municipality	Date Adopted	IS
San Mateo	Millbrae	2/14/12	1.00
San Mateo	Pacifica	12/10/12	0.33
San Mateo	South San Francisco	12/12/12	0.32
San Mateo	Foster City	1/7/13	0.27
San Mateo	Belmont	1/8/13	0.26
San Mateo	Colma	1/9/13	0.26
San Mateo	San Bruno	1/13/13	0.25
San Mateo	Daly City	1/14/13	0.25
San Mateo	Menlo Park	1/22/13	0.23
San Mateo	Portola Valley	1/23/13	0.23
San Mateo	Half Moon Bay	3/5/13	0.14
San Mateo	San Carlos	3/11/13	0.13
San Mateo	Brisbane	3/18/13	0.11
San Mateo	Burlingame	3/18/13	0.11
San Mateo	Redwood City	3/25/13	0.09
San Mateo	East Palo Alto	4/2/13	0.08
San Mateo	San Mateo City	5/6/13	0.00
San Mateo	Atherton	n/a	-0.01
San Mateo	Hillsborough	n/a	-0.01
San Mateo	Woodside	n/a	-0.01
Santa Clara	Palo Alto	3/30/09	1.00
Santa Clara	San Jose	1/11/11	0.67
Santa Clara	Sunnyvale	12/13/11	0.50
Santa Clara	Mountain View	12/11/12	0.31

Santa Clara	Cupertino	3/5/13	0.27
Santa Clara	Los Altos	3/12/13	0.27
Santa Clara	Campbell	7/16/13	0.20
Santa Clara	Los Gatos	9/3/13	0.18
Santa Clara	Morgan Hill	11/6/13	0.15
Santa Clara	City of Santa Clara	8/19/14	0.00
Santa Clara	Gilroy	n/a	-0.01
Santa Clara	Los Altos Hills	n/a	-0.01
Santa Clara	Milpitas	n/a	-0.01
Santa Clara	Monte Sereno	n/a	-0.01
Santa Clara	Saratoga	n/a	-0.01
Contra Costa	Richmond	7/16/13	1.00
Contra Costa	El Cerrito	9/17/13	0.88
Contra Costa	San Pablo	10/8/13	0.84
Contra Costa	Pittsburg	10/21/13	0.81
Contra Costa	Walnut Creek	3/18/14	0.53
Contra Costa	Martinez	6/18/14	0.35
Contra Costa	Pleasant Hill	8/4/14	0.26
Contra Costa	Hercules	9/9/14	0.19
Contra Costa	Lafayette	12/8/14	0.02
Contra Costa	Danville	12/16/14	0.00
Contra Costa	Antioch	n/a	-0.01
Contra Costa	Brentwood	n/a	-0.01
Contra Costa	Clayton	n/a	-0.01
Contra Costa	Concord	n/a	-0.01
Contra Costa	Moraga	n/a	-0.01
Contra Costa	Oakley	n/a	-0.01
Contra Costa	Orinda	n/a	-0.01
Contra Costa	Pinole	n/a	-0.01
Contra Costa	San Ramon	n/a	-0.01
Napa	Calistoga	7/15/14	1.00
Napa	Napa City	8/5/14	0.25

Napa	St. Helena	8/12/14	0.00
Napa	American Canyon	n/a	-0.01
Napa	Yountville	n/a	-0.01
Marin	Fairfax	11/4/08	1.00
Marin	Mill Valley	10/21/13	0.16
Marin	San Rafael	3/3/14	0.10
Marin	Novato	3/6/14	0.10
Marin	Sausalito	3/18/14	0.10
Marin	Larkspur	5/7/14	0.07
Marin	San Anselmo	5/27/14	0.06
Marin	Belvedere	6/9/14	0.06
Marin	Tiburon	10/3/14	0.00
Marin	Ross	10/11/14	0.00
Marin	Corte Madera	n/a	-0.01

Table 3. Innovation Scores between Counties

County	Date Adopted	IS
City and County of San Francisco	4/10/07	1.00
Marin County	1/25/11	0.45
Santa Clara County	4/26/11	0.41
Alameda County	1/25/12	0.30
San Mateo County	11/6/12	0.19
Sonoma County	2/19/14	0.00
Contra Costa County	n/a	-0.01
Solano County	n/a	-0.01
Napa County	n/a	-0.01

Demographic Correlation

Per Capita Income.

Table 4 shows the correlation coefficients between demographic data with the innovation scores from Tables 2 and 3. Per capita income had a very strong positive correlation with the counties' innovation scores, a 0.75 correlation coefficient, signifying that counties with a higher per capita income were not only more likely to adopt than counties with lower per capita income, but also tended to be earlier adopters. Although values were low, the municipalities' innovation scores had an overall negative relationship with per capita income, signifying a *minor* relationship within each county whereby jurisdictions with lower per capita incomes were somewhat more likely to adopt plastic bag policies earlier than jurisdictions with higher per capita incomes.

Electoral Data.

The correlations between electoral data and innovation scores are stronger and overall positive. The most significant values occur with the Counties' set, which shows very strong positive relationships with the percentage of Democratic ballots cast in each election. This suggests that counties that lean Democratic were likely to be earlier adopters compared to counties with a smaller proportion of Democratic voters. Likewise, in the municipalities set, the order of adoption between Contra Costa County cities had on average a very strong positive relationship with the percentage of Democratic ballots cast in each election, signifying that the most heavily Democratic municipalities were earlier adopters. The order of adoption between municipalities in Marin, Napa, and Santa

Clara Counties exhibited on average a strong positive relationship with the percentage of Democratic ballots cast in each election, while the adoption order of San Mateo County cities had a negligible relationship with Democratic voting.

Table 4. Correlation Coefficients between Innovation Score and Demographic Data

Set Type	Population	Per Capita Income	2008 Presidential Election	2012 Presidential Election	2010 California Gubernatorial Election
Counties	0.25	0.75	0.80	0.80	0.81
Municipalities of the same County					
Contra Costa County	0.15	-0.43	0.66	0.79	0.81
Marin County	-0.08	-0.30	0.53	0.48	0.57
Napa County	-0.05	-0.38	0.72	0.50	0.34
San Mateo County	-0.01	-0.33	0.06	0.23	0.21
Santa Clara County	0.45	-0.11	0.73	0.63	0.69

Legal Challenges, Court Decisions, and Impacts on CEQA Determination

The timeline in Table 5 shows how the Coalition's legal challenges and their subsequent court decisions influenced the timing and character of plastic bag policies and the types of CEQA jurisdictions employed. San Francisco's ordinance banned the distribution of plastic checkout bags from certain stores but allowed the distribution of paper, compostable, or reusable bags free of charge at checkout (City and County of San Francisco, 2007). The City filed a categorical exemption under CEQA Guidelines Sec. 15060(c)(3), which says that a project does not have the potential to result in a direct or indirect physical change in the environment (J. Poling, personal communication, March 13, 2014). San Francisco's ordinance went unchallenged by the plastic bag industry.

Several months later the cities of Oakland and Fairfax passed ordinances similar to San Francisco's, both with the following categorical exemptions: Sec. 15061(b)(3), which finds the project to have positive environmental effects and no possibility of significant adverse effects; Sec. 15183 which declares the project to be consistent with general plan elements; and Sec. 15308 and 15307 in which the project is designed to protect the environment and natural resources, respectively (*Coalition v. City of Oakland*, 2007; *City of Oakland*, 2007; *Town of Fairfax*, 2007). This time the Coalition filed lawsuits against Oakland and Fairfax for not conducting a proper environmental review under CEQA (*Coalition v. City of Oakland*, 2007; *Coalition v. Town of Fairfax*, 2007). Since consumers could easily switch to paper bags, the Coalition claimed that there was no substantial evidence to support the municipalities' conclusions that the ordinances would not have a significant impact on the environment (*ibid.*). According to the Coalition, paper bags generate more greenhouse gas emissions and water pollutants during manufacturing, require more energy to recycle, and often end up in landfills where they release methane gas in the decomposition process (*ibid.*).

To avoid a potentially costly legal battle, Fairfax rescinded its ordinance and instead made it voluntary. A year later, Fairfax passed a plastic bag ban by voter initiative, which was exempt from CEQA since it was not sponsored by a public agency. Oakland, however, continued with the suit, unsuccessfully. In April 2008, the Alameda County Superior Court ordered Oakland to vacate its ordinance and to not reenact it without complying with CEQA (*Coalition v. City of Oakland*, 2008b). The judge ruled

that without a fee on paper bags, consumers would shift from one environmentally damaging product to another (*Coalition v. City of Oakland*, 2008a). Oakland did not appeal the decision and rescinded its ordinance.

Three months after the Oakland ruling, the City of Manhattan Beach, in southern California, passed a plastic bag ordinance similar in nature to San Francisco's. The City filed a negative declaration after an initial study found the policy could not have a significant effect on the environment (*City of Manhattan Beach*, 2008). Using the same argument from the Oakland and Fairfax cases, the Coalition sued the City for violating CEQA by not conducting an EIR (*Coalition v. City of Manhattan Beach*, 2008). In February 2009, the Los Angeles County Superior Court judge ruled in favor of the Coalition, citing the need for Manhattan Beach to conduct an EIR (*Coalition v. City of Manhattan Beach*, 2009). The City appealed the ruling.

In March 2009, the City of Palo Alto adopted a plastic bag ordinance similar to San Francisco's after an initial study found that although the policy could have significant effect on the environment, education and outreach campaigns regarding reusable bags would avoid or reduce impacts to a point where no significant impacts could occur (*Palo Alto City Manager*, 2009). Therefore, the City adopted a mitigated negative declaration. Again, the Coalition sued Palo Alto for not doing an EIR, but this time the case did not go to court. Palo Alto and the Coalition agreed to a settlement whereby the ordinance was able to remain, but the City would have to complete an EIR if

it decided to amend or expand its ordinance in the future (*Coalition v. City of Palo Alto*, 2009).

In January 2010, the Court of Appeal affirmed the Superior Court's decision in the Manhattan Beach case and the City appealed to the California Supreme Court. A year passed before the next ordinance was adopted in the Bay Area. In January 2011, San Jose adopted a plastic bag ordinance that was unique in two ways—it was the first ordinance to undergo the scrutiny of an EIR, and it banned single-use plastic bags while charging a \$0.10 fee for each recycled paper bag distributed at checkout (*City of San Jose*, 2011). Overall, the EIR concluded that the fee on paper bags would promote a “bring your own bag” culture which would reduce the use of nonrenewable resources, would not cause irreversible or unavoidable environmental changes, and would have a less than significant impact on the environment (*City of San Jose*, 2010). The Coalition did not challenge San Jose's ordinance or EIR and this ordinance became a model for other Bay Area jurisdictions.

Several days after San Jose's ordinance was adopted, Marin County passed a similar ban for its unincorporated areas. The ordinance called for a \$0.05 fee on recycled paper bags and reusable bags, but instead of adopting an EIR, they filed a categorical exemption under CEQA guidelines Sec. 15308 since the project assured maintenance, restoration, enhancement, or protection of the environment (*Coalition v. County of Marin*, 2011b; *County of Marin*, 2011). Again, the Coalition sued the County for not conducting an EIR, claiming there was no certainty that a \$0.05 fee on paper bags was

sufficient enough to prevent negative environmental effects (*Coalition v. County of Marin*, 2011a).

Before the Marin County Superior Court ruling took place, Santa Clara County adopted an ordinance similar to San Jose's for its unincorporated areas after conducting an initial study and adopting a negative declaration (*County of Santa Clara*, 2011). The ordinance went unchallenged. Also previous to the Marin County decision, in July 2011 the California Supreme Court struck down the Appeals Court decision in the Manhattan Beach case. The Court ruled that due to Manhattan Beach's small size and population, no significant environmental impacts could occur from their plastic bag ban (*Coalition v. City of Manhattan Beach*, 2011). However, in a slight victory for the Coalition, the Court ruled that larger jurisdictions might need to prepare EIRs since cumulative impacts of increased paper bag consumption could have a significant impact on the environment (*ibid.*).

Two months after the Manhattan Beach Supreme Court decision, the Marin County Superior Court ruled in favor of Marin County. The judge found that the County acted reasonably by relying on a categorical exemption since the ordinance was designed to protect natural resources and the environment (*Coalition v. County of Marin*, 2011c). The Coalition appealed, but in June 2013 the Court of Appeal upheld the Superior Court's decision, citing the Manhattan Beach Supreme Court decision as basis for its ruling since the population size of the Marin's unincorporated area and the number of stores affected by the ban was less than Manhattan Beach's (*Coalition v. County of*

Marin, 2013). The Coalition did not appeal the Marin case further, and no lawsuits were filed against Bay Area jurisdictions from this point onward.

Before the Marin County Appeals Court decision, Bay Area jurisdictions continued to adopt plastic bag ordinances based upon San Jose's success and the Supreme Court's Manhattan Beach decision. Sunnyvale was the only other municipality in the Bay Area to undertake an EIR for its ordinance, even though its population size of 140,000 might not have warranted an EIR under the Manhattan Beach decision.

Countywide Efforts.

As Table 5 shows, many late adopting smaller cities used categorical exemptions or negative declarations, while the cumulative effects portion of the Manhattan Beach decision differently impacted the way counties and waste management JPAs conducted CEQA. The Alameda County Waste Management Authority and Source Reduction and Recycling Board (StopWaste.org), San Mateo County, the West Contra Costa Waste Management Authority (RecycleMore), the Sonoma County Waste Management Authority (SCWMA), and the Marin County Hazardous and Solid Waste Management Joint Powers Authority (Marin JPA) acted as lead agencies for ordinance creation and EIR preparation for their smaller participating agencies to ensure cohesive policies across jurisdictions, to ameliorate the costs of preparing individual ordinances and EIRs, and to support existing overarching policies.

Stopwaste.org has the power to enact countywide policies that implement the Alameda County Integrated Waste Management Plan, which is designed to reduce waste

disposed at landfills in Alameda County by 75 percent by 2010 and beyond (Alameda County Waste Management Authority, 2011; Alameda County Waste Management Authority, 2012; Alameda County Waste Reduction and Recycling Act of 1990). The JPA consists of 17 board members: one representative from each of the fourteen city councils, one from the County Board of Supervisors, and one from each of the two sanitary district boards (Alameda County Waste Management Authority, 2011). To address plastic bag waste in Alameda County, StopWaste.org proposed an ordinance similar to San Jose's and prepared an EIR to address the cumulative environmental impacts of a countywide ordinance. A unanimous vote by StopWaste.org's board members ensured a cohesive policy across the entire county.

Since San Mateo County does not have a waste management authority to pass a plastic bag ban for its entire jurisdiction, the San Mateo County Board of Supervisors approached the San Mateo Department of Environmental Health (DEH) about spearheading efforts for an ordinance for its unincorporated areas (D. Peterson, personal communication, March 5, 2015). Citing the need for a cohesive ordinance rather than piecemeal legislation throughout the South Bay Area, the DEH advocated for a regional approach in which cities in San Mateo and Santa Clara Counties could adopt identical ordinances and be participating agencies in an EIR (*ibid.*). Acting as the lead agency, the DEH enlisted cities, researched past lawsuits and successful ordinances, and along with the San Mateo County Board of Supervisors designed a model regional ordinance clear of any legal complications that individual jurisdictions could adopt (*ibid.*). San Mateo

County paid for all costs related to the model ordinance creation and EIR preparation and the DEH agreed to provide compliance support and enforcement (ibid.). The following jurisdictions agreed to be participating agencies: unincorporated San Mateo County, Belmont, Brisbane, Burlingame, Colma, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Portola Valley, Redwood City, San Bruno, San Carlos, San Mateo, South San Francisco, Woodside, Milpitas, Cupertino, Los Gatos, Los Altos, Campbell, and Mountain View (Rincon Consultants Inc., 2012). The most effective argument to get cities on board was the need to comply with the MRP's regulations, since the State Water Board was allowing six to twelve percent trash load reductions to jurisdictions that adopted plastic bag policies (D. Peterson, personal communication, March 5, 2015; City of San Mateo, 2012). Because Gilroy and Morgan Hill, (both located in southern Santa Clara County), are in a different watershed than the rest of San Mateo and Santa Clara Counties, and are not regulated by the MRP, they were not included as participating agencies (D. Peterson, personal communication, March 5, 2015). Atherton, Monte Sereno, and Hillsborough had no retail stores therefore they were not interested in being part of the effort (ibid.). Millbrae adopted its own ordinance with a Negative Declaration before the model ordinance and EIR process were complete. To date, all participating agencies have adopted the model ordinance except Woodside and Milpitas. Woodside only had two applicable stores and did not have the political will to pass the ordinance, while Milpitas had one city council member who strongly opposed the ordinance and blocked the effort (ibid.).

In July 2011, RecycleMore conducted a feasibility study for a plastic bag ordinance that could be adopted by its member agencies of El Cerrito, Hercules, Pinole, Richmond, and San Pablo. The study discussed current legal challenges, court decisions and their impacts on CEQA compliance; how the ordinance enables compliance with the MRP; and alternative approaches and cost-sharing options among jurisdictions (West Contra Costa Integrated Waste Management Authority, 2011). Responding to pressure from its member agencies, RecycleMore went forward with the model ordinance and conducted an initial study that concluded that the proposed policy would not result in “cumulatively considerable contributions to cumulatively significant environmental impacts”, therefore the agency drafted a negative declaration (West Contra Costa Integrated Waste Management Authority, 2012; West Contra Costa Integrated Waste Management Authority, 2013). Responding to threats from the Coalition regarding its initial study, RecycleMore protected itself from litigation by preparing an EIR in August 2012 that could be used by member agencies for the adoption of its model ordinance (West Contra Costa Integrated Waste Management Authority, 2013). Although Contra Costa County is not an official member agency of RecycleMore, parts of the County’s unincorporated areas are within RecycleMore’s service area (*ibid.*). Therefore, the County was included as a participating agency that could use the EIR for ordinance adoption in those communities (*ibid.*). In the end, Contra Costa County, Pinole, and Hercules did not adopt the RecycleMore model ordinance. Hercules adopted an ordinance on its own in 2014, and it is unclear what CEQA determination was used.

The SCWMA was next to employ a countywide effort similar to Alameda County's. The Authority is a ten-member joint powers agency, consisting of a representative from each municipality in Sonoma County and the unincorporated areas. The SCWMA is able to pass policies that promote waste reduction within the County (Sonoma County Waste Management Agency, 2014). For years the SCWMA debated alternative approaches for plastic bag policies in the County: a SCWMA countywide ordinance and EIR with the SCWMA providing enforcement; a SCWMA model ordinance and EIR for participating agencies to adopt with each jurisdiction providing enforcement; and completely individual jurisdiction efforts (Sonoma County Waste Management Agency, 2011). The first approach, the countywide effort, was estimated to cost the most—\$135,000 to \$193,000 for CEQA contractor costs, legal costs, and staff time, and a minimum of \$137,000 per year for enforcement costs (ibid.). However, this route was the least cost for each individual jurisdiction and the least cost for all jurisdictions combined (ibid). In the end, the SCWMA and its member agencies decided upon the countywide ordinance and EIR since it would ensure consistency across the county, cost the least overall for the entire county, and involve the least legal risk to each jurisdiction (Sonoma County Waste Management Agency, 2011; Sonoma County Waste Management Agency, 2012). It was passed unanimously by all member agencies in February 2014 therefore Sonoma County in its entirety is covered by the plastic bag ordinance.

To date, the last countywide effort was in Marin County. The Marin JPA consists of one representative from each Marin County municipality, plus one from the County itself. To further the County's zero waste goal and facilitate the extension of plastic bag ordinances throughout the County, the JPA acted as lead agency in the preparation of an EIR and creation of a model ordinance for its member agencies to certify and adopt individually (Rincon Consulting Inc., 2013; Marin County Hazardous and Solid Waste Management JPA, 2015; Marin County Hazardous and Solid Waste Management JPA, 2013). Between March and October 2014, eight out of ten of the JPA's member agencies adopted the model ordinance. The exceptions were Mill Valley, which previously adopted its own ordinance using a categorical exemption, and Corte Madera, which has not adopted at all.

Table 5. Timeline of Plastic Bag Ordinances Adoption, Legal Challenges, Court Decisions, and Types of CEQA employed by Jurisdictions

Date	Event	CEQA	Legal Information
3/27/07	San Francisco Ordinance	Categorical Exemption	No legal challenge
7/17/07	Oakland Ordinance	Categorical Exemption	Coalition lawsuit filed 8/3/07
8/1/07	Fairfax Ordinance	Categorical Exemption	Coalition lawsuit filed 8/24/07
11/7/07	Fairfax makes ordinance voluntary	-	-
4/17/08	Oakland Superior Court ruling	-	In favor of Coalition
7/14/08	Manhattan Beach Ordinance	Negative Declaration	Coalition lawsuit filed 8/12/08
11/4/08	Fairfax plastic bag initiative passes	No CEQA necessary	-
2/20/09	Manhattan Beach Superior Court Ruling	-	In favor of Coalition

3/30/09	Palo Alto Ordinance	Negative Declaration	Coalition lawsuit filed 4/20/09
7/27/09	Palo Alto Settlement	-	-
1/27/10	Manhattan Beach Appeal Court Ruling	-	Superior Court decision upheld
1/11/11	San Jose Ordinance	EIR	No legal challenge
1/25/11	Unincorporated Marin County Ordinance	Categorical Exemption	Coalition lawsuit filed 2/21/11
4/26/11	Unincorporated Santa Clara County Ordinance	Negative Declaration	No legal challenge
7/14/11	Manhattan Beach Supreme Court Ruling	-	Appeal Court decision struck down
9/14/11	Marin County Superior Court Ruling	-	In favor of Marin County
12/13/11	Sunnyvale Ordinance	EIR	-
1/25/12	Entire Alameda County	EIR	-
2/14/12	Millbrae	Negative Declaration	-
11/6/12	Unincorporated San Mateo County	Bi-County EIR	-
12/10/12	Pacifica	Bi-County EIR	-
12/11/12	Mountain View	Bi-County EIR	-
12/12/12	South San Francisco	Bi-County EIR	-
1/7/13	Foster City	Bi-County EIR	-
1/8/13	Belmont	Bi-County EIR	-
1/9/13	Colma	Bi-County EIR	-
1/13/13	San Bruno	Bi-County EIR	-
1/14/13	Daly City	Bi-County EIR	-
1/22/13	Menlo Park	Bi-County EIR	-
1/23/13	Portola Valley	Bi-County EIR	-
3/5/13	Half Moon Bay	Bi-County EIR	-
3/5/13	Cupertino	Bi-County EIR	-
3/11/13	San Carlos	Bi-County EIR	-
3/12/13	Los Altos	Bi-County EIR	-
3/18/13	Burlingame	Bi-County EIR	-

3/18/13	Brisbane	Bi-County EIR	-
3/25/13	Redwood City	Bi-County EIR	-
4/2/13	East Palo Alto	Bi-County EIR	-
5/6/13	City of San Mateo	Bi-County EIR	-
6/25/13	Marin County Appeal Court Ruling	-	Superior Court decision upheld
7/16/13	Richmond	RecycleMore EIR	-
7/16/13	Campbell	Bi-County EIR	-
9/3/13	Los Gatos	Bi-County EIR	-
9/17/13	El Cerrito	RecycleMore EIR	-
10/8/13	San Pablo	RecycleMore EIR	-
10/21/13	Pittsburg	Negative Declaration	-
10/21/13	Mill Valley	Categorical Exemption	-
11/2/13	Morgan Hill	Categorical Exemption	-
2/19/14	Entire Sonoma County	SCWMA EIR	-
3/3/14	San Rafael	Marin JPA EIR	-
3/6/14	Novato	Marin JPA EIR	-
3/18/14	Walnut Creek	Categorical Exemption	-
3/18/14	Sausalito	Marin JPA EIR	-
5/7/14	Larkspur	Marin JPA EIR	-
5/27/14	San Anselmo	Marin JPA EIR	-
6/9/14	Belvedere	Marin JPA EIR	-
6/18/14	Martinez	Categorical Exemption	-
7/15/14	Calistoga	Categorical Exemption	-
8/4/14	Pleasant Hill	Categorical Exemption	-
8/5/14	City of Napa	Categorical Exemption	-
8/12/14	St. Helena	Categorical Exemption	-
8/19/14	City of Santa Clara	Negative Declaration	-
9/9/14	Hercules	Unknown	-
10/3/14	Tiburon	Marin JPA EIR	-
10/11/14	Ross	Marin JPA EIR	-
12/8/14	Lafayette	Categorical Exemption	-

12/16/14	Danville	Categorical Exemption	-
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Overarching Environmental Policies

As previously mentioned, jurisdictions in Contra Costa, Alameda, Santa Clara, and San Mateo Counties are required to comply with zero trash NPDES stormwater permits. In addition, many jurisdictions have passed zero waste policies or waste diversion resolutions that are more stringent than State standards. Was compliance with these overarching environmental policies a motivating factor for jurisdictions to adopt plastic bag policies?

Table 6 lists all adopting and non-adopting jurisdictions in the Bay Area, whether they were included in a zero trash NPDES stormwater permit at the time of adoption, whether they had passed stringent waste diversion goals at the time of adoption, and whether they used these policies as justification in the passage of plastic bag policies. If a jurisdiction mentioned the NPDES permit or its waste diversion policy in its ordinance, legal responses, CEQA documents, City Council or Agency meeting notes pertaining to a plastic bag ban, or plastic bag study session documents, this was considered to be justification.

The results show that 70 percent of adopters were regulated under the zero trash NPDES permit at the time of adoption and 77 percent used compliance as justification for plastic bag policy adoption. However, 67 percent of non-adopters are regulated under a NPDES permit, as well. Thirty-six percent of adopters had stringent waste diversion policies at the time of adoption and 100 percent used the waste diversion policies as

justification for plastic bag policy adoption. Only three percent (one jurisdiction) of non-adopters had a waste diversion policy more stringent than State standards.

Six adopters were regulated by both policies at the time of adoption, with four being one of the first 12 adopters. All of the first ten adopters were regulated by at least one overarching environmental policy, and 90 percent used compliance as justification for adoption. Fifty-two out of 56 adopters were regulated by either a NPDES permit or a waste diversion policy, and 46 used compliance as justification for adoption. Each of the first 36 adopters was covered by one policy or the other, and 35 used compliance with the policy as justification.

Table 6. Overarching Environmental Policies and their Justification in Plastic Bag Policy Adoption

County	Jurisdiction	Date Adopted	NPDES permit?	Justification for adoption?	Waste diversion policy?	Justification for adoption?
San Francisco	San Francisco	4/10/07	No	-	Yes	Yes
Marin	Fairfax	11/4/08	No	-	Yes	Yes
Santa Clara	Palo Alto	3/30/09	No (pre-MRP)	-	Yes	Yes
Santa Clara	San Jose	1/11/11	Yes	Yes	Yes	Yes
Marin	Unincorporated Marin County	1/25/11	No	-	Yes	Yes
Santa Clara	Unincorporated Santa Clara County	4/26/11	Yes	No	No	-
Santa Clara	Sunnyvale	12/13/11	Yes	Yes	Yes	Yes
Alameda	Entire Alameda County	1/25/12	Yes	Yes	Yes	Yes
San Mateo	Millbrae	2/14/12	Yes	Yes	No	-
San Mateo	San Mateo County	11/6/12	Yes	Yes	No	-
San Mateo	Pacifica	12/10/12	Yes	Yes	No	-
Santa Clara	Mountain View	12/11/12	Yes	Yes	Yes	Yes
San Mateo	South San Francisco	12/12/12	Yes	Yes	No	-
San Mateo	Foster City	1/7/13	Yes	Yes	No	-
San Mateo	Belmont	1/8/13	Yes	Yes	No	-
San Mateo	Colma	1/9/13	Yes	Yes	No	-

San Mateo	San Bruno	1/13/13	Yes	Yes	No	-
San Mateo	Daly City	1/14/13	Yes	Yes	No	-
San Mateo	Menlo Park	1/22/13	Yes	Yes	No	-
San Mateo	Portola Valley	1/23/13	Yes	Yes	No	-
San Mateo	Half Moon Bay	3/5/13	Yes	Yes	No	-
Santa Clara	Cupertino	3/5/13	Yes	Yes	No	-
San Mateo	San Carlos	3/11/13	Yes	Yes	No	-
Santa Clara	Los Altos	3/12/13	Yes	Yes	No	-
San Mateo	Brisbane	3/18/13	Yes	Yes	No	-
San Mateo	Burlingame	3/18/13	Yes	Yes	No	-
San Mateo	Redwood City	3/25/13	Yes	Yes	No	-
San Mateo	East Palo Alto	4/2/13	Yes	Yes	No	-
San Mateo	San Mateo City	5/6/13	Yes	Yes	No	-
Contra Costa	Richmond	7/16/13	Yes	Yes	Yes	Yes
Santa Clara	Campbell	7/16/13	Yes	Yes	No	-
Santa Clara	Los Gatos	9/3/13	Yes	Yes	No	-
Contra Costa	El Cerrito	9/17/13	Yes	Yes	No	-
Contra Costa	San Pablo	10/8/13	Yes	Yes	No	-
Contra Costa	Pittsburg	10/21/13	Yes	Yes	No	-
Marin	Mill Valley	10/21/13	No	-	Yes	Yes
Santa Clara	Morgan Hill	11/6/13	No	-	No	-
Sonoma	Entire Sonoma County	2/19/14	No	-	-	-
Marin	San Rafael	3/3/14	No	-	Yes	Yes
Marin	Novato	3/6/14	No	-	Yes	Yes
Contra Costa	Walnut Creek	3/18/14	Yes	No	No	-
Marin	Sausalito	3/18/14	No	-	Yes	Yes
Marin	Larkspur	5/7/14	No	-	Yes	Yes
Marin	San Anselmo	5/27/14	No	-	Yes	Yes
Marin	Belvedere	6/9/14	No	-	Yes	Yes
Contra Costa	Martinez	6/18/14	Yes	No	No	-
Napa	Calistoga	7/15/14	No	-	No	-
Contra Costa	Pleasant Hill	8/4/14	Yes	No	No	-
Napa	Napa City	8/5/14	No	-	Yes	Yes
Napa	St. Helena	8/12/14	No	-	No	-
Santa Clara	City of Santa Clara	8/19/14	Yes	Yes	No	-
Contra Costa	Hercules	9/9/14	Yes	No	No	-
Marin	Tiburon	10/3/14	No	-	Yes	Yes
Marin	Ross	10/11/14	No	-	Yes	Yes
Contra Costa	Lafayette	12/8/14	Yes	No	Yes	Yes
Contra Costa	Danville	12/16/14	Yes	No	No	-

Contra Costa	Unincorporated Contra Costa County	n/a	Yes	-	No	-
Contra Costa	Antioch	n/a	Yes	-	No	-
Contra Costa	Brentwood	n/a	Yes	-	No	-
Contra Costa	Clayton	n/a	Yes	-	No	-
Contra Costa	Concord	n/a	Yes	-	No	-
Contra Costa	Moraga	n/a	Yes	-	No	-
Contra Costa	Oakley	n/a	Yes	-	No	-
Contra Costa	Orinda	n/a	Yes	-	No	-
Contra Costa	Pinole	n/a	Yes	-	No	-
Contra Costa	San Ramon	n/a	Yes	-	No	-
Marin	Corte Madera	n/a	No	-	Yes	-
San Mateo	Atherton	n/a	Yes	-	No	-
San Mateo	Hillsborough	n/a	Yes	-	No	-
San Mateo	Woodside	n/a	Yes	-	No	-
Santa Clara	Gilroy	n/a	No	-	No	-
Santa Clara	Los Altos Hills	n/a	Yes	-	No	-
Santa Clara	Milpitas	n/a	Yes	-	No	-
Santa Clara	Monte Sereno	n/a	Yes	-	No	-
Santa Clara	Saratoga	n/a	Yes	-	No	-
Solano	Unincorporated Solano County	n/a	No	-	No	-
Solano	Benicia	n/a	No	-	No	-
Solano	Dixon	n/a	No	-	No	-
Solano	Fairfield	n/a	Yes	-	No	-
Solano	Rio Vista	n/a	No	-	No	-
Solano	Suisun City	n/a	Yes	-	No	-
Solano	Vacaville	n/a	No	-	No	-
Solano	Vallejo	n/a	Yes	-	No	-
Napa	Unincorporated Napa County	n/a	No	-	No	-
Napa	American Canyon	n/a	No	-	No	-
Napa	Yountville	n/a	No	-	No	-

Master Environmental Assessment

As discussed previously, the Green Cities California's 2010 MEA on Single-Use and Reusable Bags was created to assist local jurisdictions in the adoption of plastic bag

policies by providing informational resources to be used in CEQA documents. Table 7 shows that nine out of eleven EIRs or initial studies cited the MEAs findings, with two EIRs citing the MEA over 30 times.

Table 7. MEA Use in CEQA Documents

CEQA Document	MEA used as reference?	Number of times cited
San Jose EIR Unincorporated	No	-
Santa Clara County Initial Study	Yes	5
Sunnyvale EIR	Yes	22
Alameda County EIR	Yes	1
Millbrae Initial Study	Yes	1
San Mateo Bi-County EIR	Yes	25
RecycleMore EIR	Yes	5
Pittsburg Initial Study	No	-
Sonoma County EIR	Yes	32
Marin JPA EIR	Yes	31
City of Santa Clara Initial Study	Yes	8

Discussion

Demographics, the Coalition's Obstacles, and Resource Sharing

The obstacles presented by the Coalition and the subsequent court decisions created a blueprint for how jurisdictions used CEQA to adopt policies. To comply with overarching environmental policies and to have cohesive countywide policies, some higher-level institutions like county governments and waste management authorities assisted the adoption process by paying for EIRs and creating model ordinances that individual city councils could adopt. In Alameda and Sonoma Counties, the waste

management JPA financed an EIR, created an ordinance, and adopted a countywide policy. Because of these multi-scalar intricacies, the previous demographic correlation results may not be the most meaningful analytical method for this data set.

Correlating demographic data with innovation scores in the “Municipalities of the Same County” set is misleading because while some cities adopted plastic bag bans using their own resources, other municipalities adopted bans using model ordinances and EIRs financed by larger governing institutions. This issue was exposed in Gray’s (1973) critique of Walker’s (1969) study, whereby Walker found that a state’s wealth impacted policy innovation but as Gray pointed out, Walker did not differentiate between policies that were federally funded and those funded solely by the state. In San Mateo County, Millbrae adopted its own ordinance before other cities in the County. It is unclear whether the cities that used the San Mateo County model ordinance and EIR would ever have adopted independently. Likewise in Contra Costa County, RecycleMore’s member agencies were able to adopt plastic bag policies by using the model ordinance and EIR financed by the waste management authority, which made adoption much easier than in other Contra Costa County cities at that time. These examples invalidate any significant correlation between innovation scores and demographic data, since higher-level institutions funded some municipalities’ policies. Jurisdictions that used model ordinances and EIRs for passage ultimately undertook the same low-risk, low-expense process as those of late adopting, self-financed jurisdictions since late adopters had more time to learn from the diffusion process.

Correlating demographic data to a purely “Counties” set is also problematic because of jurisdictional variation. Waste Management Districts in Alameda and Sonoma Counties passed plastic bag bans for entire counties, while Marin and Santa Clara Counties passed ordinances for unincorporated areas only. San Mateo County passed an ordinance for its unincorporated areas, but only after going through the model ordinance and EIR process with the DEH. Therefore, there is conflict about which demographic data should be used: countywide data or only data for unincorporated areas. It is invalid to correlate values from different scales and get meaningful results, but to use one type of value for the “Counties” set would be misleading. In addition, counties are not solely funded by their unincorporated areas and officials are elected by the entire county, so using only unincorporated demographic values for counties that passed ordinances for their unincorporated areas misrepresents the true character of a county.

Overall, analysis of policy diffusion at the local or regional level is most meaningful when jurisdictions are *truly* separated into comparable sets. Table 8 accounts for the nuanced policy details discussed previously by listing the municipalities in the Bay Area that adopted independently, without financial assistance from a higher-level governing authority. Table 9 lists the correlation coefficients between the jurisdiction’s innovation scores in Table 8 and their demographic data. This new set has strong positive relationships with population size and with the percentage of Democratic ballots cast in each election. Larger, more heavily Democratic municipalities were likely to

independently adopt plastic bag policies before smaller, less heavily Democratic municipalities did so.

Table 8. Municipalities That Adopted Independently

County	Jurisdiction	Date Adopted	IS
San Francisco	San Francisco	4/10/07	1.00
Marin	Fairfax	11/4/08	0.80
Santa Clara	Palo Alto	3/30/09	0.74
Santa Clara	San Jose	1/11/11	0.51
Santa Clara	Sunnyvale	12/13/11	0.39
San Mateo	Millbrae	2/14/12	0.37
Contra Costa	Pittsburg	10/21/13	0.15
Marin	Mill Valley	10/21/13	0.15
Santa Clara	Morgan Hill	11/6/13	0.14
Contra Costa	Walnut Creek	3/18/14	0.10
Contra Costa	Martinez	6/18/14	0.06
Napa	Calistoga	7/15/14	0.05
Contra Costa	Pleasant Hill	8/4/14	0.05
Napa	City of Napa	8/5/14	0.05
Napa	St. Helena	8/12/14	0.04
Santa Clara	City of Santa Clara	8/19/14	0.04
Contra Costa	Hercules	9/9/14	0.03
Contra Costa	Lafayette	12/8/14	0.00
Contra Costa	Danville	12/16/14	0.00

Table 9. Correlation Coefficients between Innovation Scores of Municipalities that Adopted Independently and Demographic Data

Set Type	Population	Per Capita Income	2008 Presidential Election	2012 Presidential Election	2010 California Gubernatorial Election
Municipalities that Adopted Independently	0.56	0.18	0.59	0.61	0.59

Another way to analyze the data is to compare the average demographic values of all adopters versus the non-adopters (Table 10). To avoid double counting, in instances where a county adopted a policy for its unincorporated areas separately from other municipalities, the unincorporated area's demographic values are used. As Table 10 shows, adopters tended to be larger jurisdictions with a more heavily Democratic electorate. Per capita income averages for adopters and non-adopters are similar. The sharing of financial resources between higher-level institutions and their participating agencies appears to have leveled the playing field for less-wealthy jurisdictions.

Table 10. Average Demographic Values of Adopters Versus Non-adopters

Set Type	2008 Presidential Election	2012 Presidential Election	2010 California Gubernatorial Election	Population	Per Capita Income
Adopters	73.33	71.35	65.48	105,241	\$51,505
Non-adopters	62.65	59.67	53.73	41,908	\$53,258

These revelations do not suggest that cities and counties adopted plastic bag bans in a vacuum. Policy adopters clearly learned from other adopters. When one jurisdiction adopted an ordinance, its process and results acted as a form of information that other places used in their own policy process. When a jurisdiction was sued over its policy, most jurisdictions waited for judicial decisions to provide the ground rules for subsequent adoptions. This is where the innovation score is valuable. The lapse in the innovation score between San Francisco and Fairfax is a result of the Coalition's lawsuits against Fairfax and Oakland's first plastic bag ordinances. The gap in the innovation score

between Palo Alto and San Jose reflects San Jose's effort to create a legally sound ordinance and prepare the first EIR that was in accordance with the Oakland and Manhattan Beach decisions. Finally, the time elapsed between Millbrae and unincorporated San Mateo County adoptions was most likely the result of the arduous process undertaken by the DEH of persuading 25 jurisdictions in the bi-county area to be participating agencies in its EIR and model ordinance. This effort spurred the passage of 22 plastic bag bans in the Bay Area in less than one year, whereas the time between the first adoption in San Francisco and the 10th adoption in San Mateo County was over five and a half years. Clearly, the Coalition's efforts to pose legal obstacles hindered early adoption of plastic bag bans in the Bay Area, but the legal outcomes facilitated widespread adoption in the end.

In addition to cross-jurisdictional learning, cities, counties and waste management authorities gained valuable informational resources from the Green Cities California MEA, which decreased the costs associated with CEQA compliance since it enabled governments and environmental consultants to spend less staff time preparing EIRs and initial studies (ICF International, 2010).

Overarching Environmental Policies

The results of Table 6 are significant. At the time of adoption, 92.8 percent of plastic bag policy adopters were regulated either by a NPDES stormwater permit or a stringent waste diversion policy, and 88.5 percent used compliance with the policy as justification for adoption. It is apparent that overarching environmental policies were a

motivational force in the adoption of plastic bag policies in the Bay Area. These results are further bolstered by interviews with government staff, which revealed that the NPDES stormwater permit (D. Peterson, personal communication, March 5, 2015) and zero waste policies (S. Chiv, personal communication, November 1, 2013) were effective arguments for the passage of plastic bag bans. This is not to say that these two overarching environmental policies were the only reasons for adopting the bans. Most jurisdictions also cited the high costs of storm drain clean-out, the desire to change consumer behavior, the reduction of greenhouse gas emissions, and the general negative impact that plastic bags have on the environment. However, the NPDES permit and stringent waste diversion goals represent two policies with which compliance can be reached via incremental measures, therefore compliance with these policies is more relevant as a motivating factor in this study.

Areas For Further Research

The drivers of policy adoption are innumerable and attempting to examine every possible reason that plastic bag ban diffusion occurred is beyond the scope of this study. During research, other variables were revealed that could become the basis for further study. For example, a lack of retail stores impacted some municipalities' decisions in San Mateo County, therefore an analysis of the number of retail stores per jurisdiction could provide important clues to understanding adoption patterns. Also, from 2006 through 2014 a spate of proposed statewide policies involving plastic bag recycling, plastic bag bans, and fees on plastic bags either passed or failed in the California State Legislature.

These legislative results may have impacted Bay Area jurisdictional decisions. It is also possible that the popularity of local plastic bag bans impacted State decisions. A full-scale investigation of the top down and/or bottom up effects of these policies would be an important contribution to this subject.

Conclusion

The results of this study demonstrate that Mohr's theory of organizational innovation is alive and well. The Coalition's lawsuits created obstacles to the adoption of plastic bag policies, however jurisdictions were motivated to adopt because the policies helped them comply with overarching environmental programs. The sharing of financial and informational resources also bolstered the adoption process by reducing uncertainty. In fact, in the Bay Area, the Coalition's obstacles ended up enabling widespread adoption once the legal blueprint had been established.

This study also shows how overarching policies can help drive the passage of smaller, related policies. While this study does not contend that plastic bag policies would not have been adopted if the NPDES permits or zero waste policies were not in place, it is clear that the incremental benefits of plastic bag bans to the larger policies played well in the policy adoption setting. This serves as a message to policymakers that it is important to pass overarching policies to establish long-range goals, since these policies can in turn facilitate the passage of smaller, more specific policies.

This study demonstrates the need for nuanced analysis of political processes and results in demographic analysis. The diffusion of innovation literature had only analyzed

demographic data at the state level, which has a more consistent application than at the county or local level. It is important to understand the qualitative nature of policy diffusion. However, when the jurisdictions were grouped according to comparable sets, the demographic analysis in this study revealed the large jurisdictions with more heavily Democratic electorates were more inclined to adopt these environmental policies than smaller, less heavily Democratic jurisdictions (if they adopted at all). This finding supports the literature and also adds to it by extending its application to the local level.

By examining qualitative and quantitative data, this study shows that the widespread and rapid diffusion of plastic bag policies in the Bay Area was determined mainly by two things: the impact of the Coalition's legal challenges, and the sharing of financial and informational resources between higher-level jurisdictions and their participating agencies. Other determinants appear to have provided ancillary support. Green Cities California's MEA was a valuable informational resource that helped jurisdictions save money related to CEQA compliance, but since San Jose conducted its EIR without the MEA's assistance, it is unclear whether other jurisdictions would have simply used San Jose's EIR as a model if the MEA had not been created. In addition, some jurisdictions were clearly motivated to pass plastic bag policies to help them achieve overarching environmental policies, but not all. Many jurisdictions cited other reasons besides waste diversion and water quality as justification for adoption. Finally, the demographic analysis revealed a significant relationship between population size and political party preference, but these results are not an absolute determinant of diffusion.

Instead, knowing this information will help policy professionals understand that shared resources may assist the adoption of environmental policies in smaller, less Democratically leaning jurisdictions, especially if there is a need to comply with overarching environmental policies.

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