THE INFLUENCE OF INCENTIVES OFFERED BY LOCAL GOVERNMENTS TO PRIVATE DEVELOPERS OR LAND OWNERS ON THE RATE OF BROWNFIELD REDEVELOPMENT

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ABSTRACT

THE INFLUENCE OF INCENTIVES OFFERED BY LOCAL GOVERNMENTS TO PRIVATE DEVELOPERS OR LAND OWNERS ON THE RATE OF BROWNFIELD REDEVELOPMENT

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Redevelopment of brownfield sites has become increasingly popular since the inception of voluntary cleanup programs in the early to mid 1990's. Local governments have begun to offer incentives to private developers or land owners to offset costs associated with contamination and encourage the redevelopment of properties that are typically underutilized. Incentives may take several forms including, but not limited to, fast-tracked project approval, risk based cleanup standards, liability relief, tax breaks, and direct funding assistance.

This study investigates how incentives that are offered by local governments to private developers or land owners influence the rate of redevelopment in their sphere of influence. A survey was administered to local governments throughout the State of California to determine how incentives are used for the redevelopment of brownfields. Results from this study show a preference by participating local governments to offer direct funding assistance, which may be directly linked to a relative level of inexperience.

Keywords: brownfield, incentive, redevelopment, local government, private developer, land owner.

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I. INTRODUCTION

This study investigates how incentives offered by local governments to private developers or land owners influence the rate of brownfield redevelopment within their sphere of influence. Federal and state level environmental policies have been created, in principle, to help protect natural resources and our earth's environment from harmful acts by humans, which affects the redevelopment of brownfield properties. Given this constraint, local governments are increasingly responsible for creating their own policies that not only include cleanup of environmentally effected sites, but also include guidelines and programs with the intention of attracting private investment to the redevelopment of brownfield sites (DeSousa, 2006). Private redevelopment of brownfield sites continues to be an attractive development option in the face of uncertainty with levels of contamination and increasing measures of required remediation by federal, state, and local municipalities (Page & Rabinowitz, 1994). Redevelopment of brownfield sites is being increasingly promoted by local governments that are providing incentive packages to private developers or land owners in order to attract development investment within their sphere of influence (Alberini, Longo, Tonin, Trombetta, & Turvani, 2005, DeSousa, 2006).

Brownfields are defined by the United States Environmental Protection Agency (EPA) as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant" (U.S. Environmental Protection Agency, 2008). The EPA estimates that there are approximately half a million industrial brownfield sites throughout the United

States that have the potential for redevelopment projects. The majority of these sites are privately owned resulting in the decision to redevelop lying solely on the landowner. In many cases, this decision occurs at the time when the landowner would like to sell the property.

Research Question and Hypotheses

Private development companies have begun to initiate redevelopment of brownfield projects where past development would typically have required some form of mandate from federal, state, or local government (Meyer & Lyons, 2000). The increasing reliance on incentive packages offered by local governments to promote the redevelopment of brownfield sites has led to this investigation on their effectiveness. How do incentives that are offered by local governments to private developers or land owners influence the rate of brownfield redevelopment? Although the decision to invest in industrial brownfield redevelopment projects by private companies has historically been based on issues of liability, research has shown that incentives such as reduction of regulatory burden and subsidies can significantly influence the rate of redevelopment (Alberini et al., 2005). This study is centered on a hypothesis that different types of incentives positively affect the rate of redevelopment. Five independent types of incentives are researched in this study; 1) fast-tracked or streamline application review process, 2) risk based cleanup standards, 3) liability relief or indemnification from future site cleanup, 4) tax breaks, and 5) direct funding assistance.

Findings are presented from an administered survey to local governments in the State of California that have authority to offer incentive packages as a means of promoting investment in brownfield redevelopment. The dependent variable of this study

is the rate of brownfield redevelopment within a participating local government's sphere of influence. The independent variables of this study that influence the rate of redevelopment are the five different types of incentives. Additional contextual variables exist the may affect the independent variables as well as the dependent variable. The contextual variables are separated by demographics and other key elements affecting the brownfield redevelopment process. Connections between the contextual variables and independent variables are measured to determine how they may influence the incentive packages that are created for brownfield redevelopment. Connections between the independent variables and the dependent variables are measured to determine how incentives influence the rate of redevelopment.

Stakeholders of an industrial brownfield project can include property owners, regulators, consultants, lenders, city/county planners, economic development agencies/authorities, politicians, developers, real estate agents, academics/students, lawyers, and surrounding communities (Lang & McNeil, 2004). This study focuses on two main groups of stakeholders; private developers or land owners and local governments. Results of this study are useful to these two main groups of stakeholders in showing how incentives offered by local governments influence the rate of redevelopment within their sphere of influence. Benefits to private developers or land owners may include knowledge that targets specific redevelopment projects resulting in higher returns on investment. Local governments may benefit from this study by gaining information regarding how other similar entities engage private developers or land owners to promote redevelopment of brownfield sites. Deductions from this proposed

study can be used in an applied manner to future considerations of investment into brownfield redevelopment projects by the different stakeholder groups.

Presuppositions

A presupposition that private land owners are primarily responsible for the decision to invest in the redevelopment of brownfields.

The decision to redevelop privately held brownfield lands, excluding sites with extenuating public safety and health risks, rests solely with the land owner. Even in cases where federal level policies mandate remediation of contaminated lands, redevelopment to a highest and best use is not always required. Private development companies or land owners choose to invest in brownfield redevelopment projects for several reasons including, but not limited to lower land costs, use of existing infrastructure, ecological and public health impacts or government mandated cleanup measures (Howland, 2003; Greenberg, Lowrie, Mayer, Miller & Solitare, 2001; DeSousa, 2006). Private developers or land owners may also be influenced by incentives for brownfield redevelopment that are offered by local governments. Alberini et al. (2005) examine market based incentives offered to private development companies with the intention of promoting environmental remediation and reuse of brownfields and how these incentives, along with regulatory relief, can influence land use. Research is silent on whether or not the offering of incentives to private development companies for brownfield redevelopment increases the amount of projects within that municipal government's sphere of influence.

A presupposition that private developers or land owners who chose to invest in brownfield redevelopment require incentives to offset the costs associated with contamination.

Many locations of brownfields present an opportunity to rehabilitate neighborhoods suffering from economic hardship, blight, and general disrepair (Dennison, 1998, Meyer & Lyons, 2000, Greenberg et al., 2001). Despite the potential for revitalization, challenges with technical issues of remediation and general liability typically restrict local governments from undertaking significant brownfield redevelopment projects (Hird, 1993). In addition, costs associated with remediation of contaminated lands generally make redevelopment a less desirable option for many private developers or land owners.

The strict enforcement of liability stemming from CERCLA in the early 1980's has cultivated a sense of fear in potential brownfield investors and has caused them to shy away from becoming involved with the redevelopment of contaminated sites (Reger, 1998). Voluntary cleanup programs were established in the early 1990's in an attempt to expedite remediation and redevelopment of contaminated sites (Greenberg et al., 2001). Several other programs initiated by the United States Environmental Protection Agency after CERCLA, including the Brownfields Economic Redevelopment Initiative, Brownfields Action Agenda, and the Brownfields National Partnership, were introduced mainly for the purpose of offsetting remediation costs and to provide incentives for brownfield redevelopment (Lowham, 2007).

A presupposition that incentives offered by local governments to private developers or land owners increase the rate of brownfield redevelopment.

The redevelopment of brownfield sites is becoming increasingly popular with private development entities for several reasons including, but not limited to prime market conditions surrounding the reuse of existing sites and the increased involvement

by local governments who have historically been risk averse by staying away from complex redevelopments involving contamination (Goldstein, 2003). This increased involvement by local governments is typically recognized through incentives offered to private developers or land owners for redevelopment that meets the needs of all stakeholders. Incentives associated with the redevelopment of brownfield sites are designed to have positive effects through fostering development activities and have demonstrated their effectiveness (Alberini et al., 2005, Goldstein, 2003).

These three presuppositions create a framework in which this study investigates how incentives offered by local governments influence the rate of brownfield redevelopment. The literature review provides further background on the history, processes and outcomes of brownfield redevelopment. Incentives investigated in this study are presented and explained through research.

II. LITERATURE REVIEW

Brownfields Background

Targeted revitalization of contaminated lands is a relatively young phenomenon. Looking at the history and evolution of brownfields and their redevelopment shows how private developers and land owners have undergone a paradigm shift of avoidance to that of pursuit. The catalyst of this paradigm shift is incentive packages that are offered by federal, state, and local governments to private developers and land owners for the redevelopment of contaminated lands. This process is one of trial and error.

Post World War II industrialization was a transitional time for America. During the decades following the war, many companies sought to increase their operations and began migrating to new areas, ending the use of existing facilities and abandoning the original site in many cases (DeSousa, 2005, Lowham, 2007). Many of these abandoned sites have contaminants from previous uses, one of the characteristics causing them to be classified as brownfields. It is estimated that there are approximately 500,000 brownfield sites throughout the United States (Simons, 1999); however, some estimates have reached over one million such sites (Wedding & Crawford-Brown, 2007). The abandonment and hazardous condition of many sites can contribute to economic hardship, poor aesthetics, and apparent lack of concern for human health in areas already considered blighted. Given these conditions, most brownfield sites are not historically considered to be attractive investment options to private development companies (Howland, 2003).

Little attention was typically given to the negative conditions of most contaminated sites until 1978, when the situation at Love Canal sparked national interest.

Love Canal is a 36 square block neighborhood located in upstate New York near Niagara Falls used as a dumping ground for toxic waste in the 1940's and 1950's by a chemical manufacturing company. The buried contaminants of the site eventually leached out and are believed to have caused significant health problems for residents of the area (Maugh, 1982). This became an international media frenzy resulting in President Jimmy Carter's declaration of Federal Emergency on August 7, 1978. The declaration resulted in the relocation of residents closest to the contamination (UB Love Canal Collections, 2008). Although there had been other national incidents involving human health and contaminated sites, the Love Canal incident raised national awareness of an issue that needed to be addressed.

Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) on December 11, 1980 largely in response to the Love Canal incident (U.S. Environmental Protection Agency, 2008). This law, commonly referred to as Superfund, provides measures for chemical and petroleum producing companies to be taxed and grants federal authorities the power to protect human health and environment. The Superfund program got off to a very slow start for several reasons, mainly because it was a new and untested program. The lack of technical knowledge surrounding remediation techniques for contaminated lands was another key reason for the slow start (deSaillen, 1993). Over 1.5 billion dollars was collected within a five year period from Superfund's inception, with the money being directed to a trust fund for cleaning up sites that have contaminants, but that proved to be insufficient (U.S. Environmental Protection Agency, 2008). Funds were exhausted by 1985, which led to the Superfund Amendments and Reauthorization Act (SARA) of 1986, increasing funds

through property tax and providing for studies and research of new technologies aiding in the cleanup of brownfield sites (deSaillen, 1993).

The mandates of CERCLA have been stern since its inception in 1980. CERCLA sets stringent liability standards where the government only needs to prove any past involvement with a contaminated site rather than direct responsibility for its contamination (Reger, 1998). CERCLA recognizes four categories of potential responsible parties that can be held liable for cleanup and remedial action of any potential damage that is done to natural resources. These categories include (1) the current owners or operators of the site, (2) any past owners that may have contributed to waste or hazardous disposal of materials, (3) generators of any hazardous substances related by contract to site operations, and (4) any transporters of hazardous substances to and from the site (Sundar & Grossman, 2003). CERCLA sometimes reaches beyond the confines of these four categories and in some extreme cases, lenders who have foreclosed on contaminated properties have been held liable for cleanup costs (Fogleman, 1992, Lowham, 2007). The rigorous enforcement of liability has cultivated fear in land owners and potential private investors, causing them to shy away from becoming involved with the redevelopment of contaminated sites. In addition, extensive legal battles in court over liability delays site remediation activities, as well as create negative connotations associated with Superfund sites (Lowham, 2007). The litigious nature of CERCLA and its slow initial results have raised concerns over its effectiveness and questions its fundamental focus being on the remediation of contaminated sites.

Individual states began to develop voluntary cleanup programs (VCP) in the early to mid 1990's in response to the perceived ineffectiveness of CERCLA. VCP's were

initially pursued because of a lack of funding for the remediation of a large number of contaminated sites (Alberini, 2007). VCP's also offer an opportunity to expedite remediation and redevelopment of underutilized land (Greenberg et al., 2001). Each state is autonomous in developing their VCP but the initial framework for programs allow the state to maintain control over plan approval and site development while setting up a Memorandum of Agreement (MoA) with the EPA. After all parties agree to the MoA for the state's VCP, the state has complete control over remediation plans for the contaminated site and redevelopment projects move forward in an expedited manner.

These programs led to third party entities, not associated with the cause of the contamination, to remediate the site according to the MoA and alleviate the liability of the property owner through property transfer and required reporting techniques (Maldonado, 1996). This arrangement allows for a win-win situation where a third party entity profits from completing remediation activities, the land owner reduces their liability, and the local government and community benefits from redevelopment of a previously underutilized site that was once contaminated. Another benefit of this situation is that local governments and communities benefit from revitalized neighborhoods and revenue from tax streams. In response to growing interest, several other programs initiated by the EPA during this time were introduced mainly for the purpose of offsetting remediation costs and to provide incentives for brownfield redevelopment (Lowham, 2007). These programs include the Brownfields Economic Redevelopment Initiative, Brownfields Action Agenda, and the Brownfields National Partnership.

Congress' passing of the Small Business Liability Relief and Brownfields Revitalization Act of 2002, commonly known as the Brownfields Act, reflects this

emerging direction in remediation of brownfield sites (U.S. Environmental Protection Agency, 2008). This act combines two earlier pieces of federal legislation; the Brownfields Revitalization and Environmental Restoration Act and the Small Business Liability Act. The new legislation's intent is to clarify ambiguity around remaining liability issues and provide monetary assistance for site assessment and remediation (Schefski, 2003). The Brownfields Act also requires states to adhere to its provisions in order to receive federal funding aiding with their voluntary cleanup programs. To date, this is the most comprehensive legislation regarding remediation and redevelopment of industrial brownfields.

Changes in legislation have created a more hospitable environment for private developers and land owners to invest in the redevelopment of brownfield sites. Brownfield redevelopment opportunities are increasing since the mid 1990's and as such, the motivation and reasons for such investments continue to evolve. Economic viability is just one value driver among other reasons to invest in brownfield redevelopment.

Reasons for Brownfield Redevelopment

As the availability of raw, unspoiled lands became increasingly scarce, greater attention was paid to the redevelopment of lands that had already been prepared for commercial, residential, and other uses. By the turn of the twenty-first century, growing concern and interest in environmental matters reached into all walks of life and institutions as influential and diverse as the Bank of America and the Roman Catholic Church called for closer scrutiny of land use patterns (Swartz & Vieweg, 2000). Redevelopment of property, as opposed to new development, is becoming more attractive to private developers and land owners for several reasons. Further, the evolving

regulatory approaches to redevelopment of contaminated lands continue to open doors of opportunity to brownfield sites (Goldstein, 2003).

There are several shared reasons why both local governments and private developers or land owners desire the redevelopment of brownfield sites. Economic vitality is a common goal for both entities. The use of existing infrastructure offers lower capital contributions from private developers or land owners and provides for a more efficient use of tax dollars in maintaining or upgrading existing systems (Deason, Sherk, & Carroll, 2001, Swartz & Vieweg, 2000). The reduction of potential risks to human health from contamination is a priority of all local governments and also benefits private developers and land owners by reducing their exposure to future liabilities (Greenberg et al., 2001, Howland, 2003). Other reasons for pursuing redevelopment of brownfield sites may be independently associated with local governments, private developers, or land owners; however, there is sufficient overlap of these reasons to foster public support.

The pursuit of economic viability is a presupposition to any development project by a private entity. Private developers or land owners that choose to invest in the redevelopment of brownfield sites can benefit from lower land costs (DeSousa, 2006, Goldstein, 2003). Incentive packages offered by federal, state, and local governments contribute to reducing overall development costs and increase bottom line profits. Many brownfield sites are located in desirable development locations, increasing their attractiveness to private investors (Bacot & O'Dell, 2006, DeSousa, 2006). Utilizing existing lands promotes infill development, reduces the expansion of urban sprawl, and aligns with most local government interests (Greenberg et al., 2001).

Local governments promote the reuse of previously developed land for several reasons. These reasons include, but are not limited to, the reduction of urban sprawl through infill development, environmental justice recognized through revitalization of previously damaged lands, protection of ecological resources, and in several cases, achieving social justice in demographic areas that may have been previously neglected (Alberini et al., 2005, Swartz & Vieweg, 2000). Local governments and their respective communities also benefit from redevelopment of certain brownfield sites with the creation of jobs and tax revenue. A survey of 148 cities in 2003 showed that 576,373 new jobs were created and nearly two billion dollars in annual tax revenues were received through the redevelopment of brownfield sites (US Conference of Mayors, 2003). Local governments may not always initiate the redevelopment of brownfield projects; however, in most cases they are typically very receptive to the reuse of underutilized lands.

Collaborative efforts between private development entities and non-governmental community organizations illustrate the ability to impact the outcome of brownfield redevelopment projects that benefit all stakeholders (Gallagher & Jackson, 2008). As the evolution of environmental and economic policies surrounding brownfield redevelopment have increased the participation in such projects by private developers and landowners, there is an increase in economic value drivers; not only for the private sector but for the local government stakeholders as well (Alberini, 2007). The increased popularity of brownfield redevelopment projects feeds the evolution of federal and state policies and incentive packages that are offered to private developers and land owners. It is critical to understand the evolution of these polices and how they could potentially affect future brownfield redevelopment.

Policies Surrounding Brownfield Redevelopment

The concept of brownfield redevelopment is less than thirty years old, which provides a relatively short window of observation for assessing long term effects of policy. CERLA set an arduous baseline standard for policy that proved to be ineffective in reaching common goals between local governments and private developers or land owners. A paradigm shift in policy has occurred over the last thirty years that fosters support from all participating entities and gives hope to resolving existing challenges with brownfield redevelopment under current environmental policies. Most current policies affecting brownfield redevelopment are commonly termed “smart growth”.

Most of the published literature surrounding industrial brownfield redevelopment focuses on factors such as site assessment, liability and regulatory measures, and other key challenges facing private development companies and local governments (DeSousa, 2005). Case studies are well documented through literature, discussing programs or policies used by government entities to attract and/or promote brownfield redevelopment. However, a consistent disparity in the literature is the lack of a clear definition of what constitutes a successful brownfield redevelopment project (Lang & McNeil, 2004). Each brownfield project has a unique set of characteristics and deserves an independent measurement of success. Efforts have been made toward the definition of uniform success measurements (DeSousa, 2005, Lang & McNeil, 2004, Wedding & Crawford-Brown, 2007); however, there is no clear consensus at this time on a singular definition. This lack of uniformity presents a challenge in proposing a single policy or program that could cover all brownfield cases. Furthermore, stakeholders generally have diverse interests with some groups more concerned about achieving successful remediation and

redevelopment, while other groups focus on socioeconomic needs of affected communities (McCarthy, 2002). Given this apparent diversity of interests, the three broad goals of economic, environmental, and social justice are generally addressed separately, or in some cases, paired with one but rarely embrace all three (DeSousa, 2005, Greenberg et al., 2001). In many cases, the redevelopment of brownfield sites can be a winning situation for both environmental and social justice goals as well as achieving some degree of economic justice (Greenberg et al., 2001).

New literature surrounding brownfield redevelopment is beginning to merge the three goals of economic, environmental, and social justice into one platform: smart growth. Greenberg et al. (2001) makes a strong argument that redevelopment of industrial brownfields contributes to smart growth policies. Growth regulation began with the concept of restricting post World War II development activities into a union of market preferences and social and environmental concerns by the early 1990's (Anthony, 2008). Increasing awareness of environmental concerns and limited effectiveness of previous growth regulation policies led to the evolution of "smart growth" polices in the mid to late 1990's where the focus now included both environmental and social concerns (Anthony, 2008, Greenberg et al., 2001). These policies continue to evolve with a focus on reducing urban sprawl through urban infill and reducing potential health risks through lowering carbon emissions. The increasing power of smart growth policies that affect brownfield redevelopment has influenced legislation and increased monetary sources, thereby creating economic opportunities for areas previously unused or underutilized (Greenberg et al., 2001).

Many brownfield locations present an opportunity to rehabilitate neighborhoods suffering from economic hardship, blight, and general neglect (Dennison, 1998, Meyer & Lyons, 2000, Greenberg et al., 2001). Despite the potential for revitalization, challenges with technical issues of remediation and general liability typically restrict local governments from undertaking significant brownfield redevelopment projects (Hird, 1993). The early CERCLA policy took a top-down approach towards contaminated properties, with government playing the ultimate enforcer role and all other stakeholders simply reacting to federal policy. However, recent and emerging attitudes towards environmental policy guiding brownfield redevelopment promote a bottom-up approach. The initiative to revitalize contaminated lands has resulted in federal, state, and local governments providing financial incentives to private developers and land owners that offset assessment and remediation costs (Gallagher & Jackson, 2008). This evolution demonstrates how early polices regarded as failures because of inefficiency, cost overruns, or unreasonable restrictions can evolve into successful long term policies (Day & Johnson, 2004).

Recent policies require public knowledge and participation in federally funded brownfield redevelopment programs to varying degrees per state (Gallagher & Jackson, 2008). Requiring public participation, along with other community outreach programs, is a key element in ensuring that environmental and social justice is acknowledged and achieves greater systemic support of brownfield redevelopment projects (Gallagher & Jackson, 2008).

It is clear that the federal government is open to a state-governing approach concerning the remediation of contaminated lands. The Uniform Environmental

Covenant Act of 2003 (UECA) is a pilot program currently enacted in twenty-three states providing institutional controls and power to enforce environmental remediation (U.S. Environmental Protection Agency, 2008). UECA allows each participating state to specify what those controls should be, what level of cleanup is appropriate, and liability standards without replacing the existing regulatory framework (Uniform Environmental Covenants Act, 2009). This arrangement demonstrates the federal government's support of federalism with respect to brownfield redevelopment.

The legislation affecting redevelopment of brownfield sites demonstrates how collaborative efforts between federal, state, local, and private entities can be effective in ensuring long term success with brownfield redevelopment projects. This paradigm shift in policy, from a top-down to a bottom-up approach, underscores a stark contrast in thinking over a relatively short period of time. This shift also supports and gives credit to state governed voluntary cleanup programs, which are the primary mechanisms controlling new brownfield redevelopment projects.

Voluntary Cleanup Programs

State run voluntary cleanup programs have been effective in fostering redevelopment of brownfield sites and are instrumental in reducing fears of private developers and land owners. Participation by independent states in these programs has steadily increased since the first one was introduced in 1988. Despite increasing popularity, VCP's have shortcomings and continue to require monitoring and assessment to reach their full potential.

Minnesota was the first state to develop a voluntary cleanup program in 1988 as a way to alleviate the regulation and pressures of the stringent CERCLA law (State

Legislatures, 1996). An unintended outcome of CERCLA was that most landowners chose to abandon their contaminated properties rather than become involved in an expensive and burdensome cleanup process. The introduction of voluntary cleanup programs provides an attractive alternative that promotes reinvestment into these underutilized lands (Alberini, 2007, State Legislatures, 1996). While some states adhere to the stringent nature of CERCLA in the development of their voluntary cleanup programs, others tend to relax their legal requirements and prioritize private sector involvement with the remediation of contaminated lands. One of the underlying motivations for states to create a voluntary cleanup program is the relief of liability that is so rigorous under CERLA law (Sundar & Grossman, 2003). Private developers and land owners have expressed fear of future liabilities, and in response to these expressed fears, many states have signed MoA with the EPA that prohibit the EPA from further actions against brownfield sites having completed state approved voluntary cleanup programs (State Legislatures, 1996). The federal government remains empowered to enact emergency responses but this potential relief from further liability represents a significant step in bolstering voluntary cleanup programs throughout the nation.

Participation by private developers and land owners has been significant; by 2000, over 90 percent of the states had their own version of a voluntary cleanup program (Lang & McNeil, 2004, Alberini, 2007). Since the passage of the Brownfields Act in 2002, all states have some form of a VCP. Participation in voluntary cleanup programs is dependent on several variables including the size of the brownfield site, proximity to residential areas, and the economic potential of development (Alberini, 2007). Because participants in voluntary cleanup programs typically do so with brownfield sites that are

not registered with the EPA, the level of contamination tends to be lower than EPA registered sites (Alberini, 2007).

Although voluntary cleanup programs have increased in popularity, studies are inconclusive about their effectiveness and unintended effects. Akinmoladun and Lewis (1998) criticized the leniency of mandated cleanup standards, limitations on the property owner's civil liability for future cleanups, and the lack of comprehensive observation and reporting over statewide site cleanups.

One prevalent effect of the popularity of voluntary cleanup programs has been an increase of recognized or stated brownfield sites. Despite no uniform regulation requiring the registration of brownfield sites, the quantity of existing brownfield sites across our country is estimated to range between one half of a million to over one million (Simons, 1999, Wedding & Crawford-Brown, 2007). In some cases, the incentives stemming from voluntary cleanup programs have caused owners of previously undocumented parcels of contaminated land to come forward in attempts to receive benefits of the VCP's (Alberini, 2007). This effect can be viewed as a double edged sword; it is bringing previously unknown contaminated properties to light while increasing the number of private developers and land owners looking for incentives that are ultimately paid through tax dollars (Alberini, 2007).

Certain states have taken measures for protection against companies that are responsible for causing contamination and looking to enter a VCP as a means of alleviating their own liability. Minnesota, along with several other states, will not extend liability protection to parties that are responsible for causing the contamination (Cavanagh, 1995). Responsible parties are not automatically precluded from participation

in a state's VCP; however, they may be subject to a higher degree of liability (Cavanagh, 1995). In a 2002 Illinois lawsuit, the insurers of a responsible party were not held responsible for covering assessment and remediation costs of a responsible party after entering into a VCP agreement (Hazardous Waste Consultant, 2003). The courts ruled that the responsible party had entered into the VCP agreement on their own and that the additional cleanup costs were federally or state mandated; therefore, sole responsibility of additional cleanup costs remained with the responsible party.

Despite these unintended effects, VCP's remain effective and continue to grow in popularity. Rationale behind the creation of voluntary cleanup programs is rooted in motivating private developers and land owners to take action towards remediation of contaminated lands. In addition to remedial actions, private developers and land owners are interested in redevelopment that will yield returns on their investment. The offering of incentive packages help offset remediation costs and promote responsible redevelopment projects, regardless of the level of contamination.

Incentive Packages

Each state has autonomy in the preparation of incentive packages aimed at promoting the redevelopment of brownfield sites. Some incentives are directed towards remediation and site cleanup efforts while others are directed towards economic redevelopment through tax increment financing, property tax abatement, or tax credits for job creation (Alberini, 2007). One might ask why the federal or state government does not simply provide direct and complete funding for the cleanup of environmentally impacted sites if that is truly the desired goal? Recall that such direct and complete funding was one of the goals of CERCLA, but it failed to provide sufficient funding for

all necessary remediation activities. It is not reasonable for public funding to cover all of the cleanup costs, so the focus needs to turn to the potential efficiency that is recognized through the receipt of incentives by the private sector (Swartz & Vieweg, 2000).

Studies in both Europe and the United States show that private developers and land owners are apt to be more interested in the redevelopment of contaminated lands when incentive packages are offered (Alberini et al., 2005). There is no set framework for the creation of these incentive packages; however, three broad categories of incentives are typically used as the foundation for most brownfields revitalization programs in each state. These three categories are liability protection, regulatory relief, and financial incentives (Alberini et al., 2005, Goldstein, 2003). Through voluntary cleanup programs, each state has discretion in creating incentive packages so they meet the needs of each stakeholders in a given project. Case studies show that previous experience with brownfield redevelopment projects affects the priorities of private developers and land owners. Lack of experience in brownfield redevelopment typically yields a strong desire for liability relief while greater amounts of brownfield redevelopment experience typically yield a strong desire for financial incentives (Alberini et al., 2005). It is reasonable to assume that local governments have similar, but inverse preferences directly relating to their level of brownfield redevelopment experience. Local governments with less brownfield redevelopment experience will prefer to retain their rights to enforce liability and offer funding assistance.

Financial incentives can take several forms and are generally seen through five broad categories. These categories include (1) tax credits, (2) tax refunds, (3) low interest loans, (4) loan guarantees, and (5) grants (Goldstein, 2003). The first four categories are

available to private sector projects while federally funded grants are typically only available to local government entities and in some cases, non-profit agencies (Goldstein, 2003). The U.S. Environmental Protection Agency and U.S. Department of Housing & Urban Development are two significant sources of grant funding for various activities of brownfield and land revitalization (U.S. Department of Housing & Urban Development, 2009, U.S. Environmental Protection Agency, 2009).

Voluntary Cleanup Tax Credits and the Brownfield Job Program are two primary financial tools used in the creation of incentive packages for private developers and land owners. The Voluntary Cleanup Tax Credit program offers a tax credit of 35 percent of every dollar spent, up to $250,000 each year, towards the assessment and cleanup of contaminated sites with a bonus of ten percent of the total cleanup costs up to $50,000 (Goldstein, 2003, Sundar & Grossman, 2003). The Brownfield Job Program offers a cash tax refund of $2,500 per job created as long as the capital investment is at least $2 million and ten or more jobs are created (Goldstein, 2003). All of these programs and financial incentives can be utilized together to create a lucrative incentive for private developers or land owners.

The effect of liability and liability relief can dramatically affect decisions regarding brownfield redevelopment. In general, private developers and land owners will prioritize liability protection; however, there are several situations where the threat of liability will not hinder the redevelopment of brownfield sites. Financial solvency of parties involved in land transactions has significant weight in determining whether or not a private developer or land owner is willing to subject themselves to any further potential liabilities (Segerson, 1993). Brownfield Site Rehabilitation Agreements can be created

where the state will grant the private developer and lenders comprehensive liability protection against cost recovery suits (Goldstein, 2003). The Small Business Liability Relief and Brownfields Revitalization Act of 2002 revised guidelines to the Innocent Landowners Defense and changed provisions for contiguous property owners so that liability can be minimized in certain scenarios and foster the redevelopment of brownfield sites (Collins, 2003, Sundar & Grossman, 2003). State and local governments have shown willingness to relax liability standards to foster the redevelopment of underutilized properties.

Similarly, streamlining the application process for brownfield redevelopment offers regulatory relief (Lang & McNeil, 2004), thereby reducing the wait time before engaging in redevelopment activities. Another example of regulatory relief is the use of risk based corrective actions. Risk based corrective actions is a system of variable cleanup standards set in proportion to the intended end land use (Alberini, 2007, Goldstein, 2003). A variety of engineering and institutional control measures can be utilized including, but not limited to, ground caps, fences, barriers (engineering controls), permanent land use restrictions, and site monitoring (institutional controls) (Alberini, 2007). These engineering and institutional controls are site specific and could be used in any combination for targeted locations corresponding directly to the proposed land use in each area of the site.

Incentive packages can, by definition, influence the redevelopment of brownfield sites; however, literature is silent on how this influence is measured. A presupposition of offering incentive packages is an increase in redevelopment of contaminated lands. Research has not shown what level of incentive is required or to what level brownfields

will be redeveloped through the offering of incentives. As incentive packages continue to evolve, monitoring their effectiveness and appropriate revisions to future incentive packages is necessary to maintain and achieve value. Success measurements for brownfield redevelopment projects are a challenging objective that is critical to the further successful development of future incentive packages.

Measurements of Successful Brownfield Redevelopment

There is no standardized framework currently used by either public or private entities for the measurement of successful redevelopment of brownfield sites. This is primarily due to the fact that each brownfield site is unique in its defining characteristics and surroundings. Success is viewed differently through the eye of the stakeholder and can vary greatly between parties, even on the same brownfield project. Emerging research has begun to create standardized metrics for the measurement of success in brownfield redevelopment projects although there does not appear to be a unified proposal for any type of universal metrics system at this time (De Sousa, 2005, Lang & McNeil, 2004, Wedding & Crawford-Brown, 2007).

Lang and McNeil's 2004 study began with an effort to capture identifying conditions and attributes that could define a successful brownfield redevelopment project. Two surveys were conducted; the first was a qualitative questionnaire asking stakeholders to indicate their level of agreement with definable attributes, and the second survey captured site specific information such as general location, existing infrastructure, land description, building descriptions, and development climate (Lang & McNeil, 2004). Results from Lang and McNeil's study indicated that environmental remediation should not be the primary focus of brownfield redevelopment projects and that outcomes of the

development itself were of primary importance (Lang & McNeil, 2004). According to survey results, the creation of long term jobs, new real estate and income tax bases, and acreage to support on-site jobs were the top three outcomes that define successful brownfield redevelopment (Lang & McNeil, 2004). This evidence supports the use of cost/benefit analysis when prioritizing indicators of success when dealing with the redevelopment of contaminated lands (Lang & McNeil, 2004, Wedding & Crawford-Brown, 2007); however, environmental factors cannot be dismissed. While economics is of clear importance, it is environmental policy that has always been the driving factor behind legislation affecting brownfield redevelopment (Bacot & O'Dell, 2006) and therefore must be given equal consideration.

One of the greatest challenges in creating a standardized framework for measurement of brownfield redevelopment success is the gathering of information. Since each state is autonomous in the construction of development agreements, there is no common thread between states in the collection of data that could be used as indicators of success. Bacot and O'Dell (2006) suggest that there be a federal direction, most likely from the EPA, for states to institute a standard framework of data collection that would ensure uniformity and provide a good base of comparability in measurements of brownfield redevelopment success. This suggestion offers a measurement of economic and environmental indicators that can be used to assess the viability of government sponsored programs (Bacot & O'Dell, 2006).

Wedding and Crawford-Brown (2007) suggest that greater weight be given to aspects of sustainability when measuring success of a brownfield redevelopment. Vertical development, (i.e. any development beyond site remediation and infrastructure), can

represent more than 75 percent of total project costs and therefore deserve significant representation in the measurement of success for the entire brownfield redevelopment project (Wedding & Crawford-Brown, 2007). There is no known federal or state brownfield incentive that is intended to support vertical construction only; however, some incentive programs require a demonstration of public benefit and the end use of a project be part of the analysis when determining a site appropriate incentive package (Wedding & Crawford-Brown, 2007).

Several research efforts have produced great models of success measurements but a unified standard does not exist. This lack of a standardized metrics system places a greater responsibility on local governments to assess the effectiveness of incentive packages that they offer. Continued work towards a unified success measurement system for brownfield redevelopment will undoubtedly affect future incentive packages that are offered to private developers or land owners.

III. METHOD

Research Design

In this study, I investigate how incentives offered by local governments to private developers or land owners influence the rate of brownfield redevelopment within their sphere of influence. The research effort does not manipulate any independent variables affecting the dependent variable. Data is collected to reflect a longitudinal trend of actions taken by local governments over a five year period. The goal is to determine how incentives offered by local governments to private developer or land owners have affected the rate of brownfield redevelopment within that local government's sphere of influence within a five year period. Gathered data is from a self-selected sample group from the State of California and is inferred to represent the generalized trend or trends on a broad level.

The basis of research design for this study is to investigate the potential relationship between the independent variables and the dependent variable, rate of brownfield redevelopment. Independent variables for this research effort are defined as five different types of incentives that a local government may offer to a private developer or land owner to encourage the redevelopment of a brownfield site. The five independent variables are:

1. Fast-tracked or streamlined application review process
2. Risk based cleanup standards
3. Liability relief or indemnification from future site cleanup
4. Tax breaks

5. Direct funding assistance

The deductive manner of research attempts to show a nomothetic causal relationship between each of the independent variables and the dependent variable. Other contextual variables may affect the five types of incentives or the rate of redevelopment. These additional contextual variables are separated into two groups. The first group of contextual variables is demographics of the participating local government and is referred to as demographic variables. The demographic variables are:

a. Population
b. Households
c. Median household income
d. Median house value

Each of these demographic variables is an indicator of potential resources that may directly affect the rate of redevelopment. Each of these demographic variables is correlated to the rate of redevelopment to investigate any potential relationships.

The remaining contextual variables are directly correlated to the five different incentive types that affect the rate of brownfield redevelopment. Each of these contextual variables is a key element in the brownfield redevelopment process and may significantly influence how a local government creates incentive packages. The six contextual variables are:

i. Any existing framework based on characteristics of a brownfield site that may dictate the type and/or amount of incentive offered.
ii. Any funding assistance from the State of California applied to the redevelopment of a brownfield site.

iii. Any funding assistance from the Federal Government applied to the redevelopment of a brownfield site.

iv. Local government taking the initiative to approach private developers or land owners with an offer of incentives for the redevelopment of a brownfield site.

v. Private developers or land owners approaching local government seeking incentives for the redevelopment of a brownfield site.

vi. Local government having any environmental policies requiring stricter cleanup standards than state or federal requirements.

Primary data gathered from a survey instrument is used to investigate relationships between each of the demographic and contextual variables and the rate of brownfield redevelopment. The contextual variables specifically related to the brownfield redevelopment process are each compared directly to the five independent variables to investigate any correlations affecting incentive packages.

The hypotheses of this study focus on how each of the five different incentive types, or five independent variables, influence the rate of redevelopment. Two main presuppositions support the hypotheses. The first presupposition is that private developers or land owners are primarily responsible for the decision to invest in the redevelopment of brownfield projects. The second presupposition is that incentives offered by local governments will increase the rate of brownfield redevelopment. Research and findings provide a generalized framework of how incentives offered by local governments influence the rate of brownfield redevelopment within their sphere of influence.

Materials Used in Research

Research tool.

The research tool for this investigation is a survey. This is the most efficient means of including the greatest number of participants given time and budget constraints. The window of opportunity to develop and administer the survey mechanism is minimal and minimizes future opportunities to conduct any interviews, observations, or field measurements. Questions contained in the survey are designed to measure independent and contextual variables in an attempt to correlate their outcomes to the rate of redevelopment. There is no reason to hide intentions or manipulate questions and responses to avoid potentially sensitive topics with the construction of the survey. Any potential bias toward redevelopment outcomes is omitted from the research tool.

Delivery mechanism.

An internet based mechanism is the vehicle by which the survey is administered. Ease of preparation, low cost, facilitated data management, and detailed reports with integrated coding are the primary reasons for using an internet based survey. Survey Monkey (www.surveymonkey.com) is a recognizable, online survey engine that many local governments in the State of California are familiar with. The website offers secure response tracking that many cities and local governments have used for other surveys. All responses are gathered, coded and stored within the online mechanism and can be filtered and downloaded into different types of reports helping to create a database.

Preparation of Research Materials

The design of the survey is constructed in three sections to account for the dependent variable, independent variables, and contextual variables. Structure of the

survey follows this format to put the most vital information at the beginning and accounts for an expected decrease in interest as respondents advance through the survey (Dillman, 2000). The number of questions in each section range from eight to 12 with several follow up or subsection questions. The total number of questions in the survey is 51 but a respondent may answer as few as 31 questions depending on the answers provided. See appendix 1 for brainstorm ideas, rough draft, and final draft of the survey.

The purpose of the demographics and baseline brownfield information section is to gather identifying information from the participating local government as well as quantitative information on the existing brownfields within their sphere of influence. The key questions of this section identify how many brownfield sites are located within that local government's sphere of influence and how many of those sites have been redeveloped. The offered responses to the question of how many brownfield sites are located within the geographic region were aggregated into groupings of one to ten, 11 to 20, 21 to 50 and 51 or more so that respondents do not need to perform inordinate amounts of investigation. The offered responses to how many of those brownfield sites have been redeveloped are singular numbers between zero and four and then a choice of five or more. The rationale behind this is that there are likely to be several brownfield sites located within a given local government's sphere of influence, some known and some only speculated, but it is most likely that only a small fraction of those sites have undergone redevelopment efforts (US Conference of Mayors, 2003).

The final version of the survey limits the number of demographic and baseline brownfield information to only necessary information and moves quickly into questions regarding incentive packages. Based on the hypotheses of this study, the incentive

questions attempt to measure the independent variables of fast-tracked or streamlined application review process, risk based cleanup standards, liability relief or indemnification from future site cleanup, tax breaks, and direct funding assistance from the participating local government. The incentive questions represent the main causal thrust of the hypotheses and are placed as close to the beginning of the survey as possible so that they would have a higher rate of participation.

Questions targeting incentive packages begin with asking whether or not the participating local government has offered that type of incentive as part of any incentive package for brownfield redevelopment. Yes or no answers allow for a bivariate analysis of correlation to the determined rate of redevelopment. Participating local governments that answer yes to any of the questions asking about each incentive type are asked to provide additional information about how that specific type of incentive is used. The goal is to determine how participating local governments use each type of incentive to foster the redevelopment of brownfield sites within their sphere of influence.

Through literature research, incentive packages can be categorized into three types; 1) financial, 2) liability relief, and 3) regulatory relief. Questions targeting at financial incentives are separated between any type of tax breaks and any type of direct funding assistance. The purpose of this separation is twofold. First, it allows for the participating local government to differentiate between two types of funding sources when answering the questions, and second, it provides insight into how aggressive the participating local government is when pursuing brownfield redevelopment within their sphere of influence. Only one question targets liability relief. Literature has shown that private developers and land owners are concerned about the potential for liability of

future site cleanup actions (Alberini et al., 2005). The rationale behind this question is to identify how local governments use relief of liability and/or indemnification from future site cleanups to encourage private developers or land owners to redevelop brownfield sites. Questions targeting regulatory actions by the participating local governments are separated into two types. The first type of regulatory relief is the offering of fast-tracked or streamlined project review, and the second type is the offering of risk based corrective actions. The purpose of separating these two categories is that these incentives are created with different intentions. Fast-tracked or streamlined project review is based purely on project approval time and risk based corrective actions are based in the relief of excessive remedial actions.

The remaining questions of the survey focus on participation in brownfield redevelopment, or contextual variables. Questions targeting state and/or federal assistance are designed to gather information on how aid from a higher level of government influences a local government's actions. Specific details or amount of aid are not collected; it is the presence of outside aid and its influence on a local government's creation of incentive packages that is of interest. Interactions between a local government and private developer or land owner and other conditions such as stricter cleanup standards may all influence the creation of incentive packages or the rate of brownfield redevelopment itself. Questions regarding these contextual variables are placed toward the end of the survey because they are not directed at the main causal thrust of the study.

Respondents are given an opportunity to provide open ended responses on their reflections of lessons learned from previous brownfield redevelopment experiences. This

provides insight into valuable experience from practitioners who are engaged in daily operations and have understanding of the challenges to brownfield redevelopment.

Participants

This research effort focuses on the State of California as a whole; therefore, all forms of local government choosing to participate are welcome. Due to time and resource constraints, the focus of this survey is directed towards city governments, whose contact information is relatively easy to come by through the internet. There are 480 incorporated cities and towns across 58 counties in the State of California (League of California Cities, 2009). There is no known central resource available to the public that would allow an individual to contact all cities located in the State of California in a single action. Different government entities such as California Environmental Protection Agency, Office of the Governor, and the Governor's Office of Planning and Research were all contacted in an effort to obtain some form of a central contact point to disperse a request of participation in this research effort. In addition, private and/or quasi public entities such as the California Redevelopment Association and SCS Engineers (private engineering firm with vast amounts of brownfield experience) were contacted as part of the same effort. This effort began in October of 2008 and lasted through February of 2009 yielding no master list of any kind that would be useful in reaching out to all 480 California cities.

The League of California Cities is an association of city officials that share knowledge and work together by exchanging information and combining resources. This organization is well known throughout the State of California and has contact, in one form or another, with nearly every city throughout the state. One of the services that the

League of California Cities offer to its members is an online, collaborative messaging system through emails known as listserves. City officials, staff and employees are free to join a listserve of their choosing so that they can exchange information with all other members. There are eight listserves; 1) administrative services, 2) community services, 3) employee relations, 4) environmental quality, 5) finance officers, 6) housing, community and economic development (HCED), 7) public safety, and 8) transportation, communication, and public works. The listserves most closely related to issues surrounding brownfield redevelopment are environmental quality, finance officers, and HCED. The moderator of the listserves would not allow for any non-city member to join; however, they were willing to send emails out on behalf of a graduate student doing research closely related to city business. The environmental listserve has 785 members. The financial officers has 821 members and the HCED listserve has 2,054 members. The League of California Cities does not track how many cities are represented in these numbers but is comfortable with estimating that approximately 65 to 70 percent of all California cities are represented through the combination of these three different listserves. In total, 3,660 city personnel, representing approximately 324 cites, were contacted with a request to participate in this research effort.

The weakness of this method is the unknown number of contacts and inability to ensure that the correct person is contacted. The listserves are property of the League of California Cities; therefore, control of distribution and accurate tracking of contacted vs. participating cities is forfeited when using them as a distribution method. The strength of this distribution method is a consolidated contact source that requires minimal effort to contact. The League of California Cities is a recognizable and trusted source of

information for all member cities and it is reasonable to assume that recipients of the request to participate in the survey do not immediately dismiss the email as junk. This distribution method is the most efficient and reliable use of available resources given time and money constraints.

Thirty-one local governments participated in the survey. Using 324 contacted cities as the base number, the 31 participating local governments represents a 9.56% response rate. This rate drops to 6.45% if considering all 480 California cities; however, there is no guarantee or reasonable indication that all California cities have brownfield sites within their sphere of influence. Cal/EPA estimates that there are 90,000 properties in the State of California that "remain idle or underutilized because of real or perceived environmental contamination" (Cal/EPA, 2009); however, there is no existing determination of how those brownfield sites are dispersed across the state, nor are there published measurements of how that figure was estimated. How many cities in the State of California contain brownfield sites within their sphere of influence? A conservative assumption of 85 percent yields a total of 408 cities, with the remaining 15 percent of brownfield sites being located somewhere other than a California city's sphere of influence. Three hundred twenty-four cities represent 79.41% of all cities within the state that potentially have brownfield sites within their sphere of influence and the revised response rate now climbs to 7.59% of all potential cities. See appendix 3 for a list of participating local governments and their respective locations.

The sample size of 31 local governments is too small to make a strong inference of trends or relationships. Exact counts of brownfield sites and their relative sizes are the only way to accurately determine the response rate of local governments. This precise

information is not available so other comparisons must be made. Population of the participating local governments compared to the State of California can be used as another comparison of sample size.

Table 1

Demographic Comparison of Sample Population to State of California

	Median City Population	Median Income	Median House Value
Sample Population	42,236	$44,540	$169,400
State of California	28,862	$47,493	$211,500

U.S. Census Bureau, Census 2000 and League of California Cities
Data Sets: Census 2000; Summary File 1 (SF 1), Table P1; Summary File 3 (SF 3), Tables P53 and H76
League of California Cities; All About Cities, Fast Facts

Table 1 shows a comparison of demographic variables between the sample population and the State of California. Using gathered information from the 2000 census, the combined population of the 31 participating local governments is 1,751,784. Total population in the State of California is 33,871,648. The participating local governments represent only 5.14% of the entire state's population. Sample size drops significantly lower when looking at representation of land area. Using statistics from Wikipedia, the total land mass of all participating local governments is 600 square miles. The total land mass of the State of California is 163,696 square miles. Participating local governments represent less than one percent, 0.37%, of the total available land mass in the State of California. These comparisons demonstrate the weakness of the collected sample size and the inability to make strong inferences from the gathered information. The primary data

allows only for generalized inferences of how incentives influence the rate of brownfield redevelopment within the participating local government's sphere of influence.

Identified Brownfield Sites

California's Department of Toxic Substance Control (DTSC) maintains a database of registered cleanup sites and permitted hazardous waste facilities across the state. This database contains registered brownfield sites that are in various stages of cleanup status. There are 832 brownfield sites, representing 53 counties on this list, broken down by status and locations. The 31 respondents represent 20 different counties, or 39.21% of the counties in California that have registered brownfield sites. Five hundred four potential brownfield sites have been identified by the respondents using aggregated response choices. This represents over 60 percent of the total registered brownfield site population in California; however, there may be several more brownfield sites that are not accounted for in the DTSC database. California EPA estimates that there are approximately 90,000 brownfield sites in the state. The 832 registered sites represent approximately less than one percent of that total potential brownfield site population.

Protocol and Measurements

Aggregated answer choices are provided for the respondents for two reasons. The first reason is for each of answering in an attempt to increase survey participation. The second reason is to provide ranges of answers to questions for which local governments may not have precise information. Not all brownfield sites are registered with state or federal government and research has shown that there are potentially thousands of sites across the State of California that may not be accounted for. Aggregated answer choices

provide the most efficient means of collecting information given constraints on time and information. Unfortunately, aggregated answer choices make it impossible to identify an accurate percentage of total brownfield site representation by the respondents.

Data from the survey is input into a database that allows descriptions and correlations to be made. See appendix 4 for complete database information. Descriptive statistics and correlations are most appropriate given the sample size and amount of information collected. Insufficient information was gathered to perform a multivariate regression analysis showing influences of each independent variable to the rate of redevelopment. In addition to the information gathered from the survey, demographic statistics from the 2000 census is entered into the database so that correlations between variables a, b, c, and d and the rate of redevelopment can be analyzed.

The rate of redevelopment for each respondent is calculated by taking the number of redeveloped brownfield sites and dividing by the indicated number of brownfields located within their sphere of influence. Answer choices for the number of redeveloped sites are used as the numerator in calculating the rate of redevelopment. For answer choice “five or more”, five is used as the numerator. Since aggregated answer choices are provided for the number of brownfield sites, the midpoint of each grouping is used as the denominator in the equation. For respondents having 51 or more sites, 51 is used as the denominator. The mean rate of redevelopment is calculated by summing all of the responses for number of redeveloped sites and dividing by the sum of all answer choices for the number of brownfield sites.

Each respondent is given a rank for their rate of redevelopment, with identical rates sharing the same rank. Two or more respondents sharing the same rank leads to

statistical insignificance when attempting to perform correlations. The rate of redevelopment, as opposed to the rank will lead to stronger generalizations of influences and trends. Corresponding demographic information is input into the database so that correlations could be made between the rate of redevelopment and values of population, households, median household income, and median house value. The remaining six contextual variables are input into a correlation database with binary answers only; zero representing a “no” answer and one representing a “yes” answer.

Bivariate analysis between the different variables using Pearson’s correlation is the most effective means of determining measures of association given the information that is gathered. Measures of association that this study attempts to identify include:

- Demographic information to rate of redevelopment
- Correlations between the five independent variables
- Each independent variable to the rate of redevelopment
- Contextual variables to each independent variable
- Contextual variables to the rate of redevelopment

In addition to each of these correlations, a chi squared test is calculated to determine the accuracy in predicting the order of pairs of cases between incentives/no incentives and redevelopment/no redevelopment.

IV. FINDINGS AND DISCUSSION

Results of the survey provide an insight to how incentives offered by local governments to private developers or land owners influence the rate of redevelopment. There were 31 participating local governments, representing less than eight percent of the available population. This size of the sample and low representation of total population allows only for generalizations to be made on how these incentives work within the State of California.

Rate of Redevelopment – Dependent Variable

A baseline rate of redevelopment was established by calculating results from two independent questions; 1) How many brownfield sites exist within your local government's sphere of influence, and 2) How many brownfield sites have been redeveloped within your sphere of influence over the last five years? Both questions had aggregated answer choices to help respondents identify qualifying brownfield sites to the best of their ability. The Brownfields Act of 2002 requires brownfield sites to be registered, but comprehensive information is not completely available to all local governments at this time. No information was gathered on whether or not these brownfield sites are registered with the state or how participating local government identifies brownfield sites.

Figure 1 shows the number of brownfield sites that were identified in each local government's sphere of influence. The reported number of brownfield sites provides one half of the information required to establish a baseline rate of redevelopment. Over 50 percent of the respondents indicated that there were ten or less brownfield sites located

within their sphere of influence. Three respondents, representing less than ten percent of the entire sample, indicated that there were no brownfield sites located within their sphere of influence. The remaining 12 respondents indicated that there were 11 or more brownfield sites located within their sphere of influence. The reported number of brownfield sites provides one half of the information required to establish a baseline rate of redevelopment. The frequency of responses that indicate a low number of brownfield sites, ten or less, implies that the associated local government may not be aware of additional brownfield sites within their sphere of influence. This may also be an indicator of minimal levels of experience that participating local governments have with brownfield redevelopment.

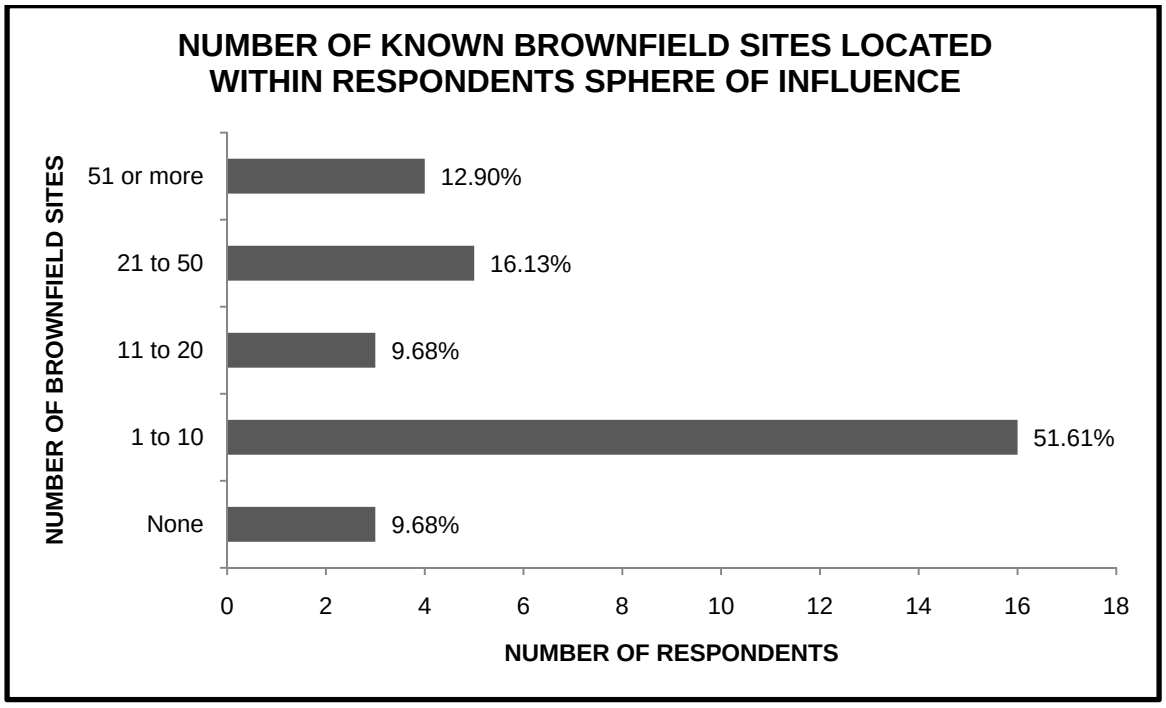

Figure 1. Number of known brownfield sites.

Figure 2 shows the number of brownfield sites that respondents have identified as having been redeveloped over the last five years within their sphere of influence. The reported number of redeveloped sites provides the second half of the information required to establish a baseline rate of redevelopment. Twelve respondents, representing almost 40 percent of the entire sample, indicated that no redevelopment of brownfield sites has occurred within their sphere of influence over the last five years. Eleven respondents indicated that they had redeveloped between one and four brownfield sites and six respondents indicated that they had redeveloped five or more brownfield sites within the last five years. The frequency of responses indicating no redevelopment has a strong correlation to the low number of brownfield sites and demonstrates that the majority of participating local governments have little to no brownfield redevelopment experience.

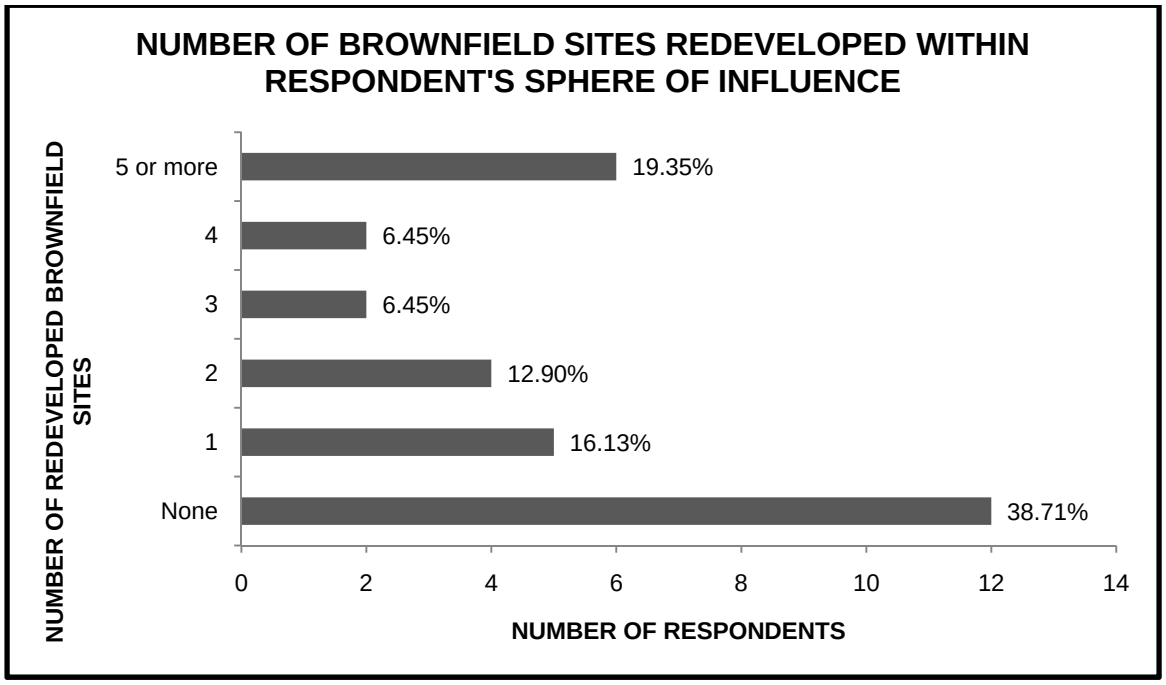

Figure 2. Number of redeveloped brownfield sites.

The rate of redevelopment was calculated for each respondent to find individual scores. Mid-points of aggregated responses for the number of brownfield sites located within the respondent's sphere of influence were used to represent the most accurate score given the available information. Responses that indicate an open ended value beyond a given number were entered as the lowest specified value to avoid unsupported rates of redevelopment. Respondents indicating either zero brownfield sites or zero redeveloped sites over the last five years were given a rate of redevelopment equal to zero. Figure 3 the frequency of redevelopment rates for the entire sample.

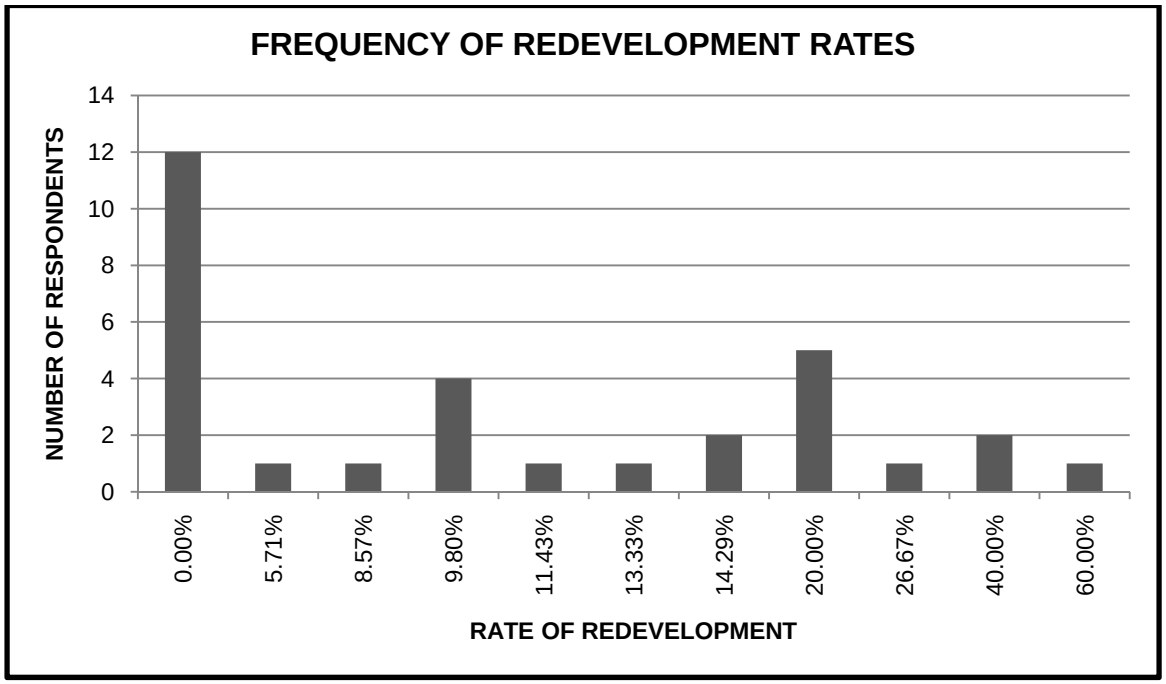

Figure 3. Frequency of redevelopment rates.

The median rate of redevelopment is 9.80% and the mean rate for all respondents is 11.31% with a variation of 2.07% and a standard deviation of 14.40%. The small sample size contributes to a low mean rate of redevelopment and a standard deviation that

cannot be used for statistical analysis. Measures of association are inferred weakly throughout the findings based on the rates of redevelopment shown above. The calculated rates demonstrate a wide range of redevelopment implying that participating local governments have different levels of experience that do not have strong relationships with each other.

All of the gathered information leading to a baseline rate of redevelopment indicates that participating local governments have very little to no experience with brownfield redevelopment. Participating local governments with rates of redevelopment 40 percent or greater can be considered outliers compared to the entire sample. This information affects how incentives are viewed. It could imply that the incentives offered to date have been ineffective, or that the more inexperienced participating local governments are still experimenting with incentive packages that will be more effective in increasing the future rate of redevelopment. Although strong inferences cannot be made with this study, relationships between different types of incentives, demographic variables, contextual variables and the rate of redevelopment show a positive influence in brownfield redevelopment.

Incentives – Independent Variables

Each of the five different types of incentives investigated in this study represents an independent variable that may influence the rate of redevelopment. Correlations between each type of incentive are investigated to see if any patterns emerge showing preferences of groupings. The incentives are also independently correlated to the rate of redevelopment to show how each one affects brownfield redevelopment in the

participating local government's sphere of influence. Table 1 identifies each of the incentives that have been investigated.

Table 2

Types of Incentives

Incentive #1	Fast-tracked or streamlined development application process
Incentive #2	Risk based cleanup standards
Incentive #3	Liability relief or indemnification of future site cleanup
Incentive #4	Tax breaks
Incentive #5	Any type of direct funding assistance

Figure 4 shows the frequency of each incentive type being offered by participating local governments. Range of responses varied between 13 cases for direct funding assistance, representing approximately 42 percent of respondents, to only two cases for tax breaks, representing approximately six percent of respondents. Fourteen respondents, representing approximately 45 percent of all respondents, indicated that they did not offer any type of incentive. Only two respondents indicated that they offered four or more incentives together while 15 respondents indicated that they had offered between one and three incentives. These results show that participating local governments are more likely to provide direct funding assistance with the redevelopment of brownfield sites than any other type of incentive. This could be for a variety of reasons including the level of experience and a desire to retain rights of liability enforcement of the local government.

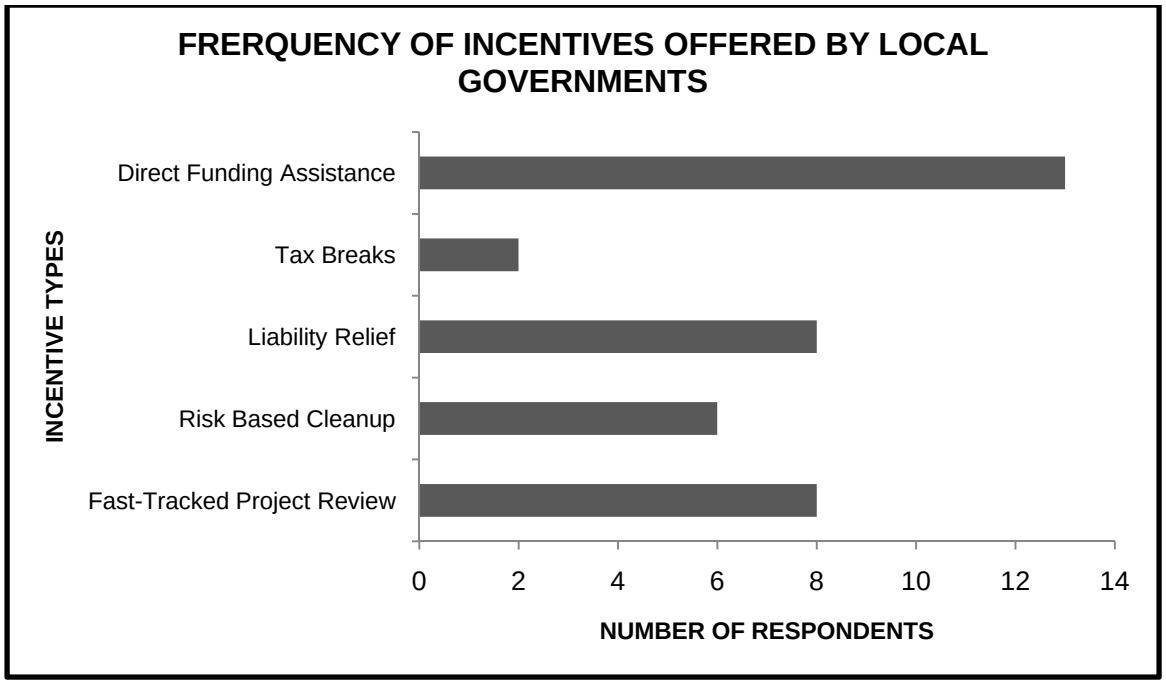

Figure 4. Frequency of incentives offered by local governments.

Research by Alberini et al. (2005) has shown that private developers will prefer liability relief over direct funding assistance when they have little to no experience with brownfield redevelopment and then prefer the direct funding assistance over liability protection as their experience level increases. It is reasonable to assume an inverse preference for local governments. Results of this study show that participating local governments have little to no experience and that direct funding assistance is the most frequently offered type of incentive. A larger sample size that includes participating local governments that have more brownfield redevelopment experience may yield an increase in frequency of risk based cleanup and liability relief being offered as incentives to foster brownfield redevelopment.

Incentives are typically offered as part of a package to private developers or land owners that may include several different types. The statistical analysis shows three

patterns of association that are statistically significant at the .01 and .05 levels. Risk based cleanups and liability relief are the most common pairs of incentives offered by participating local governments. From review of the relevant literature, it is known that risk based cleanup standards are both a form of liability relief, so it is not surprising to see a strong correlation between the two types of incentives. Results support the belief that local governments will typically offer these two incentives together as part of an incentive package to promote the redevelopment of brownfield sites. See appendix E, table 2 for correlations between the five different types of incentives that are investigated.

The pairing of direct funding assistance to risk based cleanup and to liability relief are statistically significant at the .01 and .05 levels respectively. Direct funding assistance is the most frequently offered incentive to private developers or land owners by the participating local governments, which partially explains correlations between other types of incentives. Types and amounts of direct funding assistance are at the sole discretion of the offering local government and are not accounted for in this study. Local governments have less discretion over risk based cleanup standards and liability relief because these are directly tied to the framework of the state's voluntary cleanup program.

Results shown in table 2 imply that direct funding assistance has a strong influence over other types of incentives that are offered by participating local governments. Local governments have more control over direct funding assistance and can utilize their discretion in how funds are allocated. The strong correlations between direct funding assistance, risk based cleanups and liability relief may demonstrate the need for financial assistance to be present before risk based cleanup or liability relief is offered. Research has shown the need for financial incentives to offset the costs

associated with contaminated lands. Risk based cleanup and liability relief may not be enough of an incentive to encourage redevelopment of severely contaminated lands.

Each independent type of incentive may be offered as part of a larger incentive package. The percentage of incentive packages that include each type of incentive was determined to further investigate any patters of groupings. Figures 5.1 through 5.5 each show what percentage of respective incentives are included with all incentive packages offered to private developers or land owners. Aggregated answer choices were provided to represent zero, 25, 50, 75 and 100 percent increments. Respondents indicating zero percent may have offered that respective incentive type for an isolated case.

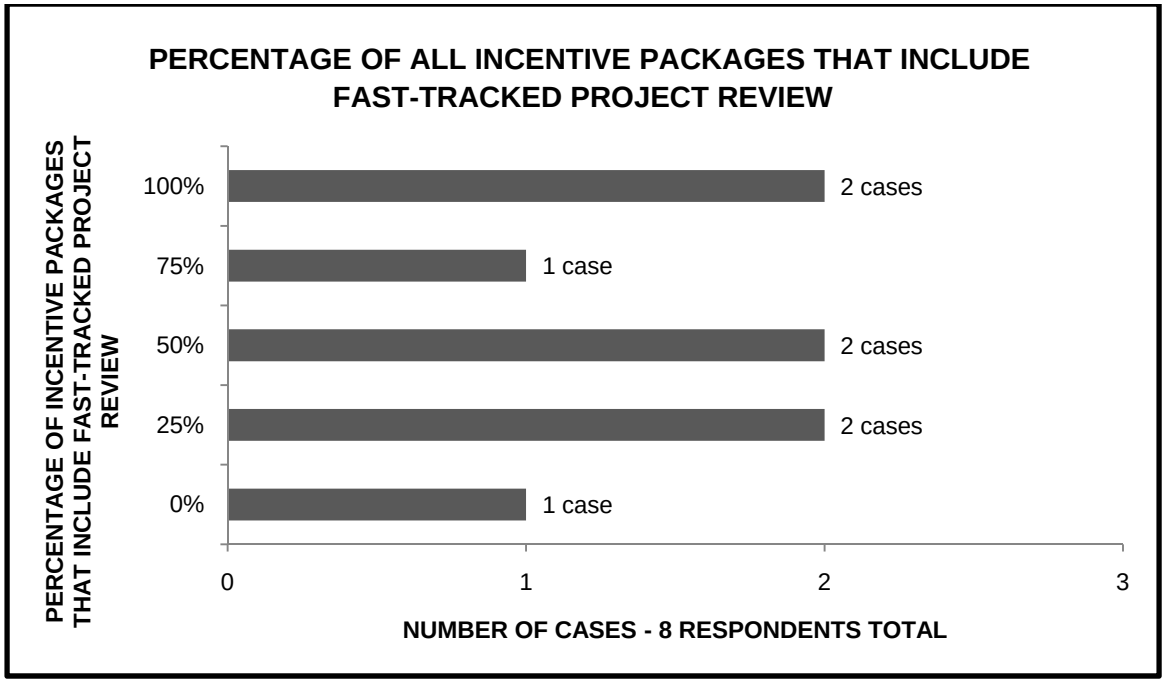

Figure 5.1. Percentage of all incentive packages that include fast-tracked project review.

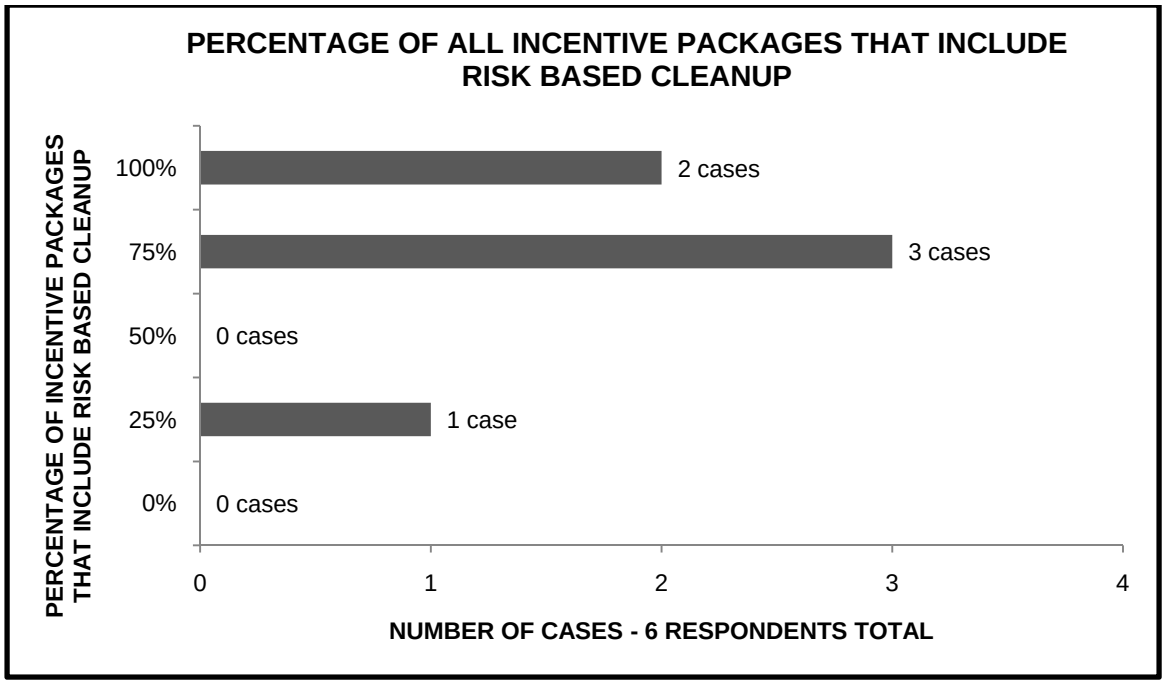

Figure 5.2. Percentage of all incentive packages that include risk based cleanup.

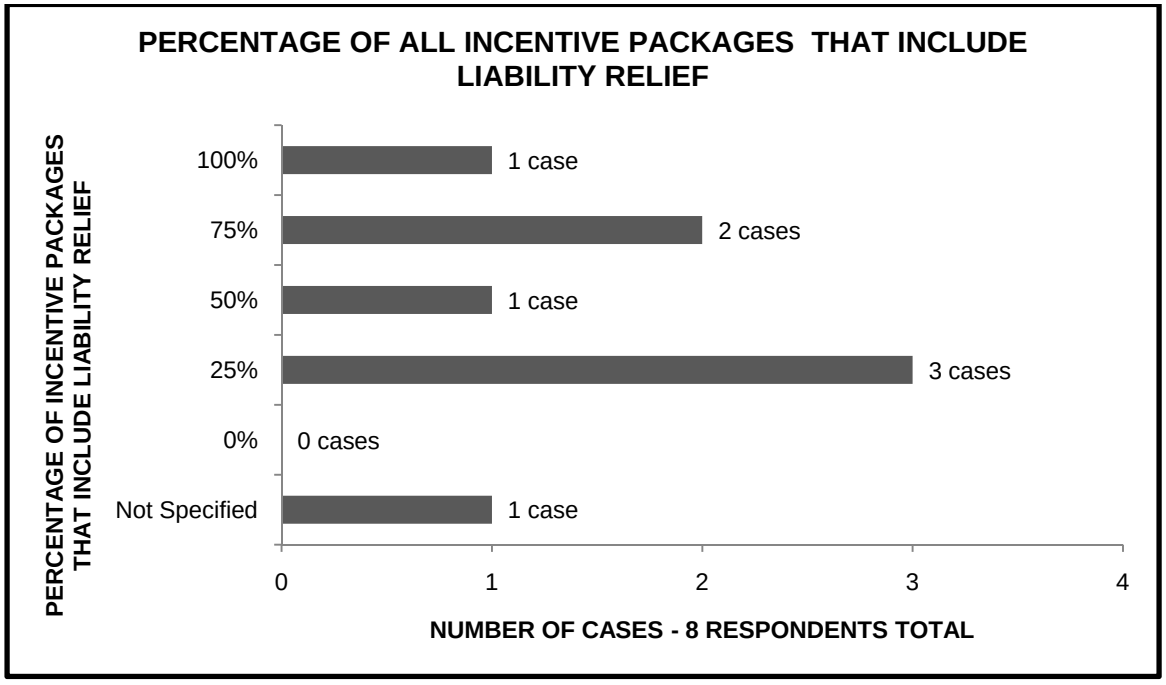

Figure 5.3. Percentage of all incentive packages that include liability relief. In the single case offering liability relief with 100% of all incentive packages, the respondent stated that liability protection under the Polanco Act is the key trigger.

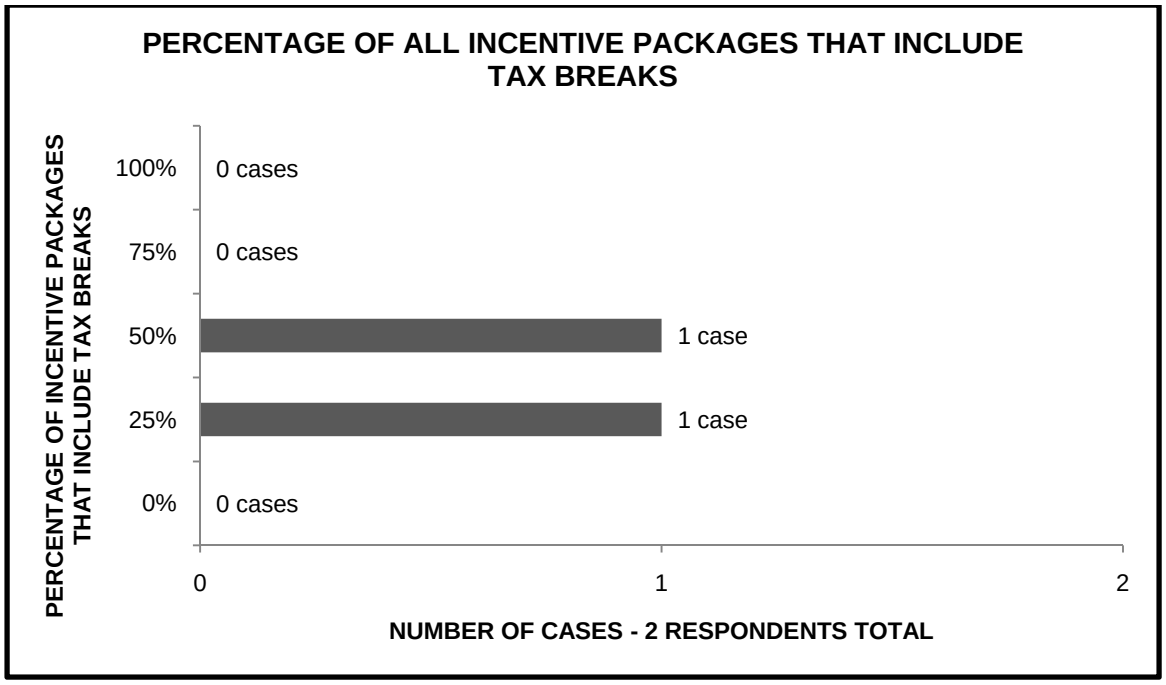

Figure 5.4. Percentage of all incentive packages that include tax breaks.

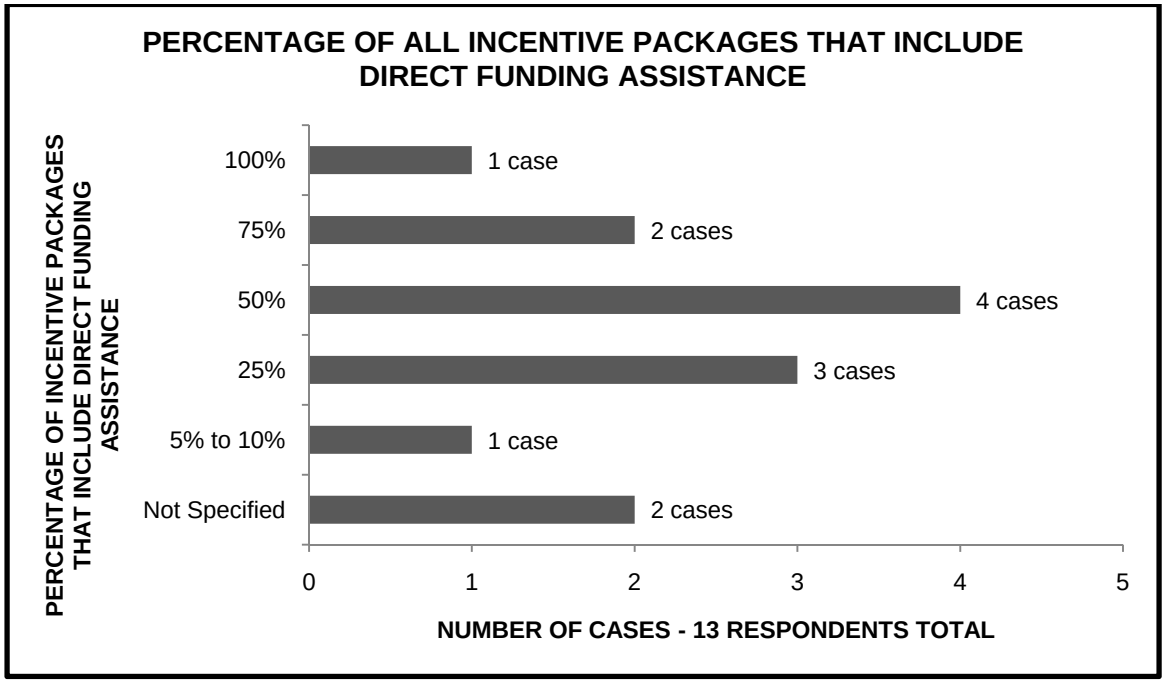

Figure 5.5. Percentage of all incentive packages that include direct funding assistance.

No statistical significance was determined through analysis of percentage of all incentive packages that included each type of incentive. This demonstrates the fact that

each brownfield site has unique characteristics and implies that incentive packages are created independently for each project. Less than half of participating local governments chose to provide information on the percentage of all incentive packages that include each type of specific incentive; therefore, it was not optimal to run any type of regression analysis on how the number or amount of incentives included affected the rate of redevelopment.

The influence of incentives on redevelopment of brownfield sites was first analyzed as a total grouping of all incentives and then separately by individual incentive. A chi squared test was calculated to determine the measure of association between grouped pairs of incentives/no incentives and redevelopment/no redevelopment. The table and calculation were set up only to determine an ordinal level of association to predict the order of pairs of cases between incentives that are offered and redevelopment that occurs.

Table 3

Chi Square Test for Redevelopment and Incentives

	Brownfield Redevelopment		
Redeveloped Sites	No Incentives	Incentives	Totals
No Redevelopment	8	4	12
Redevelopment	6	13	19
Totals	14	17	31

The resulting gamma of .625 means that when predicting the order of pairs of cases on the dependent variable of redevelopment, 62.5% more errors are made by taking

the set of independent variables of incentives into account. This reflects a very weak measure of association perhaps due to the small sample size; however, a pattern exists that could offer different results if the sample size were to increase. The pattern implies a positive relationship between incentives and the rate of redevelopment.

Appendix E, table 3 shows the statistical correlations between the rate of redevelopment and each type of incentive. Correlations between the rate of redevelopment and each type of incentive are very weak, and in three cases, show a negative relationship. Direct funding assistance has the closest correlation to rate of redevelopment but is not statistically significant at the .10 level. Small sample size may be the primary influence in this statistical outcome, but there may be other generalized inferences that can be drawn.

The results of the survey generally show that incentive packages offered by participating local governments to private developers or land owners for the redevelopment of brownfield sites only marginally influences the rate of redevelopment. This may imply that state or federal involvement matters more to the private developer or land owner when choosing to invest in brownfield redevelopment. Federal and State governments may be more suited to providing incentives that influence the rate of brownfield redevelopment. Risk based cleanup standards and liability relief are directly connected to the state's voluntary cleanup program so it is not surprising that participating local governments have not offered these types of incentives as often as direct funding assistance. Local governments may generally feel more comfortable with offering direct funding assistance because any loss would be limited to financial terms.

It is interesting that more participating local governments do not offer fast-tracked project review; however, this may be directly related to issues of liability relief. Hesitation to offer fast-tracked project review more often may be based either in a local governments desire to maintain as much control as possible over the redevelopment of brownfield sites or their lack of experience and a desire to thoroughly review all applications pertaining to brownfield redevelopment. That said, there is a statistically significant relationship at the .10 level between participating local governments that have stricter cleanup standards than those of the Federal or State government and fast-tracked project review. This suggests that there may be other variables influencing how incentive packages are created or even the rate of redevelopment itself.

Demographics – Contextual Variables

Demographic variables of a local government may influence how incentives are used to foster brownfield redevelopment. The demographics of a local government may also directly affect the rate of redevelopment. Geographic location of each participating local government was identified and investigated for any potential relationships in addition to demographic variables of population, median house value, and available sales and use tax.

There are no formal or politically recognized boundaries in the State of California between north, south, central coast, or central valley areas. These boundaries are social boundaries only and their placement or limits are debated. Appendix C shows the location of all participating local governments and set boundaries between the four demographic areas. Figure 6 shows a percentage breakdown of participating local governments by demographic area. The majority of respondents came from Northern

California, but Southern California and the Central Valley have strong representation at an equal rate. The breakdown of geographic location does not yield any statistically significant relationships to the rate of redevelopment.

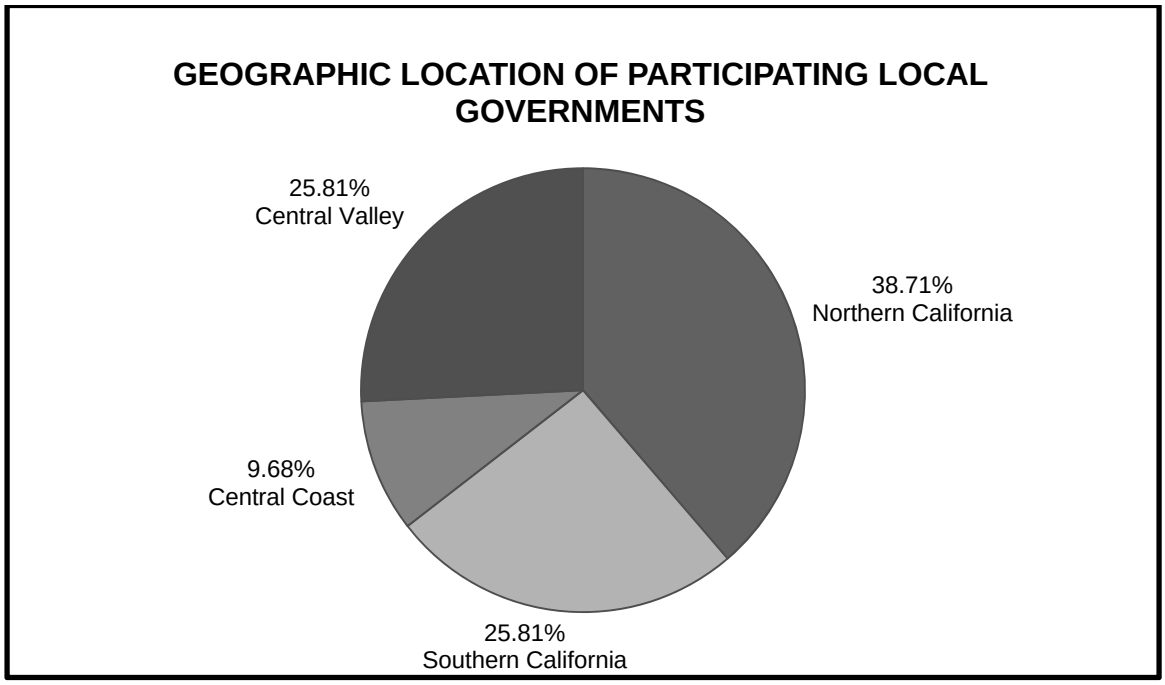

Figure 6. Location of participating local governments.

Population, households, median household income, and median house value are all indicators of potential resources available to a local government when creating incentive packages for brownfield redevelopment. Larger populations typically require a larger government structure and, in terms of available resources, should be better suited to deal with complex issues such as brownfield redevelopment. A higher median household income and median house value are indicators of a larger tax base to draw from when creating incentive packages. Geographic locations of participating local governments may also show a trend of redevelopment specific to certain areas.

The United States Census Bureau classifies the divide between urban and rural populations as 50,000. Twenty respondents, approximately 65 percent, have a population of 50,000 or less with the remaining 11 respondents having a population of greater than 50,000, which skews the results into showing a stronger bias towards rural populations. However, some of the participating local governments with rural populations are located inside of larger metropolitan areas but have a limited sphere of influence confined to their political boundaries.

The range of population of the respondents was from 3,621 to 243,771. The total population of all responding local governments is 1,751,784, which represents a little more than five percent of California's 33,871,648 residents but the median population of participating local governments is 42,236 compared to the median population of 28,862 for all California cities. This implies that while the sample size may be weak, the participating local governments represent a population that greater than most California cities. The range of median house values of the respondents was from $86,700 to $479,800, with a median value of $169,400. The median house value in the State of California is $211,500, which shows that participating local governments are below median value. Similar to population, the median house value of a local government is one indicator of potential resources available that could influence incentive packages for the redevelopment of brownfield sites. Sales and use tax figures for the participating local governments were researched to provide additional context of the sample size and its demographic representation. Participating local governments account for five and a quarter percent of all available sales and use tax for 2006 through 2007 according to the California State Board of Equalization.

Table 4 in appendix E shows the correlations between each type of incentive and the different demographic variables noted. The only statistically significant positive relationship found was between risk based cleanup and a participating local government's population, implying that local governments with larger populations are more likely to offer this type of incentive. A strong relationship between liability relief and population was not found, which is contrary to the relationship found between the two types of incentives earlier. Negative relationships were consistently found between fast-tracked project review and tax breaks and all demographic variables. This negative relationship may reflect the level of experience for participating local governments in addition to the small sample size.

Table 5 in appendix E shows correlations between the rate of redevelopment and the different demographic variables noted. The number of households and median income were added to investigate the potential of any other measure of association. No statistical significance was found between the rate of redevelopment and any of the census information gathered.

Other Contextual Variables

There are several other factors that may contribute to the creation of incentive packages affecting the rate of brownfield redevelopment. Some of these factors may directly influence the rate of redevelopment itself. This research effort focused on the following additional factors:

- Any existing framework based on characteristics of a brownfield site that may dictate the type and/or amount of incentive offered.

- Any funding assistance from the State of California applied to the redevelopment of a brownfield site.
- Any funding assistance from the Federal Government applied to the redevelopment of a brownfield site.
- Local government taking the initiative to approach private developers or land owners with an offer of incentives for the redevelopment of a brownfield site.
- Private developers or land owners approaching local government seeking incentives for the redevelopment of a brownfield site.
- Local government having any environmental policies requiring stricter cleanup standards than state or federal requirements.

Each of these factors was correlated to the five different types of incentives to investigate if there were any trends. There are several statistically significant correlations that appear when looking at these other factors; however, there are also correlations that indicate a negative relationship. Small sample size may be a primary influence in these relationships, but there are a few noted trends that may have larger implications. Table 6 in Appendix E shows the correlations between each of these contextual variables and the five different types of incentives.

The statistically significant relationship, at the .10 level, between stricter cleanup standards and fast-tracked project review is the only other factor that appears to have a positive influence when looking at this incentive type. However, only one respondent indicated that their local government has any form of environmental policy or cleanup standards that are stricter than those of the state or federal government, which renders this relationship statistically insignificant. A weak positive connection exists between fast-

track project review and when a participating local government approaches a developer, but this is also reasonable. If a local government is approaching a private developer or land owner to initiate redevelopment of a brownfield site, then offering a streamline project approval process would be an easy accommodation. The local government is acting as the primary stakeholder and it is in their best interest to process the development application in an expedited manner. It is interesting to note the appearance of a negative correlation between state funding and the offering of fast-track project review. It may be the case that a participating local government feels more secure with the backing of state funding and is no longer acting as the primary stakeholder; thereby not demonstrating the need to expedite any project approval.

Correlating each of the contextual variables to risk based cleanup standards has produced interesting results with an equal number of negative and positive relationships. The presence of federal funding and initiation of development by either local government or private parties all show a statistically significant positive relationship to risk based cleanup standards. This connection reflects a comfort level that local governments have in offering any type of incentives with liability relief when federal assistance is present. Existing frameworks for incentives, the presence of state funding, and stricter cleanup standards all yield a negative relationship to risk based cleanups with participating local governments. Generalized inferences can be drawn on the positive correlation between stricter cleanup standards and risk based cleanup, but the lack of consistency and the negative relationships seen with other contextual variables makes this very difficult. This lack of consistency is most likely contributed to the small sample size.

Liability relief has similar inconsistencies as risk based cleanup standards but there are two positive relationships worth noting. Participating local governments that approach a private developer or land owner for redevelopment of brownfield sites yields a very strong correlation to liability relief. This supports Alberini's research (2005) results showing private parties with less brownfield redevelopment experience preferring liability relief over any type of funding assistance. There is also a strong correlation at the .10 level between this incentive type and when private parties approach the participating local governments for redevelopment of brownfield sites. In addition, there is a strong correlation between liability relief and the presence of federal funding suggesting that the financial security provided by the federal government may promote participating local governments to offer this type of incentive.

No statistically significant relationships exist between the other contextual variables and tax breaks offered by participating local governments. No relationship, positive or negative, would be statistically significant given only two respondents indicating this type of incentive. Tax structure is closely related to state and federal systems and it would be difficult for a local government to provide additional tax breaks given this constraint.

Direct funding assistance is the most common incentive offered by participating local governments to private developers or land owners. It does not come as a surprise that the presence of state and federal funding have a strong correlation to the offering of this incentive. Research has shown that the redevelopment of brownfield sites can be very complex and requires a substantial amount of funding incentives in order to offset many of the negative conditions associated with most brownfield sites. Direct funding

assistance was offered by nearly 50 percent of participating local governments and in most cases, state and federal money has been dedicated to the redevelopment of all brownfield sites. The other strong correlation to direct funding assistance is when the participating local government approaches the private developer or land owner. This may be attributed directly to the interest of the participating local government as a primary stakeholder and their desire to see a specific brownfield site redeveloped. It is interesting to note the negative relationship between direct funding assistance and any existing framework within participating local governments for the creation of incentives. This may be a result of inexperience with participating local governments who have not previously offered any type of incentive to private developers or land owners.

Each of these factors may influence the rate of redevelopment independently. Table 7 in Appendix E shows the correlations between each of these contextual variables and the rate of redevelopment. Several correlations that are statistically significant between the .05 and .10 level are found when looking at this data, matching the results of previously presented data. There is a strong relationship between the presence of an existing framework for incentives and the rate of redevelopment. This is supported by a strong relationship between when a participating local government approaches a private developer or land owner to initiate the redevelopment of a brownfield site. It is likely that participating local governments having an existing framework for the creation of incentives are more likely to be proactive acting as primary stakeholders in fostering the redevelopment of brownfield sites.

There is also a strong correlation between the presence of state and federal funding assistance. It makes sense that any local government pursuing state or federal

assistance would indeed pursue both. The data also shows that private developers or land owners are more likely to engage the participating local governments when federal assistance is available. Another interesting correlation exists between participating local governments approaching the private developer or land owner and the other way around. This suggests a relationship built between the two entities for the sake of pursing a common interest. A presupposition of any development by private entities is the increase of profits, which in turn, benefits the local government. This data supports the notion, on a general level, that participating local governments work in conjunction with private developers or land owners to foster the redevelopment of brownfield sites.

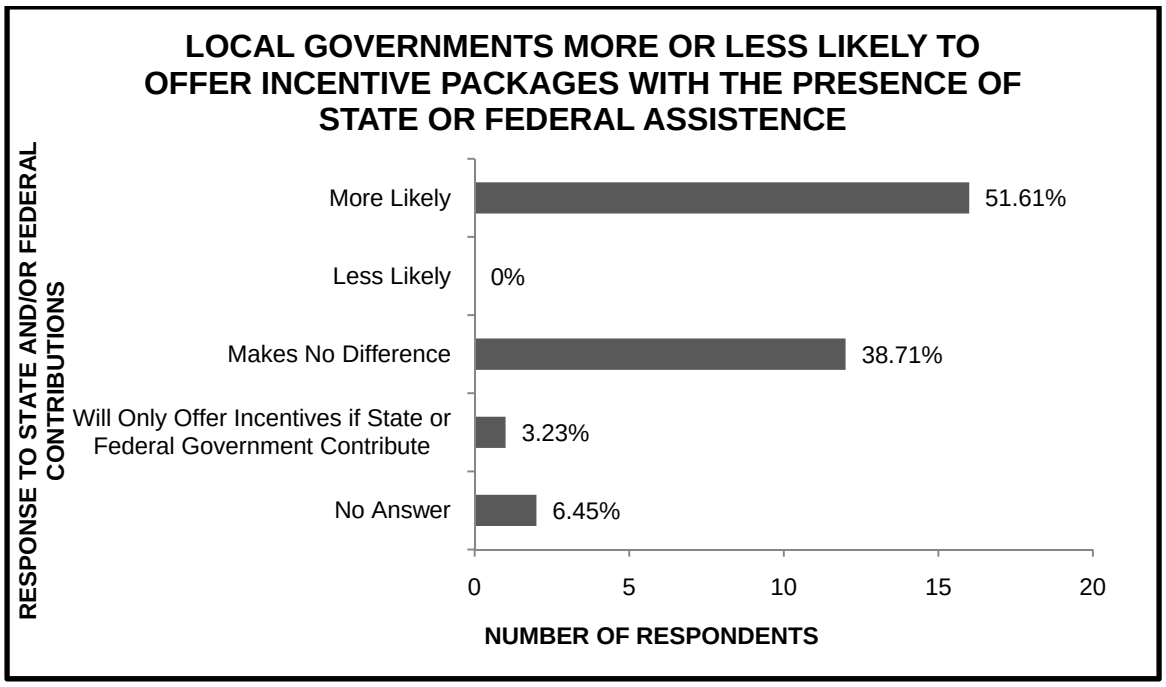

Figure 7. Local governments more or less likely to offer incentive with state or federal assistance.

Participating local governments had the opportunity to provide feedback on contextual variables that could influence the creation of incentive packages. One of the primary influences in the creation of any incentive package is the presence of state or federal assistance. Respondents were asked if they were more or less likely to offer incentive packages to private developers or land owners if the State of California or the Federal Government had already contributed to the redevelopment of a brownfield site. Figure 7 shows how participating local governments are likely to offer incentive packages based on the presence of state or federal assistance.

It is not surprising that the majority of participating local governments state that they are more likely to offer incentive packages if there is additional assistance from the state or federal government or that they are less likely to do so without it. What is interesting is the 12 respondents, representing a little less than 40 percent of all participating local governments, indicating that it makes no difference if state or federal assistance is present. This may be due to the small sample size or it may reflect a proactive approach by the participating local governments. There is a strong correlation between the local government who approached the private developer or land owner to initiate the redevelopment of brownfield sites (see table 6 below). This suggests that participating local governments acting as the primary stakeholder are interested in the redevelopment of brownfield sites regardless of any state of federal involvement; which also supports the strong presence of incentive type five, direct funding assistance from the local government. Only one respondent indicated that the private developer or land owner backed away from redevelopment after they had assessed the risk when the participating local government had approached them and offered financial assistance.

Most participating local governments stated individual management of brownfield redevelopment sites on a case by case basis when asked if there was any framework for the creation of incentive packages based on site characteristics. One of the respondents indicated that there was an EPA Brownfields Revolving Loan Fund grant in place allowing different incentives for site contaminated with petroleum versus other materials. Two respondents indicated that the offering of incentives was tied to limits of tax increment and sales tax financing available through the redevelopment of the site. Two respondents indicated that the level of need for the project was a deciding factor and one respondent indicated that the location of the brownfield site was important because of public involvement. All of these responses are isolated but still provide insight to the thought process of participating local governments when creating a framework for incentive packages. The fundamental factor is that each brownfield site is treated differently for reasons ranging from level of contamination to its location.

Liability relief in the State of California is closely tied to the Polanco Redevelopment Act of 1990. The Polanco Act provides a framework of process for redevelopment agencies in the state to follow when cleaning up contaminated lands. This Act provides redevelopment agencies power to enforce prescribed cleanup plans and grants the ability to perform the work itself or outsouce the cleanup is the responsible party does not comply. The Polanco Act has become a powerful tool for redevelopment agencies throughout the state to foster the cleanup of contaminated lands. Incentive type three, liability relief, can be directly tied to the Polanco Act if the participating local government has enacted this legislation. One respondent indicated that the Polanco Act was invoked after a private developer or land owner insisted that the participating local

government offer incentives for the redevelopment of a brownfield site. This demonstrates a local governments due diligence in pursing brownfield redevelopment while retaining their right to enforce liability as needed.

Other Observations

Each respondent was given the opportunity to provide open ended feedback on his or her experiences of brownfield redevelopment. Several comments echo literature and research surrounding all topics of redevelopment. There were other comments made that are interesting and can apply to any brownfield redevelopment site regardless of location. One respondent pointed out that corporate priorities and market conditions are a greater influence on the redevelopment of brownfield sites than any action taken by a local government. This sentiment was supported by another respondent's comment that the perceived value of brownfield sites has been growing with private developers and land owner's sophistication and that public agencies should be careful not to over incentivize any brownfield site. Economic factors are a primary concern for all parties involved with redevelopment projects and a noted concern by several respondents is that the cost of remediation is prohibitive for most contaminated sites. Federal, state, and local incentives are required in many cases to offset the cost of remediation associated with contaminated sites. One of the side effects of state or federal assistance in some cases is the requirement of prevailing wages, which tends to increase construction costs by approximately 20 to 30 percent.

All of these factors are easier to deal with when they are known as opposed to coming up as a surprise once action has been taken towards redevelopment. One respondent noted that private developers would rather deal with higher known costs than

any surprises. Other respondents indicated that education of the public and the city council are equally important so that additional roadblocks can be avoided and money can be saved. Starting with a vision of end use and working backwards to identify all the necessary steps of redevelopment is a noted piece of advice from one respondent. Unknown costs that are unexpected can be a greater deterrent for brownfield redevelopment than liability. Another respondent noted that private developers will shy away from brownfield redevelopment projects if funding is not identified and indemnity offered as incentives. This supports the need of local governments to have a clear and feasible process in place when approaching brownfield redevelopment.

V. CONCLUSION

Results from this study show several correlations between the five different types of incentives that were investigated and the rate of brownfield redevelopment. The small sample size of 31 participating local governments does not provide a strong base from which statewide inferences can be made; however, recognizable patterns have emerged that are interesting to observe and important to note. Each of these noted patterns may have significant implications for brownfield redevelopment within the State of California and possibly throughout the nation. The most notable pattern recognized from the sample was the level of experience from participating local governments. This relative level of inexperience, combined with the small sample size suggests that future research of how incentive packages offered by local governments to private developers or land owners for the redevelopment of brownfield sites should be pursued.

Over half of the participating local governments were able to identify 10 or fewer brownfield sites within their sphere of influence. Exact numbers and locations of all brownfield sites within the State of California are not known, but with an estimated 90,000 sites in the state, it is likely that local governments having at least one brownfield site may have several more that they are unaware of. It is possible that individual respondents may be conflating brownfield sites with Superfund sites, which is only a small portion of all brownfield sites throughout the nation. The U.S. EPA has defined brownfields as sites having contaminants as well as sites that are simply perceived to have contaminants (U.S. Environmental Protection Agency, 2008). The inclusion of perception is important because it expands the definition of brownfields to include sites

that have not been formally assessed for contamination. It is likely that there are more brownfield sites located within the participating local government's sphere of influence than actually known or documented. Estimates ranging from 500,000 to 1,000,000 brownfield sites across the nation (Simons, 1999, Wedding & Crawford-Brown, 2007) support the notion of there being more contaminated lands than most local governments are aware of.

Many brownfield sites remain dormant without any attention until the land owner has made the decision to either sell or redevelop. Some local governments are proactive in approaching private developers or land owners to initiate the redevelopment of these underutilized lands and results from this study show that they will typically have a higher rate of redevelopment. A higher rate of redevelopment will yield more tax revenue for the local government in addition to environmental justice for the contaminated land and in many cases, a social justice for the underutilized property. Local governments that approach private developers or land owners for the redevelopment of brownfield sites typically offer some form of incentive to offset the challenges associated with contaminated lands (Alberini et al., 2005, Swartz & Vieweg, 2000). This research has investigated how those incentive packages, along with other contextual variables, influences the rate of brownfield redevelopment.

The median rate of redevelopment for the participating local governments in this research effort was 9.80%, which is lower than expected when reviewing available literature that supports a growing trend of brownfield redevelopment. The median rate implies that the process of brownfield redevelopment is relatively new for the participating local governments and that more experienced local governments should be

included with future research to report more accurate results. Thirty-eight percent of the participating local governments had a rate of redevelopment equal to zero, and in three of these cases, there were no identified brownfield sites at all. This condition contributes to the weakness in findings from this research effort, but it also suggests that local governments are interested in learning how to increase their rate of brownfield redevelopment.

Demographic variables may contribute to the rate of brownfield redevelopment within a local government's sphere of influence. Local governments with populations of less than 50,000 do not have the same level of resources available as urban local governments with lager populations. Resources include available tax revenue and staff members that can dedicate time to the complex brownfield redevelopment process. Results from this study indicate that rural local governments may have a strong vested interest in redevelopment of brownfield sites located within their sphere of influence. This could be for several reasons including, but not limited to, high needs for tax revenue from underutilized lands, strong community input, or less available land area, resulting in a greater need for infill redevelopment.

Each brownfield site has unique set of characteristics and opportunities for redevelopment. Development potential for each brownfield site is independent and may be one of the greatest contributing influences in the decision to invest by private developers or land owners. It is reasonable to assume that not all brownfield sites are prime redevelopment opportunities, which explains, in part, the low number of brownfield sites that were reported by participating local governments.

Incentives

Incentives are a key element of the brownfield redevelopment process. Research has shown that private developers and land owners require incentives to offset remediation costs associated with contaminated lands (Alberini et al., 2005, DeSousa, 2005). This research effort has focused on five common types of incentives offered by local governments to promote the redevelopment of brownfields and how those incentives influence the rate of redevelopment. Results from this study do not show any statistically significant correlations between the different types of incentives and the rate of redevelopment; however, these results may be misleading because of the small sample size. The total number of respondents with any rate of redevelopment above zero offered almost twice as many incentives as those respondents who did not have any redevelopment within their sphere of influence. This broadly shows a positive relationship between incentives and the occurrence of brownfield redevelopment and could be statistically significant if the sample size was increased. Local governments considering an offer of incentives to private developers or land owners for the redevelopment of brownfield sites should expect to see a positive return on their own investment.

Incentives are often offered as part of a package that may include more than just one type. This focus of this study has not been the grouping of different incentive types or the influence that each type has on the other; however, results have some patterns worth noting. Over half of the respondents indicated that they would be more likely to offer incentives to private developers or land owners if there is a presence of state or federal government assistance. Less than half of the respondents had even pursued state

or federal government assistance, which can explain the weak correlation between incentive packages and rate of redevelopment found in this study. Results of this study support the idea that local governments are less likely to become involved with brownfield redevelopment unless there is some form of state or federal assistance to supplement their efforts.

The most common type of incentive offered by participating local governments in this study was direct funding assistance. Preference in offering direct funding assistance shows a bias towards economic priorities or goals that local governments may wish to achieve through brownfield redevelopment. Several of the respondents commented on how the redevelopment of brownfield sites within their sphere of influence was directly linked to tax increment financing from that project. This demonstrates an economic expectation that participating local governments have when offering direct funding assistance. The cost of offering direct funding assistance is outweighed by the potential benefit recognized through a redeveloped brownfield site. There is no guarantee of financial gain from any development project, but local governments should give strong consideration to offering direct funding assistance with an expectation of benefits.

There is insufficient evidence to reject the hypothesis that different types of incentives positively affect the rate of redevelopment. Despite statistical correlations that show no significant relationships, the small sample size and other noted trends indicate that local governments offering incentives to private developers or land owners for the redevelopment of brownfield sites within their sphere of influence will see a higher rate of redevelopment. Data that was gathered shows that local governments are willing to offer incentive packages even when the resulting rate of redevelopment is zero. This

demonstrates a high level of interest by local governments in redevelopment of underutilized lands that could bring economic, environmental, and social benefits to all stakeholders. The relative inexperience of participating local governments in this study may also suggest that more experience will lead to refinement of incentive packages that are more effective in increasing the rate of redevelopment. Contextual variables that may differ between local governments can also have a significant effect on the rate of redevelopment.

Future Research

Future research of brownfield redevelopment should continue to focus on how incentives influence the rate of redevelopment. A longitudinal study to investigate changes in rate of redevelopment influenced by incentives may be possible if the same respondents are willing to participate in the future. Other types of incentives may be included with future investigation in addition to patterns of incentive packages that local governments offer to private developers or land owners. Specific attention should be directed to correlations between incentives that are offered and the rate of redevelopment for the participating local government.

Researchers interested in furthering this study should attempt to increase the sample size from the State of California or concentrate on a targeted geographic area. Local governments could be expanded to include county and other municipal agencies that may have experience with brownfield redevelopment. This research effort may also be duplicated in a similar manner to geographic areas outside the State of California. Inferences from this study are useful to any level of local government interested or experienced with brownfield redevelopment. Aggregated response choices should be

grouped by smaller and more consistent increments to avoid duplicate rankings with a larger sample size. Case studies showing the effectiveness of incentives on the rate of brownfield redevelopment should be developed and included in any future research.

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Appendix A: Survey

SURVEY BRAINSTORM

- Name of municipal agency (and department housed in – might make a difference if you are in an environment/health versus economic development)
- Solely responsible for brownfield redevelopment issues within municipal/geographical area (if not, can you provide the name of the other individuals responsible and describe what they are responsible for)
- Average fiscal year operating budget over last five years
- Are you aware of state and federal assistance programs for the redevelopment of brownfields (separate state and federal)
- Estimated brownfield sites within sphere of influence (site # or/and acreage)
- How many brownfield sites have been redeveloped over the last five years (how many sites have received certification of completion? How many sites have been redeveloped?)
- Level of community involvement with in the redevelopment of brownfield sites (by redevelopment type?)
- Required disclosure to the public of any incentives that are offered to private companies
- When did your agency start offering incentives to private developers for the redevelopment of brownfield sites? / When was the first incentive offered?
- Does your agency believe that offering incentives is beneficial to the community?
- Have you increased or decreased the amount of incentives offered over the last five years? (or changed the relative percentage of type?)
- Have private developers or land owners specifically asked for incentives or stated that they will not redevelop without an incentive?
- Have you offered any unsolicited incentives to land owners of brownfield sites? / Have they been redeveloped as a result?
- Does your municipality have any environmental polices different that those of the state or federal government that require the cleanup of brownfield sites?

<u>Incentives</u>

- Have you offered any incentives with the brownfield sites that have been redeveloped within the last five years
- Have you offered streamlined plan review process as an incentive
- Have you offered risk based cleanup standards as an incentive
- Have you offered any relief or indemnification of future site cleanup as an incentive
- Have you offered any tax breaks to property owners or development companies as an incentive
- Have you offered any direct funding assistance towards remediation or any other part of development as an incentive. Money may be from any funding source.

BROWNFIELD REDEVELOPMENT SURVEY

DEMOGRAPHICS & BASELINE BROWNFIELD INFORMATION

1) Name of the city/county/other participating in the survey.

_____

2) Department within municipality that is responsible for completing this survey.

_____

3) Contact information of person responsible for completing this survey.

_____
_____
_____

4) Is your department solely responsible for the redevelopment of brownfield sites and related issues within your municipal/geographic area?

Yes No

a. If not, will you please provide contact information for other individuals or departments who may be responsible for issues relating to the redevelopment of brownfields?

_____
_____
_____

b. Does your department typically take the lead role in the redevelopment of brownfields?

Yes No

c. What other departments have participated with issues relating to the redevelopment of brownfield sites within your municipal or geographic areas?

Planning
Economic Development
Housing
Other (Please describe)

5) Please indicate your departments' average fiscal year operating budget over the last five years.

_____
_____

6) To the best of your knowledge, how many brownfield sites exist within your muni1cipality's sphere of influence.

0
1 - 10
11 - 20
21 - 50
51 or more

7) To the best of your knowledge, how much acreage within your sphere of influence would be considered a brownfield site?

_____
_____

8) How many brownfield sites have been redeveloped within your sphere of influence over the last five years?

0
1
2
3
4
5 or more

a. How many redeveloped brownfield sites have received a certification of completion over the last five years?

0
1
2
3
4
5 or more

INCENTIVE PACKAGES

The following questions are targeting incentives that are offered by your municipality to private developers and/or land owners for the purposes of brownfield site redevelopment. **The only incentives pertaining to this section of the survey are those that your municipality offers above and beyond those of the state or federal government.**

9) Of the brownfield sites that have been redeveloped over the last five years within your sphere of influence (identified in question #8a above), how many have had locally provided incentive packages as part of the redevelopment process?

All
None
Other Amount (please specify)

10) Is your municipality more or less likely to offer additional incentive packages to private developers and/or land owners for the redevelopment of brownfield sites if the State of California or the Federal government has contributed incentives

Will only offer incentive packages if State or Federal incentives are offered
More Likely
Less Likely
Makes no difference
Other (please explain)

11) Has your municipality increased or decreased the amount of incentive packages offered to private developers or land owners over the last five years?

Increased Decreased

a. Why?
_____
_____
_____
_____
_____

12) Has your municipality offered any type of fast-tracked or streamlined application review process as an incentive?

Yes No

a. Is this type of incentive used as the primary incentive in packages that are offered with the redevelopment of brownfield sites?

Yes No N/A

b. Is this type of incentive your municipality's preference over other incentives offered with the redevelopment of brownfield sites?

Yes No N/A

c. Is this offered as a part of every incentive package tied to the redevelopment of brownfield sites?

Yes No N/A

d. What percentage of incentive packages that are offered to private developers or land owners include this type of incentive?

25%
50%
75%
100%
Other Percentage (please provide) _____

13) Has your municipality offered any type of risk based cleanup standards as an incentive?

Yes No

a. Is this type of incentive used as the primary incentive in packages that are offered with the redevelopment of brownfield sites?

Yes No N/A

b. Is this type of incentive your municipality's preference over other incentives offered with the redevelopment of brownfield sites?

Yes No N/A

c. Is this offered as a part of every incentive package tied to the redevelopment of brownfield sites?

Yes No N/A

d. What percentage of incentive packages that are offered to private developers or land owners include this type of incentive?

25%
50%
75%
100%
Other Percentage (please provide) _____

14) Has your municipality offered any type of relief or indemnification of future site cleanup as an incentive?

Yes No

a. Is this type of incentive used as the primary incentive in packages that are offered with the redevelopment of brownfield sites?

Yes No N/A

b. Is this type of incentive your municipality's preference over other incentives offered with the redevelopment of brownfield sites?

Yes No N/A

c. Is this offered as a part of every incentive package tied to the redevelopment of brownfield sites?

Yes No N/A

d. What percentage of incentive packages that are offered to private developers or land owners include this type of incentive?

25%
50%
75%
100%
Other Percentage (please provide) _____

15) Has your municipality offered any type of tax breaks to private developers or land owners as an incentive?

Yes No

a. Is this type of incentive used as the primary incentive in packages that are offered with the redevelopment of brownfield sites?

Yes No N/A

b. Is this type of incentive your municipality's preference over other incentives offered with the redevelopment of brownfield sites?

Yes No N/A

c. Is this offered as a part of every incentive package tied to the redevelopment of brownfield sites?

Yes No N/A

d. What percentage of incentive packages that are offered to private developers or land owners include this type of incentive?

25%
50%
75%
100%
Other Percentage (please provide) _____

16) Has your municipality offered any type of direct funding assistance towards remediation or any other part of development as an incentive? (Money may come from any funding source.)

Yes No

a. Is this type of incentive used as the primary incentive in packages that are offered with the redevelopment of brownfield sites?

Yes No N/A

b. Is this type of incentive your municipality's preference over other incentives offered with the redevelopment of brownfield sites?

Yes No N/A

c. Is this offered as a part of every incentive package tied to the redevelopment of brownfield sites?

Yes No N/A

d. What percentage of incentive packages that are offered to private developers or land owners include this type of incentive?

25%
50%
75%
100%
Other Percentage (please provide) _____

17) Please describe how your municipality decides on what types of incentive packages or the amount of incentives that are offered to private developers or land owners for the redevelopment of brownfield sites?

Discretionary action by municipality
Direct community input
Feedback from private developer or land owner
Other (please describe)

Please use the space below to outline and/or describe the decision making process:
_____
_____
_____
_____
_____

18) Do the incentive packages that are offered to private developers or land owners change from site to site?

Yes No

a. Is there any framework within your municipality that dictates the type and/or amount of incentive offered in relation to characteristics of the brownfield site?

Yes No

Please describe:
_____
_____
_____
_____
_____

PARTICIPATION IN BROWNFIELD REDEVELOPMENT

19) Are you aware of brownfield redevelopment assistance programs that are available from the State of California?

Yes No

a. Has your municipality applied for or received any assistance money from the State of California to redevelop any brownfield site within your geographic area?

Yes No

b. What approximate percentage of brownfield sites has your municipality received funding for from the State of California?

Less than 25%
25%
50%
75%
100%

c. If any state monies have been received and applied to the redevelopment of brownfield sites, what is the approximate percentage of total project costs received per site?

Less than 5%
5% to 10%
11% to 25%
26% or more

20) Are you aware of brownfield redevelopment assistance programs that are available from the federal government?

Yes No

a. Has your municipality applied for or received any assistance money from the federal government to redevelop any brownfield site within your geographic area?

Yes No

b. What approximate percentage of brownfield sites has your municipality received funding for from the federal government?

Less than 25%
25%
50%
75%
100%

c. If any federal monies have been received and applied to the redevelopment of brownfield sites, what is the approximate percentage of total project costs received per site?

Less than 5%
5% to 10%
11% to 25%
26% or more

21) Has your municipality ever taken the initiative to offer any type of unsolicited incentive to a private developer or land owner to foster the redevelopment of a brownfield site within your sphere of influence?

Yes No

a. When was the first incentive offered to a private developer or land owner for the redevelopment of a brownfield site? (approximate month and year)

_____
_____

22) To the best of your knowledge, how many private development companies within your sphere of influence have worked with the redevelopment of brownfield sites?

None
1 – 5
6 – 10
11 – 20
21 or more

23) Has any private developer or land owner approached your municipality seeking an incentive package for the redevelopment of a brownfield site?

Yes No

a. As a result, were any incentives offered to the private developer or land owner for the redevelopment of a brownfield site?

Yes No

i. Please describe any related circumstances
_____
_____
_____

b. Have any private developers or land owners insisted that your municipality offer them an incentive package for the redevelopment of a brownfield site and/or stated that they would not develop without one?

Yes No

i. Please describe any related circumstances

_____
_____
_____

24) Has your municipality approached any private developers or land owner with an unsolicited offer of incentives to redevelop a brownfield site?

Yes No

a. If so, has the private developer or land owner engaged in the redevelopment of that brownfield site due to the incentive package that was offered?

Yes No

25) Does your municipality believe that there are community benefits from the offering of incentive packages to private developers or land owners for the redevelopment of brownfield sites?

Not at all
Rarely, only in special circumstances
Sometimes
All the time
Case by case basis

Please describe two (2) potential benefits that your municipality would consider desirable to the community.

1) _____

2) _____

26) Is there any level of public disclosure that is required for incentive packages that are offered to private developers or land owners for the redevelopment of brownfield sites?

Yes No

If yes, please describe:

_____
_____
_____
_____

27) Does your municipality seek community participation with the redevelopment of brownfield sites?

Yes No

a. If so, what level of community participation is *required*?

Public notices
Public hearings
Required public input
Other (please describe)
_____
_____
_____

b. If so, what level of community participation is *preferred*?

Public notices
Public hearings
Required public input
Other (please describe)
_____
_____
_____

c. Does the type of redevelopment dictate the level of community participation?

Yes No

If yes, how so:
_____
_____
_____
_____

28) Does your municipality have any environmental policies different to those of the state or federal government that requires the cleanup of brownfield sites?

Yes No

Please describe:
_____
_____

29) Please describe any best practices that your municipality has incorporated into handling issues related to the redevelopment of brownfield sites?

_____
_____
_____
_____
_____
_____
_____
_____
_____

30) Please provide one or two examples of lessons learned from a past project where a brownfield site was (or was not) redeveloped based on an incentive package offered to the private developer or land owner.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

31) Would you be willing to participate in an interview regarding the redevelopment of brownfield sites within your sphere of influence?

Yes No

Appendix B: Invitation to Participants

INVITATION TO PARTICIPANTS

To All Local Governments in California,

I am a graduate student in City and Regional Planning at California Polytechnic State University in San Luis Obispo working on a master's thesis in brownfield redevelopment. The following survey has been created to aid in my research of incentive packages influencing the redevelopment of brownfield sites. Your participation will contribute to an increased understanding of factors that influence brownfield redevelopment throughout the State of California. Findings and implications from this research effort will be available for your use by the third quarter of 2009.

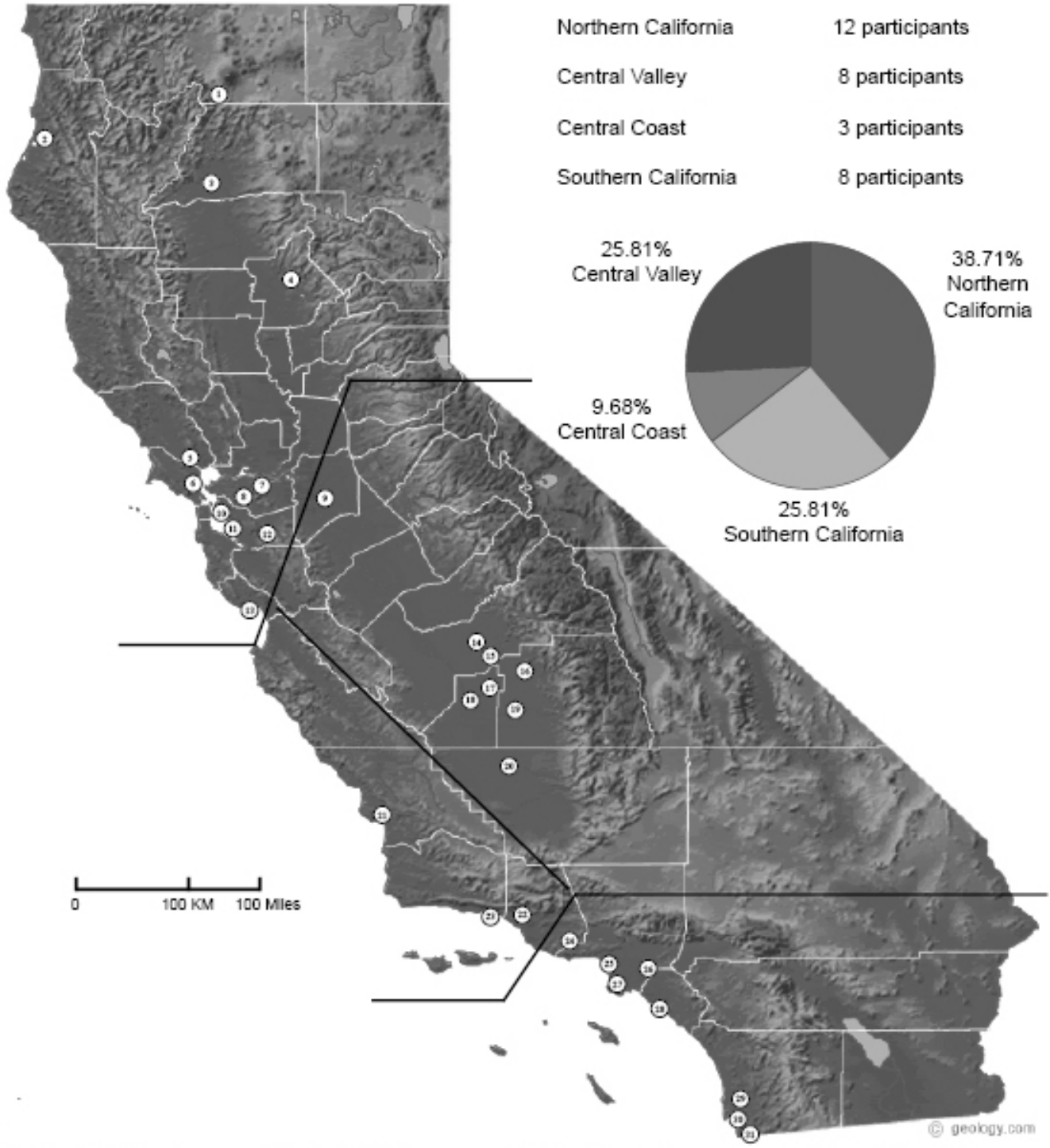
It is important that your local government entity contributes to this research effort regardless of your redevelopment experience with brownfields. A greater range of responses will provide more detailed and accurate information. All participating local governments will potentially benefit from statewide research that may aid in future brownfield redevelopment projects. The survey should take approximately 30 minutes to complete. Please follow the link below to participate in this survey on line. Survey responses need to be collected by April 3, 2009.

If you have any questions or further comments, please feel free to contact me. Thank you for your time and participation.

Erik Simon
ebsimon@calpoly.edu

If you are not the person who is or would be responsible for decisions surrounding incentives for brownfield redevelopment, please forward this request to the appropriate person if possible. Thank you.

Appendix C: Map of California Participants



① City of Mt. Shasta
② City of Eureka
③ City of Redding
④ Town of Paradise
⑤ City of Rohnert Park
⑥ City of Novato
⑦ City of Pittsburg
⑧ Pleasant Hill
⑨ City of Stockton
⑩ City of Albany
⑪ City of Emeryville
⑫ City of Livermore
⑬ City of Santa Cruz
⑭ City of Sanger
⑮ City of Selma
⑯ City of Dinuba
⑰ City of Hanford
⑱ City of Lemoore
⑲ City of Tulare
⑳ City of Delano
㉑ City of San Luis Obispo
㉒ City of Ojai
㉓ City of Santa Barbara
㉔ City of Thousand Oaks
㉕ City of Culver City
㉖ City of Santa Fe Springs
㉗ City of Gardena
㉘ City of Huntington Beach
㉙ City of Poway
㉚ City of National City
㉛ City of Chula Vista

Appendix D: Database

		What other departments within your municipality or geographic area have participated with issues directly related to the redevelopment of brownfield sites? (check all that apply)				To the best of your knowledge, how many brownfield sites exist within your municipality's sphere of influence?
	Local Government	Planning	Economic Development	Housing	Other (please describe)	
1	City of Tulare	Planning	Economic Development	Housing	Fire Department	11 to 20
2	City of Santa Barbara	Planning				1 to 10
3	City of Redding				Resource Management Department,	11 to 20
4	City of Sanger		Economic Development		redevelopment	1 to 10
5	City of San Luis Obispo	Planning	Economic Development			1 to 10
6	City of National City	Planning			Engineering	21 to 50
7	City of Pittsburg				Planning assisted the Agency with a few	11 to 20
8	City of Lemoore	-6700	Economic Development	Housing		1 to 10
9	City of Delano		Economic Development	Housing	City Engineer Public Works Director	1 to 10
10	City of Rohnert Park				brownfields within our jurisdiction.	None
11	City of Santa Cruz	Planning	Economic Development		Environmental Health Department	21 to 50
12	City of Poway	Planning	Economic Development	Housing		21 to 50
13	City of Livermore	Planning	Economic Development	Housing	development department consists of	21 to 50
14	Chula Vista/San Diego	Planning	Economic Development	Housing		51 or more
15	City of Gardena	Planning	Economic Development	Housing		51 or more
16	Town of Paradise	Planning	Economic Development	Housing		1 to 10
17	City of Emeryville				dev't are in the same dept. We take the lead	51 or more
18	City of Pleasant Hill	Planning	Economic Development		Public Works	1 to 10
19	City of Albany					1 to 10
20	City of Hanford	Planning			public works	1 to 10
21	City of Huntington Beach		Economic Development			1 to 10
22	City of Stockton	Planning	Economic Development	Housing	infrastructure and stormwater issues.	21 to 50
23	City of Santa Fe Springs	Planning		Housing	CUPA	51 or more
24	City of Novato				would participate, however, we don't	None
25	Culver City		Economic Development			1 to 10
26	City of Ojai	Planning	Economic Development		City Engineer	1 to 10
27	City of Selma	Planning				None
28	Thousand Oaks	Planning			Department as a condition of	1 to 10
29	City of Dinuba	Planning		Housing	Works and Development Services)	1 to 10
30	City of Mt. Shasta	Planning				1 to 10
31	City of Eureka	Planning	Economic Development			1 to 10

	Local Government	To the best of your knowledge, how much acreage within your municipality's sphere of influence would be considered brownfields?	To the best of your knowledge, how many brownfield sites have been redeveloped within your sphere of influence over the last five years?	Of the brownfield sites that have been redeveloped over the last five years within your sphere of influence (identified in question #10 from previous page), how many had locally provided incentive packages as part of the redevelopment process?	Other Amount (please specify)	Is your municipality more or less likely to offer additional incentive packages to private developers and/or land owners for the redevelopment of brownfield sites if the State of California of the Federal Government has contributed incentives?
1	City of Tulare	would estimate 100 acre	2	None		More Likely
2	City of Santa Barbara	15 acres	None	None		More Likely
3	City of Redding		None			
4	City of Sanger	unknown	None	None		Makes no difference
5	City of San Luis Obispo	300	None	None		More Likely
6	City of National City		3	75%		Makes no difference
7	City of Pittsburg	d be more that we will n	4	Other	Less than 25%. The ince	Makes no difference
8	City of Lemoore	25	3	25%		More Likely
9	City of Delano	35	None			More Likely
10	City of Rohnert Park	0	None	None		Makes no difference
11	City of Santa Cruz	Don't know	4	50%		Makes no difference
12	City of Poway		5 or more	None		More Likely
13	City of Livermore	10	2	Other	assisted in clean up thr	More Likely
14	Chula Vista/San Diego	2000	5 or more	All		Makes no difference
15	City of Gardena	100 acres plus	5 or more	None		More Likely
16	Town of Paradise	10	None	None		More Likely
17	City of Emeryville	200	5 or more	All		Makes no difference
18	City of Pleasant Hill	>10 acres	1	All		More Likely
19	City of Albany	5	1	None	Will only offer incentives if State or Federal in	
20	City of Hanford	over 50??????	None	None		Makes no difference
21	City of Huntington Beach	50	1	None		Makes no difference
22	City of Stockton	150	5 or more	All		More Likely
23	City of Santa Fe Springs	250	5 or more	Other	The CDC provides techı	Makes no difference
24	City of Novato	0	None	None	not applicable as we do	Makes no difference
25	Culver City	4 Acres	2	None		More Likely
26	City of Ojai	10?	None	None	N/A	More Likely
27	City of Selma	0	None	None		
28	Thousand Oaks	mer gas stations parcel.	1	None		Makes no difference
29	City of Dinuba	About 3.5 acres	2	50%		More Likely
30	City of Mt. Shasta	70	None	None		More Likely
31	City of Eureka	70 acres	1	None		More Likely

	Local Government	Has your municipality increased or decreased the amount of incentive packages offered to private developers and/or land owners over the last five years?	Based on your response to the previous question #13, why has your municipality increased or decreased the amount of incentive packages that are offered to private developers and/or land owners over the last five years?	Please use the space below to describe the key factors that are taken into account when creating incentive packages for the redevelopment of brownfield sites.	Is there any framework within your municipality, based on characteristics of a brownfield site, that dictates the type and/or amount of incentive that is offered?	Please describe
1	City of Tulare	Increased	Offered incentives to ma	We do all of the cleanup	No	
2	City of Santa Barbara	Stayed the same	Santa Barbara wants to k	Public or Private use, le	No	
3	City of Redding	Stayed the same			No	
4	City of Sanger	Stayed the same			No	
5	City of San Luis Obispo	Stayed the same	NA	City has little to offer as	No	
6	City of National City	Stayed the same	"Incentive" is perhaps n	Same as 14 above.	Yes	Each project is individu
7	City of Pittsburg	Stayed the same	We don't offer incentive	It really depends on the	No	
8	City of Lemoore	Stayed the same		community economic b	No	
9	City of Delano	Increased	In order to stimulate the	Return on the investmer	No	
10	City of Rohnert Park	Stayed the same			No	
11	City of Santa Cruz	Stayed the same	NA	Proposed use of site; im	Yes	We have an EPA Brownf
12	City of Poway	Stayed the same	NA	Federal Grants or within	No	
13	City of Livermore	Decreased	Lack of local funds avail	Cost, level of clean up,	Yes	Level of contamination,
14	Chula Vista/San Diego	Stayed the same		Return on investment, p	No	Case by case
15	City of Gardena	Stayed the same			No	
16	Town of Paradise	Stayed the same			Yes	The location of the site i
17	City of Emeryville	Increased	No incentive, no project	Project needs gap finan	Yes	Need based regardless
18	City of Pleasant Hill	Stayed the same		First priority is to devel	Yes	Amount of incentive for
19	City of Albany	Stayed the same	no packages offered	Albany is a small city, p	No	
20	City of Hanford	Decreased	prevailing wage trigger	we have not done any	No	
21	City of Huntington Beach	Stayed the same	No incentives provided/	NA	No	
22	City of Stockton	Stayed the same		type of development an	No	
23	City of Santa Fe Springs	Stayed the same	The CDC has worked w	The way State redevelop	No	SFS CDC has been invol
24	City of Novato	Stayed the same	BA	NA	No	
25	Culver City	Stayed the same		Matching funds require	No	
26	City of Ojai	Stayed the same	n/a	Credible developer wit	No	
27	City of Selma	Stayed the same	n/a	We have not offered inc	No	
28	Thousand Oaks	Stayed the same	City or Agecny has not	If site would not be rede	No	If site could not be deve
29	City of Dinuba	Decreased	Over the years the State	Additional property tax	Yes	RDA has adopted an inv
30	City of Mt. Shasta	Stayed the same			No	
31	City of Eureka	Decreased	State Prevailing Wage R	Development potential,	No	

	Local Government	Incentive #1					
		Has your municipality offered any type of fast-tracked or streamlined application review process as an incentive for brownfield redevelopment?	Is fast-tracked or streamlined application review process used as the primary incentive in packages that are offered with the redevelopment of brownfield sites?	Is a fast-tracked or streamlined application review process your municipality's preference over other incentives offered with the redevelopment of brownfield sites?	Is fast-tracked or streamlined application review process offered as a part of every incentive package tied to the redevelopment of brownfield sites?	What approximate percentage of incentive packages that are offered to private developers or land owners include a fast-tracked or streamlined application review process?	Other percentage amount
1	City of Tulare	No					
2	City of Santa Barbara	No					
3	City of Redding	No					
4	City of Sanger	Yes	No	No	No	Other (please specify)	none
5	City of San Luis Obispo	Yes	Yes	Yes	No	25%	
6	City of National City	No					
7	City of Pittsburg	No					
8	City of Lemoore	No					
9	City of Delano	No					
10	City of Rohnert Park	No					
11	City of Santa Cruz	No					
12	City of Poway	No					
13	City of Livermore	No					
14	Chula Vista/San Diego	No					
15	City of Gardena	Yes	It is the only type of ince	No	No	25%	
16	Town of Paradise	No					
17	City of Emeryville	Yes	No	No	No	75%	
18	City of Pleasant Hill	No					
19	City of Albany	No					
20	City of Hanford	No					
21	City of Huntington Beach	No					
22	City of Stockton	Yes	No	No	No	50%	
23	City of Santa Fe Springs	Yes	Yes	Yes	Yes	100%	
24	City of Novato	No					
25	Culver City	No					
26	City of Ojai	No					
27	City of Selma	No					
28	Thousand Oaks	No					
29	City of Dinuba	Yes	No	No	Yes	100%	
30	City of Mt. Shasta	Yes	It is the only type of incentive offered			50%	
31	City of Eureka	No					

		Incentive #2					
	Local Government	Has your municipality offered any type of risk based clean up standards as an incentive for the redevelopment of brownfield sites?	Are risk based cleanup standards used as the primary incentive in packages that are offered with the redevelopment of brownfield sites?	Are risk based cleanup standards your municipality's preference over other incentives offered with the redevelopment of brownfield sites?	Are risk based cleanup standards offered as part of every incentive package tied to the redevelopment of brownfield sites?	What approximate percentage of incentive packages that are offered to private developers or land owners include risk based cleanup standards?	Other percentage amount
1	City of Tulare	No					
2	City of Santa Barbara	No					
3	City of Redding	No					
4	City of Sanger	No					
5	City of San Luis Obispo	Yes	No	No	No	75%	
6	City of National City	Yes	No	Yes	Yes	Other (please specify)	All projects except hous
7	City of Pittsburg	No					
8	City of Lemoore	No					
9	City of Delano	No					
10	City of Rohnert Park	No					
11	City of Santa Cruz	Yes	No	No	No	75%	
12	City of Poway	No					
13	City of Livermore	No					
14	Chula Vista/San Diego	Yes	No	No	Yes	75%	
15	City of Gardena	No					
16	Town of Paradise	No					
17	City of Emeryville	Yes	No	No	Yes	100%	
18	City of Pleasant Hill	No					
19	City of Albany	No					
20	City of Hanford	No				Other (please specify)	what is risk based clean
21	City of Huntington Beach	No					
22	City of Stockton	Yes	No	No	No	25%	
23	City of Santa Fe Springs	No					
24	City of Novato	No					
25	Culver City	No					
26	City of Ojai	No					
27	City of Selma	No					
28	Thousand Oaks	No					
29	City of Dinuba	No					
30	City of Mt. Shasta	No					
31	City of Eureka	No					

	Local Government	Incentive #3					
		Has your municipality offered any type of relief or indemnification of future site cleanup as an incentive to redevelop brownfield sites?	Is relief or indemnification of future site cleanup used as the primary incentive in packages that are offered with the redevelopment of brownfield sites?	Is relief or indemnification of future site cleanup your municipality's preference over other incentives offered with the redevelopment of brownfield sites?	Is relief or indemnification of future site cleanup offered as a part of every incentive package tied to the redevelopment of brownfield sites?	What approximate percentage of incentive packages that are offered to private developers or land owners include relief or indemnification of future site cleanup?	Other percentage amount
1	City of Tulare	Yes	Yes	No	No	75%	
2	City of Santa Barbara	No					
3	City of Redding	No					
4	City of Sanger	No					
5	City of San Luis Obispo	No					
6	City of National City	Yes	Yes	No	No	Other (please specify)	As often as appropriate.
7	City of Pittsburg	No					
8	City of Lemoore	No					
9	City of Delano	No					
10	City of Rohnert Park	No					
11	City of Santa Cruz	Yes	No	No	No	25%	
12	City of Poway	No	It is the only type of incentive offered				
13	City of Livermore	No					
14	Chula Vista/San Diego	Yes	Yes	No	No	50%	
15	City of Gardena	No					
16	Town of Paradise	No					
17	City of Emeryville	Yes	No	No	No	25%	
18	City of Pleasant Hill	No					
19	City of Albany	No					
20	City of Hanford	No					
21	City of Huntington Beach	No					
22	City of Stockton	Yes	Yes	No	Yes	Other (please specify)	100% Some Polanco Ac
23	City of Santa Fe Springs	Yes	N/A	N/A	No	25%	
24	City of Novato	No					
25	Culver City	Yes	Yes	Yes	No	75%	
26	City of Ojai	No					
27	City of Selma	No					
28	Thousand Oaks	No	No	No	No	Other (please specify)	none
29	City of Dinuba	No					
30	City of Mt. Shasta	No					
31	City of Eureka	No					

		Incentive #4					
	Local Government	Has your municipality offered any type of tax breaks to private developers or land owners as an incentive for redevelopment of brownfield sites?	Are any type of tax breaks used as the primary incentive in packages that are offered with the redevelopment of brownfield sites?	Are tax breaks your municipality's preference over other incentives offered with the redevelopment of brownfield sites?	Are tax break incentives offered as a part of every incentive package tied to the redevelopment of brownfield sites?	What approximate percentage of incentive packages that are offered to private developers or land owners include tax breaks of any type?	Other percentage amount
1	City of Tulare	No					
2	City of Santa Barbara	No					
3	City of Redding	No					
4	City of Sanger	No					
5	City of San Luis Obispo	No					
6	City of National City	No					
7	City of Pittsburg	No					
8	City of Lemoore	No					
9	City of Delano	Yes	No	No	Yes	50%	
10	City of Rohnert Park	No					
11	City of Santa Cruz	No					
12	City of Poway	No					
13	City of Livermore	No					
14	Chula Vista/San Diego	No					
15	City of Gardena	No					
16	Town of Paradise	No					
17	City of Emeryville	Yes	No	No	No	25%	
18	City of Pleasant Hill	No					
19	City of Albany	No					
20	City of Hanford	No					
21	City of Huntington Beach	No					
22	City of Stockton	No					
23	City of Santa Fe Springs	Yes - See "Other"	N/A	N/A	No	Other (please specify)	In the past the CDC cou
24	City of Novato	No					
25	Culver City	No					
26	City of Ojai	No					
27	City of Selma	No					
28	Thousand Oaks	No	No	No	No	Other (please specify)	none
29	City of Dinuba	No					
30	City of Mt. Shasta	No					
31	City of Eureka	No					

		Incentive #5					
	Local Government	Has your municipality offered any type of direct funding assistance towards remediation or any other part of development as an incentive? (Money may come from any funding source).	Is any type of direct funding assistance towards remediation or any other part of development used as the primary incentive in packages that are offered with the redevelopment of brownfield sites?	Is any type of direct funding assistance towards remediation or any other part of development your municipality's preference over other incentives offered with the redevelopment of brownfield sites?	Is direct funding assistance towards remediation or any other part of development offered as a part of every incentive package tied to the redevelopment of brownfield sites?	What percentage of incentive packages that are offered to private developers or land owners include any type of direct funding assistance towards remediation or any other part of development?	Other percentage amount
1	City of Tulare	Yes	Yes	No	Yes	75%	
2	City of Santa Barbara	No					
3	City of Redding	No					
4	City of Sanger	No					
5	City of San Luis Obispo	No					
6	City of National City	Yes	Yes	No	No	50%	
7	City of Pittsburg	Yes	N/A	N/A	No	Other (please specify)	At least 75%. Many of tl
8	City of Lemoore	Yes	It is the only type of ince	Yes	No	25%	
9	City of Delano	Yes	No	No	No	50%	
10	City of Rohnert Park	No					
11	City of Santa Cruz	Yes	Yes	No	No	Other (please specify)	5-10%
12	City of Poway	No					
13	City of Livermore	Yes	Yes	N/A	No	50%	
14	Chula Vista/San Diego	Yes	No	No	No	25%	
15	City of Gardena	No					
16	Town of Paradise	No					
17	City of Emeryville	Yes	No	No	Yes	50%	
18	City of Pleasant Hill	No					
19	City of Albany	No					
20	City of Hanford						
21	City of Huntington Beach	No					
22	City of Stockton	Yes	Yes	No	Yes	Other (please specify)	100%
23	City of Santa Fe Springs	Yes	No	N/A	No	Other (please specify)	See above.
24	City of Novato						
25	Culver City	No					
26	City of Ojai	No					
27	City of Selma	No					
28	Thousand Oaks	No	No	No	No	Other (please specify)	none
29	City of Dinuba	Yes	No	No	No	25%	
30	City of Mt. Shasta	Yes	No	No	No		
31	City of Eureka	No					

		State Funding Assistance			Federal Funding Assistance		
	Local Government	Has your municipality applied for and/or received any assistance money from the State of California for the redevelopment of any brownfield site within your sphere of influence?	What approximate percentage of brownfield sites has your municipality received funding for from the State of California?	Other Amount	Has your municipality applied for and/or received any assistance money from the federal government for the redevelopment of any brownfield site within your sphere of influence?	What approximate percentage of brownfield sites has your municipality received funding for from the federal government?	Other Amount
1	City of Tulare	Yes	50%		Yes	50%	
2	City of Santa Barbara	Yes	Other	0%	No	Other	0%
3	City of Redding	Yes	Less than 25%		Yes	Less than 25%	
4	City of Sanger	No			No		
5	City of San Luis Obispo	No	Less than 25%		No	Less than 25%	
6	City of National City	Yes	Other	30-percent	Yes	Other	This funding was just aw
7	City of Pittsburg	No	Other	I can't think of any.	No	Other	I can't think of any.
8	City of Lemoore	Yes	50%		No	Less than 25%	
9	City of Delano	Yes	Less than 25%		Yes	Less than 25%	
10	City of Rohnert Park	No	Other	None - We have no brov	No	Other	None -We have no brow
11	City of Santa Cruz	No	Less than 25%		Yes	Less than 25%	
12	City of Poway	No	Other	I don't know	No	Other	I don't know
13	City of Livermore	Yes	Other	Borwn field grant from t	No	Less than 25%	
14	Chula Vista/San Diego	No			Yes	50%	
15	City of Gardena	No	50%		Yes	25%	
16	Town of Paradise	No	Less than 25%		No	Less than 25%	
17	City of Emeryville	Yes	Less than 25%		Yes	25%	
18	City of Pleasant Hill	No	Less than 25%		No	Less than 25%	
19	City of Albany	No	Less than 25%		No	Less than 25%	
20	City of Hanford	No	Other	0	No	Other	0
21	City of Huntington Beach	No	Less than 25%		Yes	Less than 25%	
22	City of Stockton	No	Less than 25%		Yes	50%	
23	City of Santa Fe Springs	No	Other	Not applicable	Yes	Less than 25%	
24	City of Novato						
25	Culver City	Yes	Less than 25%		Yes	Less than 25%	
26	City of Ojai	No	Less than 25%		No	Less than 25%	
27	City of Selma	No	Less than 25%		No	Less than 25%	
28	Thousand Oaks	No	Other	none, State assistance hi	No	Other	none, Federal assistanc
29	City of Dinuba	Yes	25%		No	Other	0% (none)
30	City of Mt. Shasta	Yes	75%		Yes	75%	
31	City of Eureka	Yes	Less than 25%		Yes	Less than 25%	

	Local Government	Has your municipality ever taken the initiative to approach any private developer or land owner with an offer of incentives for the redevelopment of a brownfield site?	If yes, has the private developer or land owner engaged in the redevelopment of that brownfield site due to the incentive package that was offered?	Has any private developer or land owner approached your municipality seeking an incentive package for the redevelopment of a brownfield site?	If yes, were any incentive packages offered to that private developer or land owner as a result of their actions?	Have any private developers or land owners insisted that your municipality offer them an incentive package for the redevelopment of a brownfield site and/or stated that they would not develop without one?	Please describe any related circumstances
1	City of Tulare	Yes	in progress of negotiatir	No		No	
2	City of Santa Barbara	No		No		No	
3	City of Redding	No		No		No	
4	City of Sanger	No		No		No	
5	City of San Luis Obispo	Yes	No	Yes	Yes - Expedited proces:	Yes	
6	City of National City	Yes	Yes.	Yes	Yes.	Yes	immunity from regulato:
7	City of Pittsburg	No		No		No	
8	City of Lemoore	Yes		Yes		Yes	
9	City of Delano	No		Yes		Yes	
10	City of Rohnert Park	No		No		No	
11	City of Santa Cruz	Yes	No.	Yes	We are currently reviev	No	
12	City of Poway	No		Yes		No	
13	City of Livermore	Yes	yes	No		No	
14	Chula Vista/San Diego	Yes	yes	Yes	yes	Yes	Without our assistance t
15	City of Gardena	No		No		No	
16	Town of Paradise	No		No		No	
17	City of Emeryville	Yes	sometimes	Yes	Funding/tax break, reg	Yes	Where the funding gap
18	City of Pleasant Hill	Yes	yes	Yes	yes	No	
19	City of Albany	No		No		No	
20	City of Hanford						
21	City of Huntington Beach	No		Yes		No	
22	City of Stockton	Yes	Yes	Yes	Yea	Yes	
23	City of Santa Fe Springs	Yes	Yes	Yes	Yes	Yes	That's when the negotiat
24	City of Novato						
25	Culver City	Yes	Yes	No		Yes	Invocation of the Polanc
26	City of Ojai	No		Yes		No	
27	City of Selma	No		No		No	
28	Thousand Oaks	No		No		No	
29	City of Dinuba	Yes	NO. Once they evaluate	No		No	
30	City of Mt. Shasta	No		No		No	
31	City of Eureka	No		Yes	no	No	

	Local Government	Does your municipality have any environmental policies different to those of the state or federal government that requires stricter cleanup standards for brownfield sites?	Please describe	Please describe one or two examples of lessons learned from a past project where a brownfield site was (or was not) redeveloped based on an incentive package offered to the private developer or land owner.	Would you be willing to participate in an interview regarding the redevelopment of brownfield sites within your sphere of influence?
1	City of Tulare	No		In my experience, the s	Yes
2	City of Santa Barbara	No		A site was contaminated	No
3	City of Redding	No			Yes
4	City of Sanger	No			No
5	City of San Luis Obispo	No		Corporate priorities and	No
6	City of National City	No		The perceived value of	Yes
7	City of Pittsburg	No		NA	No
8	City of Lemoore	No			No
9	City of Delano	No		Problem is dealing with	No
10	City of Rohnert Park	No		We have no brownfields	No
11	City of Santa Cruz	No		Our main funding source	Yes
12	City of Poway	No			Yes
13	City of Livermore	No			No
14	Chula Vista/San Diego	No		Begin with the end in m	Yes
15	City of Gardena	No			No
16	Town of Paradise	No			Yes
17	City of Emeryville	No		If the municipal govt (C	Yes
18	City of Pleasant Hill	No			Yes
19	City of Albany	No			Yes
20	City of Hanford	No			No
21	City of Huntington Beach	No			No
22	City of Stockton	No		Redeveloping Brownfie	Yes
23	City of Santa Fe Springs	Yes	Because SFS is part of ar	Each project stands on i	Yes
24	City of Novato				
25	Culver City	No			Yes
26	City of Ojai		The City depends on the	I'm sure the site would c	No
27	City of Selma	No		n/a	No
28	Thousand Oaks	No		none to offer.	No
29	City of Dinuba	No		Developers will not dev	No
30	City of Mt. Shasta	No			No
31	City of Eureka	No		The cost of remediation	Yes

Raw Data					
	Respondent		Mid Range of Brownfield Sites Within SOI	Number of Redeveloped Sites	Percentage of Redeveloped Sites
1	City of Tulare		15	2	13.33%
2	City of Santa Barbara		5	0	0.00%
3	City of Redding		15	0	0.00%
4	City of Sanger		5	0	0.00%
5	City of San Luis Obispo		5	0	0.00%
6	City of National City		35	3	8.57%
7	City of Pittsburg		15	4	26.67%
8	City of Lemoore		5	3	60.00%
9	City of Delano		5	0	0.00%
10	City of Rohnert Park		0	0	0.00%
11	City of Santa Cruz		35	4	11.43%
12	City of Poway		35	5	14.29%
13	City of Livermore		35	2	5.71%
14	Chula Vista/San Diego		51	5	9.80%
15	City of Gardena		51	5	9.80%
16	Town of Paradise		5	0	0.00%
17	City of Emeryville		51	5	9.80%
18	City of Pleasant Hill		5	1	20.00%
19	City of Albany		5	1	20.00%
20	City of Hanford		5	0	0.00%
21	City of Huntington Beach		5	1	20.00%
22	City of Stockton		35	5	14.29%
23	City of Santa Fe Springs		51	5	9.80%
24	City of Novato		0	0	0.00%
25	Culver City		5	2	40.00%
26	City of Ojai		5	0	0.00%
27	City of Selma		0	0	0.00%
28	Thousand Oaks		5	1	20.00%
29	City of Dinuba		5	2	40.00%
30	City of Mt. Shasta		5	0	0.00%
31	City of Eureka		5	1	20.00%
			504	57	
			Mean =	11.31%	

	Ranked Data			
	Respondent		Rate of Redevelopment	Rank
	8	City of Lemoore	60.00%	1
	25	Culver City	40.00%	2
	29	City of Dinuba	40.00%	2
	7	City of Pittsburg	26.67%	4
	18	City of Pleasant Hill	20.00%	5
	19	City of Albany	20.00%	5
	21	City of Huntington Beach	20.00%	5
	28	Thousand Oaks	20.00%	5
	31	City of Eureka	20.00%	5
	12	City of Poway	14.29%	10
	22	City of Stockton	14.29%	10
	1	City of Tulare	13.33%	12
	11	City of Santa Cruz	11.43%	13
	14	Chula Vista/San Diego	9.80%	14
	15	City of Gardena	9.80%	14
	17	City of Emeryville	9.80%	14
	23	City of Santa Fe Springs	9.80%	14
	6	City of National City	8.57%	18
	13	City of Livermore	5.71%	19
	2	City of Santa Barbara	0.00%	20
	3	City of Redding	0.00%	20
	4	City of Sanger	0.00%	20
	5	City of San Luis Obispo	0.00%	20
	9	City of Delano	0.00%	20
	10	City of Rohnert Park	0.00%	20
	16	Town of Paradise	0.00%	20
	20	City of Hanford	0.00%	20
	24	City of Novato	0.00%	20
	26	City of Ojai	0.00%	20
	27	City of Selma	0.00%	20
	30	City of Mt. Shasta	0.00%	20

			Standard Deviation				
			Score (X_i)	Deviations (X_i - X)	Deviations^2		
			60.00%	47.95%	22.99%		
			40.00%	27.95%	7.81%		
			40.00%	27.95%	7.81%		
			26.67%	14.62%	2.14%		
			20.00%	7.95%	0.63%		
			20.00%	7.95%	0.63%		
			20.00%	7.95%	0.63%		
			20.00%	7.95%	0.63%		
			20.00%	7.95%	0.63%		
			14.29%	2.24%	0.05%		
			14.29%	2.24%	0.05%		
			13.33%	1.28%	0.02%		
			11.43%	-0.62%	0.00%		
			9.80%	-2.24%	0.05%		
			9.80%	-2.24%	0.05%		
			9.80%	-2.24%	0.05%		
			9.80%	-2.24%	0.05%		
			8.57%	-3.48%	0.12%		
			5.71%	-6.33%	0.40%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			0.00%	-12.05%	1.45%		
			373.50%	0.00%	62.18%		
		X =	12.05%				
	Variance =		2.07%	N-1 used as the denominator because			
				this is for a random sample			
	Standard Deviation =		14.40%				

Respondent	Rate		Respondent	Population
City of Lemoore	60.00%		City of Stockton	243,771
Culver City	40.00%		City of Huntington Beach	189,594
City of Dinuba	40.00%		Chula Vista/San Diego	173,556
City of Pittsburg	26.67%		Thousand Oaks	117,005
City of Pleasant Hill	20.00%		City of Santa Barbara	92,325
City of Albany	20.00%		City of Redding	80,865
City of Huntington Beach	20.00%		City of Livermore	73,345
Thousand Oaks	20.00%		City of Gardena	57,746
City of Eureka	20.00%		City of Pittsburg	56,769
City of Poway	14.29%		City of Santa Cruz	54,593
City of Stockton	14.29%		City of National City	54,260
City of Tulare	13.33%		City of Poway	48,044
City of Santa Cruz	11.43%		City of Novato	47,630
Chula Vista/San Diego	9.80%		City of San Luis Obispo	44,174
City of Gardena	9.80%		City of Tulare	43,994
City of Emeryville	9.80%		City of Rohnert Park	42,236
City of Santa Fe Springs	9.80%		City of Hanford	41,686
City of National City	8.57%		City of Delano	38,824
City of Livermore	5.71%		Culver City	38,816
City of Santa Barbara	0.00%		City of Pleasant Hill	32,837
City of Redding	0.00%		Town of Paradise	26,408
City of Sanger	0.00%		City of Eureka	26,128
City of San Luis Obispo	0.00%		City of Lemoore	19,712
City of Delano	0.00%		City of Selma	19,444
City of Rohnert Park	0.00%		City of Sanger	18,931
Town of Paradise	0.00%		City of Santa Fe Springs	17,438
City of Hanford	0.00%		City of Dinuba	16,844
City of Novato	0.00%		City of Albany	16,444
City of Ojai	0.00%		City of Ojai	7,862
City of Selma	0.00%		City of Emeryville	6,882
City of Mt. Shasta	0.00%		City of Mt. Shasta	3,621
				1,751,784
Percentiles				
95th	40.00%		95th	181,575
90th	26.67%		90th	117,005
75th	20.00%		75th	57,258
60th	11.43%		60th	47,630
55th	9.80%		55th	44,084
50th	9.80%		50th	42,236
45th	9.19%		45th	40,255
40th	5.71%		40th	38,816
				33871648
				5.17%
				56,509

Respondent	Households	Respondent	Income
City of Stockton	78,556	Thousand Oaks	$76,815
City of Huntington Beach	73,657	City of Livermore	$75,322
Chula Vista/San Diego	57,705	City of Poway	$71,708
Thousand Oaks	41,793	City of Pleasant Hill	$67,489
City of Santa Barbara	35,605	City of Huntington Beach	$64,824
City of Redding	32,103	City of Novato	$63,453
City of Livermore	26,123	City of Albany	$54,919
City of Santa Cruz	20,442	City of Rohnert Park	$51,942
City of Gardena	20,324	Culver City	$51,792
City of San Luis Obispo	18,639	City of Santa Cruz	$50,605
City of Novato	18,524	City of Pittsburg	$50,557
City of Pittsburg	17,741	City of Santa Barbara	$47,498
Culver City	16,611	City of Emeryville	$45,359
City of Rohnert Park	15,503	Chula Vista/San Diego	$44,861
City of Poway	15,467	City of Ojai	$44,593
City of National City	15,018	City of Santa Fe Springs	$44,540
City of Hanford	13,931	City of Lemoore	$40,314
City of Pleasant Hill	13,753	City of Gardena	$38,988
City of Tulare	13,543	City of Hanford	$37,582
Town of Paradise	11,591	City of Stockton	$35,453
City of Eureka	10,957	City of Selma	$34,713
City of Delano	8,409	City of Redding	$34,194
City of Albany	7,011	City of Tulare	$33,637
City of Lemoore	6,450	City of Dinuba	$33,345
City of Selma	5,596	City of Sanger	$32,072
City of Sanger	5,220	City of San Luis Obispo	$31,926
City of Santa Fe Springs	4,834	Town of Paradise	$31,863
City of Dinuba	4,493	City of National City	$29,826
City of Emeryville	3,975	City of Delano	$28,143
City of Ojai	3,068	City of Mt. Shasta	$26,500
City of Mt. Shasta	1,669	City of Eureka	$25,849
95th	65,681	95th	$73,515
90th	41,793	90th	$67,489
75th	20,383	75th	$51,867
60th	16,611	60th	$45,359
55th	15,485	55th	$44,727
50th	15,018	50th	$44,540
45th	13,842	45th	$39,651
40th	13,543	40th	$37,582

Respondent	Median House Value
City of Santa Barbara	$479,800
City of Santa Cruz	$411,900
City of Novato	$381,400
City of Albany	$334,800
Thousand Oaks	$324,800
City of Livermore	$314,600
City of Huntington Beach	$311,800
Culver City	$311,100
City of Pleasant Hill	$294,000
City of Poway	$284,200
City of San Luis Obispo	$278,800
City of Ojai	$272,100
City of Rohnert Park	$237,300
Chula Vista/San Diego	$197,000
City of Gardena	$179,500
City of Santa Fe Springs	$169,400
City of Pittsburg	$165,100
City of Emeryville	$161,600
City of National City	$141,500
Town of Paradise	$129,100
City of Mt. Shasta	$124,800
City of Redding	$121,600
City of Stockton	$119,500
City of Eureka	$114,000
City of Lemoore	$110,900
City of Hanford	$102,900
City of Selma	$97,000
City of Dinuba	$97,000
City of Tulare	$94,700
City of Sanger	$92,200
City of Delano	$86,700
95th	$396,650
90th	$334,800
75th	$302,550
60th	$237,300
55th	$188,250
50th	$169,400
45th	$163,350
40th	$141,500

Respondent	Rank	Population	Households	Income	Median House Value	
City of Lemoore	1	23	24	17	25	
Culver City	2	19	13	9	8	
City of Dinuba	2	27	28	24	28	
City of Pittsburg	4	9	12	11	17	
City of Pleasant Hill	5	20	18	4	9	
City of Albany	5	28	23	7	4	
City of Huntington Beach	5	2	2	5	7	
Thousand Oaks	5	4	4	1	5	
City of Eureka	5	22	21	31	24	
City of Poway	10	12	15	3	10	
City of Stockton	10	1	1	20	23	
City of Tulare	12	15	19	23	29	
City of Santa Cruz	13	3	3	14	14	
Chula Vista/San Diego	14	11	16	28	19	
City of Gardena	14	8	9	18	15	
City of Emeryville	14	30	29	13	18	
City of Santa Fe Springs	14	26	27	16	16	
City of National City	18	10	8	10	2	
City of Livermore	19	7	7	2	6	
City of Santa Barbara	20	5	5	12	1	
City of Redding	20	6	6	22	22	
City of Sanger	20	25	26	25	30	
City of San Luis Obispo	20	14	10	26	11	
City of Delano	20	18	22	29	31	
City of Rohnert Park	20	16	14	8	13	
Town of Paradise	20	21	20	27	20	
City of Hanford	20	17	17	19	26	
City of Novato	20	13	11	6	3	
City of Ojai	20	29	30	15	12	
City of Selma	20	24	25	21	27	
City of Mt. Shasta	20	31	31	30	21	

Rate	Population	Households	Income	Median House Value	
60.00%	19,712	6,450	$40,314	$110,900	
40.00%	38,816	16,611	$51,792	$311,100	
40.00%	16,844	4,493	$33,345	$97,000	
26.67%	56,769	17,741	$50,557	$165,100	
20.00%	32,837	13,753	$67,489	$294,000	
20.00%	16,444	7,011	$54,919	$334,800	
20.00%	189,594	73,657	$64,824	$311,800	
20.00%	117,005	41,793	$76,815	$324,800	
20.00%	26,128	10,957	$25,849	$114,000	
14.29%	48,044	15,467	$71,708	$284,200	
14.29%	243,771	78,556	$35,453	$119,500	
13.33%	43,994	13,543	$33,637	$94,700	
11.43%	54,593	20,442	$50,605	$411,900	
9.80%	173,556	57,705	$44,861	$197,000	
9.80%	57,746	20,324	$38,988	$179,500	
9.80%	6,882	3,975	$45,359	$161,600	
9.80%	17,438	4,834	$44,540	$169,400	
8.57%	54,260	15,018	$29,826	$141,500	
5.71%	73,345	26,123	$75,322	$314,600	
0.00%	92,325	35,605	$47,498	$479,800	
0.00%	80,865	32,103	$34,194	$121,600	
0.00%	18,931	5,220	$32,072	$92,200	
0.00%	44,174	18,639	$31,926	$278,800	
0.00%	38,824	8,409	$28,143	$86,700	
0.00%	42,236	15,503	$51,942	$237,300	
0.00%	26,408	11,591	$31,863	$129,100	
0.00%	41,686	13,931	$37,582	$102,900	
0.00%	47,630	18,524	$63,453	$381,400	
0.00%	7,862	3,068	$44,593	$272,100	
0.00%	19,444	5,596	$34,713	$97,000	
0.00%	3,621	1,669	$26,500	$124,800	

	Respondent	Area
	City of Lemoore	8.50
	Culver City	5.13
	City of Dinuba	3.40
	City of Pittsburg	16.82
	City of Pleasant Hill	7.10
	City of Albany	5.50
	City of Huntington Beach	31.60
	Thousand Oaks	55.00
	City of Eureka	14.40
	City of Poway	39.30
	City of Stockton	75.10
	City of Tulare	16.70
	City of Santa Cruz	15.60
	Chula Vista/San Diego	51.20
	City of Gardena	5.82
	City of Emeryville	1.90
	City of Santa Fe Springs	8.90
	City of National City	9.20
	City of Livermore	24.10
	City of Santa Barbara	41.40
	City of Redding	59.60
	City of Sanger	4.70
	City of San Luis Obispo	10.80
	City of Delano	10.20
	City of Rohnert Park	6.43
	Town of Paradise	18.20
	City of Hanford	13.10
	City of Novato	28.30
	City of Ojai	4.40
	City of Selma	4.30
	City of Mt. Shasta	3.70
	California	163,696

	Respondent	Ranked Rate of Redevelopment	Rate of Redevelopment	Local Government Offers Incentive Type 1
1	City of Lemoore	1	60.00%	0
2	Culver City	2	40.00%	0
3	City of Dinuba	2	40.00%	1
4	City of Pittsburg	4	26.67%	0
5	City of Pleasant Hill	5	20.00%	0
6	City of Albany	5	20.00%	0
7	City of Huntington Beach	5	20.00%	0
8	Thousand Oaks	5	20.00%	0
9	City of Eureka	5	20.00%	0
10	City of Poway	10	14.29%	0
11	City of Stockton	10	14.29%	1
12	City of Tulare	12	13.33%	0
13	City of Santa Cruz	13	11.43%	0
14	Chula Vista/San Diego	14	9.80%	0
15	City of Gardena	14	9.80%	1
16	City of Emeryville	14	9.80%	1
17	City of Santa Fe Springs	14	9.80%	1
18	City of National City	18	8.57%	0
19	City of Livermore	19	5.71%	0
20	City of Santa Barbara	20	0.00%	0
21	City of Redding	20	0.00%	0
22	City of Sanger	20	0.00%	1
23	City of San Luis Obispo	20	0.00%	1
24	City of Delano	20	0.00%	0
25	City of Rohnert Park	20	0.00%	0
26	Town of Paradise	20	0.00%	0
27	City of Hanford	20	0.00%	0
28	City of Novato	20	0.00%	0
29	City of Ojai	20	0.00%	0
30	City of Selma	20	0.00%	0
31	City of Mt. Shasta	20	0.00%	1

	Respondent	Local Government Offers Incentive Type 2	Local Government Offers Incentive Type 3	Local Government Offers Incentive Type 4
1	City of Lemoore	0	0	0
2	Culver City	0	1	0
3	City of Dinuba	0	0	0
4	City of Pittsburg	0	0	0
5	City of Pleasant Hill	0	0	0
6	City of Albany	0	0	0
7	City of Huntington Beach	0	0	0
8	Thousand Oaks	0	0	0
9	City of Eureka	0	0	0
10	City of Poway	0	0	0
11	City of Stockton	1	1	0
12	City of Tulare	0	1	0
13	City of Santa Cruz	1	1	0
14	Chula Vista/San Diego	1	1	0
15	City of Gardena	0	0	0
16	City of Emeryville	1	1	1
17	City of Santa Fe Springs	0	1	0
18	City of National City	1	1	0
19	City of Livermore	0	0	0
20	City of Santa Barbara	0	0	0
21	City of Redding	0	0	0
22	City of Sanger	0	0	0
23	City of San Luis Obispo	1	0	0
24	City of Delano	0	0	1
25	City of Rohnert Park	0	0	0
26	Town of Paradise	0	0	0
27	City of Hanford	0	0	0
28	City of Novato	0	0	0
29	City of Ojai	0	0	0
30	City of Selma	0	0	0
31	City of Mt. Shasta	0	0	0

	Respondent	Local Government Offers Incentive Type 5	Sought State Funding	Applied State Funding
1	City of Lemoore	1	1	50%
2	Culver City	0	1	12.50%
3	City of Dinuba	1	1	25%
4	City of Pittsburg	1	0	0%
5	City of Pleasant Hill	0	0	0%
6	City of Albany	0	0	0%
7	City of Huntington Beach	0	0	0%
8	Thousand Oaks	0	0	0%
9	City of Eureka	0	1	12.50%
10	City of Poway	0	0	0%
11	City of Stockton	1	0	0%
12	City of Tulare	1	1	50%
13	City of Santa Cruz	1	0	0%
14	Chula Vista/San Diego	1	0	0%
15	City of Gardena	0	0	0%
16	City of Emeryville	1	1	12.50%
17	City of Santa Fe Springs	1	0	0%
18	City of National City	1	1	30%
19	City of Livermore	1	1	100%
20	City of Santa Barbara	0	1	0%
21	City of Redding	0	1	12.50%
22	City of Sanger	0	0	0%
23	City of San Luis Obispo	0	0	0%
24	City of Delano	1	1	12.50%
25	City of Rohnert Park	0	0	0%
26	Town of Paradise	0	0	0%
27	City of Hanford	0	0	0%
28	City of Novato	0	0	0%
29	City of Ojai	0	0	0%
30	City of Selma	0	0	0%
31	City of Mt. Shasta	1	1	0%
				* Mt Shasta indicated that they applied state funding to 75% of sites but also entered that 0 sites had been redeveloped

	Respondent	Sought Federal Funding	Applied Federal Funding	Local Government Approached Developer / Land Owner
1	City of Lemoore	0	0%	1
2	Culver City	1	12.50%	1
3	City of Dinuba	0	0%	1
4	City of Pittsburg	0	0%	0
5	City of Pleasant Hill	0	0%	1
6	City of Albany	0	0%	0
7	City of Huntington Beach	1	12.50%	0
8	Thousand Oaks	0	0%	0
9	City of Eureka	1	12.50%	0
10	City of Poway	0	0%	0
11	City of Stockton	1	50%	1
12	City of Tulare	1	50%	1
13	City of Santa Cruz	1	12.50%	1
14	Chula Vista/San Diego	1	50%	1
15	City of Gardena	1	25%	0
16	City of Emeryville	1	25%	1
17	City of Santa Fe Springs	1	12.50%	1
18	City of National City	1	Undetermined	1
19	City of Livermore	0	0%	1
20	City of Santa Barbara	0	0%	0
21	City of Redding	1	12.50%	0
22	City of Sanger	0	0%	0
23	City of San Luis Obispo	0	0%	1
24	City of Delano	1	12.50%	0
25	City of Rohnert Park	0	0%	0
26	Town of Paradise	0	0%	0
27	City of Hanford	0	0%	0
28	City of Novato	0	0%	0
29	City of Ojai	0	0%	0
30	City of Selma	0	0%	0
31	City of Mt. Shasta	1	0%	0
			** Mt Shasta indicated that they applied federal funding to 75% of sites but also entered that 0 sites had been redeveloped	

	Respondent	Land Owner / Developer Approached Local Government	Local Government Has Stricter Cleanup Standards
1	City of Lemoore	1	0
2	Culver City	0	0
3	City of Dinuba	0	0
4	City of Pittsburg	0	0
5	City of Pleasant Hill	1	0
6	City of Albany	0	0
7	City of Huntington Beach	1	0
8	Thousand Oaks	0	0
9	City of Eureka	1	0
10	City of Poway	1	0
11	City of Stockton	1	0
12	City of Tulare	0	0
13	City of Santa Cruz	1	0
14	Chula Vista/San Diego	1	0
15	City of Gardena	0	0
16	City of Emeryville	1	0
17	City of Santa Fe Springs	1	1
18	City of National City	1	0
19	City of Livermore	0	0
20	City of Santa Barbara	0	0
21	City of Redding	0	0
22	City of Sanger	0	0
23	City of San Luis Obispo	1	0
24	City of Delano	1	0
25	City of Rohnert Park	0	0
26	Town of Paradise	0	0
27	City of Hanford	0	0
28	City of Novato	0	0
29	City of Ojai	1	0
30	City of Selma	0	0
31	City of Mt. Shasta	0	0

Appendix E: Statistical Tables

Table 4

Correlation Between Different Incentive Types

		Fast-Tracked Project Review	Risk Based Cleanup	Liability Relief	Tax Breaks	Direct Funding Assistance
Fast-Tracked Project Review	Pearson Correlation	1.000	.271	.158	.145	.246
	Significance		.141	.397	.436	.183
	Number	31	31	31	31	31
Risk Based Cleanup	Pearson Correlation	.271	1.000	.644**	.204	.411*
	Significance	.141		.000	.272	.022
	Number	31	31	31	31	31
Liability Relief	Pearson Correlation	.158	.644**	1.000	.145	.545**
	Significance	.397	.000		.436	.002
	Number	31	31	31	31	31
Tax Breaks	Pearson Correlation	.145	.204	.145	1.000	.309
	Significance	.436	.272	.436		.091
	Number	31	31	31	31	31
Direct Funding Assistance	Pearson Correlation	.246	.411*	.545**	.309	1.000
	Significance	.183	.022	.002	.091	
	Number	31	31	31	31	31

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5

Correlation Between Rate of Redevelopment and Different Incentive Types

		Rate of Redevelopment	Fast-Tracked Project Review	Risk Based Cleanup	Liability Relief	Tax Breaks	Direct Funding Assistance
Rate of Redevelopment	Pearson Correlation	1.000	-.066	-.106	.107	-.133	.244
	Significance		.724	.570	.565	.477	.187
	Number	31	31	31	31	31	31

Table 6

Correlation Between Demographic Variables and Incentives

		Streamlined Project Review	Risk Based Cleanup	Liability Relief	Tax Breaks	Direct Funding Assistance
Population	Pearson Correlation	-.058	.356*	.244	-.162	.082
	Sig. (2-tailed)	.759	.050	.185	.385	.659
	N	31	31	31	31	31
Households	Pearson Correlation	-.085	.320	.198	-.190	-.001
	Sig. (2-tailed)	.651	.079	.286	.307	.995
	N	31	31	31	31	31
Income	Pearson Correlation	-.371*	-.185	-.129	-.152	-.220
	Sig. (2-tailed)	.040	.318	.491	.414	.235
	N	31	31	31	31	31
Median House Value	Pearson Correlation	-.316	.033	-.055	-.210	-.330
	Sig. (2-tailed)	.083	.859	.768	.256	.070
	N	31	31	31	31	31

Table 7

Correlation Between Rate of Redevelopment and Demographic Variables

		Rate of Redevelopment	Population	Households	Median Income	Median House Value
Rate of Redevelopment	Pearson Correlation	1.000	.009	.010	.163	-.045
	Sig. (2-tailed)		.960	.957	.381	.809
	N	31	31	31	31	31

Table 8

Correlation Between Incentives and Other Contextual Variables

		Framework For Incentives	State Funding	Federal Funding	Government Approaches Developer	Developer Approaches Government	Stricter Cleanup Standards
Incentive1	Pearson Correlation	.123	-.015	.205	.246	.057	.310
	Sig. (2-tailed)	.511	.938	.267	.183	.759	.090
	N	31	31	31	31	31	31
Incentive 2	Pearson Correlation	-.425*	-.054	.376*	.576**	.540**	-.089
	Sig. (2-tailed)	.017	.773	.037	.001	.002	.632
	N	31	31	31	31	31	31
Incentive 3	Pearson Correlation	-.353	.137	.650**	.694**	.354	.310
	Sig. (2-tailed)	.052	.463	.000	.000	.051	.090
	N	31	31	31	31	31	31
Incentive 4	Pearson Correlation	-.228	.330	.289	.043	.289	-.048
	Sig. (2-tailed)	.218	.069	.114	.819	.114	.798
	N	31	31	31	31	31	31
Incentive 5	Pearson Correlation	-.245	.398*	.411*	.603**	.280	.215
	Sig. (2-tailed)	.184	.026	.022	.000	.128	.246
	N	31	31	31	31	31	31

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 9

Correlation Between Rate of Redevelopment and Other Contextual Variables

		Rate	Framework For Incentives	State Funding	Federal Funding	Government Approaches Developer	Developer Approaches Government	Stricter Cleanup Standards
Rate of	Pearson Correlation	1.000	.297	.247	-.008	.397*	.134	-.029
	Sig. (2-tailed)		.105	.180	.964	.027	.472	.877
	N	31	31	31	31	31	31	31
Framework For Incentives	Pearson Correlation	.297	1.000	-.119	-.229	-.104	-.090	.038
	Sig. (2-tailed)	.105		.522	.215	.577	.631	.839
	N	31	31	31	31	31	31	31
State Funding	Pearson Correlation	.247	-.119	1.000	.343	.264	-.056	-.145
	Sig. (2-tailed)	.180	.522		.059	.151	.766	.436
	N	31	31	31	31	31	31	31
Federal Funding	Pearson Correlation	-.008	-.229	.343	1.000	.280	.349	.201
	Sig. (2-tailed)	.964	.215	.059		.128	.055	.278
	N	31	31	31	31	31	31	31
Government Approaches Developer	Pearson Correlation	.397*	-.104	.264	.280	1.000	.411*	.215
	Sig. (2-tailed)	.027	.577	.151	.128		.022	.246
	N	31	31	31	31	31	31	31

*. Correlation is significant at the 0.05 level (2-tailed).

Table 9 - Continued

Correlation Between Rate of Redevelopment and Other Contextual Variables

		Rate	Framework For Incentives	State Funding	Federal Funding	Government Approaches Developer	Developer Approaches Government	Stricter Cleanup Standards
Developer Approaches Government	Pearson Correlation	.134	-.090	-.056	.349	.411*	1.000	.201
	Sig. (2-tailed)	.472	.631	.766	.055	.022		.278
	N	31	31	31	31	31	31	31
Stricter Cleanup Standards	Pearson Correlation	-.029	.038	-.145	.201	.215	.201	1.000
	Sig. (2-tailed)	.877	.839	.436	.278	.246	.278	
	N	31	31	31	31	31	31	31

*. Correlation is significant at the 0.05 level (2-tailed).