E-waste in Relation to Geopolitical Forces: A Case Study of the United States - Mexico Border Region

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E-waste in Relation to Geopolitical Forces: A Case Study of the United States - Mexico Border Region

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Thesis Sponsor:

December 21st, 2016
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Dr. Aminata Maraesa
Signature of Second Reader
This thesis is dedicated to the thousands of marginalized e-waste workers spread throughout the globe and all those affected by overconsumption. Their hardships will not go unrecognized.

Image 1: Informal e-waste and metal collector dropping off material at a scrap facility in Tijuana, Mexico. Photo by Michael Hicks.
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Abstract:

My analysis deconstructs the electronic waste (e-waste) industry and its interconnectedness to geopolitical forces and economic development. E-waste is definable as any type of discarded or obsolete electronic or appliance that has reached its end-of-life cycle. Scholarly e-waste research has generally focused on South East Asia and Africa with little emphasis on Mexico. My research aims to bridge this information gap and help chart the flow of e-waste sent to or produced in Tijuana, Mexico. Is the United States’ societal process of speed, mixed with constant growth industrialization fueling the overconsumption of electronics? Is this issue creating a correlation between e-waste pollution and slow/structural violence in Mexico? Furthermore, how does the e-waste industry influence geopolitical and economic relations between the United States and Mexico? New research into e-waste recycling near the U.S.-Mexico border shows an unfolding problem that can prove deleterious to humans and our environment.
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Introduction: The Global Electronic Waste Crisis

Envision an area where billowing toxic clouds rise in the distance as cars and pedestrians rush by in hectic commotion. The pungent smell of roasting plastic fills nasal cavities and makes its way through waste workers’ bodies causing maladies to build up over time. It is a land created by the inner workings of government policy, economics, and informal labor. Those cast from formal society dig through ash pits pulling copper wire from a technological nightmare whose remnants could have originated in offices, living rooms, or local hospitals. The comforts of modernity become instruments of embarrassing guilt and hopes for a sustainable existence fade away once witnessing the destructive force of informal electronic waste (e-waste) recycling. This is reality for the planet’s worst e-waste dumping grounds.

Toxic e-waste is rarely recycled in its country of origin. The justifications for toxic exportation are purely economic. It is more cost effective to dump e-waste in developing countries than to recycle it in its country of origin.¹ This does little to expose the lax toxic import/export practices utilized by governments and businesses that profit from e-waste. A symbiotic business relationship exists between informal e-waste collectors, non-profit collection sites, and for-profit recyclers. Each of these sectors has a specific function in the e-waste industry. Tensions between economy and human rights are caused by the interconnectedness of each sector. These connections exist through the interactions of local governments, their legal systems, secondary electronics markets, and informal recyclers living in poverty. The amalgamation of these sectors creates the basis for impoverished humans to become paradoxically deemed dispensable yet indispensable. Their basic rights are sacrificed for the sake of geopolitics despite the damage informal e-waste recycling causes.

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Is the United States’ societal process of speed, mixed with constant growth industrialization fueling the overconsumption of electronics? Is this issue creating a correlation between e-waste pollution and slow/structural violence in Mexico? Furthermore, how does the e-waste industry influence geopolitical and economic relations between the United States and Mexico?

 Scholars, NGOs, and ironically some governments that allow toxic importation have argued for the closure of global e-waste dumping zones. The reasons for pursuing closures stem from the inherent health and environmental problems associated with each site. Therefore, I wish to explore the tension between policy and morality by asking who is accountable for the e-waste industry’s practices despite the damage it causes and what local mechanisms contribute to its function. I have approached this by analyzing fieldwork data gathered from the border region between San Diego, California, and Tijuana, Mexico. I aim to show how the interconnectedness of consumerism, refurbishing, manufacturing, scrap collection, and recycling coincide with governmental policy and geopolitical relations.

The United Nations reports that forty-one million tons of electronic waste worth $50 billion dollars are discarded globally per year and of this, only six million tons are formally recycled.\(^2\) The remainder is sold to exporters, mainly in developing countries such as Ghana, Nigeria, China, Pakistan, and India. Exporters deceptively package functioning and non-functioning electronics together. This disguises non-functioning material as recyclable goods or as donations to help bridge the digital divide. After importation, the material is again sorted and classified as functional or non-functional. Functioning electronics are sold in secondary markets. Whatever remains after this process (e-waste), is dumped into areas reminiscent of landfills, where it is scavenged by those living in poverty. This material is then further recycled for rare earth minerals and other recyclable

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material on secondary markets. Child labor is not uncommon and workers earn very low wages. These makeshift operations function without much consideration for the people being exposed to toxins associated with e-waste disassembly. These toxins also leach into ground water, poisoning vegetation and livestock, which is then consumed by individuals living nearby. The main causes of this phenomenon are overconsumption in the Global North, international law circumvention, and geopolitical economics related to free-trade. Johan Galtung’s concept of structural violence was first proposed in 1969 and is abstractly defined as the latent harm created by social structures and institutions that prevent individual well-being and basic survival. The e-waste issue is best understood by analyzing the systems and institutions that create structural violence.

**Neoliberalism**

The influence neoliberalism has on U.S. – Mexico relations must be addressed to analyze the way e-waste is connected to economic and environmental policy. Neoliberalism’s meaning and relevance to development has changed over time. Neoliberalism promotes business privatization and the deregulation of free-trade commerce in pro-capitalist countries. In most current discourse neoliberalism is portrayed negatively, contrary to its hopeful beginnings as an improvement upon classical liberalism and equality. Since the 1980s, the International Monetary Fund (IMF) and World Bank (WB) have pushed structural adjustment reform in developing countries and favored technocratic forms of control. These institutions aim to alleviate poverty but tend to produce the

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5 Boas and Gans-Morse “Neoliberalism: From New Liberal Philosophy to Anti-Liberal Slogan”, 139.

opposite effect. In Mexico, electronics companies utilize the neoliberal business model to maximize corporate profits and pay workers sub-standard wages. This promotes free-trade between the United States and Mexico but undermines the labor force. The IMF, WB, and the World Trade Organization (WTO) operate without much accountability or visibility in the globalization process. Policy makers who agree with “Washington Consensus” prescriptions, encourage pro-corporate business in Mexico that has spread to other developing countries. Many scholars such as Marc Edelman, David Harvey, and Michael Perelman have argued that these abandoned modes of thinking still dictate modern policy.

The way neoliberalism seeks to implant modernity into globalized systems of commerce is very political in nature. Technology is the driving force for modernization in a globalized society. Some nations prosper from this technological force while others carry the burden of what remains. The remnants left behind coalesce into a mechanism whereby biological and environmental damage is caused by electronic waste. This is biopolitical in nature because informal recyclers are forced to subjugate their bodies for physical and economic survival. Neoliberalism practices generally exploit the poor for the benefit of wealthy individuals or corporations. This concept is echoed in the executive, legislative, and judicial branches of U.S. government, which should protect its people rather than exploit them for profit. These branches of

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8 Noam Chomsky Profits Over People: Neoliberalism and Global Order (Seven Stories Press, 1999). pp. 20, 27.


11 Chomsky, Profits Over People: Neoliberalism and Global Order, 47.
government have relevant ties to the separate sectors of the e-waste industry. This is further compounded by government policy, secondary markets, and informal recyclers. Policies affecting these sectors accelerate the economic subjugation of the poor. The e-waste industry uses the exporting sector of global business to dump toxic material in developing countries.

At the heart of this issue is the invisibility of long-term biological and environmental damage associated with the blatantly visible amounts of e-waste spread throughout the world. David Naguib Pellow argues that the idea of constant technological advancement is reflective of both old and new hegemonies that throughout history have created divisions between those with access to technology and those without. When taking apart electronic waste without proper safety measures humans are exposed to hazardous chemicals such as lead, beryllium, mercury, cadmium, polyvinyl chloride plastics (PVC), hexavalent chromium, and brominated-flame retardants (BFRs). Pellow further argues that “the extension of unearned privileges to certain groups and unjust disadvantage to others in the context of the systemic manipulation and exploitation of nature is a defining feature of modern nation-states” (Pellow 2007: 5). The exploitation of developing countries by so called “modern nations-states” results in economic dominance. Commerce is used to gain geopolitical leverage over developing sovereign nations. This is achieved via the introduction of neoliberal modes of business such as multinational spaces, unregulated markets, perpetual debt, and WTO authority over sovereign law. Neoliberal forms of deregulation can only exist by passing laws that favor big-business, even if this means sacrificing the welfare of individuals.

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Circumvention of Laws

This section will cover law circumvention pertaining to e-waste dumping. Loopholes in law enable destructive practices to persist at dump sites throughout the world. In many aspects, the processes for creating new polluted frontiers arise from law circumvention. The International Basel Convention was created to regulate hazardous waste sent from developed countries to developing ones. This convention is not well enforced in most industrialized countries. Numerous countries have ratified the Basel Convention but its framework still allows the importation of e-waste into most ports. The United States and the European Union are primary contributors to the e-waste problem. The United States refuses to sign the Basel Convention, while the European Union has signed but only abides by it 48 percent of the time. The United Nations Environmental Programme (UNEP) persuades Western countries to cease using Africa as a dumping ground. This has led to a movement calling for more effective legislation pertaining to e-waste management. The United States, the European Union, Japan, Korea, and Taiwan have introduced legislation requiring manufactures to take back e-waste but with limited success. Twenty-Five American states have passed e-waste laws with either a consumer fee or producer responsibility approach. This protective legislation must be ratified by all parties involved to effectively ban e-waste exports that fall under the jurisdiction of international trade.

17 Id.
Loopholes exist within the Basel Convention making e-waste exempt from the Resource Conservation and Recovery Act (RCRA). Under the RCRA, e-waste is not considered hazardous because certain components are deemed reusable. In reaction, the Responsible Electronics Recycling Act of 2010 was introduced to stop U.S. recyclers from dumping e-waste in developing countries by adding a “restricted electronic waste” clause to the RCRA.20 The Bamako Convention was also designed to essentially ban all hazardous dumping in Sub-Saharan Africa.21 This convention does little to stop the importation of e-waste into developing African nations. For example, Ghana signed but did not ratify the Bamako Convention, which means Ghana becomes liable for all hazardous material after importation, leaving the exporter relieved of any accountability.22 The treaty body of the International Covenant on Economic, Social, and Cultural Rights (ICESCR) could expose human rights violations in relation to e-waste.23 The U.N. Convention on Rights of a Child is another avenue of approach in banning child labor from the recycling process, yet enforcement seems doubtful since children under 15 years of age constitute a small portion of the work force.24

Upon closer analysis, poorer developing Global North and South countries are also taking advantage of lax import laws. Data gathered by Grant and Oteng-Ababio (2012) from the Customs Excise and Preventive Services (CEPS) data management system (GcNET/GCMS), documents

21 Id.
23 Designed to promote universal human rights. Preamble available at: http://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx
trade activity from all major ports world-wide.25 Their findings suggest that in addition to the United States and the European Union, a large percentages of e-waste importation to Ghana is originating in countries such as China, South Africa, Nigeria, and Tunisia.26 This proves how many nations outside Global North boundaries are circumventing the Basel Convention. The existing laws essentially promote the well-being of one country at the expense of another based on economic differences and duty importation fee avoidance. This same mode of thinking begins to influence each country’s local governments, secondary markets, and informal e-waste recyclers.

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Approach

My analysis should not be taken as an attack on technology or pro-capitalist governments. I wish to avoid being perceived as a Luddite who aims to destroy technological advancement. Instead I aim to promote sustainability within the technology industry and the capitalist structures that enforce industrialized growth. Advocating for economic equality and environmental sustainability are recurring themes within my argument. Inherent in these issues are the underlying social tensions such as economic inequality and labor rights. I will show how these tensions are created through a deep local interconnectedness between administration, commerce, and survival. This local interconnectedness plays a critical role in propelling the e-waste industry’s role in global economics. Scholars such as David Naguib Pellow place considerable blame on globalization for the deplorable condition in e-waste dump sites. My approach aims to examine the local mechanisms that contribute to these conditions. If every dump site spread throughout the globe operates around different economic dynamics, then the e-waste problem cannot be summed up as a universal issue. Each country’s e-waste industry has its own specific method.

The framework for my research builds on scholars such as Anna Lowenhaupt Tsing’s “scaling” and “frontier” concepts while also exploring Giorgio Agamben’s adaptation of “homo sacer/bare life”. Tsing uses scaling to show how globalization emerges from the ground up in a process designed to predict local conditions based off a global model. To gain a full perspective on the global e-waste issue the local mechanisms must first become visible. I will examine how


hazardous waste dumping in developing countries is partially rooted in economics. Specifically, how “fast capitalism” is possibly causing, as Rob Nixon argues, “slow violence.” This fast capitalism model fuels the incessant need for technological time-saving devices. The tools for a fast-capitalist system such as constant upgradable hardware of computers, cell phones, and communication systems breeds a necessary exponential growth pattern. Electronics companies cleverly use a planned obsolescence strategy to promote consumer product sales. This constant economic growth model adopted by most pro-capitalist countries means more consumption hence, the exponential growth of e-waste. Economic growth essentially becomes a driving force behind opening new geographies for e-waste disposal in which Mexico and Central American countries could suffer the burden. The sustainability movement is often used by for-profit e-waste businesses to gain cheap material which is then sold to developing countries. Through fieldwork I will show how this concept develops near the San Diego, California - Tijuana, Mexico border. Limited research exists in relation to Mexico and the electronic waste disposal trade, even though it is one of the largest manufacturers of electronics globally. Despite mass manufacturing little evidence of e-waste has surfaced apart from maquiladora areas along the Mexico - Texas border. Further maquiladora studies, such as Alejandro Lugo’s Fragmented Lives Assembled Parts, offer examples of constant growth capitalism’s role in creating dividers between American and Mexican living standards.

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31 Naguib Pellow, Resisting Global Toxics: Transnational Movements for Environmental Justice, 201.

Mexico’s recent nationwide switch from analog to digital television signals and increased investment in telecom wireless infrastructure will drastically increase the amount of discarded “obsolete” e-waste. My research comes at a crucial moment and could help expose either, further exportation of e-waste to other developing countries, or discover internal slow/structural violence exacerbated by informal recycling methods. In many instances the e-waste issue is overshadowed by the more obvious acts of violence associated with Mexico’s and the United States’ war on drugs. This concept builds on Rob Nixon’s argument that slow violence unfolds across environmental and epidemiological time, often undermined in the media by saturated violent imagery.\(^{33}\) I aim to show how e-waste does in fact create slow violence to the environment and to human biology. Jennifer Clapp, in her book *Toxic Exports*, gives some limited background on Mexico’s hazardous waste history.\(^{34}\) David Naguib Pellow’s book *Resisting Global Toxics* outlines many of the historical and current trends in global e-waste analysis.\(^{35}\) Numerous scholarly journals related to the global e-waste crisis exists but mainly focus on the immediate effects in Africa and Asia. What is missing in most instances is a detailed evaluation of Mexico and its role in the global e-waste trade from a slow/structural violence perspective. Examining Mexico and its proximity to the United States opens a new geography to the flow of e-waste while exposing its structural impact that could spread to Central American countries.

I approach the border region of San Diego, United States and Tijuana, Mexico by adopting a de-scaling model void of global focus to help dissect three distinct layers of interaction consisting of local government (upper), secondary electronics market (middle), and informal recyclers

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By setting parameters for the interconnectedness of local tiers the model stays closer to perceivable reality and away from a globalized abstraction. This method helps explain how the e-waste industry functions on the micro-scale.

In Tijuana, the interaction between upper, middle, and lower sectors may be creating a new form of frontier best described as a meta-frontier; a land caught between economics, law, and morality. A meta-frontier exists not because of its qualities such as ripe resources but because of unique regional interactions between e-waste industry sectors. Meta-frontier parameters are domestically regulated by local government or legal systems which cannot be universal. Meta-frontiers do not yield significant monetary returns, and its polluted territory is unsuitable for habitation. It becomes disconnected from the initial electronics frontier and in the end process creates its own micro-level space. I aim to propose that extreme cases such as Agbogbloshie, Ghana and Guiyu, China can be categorized as such, while emerging e-waste sites in places like Mexico could be at risk of becoming oversaturated with toxic material. Like metaphysical relationships, the meta-frontier framework helps pinpoint why e-waste dump sites exist, continue to exist, and how they could change due to global, social, and economic conditions. Condition fluctuations eventually affect localized policy. My concept of meta-frontier conceptually differs from Tsing’s frontier through the dynamics in which it is defined. Tsing conceptualizes frontiers as universal, deregulated because they arise from collaborations among legitimate and illegitimate partners, and are generally applied to exploitable resources yet to be or in the process of extraction. I would argue this explanation pertains more to the production of electronics rather than their final resting place. In either case the global demand for electronics plays a significant role in how humans are willing to sacrifice nature and individual well-being for commerce.

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The quest for modernity through technological means plays a significant role in how e-waste is approached by local governments. In reaction to this, many governments use biopower to regulate their citizens bodies through commercializing e-waste. Agamben’s adopted Roman concept of “homo sacer, bare life” is defined as an individual struggling for basic daily survival after being excluded from society and its laws. Under these parameters an outcast may be killed but not sacrificed within ancient society. The bare life individual becomes both subject and object of political order. Thus, in modern times the informal recycler has become "homo sacer", able to be killed by the health risks involved with scrapping e-waste but not sacrificed by the secondary market because it needs him/her for its own existence. He or she is somehow made responsible for extracting the last drop from the metaphorical bottle of global economics. There is a paradox to explore if governments legally defend secondary markets by allowing e-waste importation but deny legal protection and safe conditions to informal recyclers living in poverty.

**Methodology**

I’m particularly interested in border regions and how e-waste commerce is conducted within these areas. The border region between San Diego, California and Tijuana, Mexico is a logical starting point in determining the flow of e-waste. To make my approach feasible I had to see the relationship between all e-waste sectors first-hand. I conducted fieldwork in these two areas for ten days during early summer of 2016. While in Tijuana, I hired a local fixer to help with transportation and translation. His local connections were invaluable to the research and granted

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37 Biopower concept defined in Foucault, *The History of Sexuality Volume I: An Introduction*


me access to areas and people I wouldn’t have been able to approach on my own. In San Diego, I visited several e-waste collection facilities. I also gained perspective from a general consumer’s experiences with e-waste disposal. Fieldwork consisted of interviews, observation, and still photography with recyclers, collectors, scrappers, refurbishers, and consumers. Participants were selected from the e-waste industry’s formal and informal sectors. Interviews were informal and free flowing. Each participant was given a consent form prior to being interviewed. Audio recording of interviews was done for note taking accuracy and interviews were later transcribed. All audio is accessible only to me, assuring participant confidentiality. Partial funding for this research was provided by Hunter College’s Department of Anthropology Research and Training program (DART). CITI certification for research with human subjects was completed and all research was approved by the Hunter College Institutional Review Board.

The initial goals of this fieldwork were to generate a better understanding of how the e-waste industry functions in and beyond the San Diego/Tijuana border region. Acquired data provided demographic information associated with each sector involved in e-waste commerce. This helps expose sub-tiered labor division within the formal and informal sectors. A hierarchy of competition comes into focus between networks of collectors, recyclers, refurbishers, and scrap dealers. A similar method was conducted in Accra, Ghana by E. F. Amankwa to collect demographic and health data from e-waste workers. My methods build on this type of approach but in Tijuana, Mexico. Additional geopolitical findings pertaining to global scale e-waste commerce will be provided by the NGO Basel Action Network, United Nations reports, NAFTA analysis, visible violence studies, and various scholarly works.


Chapter One: San Diego/Tijuana Border Region Data

This chapter will analyze fieldwork data from the border regions of San Diego, California and Tijuana, Mexico. I visited, conducted informal interviews, and took still photographs at two non-profit organizations in San Diego county. The first NGO, Computers 2 San Diego Kids (C2SDK), operates as a certified refurbishing company and attempts to bridge the digital divide by giving or selling discounted computers to impoverished families living in San Diego county. The second NGO, the Electronics Recycling Center, is affiliated with the University of San Diego and operates around a similar model of resale and sustainable electronics collection. I made multiple attempts to meet with for-profit e-waste recyclers operating in San Diego county but without success. Most companies did not return my inquiries or simply said they did not have time to meet with me. To fill this gap, I shadowed a consumer through the process of dropping off e-waste to one of the for-profit facilities while observing each step. This consisted of informal interviews with the consumer before and after dropping off e-waste to the facility. This particular facility is located near the San Ysidro, San Diego border with Tijuana, Mexico. The purpose was to gain a basic understanding from the consumer’s perspective in relation to how residents become informed about e-waste collection. I also visited and photographed one of the many monthly held e-waste drop-off sites generally located within high school parking lots. The visited drop-off site was located approximately nine miles north of the Mexican border in Jamul, San Diego county.

The California Model

Many California residents place considerable importance on environmental sustainability and pride themselves on living in a “green” state. California has mandated some of the most stringent laws on recycling in the United States. Cal Recycle operates as the state governing body over all companies involved in recycling. There is an increasing movement pertaining to e-waste
recycling in San Diego county. This movement is fueled by the non-profit and for-profit sectors who operate in the region. Both sectors operate independently of one another but also share a symbiotic relationship when it comes to unusable e-waste.

Overall the stringent California model of environmental e-waste protection still operates within a capitalist framework and circumvents some environmental protection laws. It appears to salvage as much for refurbish and resale as possible while stretching the value further by selling e-scrap to foreign countries. The increase of material is difficult to keep up with according to e-waste collection facility managers who see this annual exponential increase. Any company involved in e-waste recycling must meet the Responsible Recycling Practices Standard, known as (R2) certification. In addition, any downstream vendors with whom they do business with must also be certified under the same parameters. Many loopholes exist within the R2 certification system, including the allowance of exportation to developing countries. The R2 certification is seen by many environmental and human rights activists as a formality which surreptitiously protects no one outside the corporate business sector.

The non-usable e-waste from most collection facilities is taken to one of the larger recycling plants in northern San Diego. At this stage, e-waste is broken down, categorized, and predominately sold to China. Apparently very little is formally sent to Tijuana, due to R2 environmental restrictions between the border cities. In the earlier days of e-waste recycling certain companies would attempt to dump material in Tijuana but due to the illegality of such actions no collection facilities would partake. Not to say that this didn't occur on occasion, but is difficult to prove without formal evidence.
California’s Non-profit E-waste Sector

I wanted to analyze the mechanisms involved in San Diego’s e-waste industry and the governing dynamics that make it function. This led to the discovery of interaction patterns between consumers, collection sites, and recyclers. Past e-waste collection sites seemed disorganized, lacked convenience, and were insufficiently promoted to the public. Clearly, more needed to be done to accommodate the ever-growing amount of e-waste and do so in a manner that is appealing to residents. In response, a few non-profit organizations rose to this challenge. I scheduled tours and interviews with two non-profit e-waste collection sites.

Image 2: Computers ready for donation or resale at C2SDK. Photo by Michael Hicks.

I first interviewed a representative for Computers 2 San Diego Kids (C2SDK). C2SDK is a non-profit organization designed to bridge the digital divide. It caters to low-income families in San Diego county. The NGO is very concerned about overconsumption in American society. This strengthens its model to reuse technological equipment whenever possible. It has operated since
2004 and relies on computer technologies donated from large companies and consumers. The breakdown between these two contributing bases consists of 80 percent business donation and 20 percent consumer donation. In 2015 the NGO distributed 7,843 computers to low-income families. This number rises annually by approximately 1,500 computers. The ideal goal for 2016 is to achieve a 10,000-computer distribution total. Most of the families in need are Latino. There is a rising number of military veterans in need and an estimated 1,500 Middle Eastern families currently on the waiting list for computers. The operation is generally perceived as a positive contribution to the San Diego community. However, if this number continually climbs it also means families living below the poverty line could also be increasing. It is debatable whether this increase is representational of a larger demographic of families already below the poverty line whom have recently discovered the program.

C2SDK recognizes that to bridge the digital divide it must ensure that older equipment is functioning to the standards of current software. This is a major problem with older equipment. Even though impoverished families are receiving technology, it is still one or two steps behind the latest models. The gap is never fully narrowed but does offer families a chance at providing adequate tools for navigating a modern technologically based society. Computer technology plays a crucial role in developing an individual’s social standing in the United States. In most democratic societies individuals need to be fluent in working with complex technological systems. The correlation between modernity and technology is seen in almost every aspect of American living, from commerce to healthcare. This ever-present need for computer technology drives the creation

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of inevitable e-waste. Establishing reuse programs similar to C2SDK on a nation-wide scale could significantly reduce the amount of discarded e-waste.

C2SDK receives approximately 500,000 pounds of e-waste annually. It has seen a steady increase in cell phones, CRT and LCD monitors, printers, and large copiers. These items can be extremely deleterious to the environment and human biology. Printer inks and toners are especially prone to environmental leakage if not separated properly. Unfortunately, most printers and copiers end up in e-waste streams. Cell phones can be salvageable for resale but rarely offer a life span beyond 2-5 years. C2SDK goes above and beyond in attempting to salvage this type of material. A large percentage of this hazardous material still ends up in the e-waste stream. The non-salvageable material is sent to recycling companies where its final resting place remains undetermined.

Image 3: Volunteer working on refurbishing a donated computer for resale. Photo by Michael Hicks.
The NGO charges families $50.00 for a fully loaded computer/CRT monitor, $80.00 for a computer/LCD set up, and $150 for laptops. They offer free tech support for the first year and $20.00 per year thereafter. The facility works with other companies such as Microsoft, Qualcomm, and Cox along with local libraries and school districts in San Diego. These companies play a mutually beneficial role in relation to donations, while the libraries and schools provide a way for residents to connect with the C2SDK representatives on a personal level. It was explained to me how most larger companies replace their systems every two to three years, which creates an excessive amount of e-waste that would otherwise end up in for-profit recycling facilities or landfills. By donating to C2SDK these companies gain positive “green” publicity and tax write offs.

Image 4: Donated computers at the University of San Diego’s Electronics Recycling Center. Photo by Michael Hicks.

Another NGO operating in the same region is the University of San Diego’s Electronics Recycling Center. It accepts donations from the public and manages all of USD’s technological
waste. The center opened five-years ago in response to an increased amount of e-waste from USD and San Diego residents. It offers a valuable service to the San Diego community that was not readily available prior, except for C2SDK. Similar to C2SDK’s model, the center works with local businesses looking for an alternative method of e-waste disposal. The amount of nationwide e-waste could arguably reduce if every educational establishment operated a similar on-campus facility. The center is run by a small staff and volunteers. A government funded program exists at the center for developmentally challenged individuals who under staff supervision safely disassemble computer components. Staff members also manage a store where they sell functional donated material. The issue of overconsumption in American society has disheartened staff at the facility and pushes them to instill a reuse method whenever possible. Recycling is considered a last resort option.

Image 5: Sorting material at the University of San Diego Electronics Recycling Center. Photo by Michael Hicks.
In 2015 the center collected 750,000 pounds of e-waste with that amount expected to increase to 1,000,000 pounds in 2016. This is a staggering increase compared to the 2012 opening which only produced 17,000 pounds of e-waste. Staff haven’t noticed an increase in any particular item. Recurring items include, computer components such as mice, mother boards, hard drives, wiring, keyboards, CRT and LCD monitors. Cell phone collection numbers are low apart from obsolete models. This is most likely because of the increase in buy-back programs offered by cellular companies. Printers are picked up in regular intervals by an outside refurbishing company. The facility will not work with any agency that isn’t R2 certified. Profits from the sale of e-waste to downstream vendors go towards sustainability efforts. All downstream vendors are assumed to operate in accordance with environmental law. This is based on contractual and verbal agreements designed to protect against the illegal exportation or dumping of e-waste. The NGO is certified as collectors and handlers of e-waste, which distances the center from the exportation process. In many respects the facility acts as a filter or intermediary to salvage reusable technology before it ends up in e-waste streams.

**California’s For-profit E-waste Sector**

Material that cannot be refurbished or resold by either NGOs or businesses operating in San Diego County is considered e-waste. The confusing flow of e-waste moves throughout different sectors of businesses, NGOs, consumers, and exporters until the remnants are deemed no longer usable. This model is a better alternative than landfills or incineration but remains difficult to track. The main concern should be focused around individual health and environmental protection but more often revolves around commerce. In many aspects, recycling companies are using NGOs to maximize profits. They essentially feed off the sustainability movement to gain cheap material which is then sold to developing countries. For example, The Industrial Metal and
Salvage (IMS) Group, which operates in northern San Diego County, conveniently places a storage container in the parking lot of C2SDK. This shipping container is picked up bi-weekly from C2SDK and brought to an IMS electronics recycling center. IMS abides by R2 certification standards which still allow for the exportation of e-waste into developing countries. According to my sources, the majority of IMS’s exported e-waste ends up in China. Most exported material is broken down to small pieces and sold as scrap. Incineration is a banned method of disposal within California but not in most developing countries that import e-waste. There are numerous companies operating around a similar framework in the state of California and nationwide. Domestic companies such as UNICOR facilitate the sending of e-waste into prison systems where incarcerated workers dissemble material in return for substandard remuneration. This model of commerce is a perfect example of neoliberalism operating in conjunction with state policy. Prison systems extract wealth from inmates for the benefit of corporate businesses.

Image 6: C2SDK staff examine a container used for e-waste material. Container is picked up bi- weekly by IMS. Photo by Michael Hicks.

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44 UNICOR is the trade name for Federal Prison Industries, Inc.
None of the for-profit e-waste recycling companies would schedule meetings with me. To fill this data gap, I interviewed and shadowed a consumer through every step of a donation drop-off. The interviewed consumer believes many residents are still throwing away electronics even with the uptick in publicity against such actions. By living in a constantly changing technological society most consumers are producing more e-waste than ever. For example, the consumer tends to operate around a two-year upgrade cycle for items such as cell phones.

We located a facility in San Ysidro, near the U.S. – Mexico border. Though advertised online as a convenient consumer friendly location, it was anything but. Nestled into a large industrial park combined with insufficient signage made the location almost impossible to find. Upon arrival, we noticed the site was clean and well-kept, operating with approximately five employees. The material being dropped off consisted of electrical ballasts, one CRT monitor, one
LCD television, a general house fan, and a laptop computer. We also dropped off an array of light bulbs which came with a monetary cost to the consumer. The cost consisted of six florescent light bulbs for .85 cents apiece and six high pressure sodium 1000-watt light bulbs for $1.25 per piece. The consumer inquired as to where this material would be sent. The response was Poway, which is in northern San Diego, consistent with the location of IMS’s recycling and sorting facility. He was also told a percentage of it ends up in Chino, where one of the largest prison systems in Southern California is located. According to the site manager, none of this material is sent to Mexico but some is exported to China. This collection center appeared to operate as another intermediary for the larger recycling facilities. Overall, the consumer was relieved to discard e-waste that could have ended up in a landfill but still left confused as to where exactly this material might be sent. It also cost considerable time, money, and effort to drop off the e-waste. These types of facilities cater more to large businesses rather than individual consumers in order to maximize profit.

*Image 8: General consumers from San Diego gathering electronics to be dropped off at a collection facility near the U.S.-Mexico border. Photo by Michael Hicks.*
The consumer and I spoke at length regarding public accessibility to e-waste drop off locations. Over the past five years the interviewee has seen an increase in e-waste drives predominantly located in school parking lots. This compelled me to visit one of these locations, which did in fact produce some useful data. I encountered a company called Secure Electronics Solutions (SEC), which collects consumer e-waste that is later broken down into scrap and sold for profit. A truck with the capacity to take in 26,000 pounds of e-waste sets up in a high school parking lot every weekend. After speaking with workers at the site I found that on a “good” day they can fill the truck to capacity. I viewed this truck around 11am on a Sunday when it was filled to approximately 15,000 pounds. The magnitude of current e-waste accumulations is staggering if this much material is coming in on a weekly basis from one location.

Image 9: San Diego residents dropping off e-waste to a for-profit pop-up collection site run by SES. Photo by Michael Hicks.
E-waste in Tijuana

While in Tijuana, Mexico, I visited, conducted informal interviews, and took still photography imagery of scrappers/collectors living in poverty, scrap yard employees and managers. In addition, I followed the same format for electronic and appliance refurbishers who make up the secondary electronics market in Tijuana. Data gathered from informal scrappers suggest a divide between individuals living in poverty trying to support themselves or their immediate family and drug addicts looking for a quick cash source. My findings also cast a wide net into the refurbishing sector, which seems to operate around a generational divide. The older generation tends to refurbish audio, appliance, and computer technologies while the younger generation focuses heavily on cell phones and computer technologies. I was told that the Mexican government runs larger recycling plants on the outskirts of Tijuana and Mexicali. I attempted to schedule a visit with representatives at two of these facilities but was denied access.

Mexican Informal and Formal E-waste Scrappers/Collectors

I began my research to locate e-waste scrappers and collectors in the Jibarito scrap yard. This area is filled with towering stacks of cars waiting to be stripped for any valuable metal or electrical components. The lower area consisted mainly of metal scrap brought in by collectors who search the streets for anything salvageable. Within this heaping mess of metal was classifiable e-waste. Most of the e-waste consisted of satellite dishes, computer parts, car stereo components, mother boards, and appliances. Massive amounts of e-waste are not visibly obvious in these areas as compared to well-documented sites in Nigeria, Ghana, or China. However, upon closer inspection e-waste does exist and has the potential to increase over time.
The Jibarito scrap yard’s upper area is mainly dedicated to tearing apart car components and salvaging any type of electronic such as car stereos, speakers, internal computers, and wiring. The wiring is stripped of its plastic insulation, exposing the copper, which is gathered and sold on secondary markets. This process is also used to extract metals such as cobalt, steel, nickel, and aluminum. According to the site manager’s testimony, most of the material is sent to another facility further east in Mexicali where it is treated and resold. Whether this material is kept in Mexico or sent to other countries was not clear. This particular scrap yard handles approximately twenty-tons of electronic related material per year. The site manager further explained that the amount of material handled is dependent upon the global price of material at any given time. This strengthens the argument that e-waste in its many forms is dependent upon the ever-changing flux of local and global economics.
The scrap collector demographic is split between workers trying to support themselves or additional family members and individuals scrapping due to drug addiction. Both types of scrap collectors live below the poverty line. The non-drug addicted scrappers I spoke with work an average of 5-7 days per week. Main health complaints from scrappers and collectors were related to respiratory function. Daily inhalation of dust along with toxic material can trigger such ailments. Some collectors knew about the health risks involved in disassembling electronics while others remained unaware. They do this work out of necessity regardless of the health risks. A slow violence aspect exists but is very difficult to detect within a brief timespan. More research is needed to properly evaluate a larger sample of individuals over a longer course of time.

Scrap yard employees earned around 1,000 pesos ($54.00) per week, like the informal scrap collector who earned an upper average of 200 pesos ($11.00) per day. This is roughly equivalent to $1.40 per hour. Those who had formal employment generally worked a five-day week while individuals operating independently had a 5-7-day work week. Those who are employed by a scrap yard or facility tend to have a regular steady income as opposed to the informal self-employed scrapper. In certain instances, it is possible for independent scrappers to make more than formal employed workers. However, they also have the potential to make significantly less than employed workers due to the instability of finding material to sell and variations in metal prices per pound.
The average education level of scrappers from both formal and informal sectors was between mid to full elementary equivalence. Though taken from a small sample of participants, this education level is typical of numerous poverty stricken individuals who become forced to leave school at an early age. Reasons vary but tend to be financially driven. This is a prime example of structural violence; the worker is denied access to education in exchange for basic survival. This ties directly into the economic survival methods forced upon the poor due to hopelessness and economic inequality. Survival is their modus operandi and without the option of higher education they are forced into a life of perpetual economic subjugation and constrained agency.\(^{45}\)

Drug addiction is a major problem in Tijuana. Addicts see scrap collecting as a means of income to support their habit. I visited an area within a three-block radius known for its heroin problem. Used syringes are scattered along the streets accompanied by the site of addicts lying on

sidewalks. Within this area there is one scrap facility frequented by addicts dropping off their daily collections. Drug addicted individuals gathered around a busy entrance to the facility. Some did not hesitate to inject heroin in open view of the public. Individuals were somewhat reluctant to be interviewed and generally confused about my presence. Observation and still photography was employed for data gathering purposes. Many individuals displayed signs of skin disease and irritations most likely brought on from life on the street or possibly HIV/AIDS infection. I witnessed one individual pull out a knife to cut lesions off his arm, leaving his body prone to further infection. In these instances, scrappers were most likely suffering from other ailments related to heroin addiction rather than maladies brought on from e-waste dismantling. The seriousness of drug related ailments is overshadowing the less obvious long-term effects of e-waste toxins being introduced into the blood stream. A sick individual is more prone to the effects of e-waste toxins than a healthy person. The e-waste is simply one of many contributing factors to their deteriorating health.

My fixer and I located more collection facilities where e-waste and metal scrap is sold near the La Gloria section of Tijuana. This isolated area is at a higher elevation within the hills and is prone to drug-sale activity. People seemed more reluctant to speak about daily activities but nonetheless I was able to gather more relevant data. Here I encountered scrappers who operate on a larger scale with trucks or other collection vehicles. They are only allowed to do so two-days per week due to local regulations. E-waste metal is mixed in with the overall metal stream. After inspecting collection dumpsters, I found computer tower frames and other electrical components made from metal. Everything that is not precious metal is incinerated. This method creates air contamination and overall environmental degradation. The scrapper brings in material by the truck load, sells to a scrap facility manager, who then sells to the government-run facilities. Information pertaining to the amount of material generated per year was not known by many scrap facility managers. All inquiries into the matter had to be directed towards government run offices who refused to speak with me. There are five recycling facilities in the Tijuana region which also handle material brought in from Los Cabos and other areas in Baja California. There was an obvious sense of fearfulness in relation to divulging information pertaining to governmental practices.
Since Mexico's 2015 switch from analog to digital systems a lot of material has become obsolete, such as satellite dishes and TVs. This material tends to become part of the overall metal waste stream. The Mexican government seems to be controlling most of the e-waste through state-run facilities, while using scrap yards as intermediaries. A prime example of this was uncovered after visiting the Autonomous University of Baja California (UABC). A university representative identified a company called Global Electronics Recycling (GER) that operates a collection location on campus in conjunction with the school. The average amount collected annually is approximately eleven-tons. It was not specified how often GER collects donated material but the last pick up was on April 20th, 2016. The amount has been increasing with each pick up for the past six years. This material is and continues to be recycled and sold as scrap. The drop off is open to businesses as well as consumers. The University does not financially profit from this in any way. GER, on the other hand, like all the other recycling companies of its kind, does profit. My
fixer and I contacted a representative from GER via phone who was willing to meet with us but due to business travel was not in the area. I attempted to email questions to this person but never received a response.

According to a UABC representative, the 2015 switch to digital systems was mentioned as a main contributing factor to the general increase of e-waste on Mexican streets. This further strengthens the argument that obsolete electronics are increasing not only within the United States but also in Mexico. One key factor to point out was that after the switch to digital communications the government didn’t immediately create a collection plan for the increased amounts of e-waste that would be thrown into the waste stream. Thus, many companies like GER were given permission to aid in the collection of e-waste. The Mexican government also orchestrated e-waste collection events in hopes of gathering more material. This further exemplifies how both private and governmental sectors are profiting from e-waste.

Image 14: Example of discarded obsolete satellite dishes in Tijuana due to the nation-wide digital transition. Photo by Michael Hicks.
Refurbishing Sector

There is a large sector of commerce devoted to electronic refurbishing within Tijuana. My findings indicate that the younger generation places more importance on technologies such as computers and cell phones whereas the previous generation of refurbishers places more emphasis on stereo/audio type equipment. The younger generation ranges in age from 15-30 years old. This was blatantly obvious after visiting a location called the Plaza de la Tecnología (Mall of Technology). This mall is located in the middle of busy downtown Tijuana. The building is equipped with its own garage system and private security. I was given formal clearance to interview and photograph there. Upon entering via an escalator system one begins to realize how technological modernity has become a valuable commodity within Mexican society. The mall radiates with activity as mostly younger people buy, sell, and refurbish technological equipment. Items include cell phones, tablets, related accessories, laptops and desktop computers. The floor plan is broken up into a labyrinth of individual kiosks, each providing a special service. Most Mexican consumers replace or upgrade existing electronics as opposed to buying new devices. This model mainly stems from limited economic means but also speaks volumes about the observed pragmatic mentality of Mexican consumers.
Image 15: Interior of The Plaza de la Tecnología in Tijuana. Photo by Michael Hicks.

Image 16: Cell phone refurbishing kiosk at the Plaza de la Tecnología in Tijuana. Photo by Michael Hicks.
I visited an electronics repair shop on the corner of a lonely block outside the downtown section of Tijuana. This family-run shop has remained in business for fifty-six years, according to the seventy-seven-year-old owner. Throughout the years this small business provided the necessary economic means for the owner to formally educate himself and send his children to college, while also teaching them a practical skill set. This type of skill helped them escape the traps of poverty while providing a valuable service to Mexican consumers. The shop specializes in repairing an array of electronics ranging from computers, tablets, stereos, speakers, amplifiers, etc. Over the years they have amassed a library of electronic components organized on shelving units that stretch through a maze of back rooms and storage areas.

*Image 17: Back room of a repair shop housing computer components used for refurbishing electronics in Tijuana. Photo by Michael Hicks.*

The owner explained that Tijuana has always had second hand electronics due to its proximity to the United States. This made it easier to acquire supplies either within Tijuana or
across the U.S. border. He also buys parts from Singapore and China via the internet. Besides being a newer technology specialist, the owner is also a much sought after repairer of antique radios. This nuanced specialty has given him the opportunity to expand his client base outside of Tijuana. He further explained that without higher education in Mexico it is extremely difficult to attain financial security. Based on his experience in the refurbishing and repair business he believes most Mexicans would rather repair an existing electronic device rather than buy a new one unless the cost for repair outweighs the price of a newer item. He described how plasma and CRT televisions have become prime examples of discarded e-waste even though analog to digital convertors exist. Some choose this option rather than buying new TVs. The owner remarked how a large generation gap exists in Tijuana between older and younger refurbishers. This strengthens my argument that generational dividers exist within the refurbishing sector. He himself is an exception, but has worked for years mastering the craft of computer repair and kept up with current trends to sustain his business. His sons have also contributed to his understanding of newer models and advancements. They began this type of training in the late 1980s and remained ahead of the curve since.
Another block of garage style storefronts nestled on a hilly street away from downtown Tijuana showcased numerous audio electronic secondary markets. This sector of business relies heavily on a steady supply of used electronics. Most of these products originated in the United States and are sold to store owners via street collectors and scrappers. Some are refurbished while other functional items are sold as is. These store fronts operate on a seven-day work schedule. Some products are brought in from the same scrap yards previously mentioned. Quantities of electronic material sold to these businesses vary. Owners refuse to buy older CRT televisions from scrappers due to the 2015 switch to digital signals. One interviewee described how most scrappers take apart the older products for rare metals only after they have exhausted the possibility of selling it outright. None of the store front workers disassemble electronic material for scrap as they generally regard this as a lower job for poorer individuals. This points to a hierarchal system operating between each sector of e-waste commerce.
There is also a large demand for appliance collection and refurbishing. These secondary appliance markets create much needed jobs for Mexican workers. Businesses scattered throughout Tijuana that specialize in appliance repair also depend on scrap collectors to bring in discarded material such as microwaves, stoves, washing machines, and dryers. Components for these parts are also collected and sold to businesses that then use those parts for refurbishing. The cost to buy a refurbished appliance is significantly less than a new model.
The jobs created due to e-waste in Tijuana can arguably be classified as a necessary evil for basic economic survival. Too many individuals rely on this material for its collection and selling to be banned outright. As Mexico becomes more economically developed the potential for e-waste streams causing environmental and health damage will also increase. Mexico's environmental protection system may not be able to keep up with increasing e-waste streams. Regulation and enforcement of hazardous waste management policy is stricter in the United States compared to Mexico. I would argue that the refurbishing sector is stronger in Tijuana than San Diego. This speaks more to the throw away culture embraced by American society. However, the distribution of wealth has widened in the United States, causing consumers to become more conscious of their electronic purchases. This has not slowed the current capitalist model of fueling the economy with constantly upgradable devices. These devices are feverishly sought after by Americans who believe their place in society is dependent upon the ability to keep up with
technological advances, no matter how insignificant they may be. This also occurs in Mexico but on a much smaller scale. Both the United States and Mexico operate around similar models of interconnected internal commerce. The larger recycling firms tend to gain the most profits while the sectors beneath do all the labor. Clearly, neoliberalism’s impact on free-trade has played a significant role in the foundation of both countries’ e-waste economies.
Chapter Two: Data Analysis in Relation to Geopolitics

The two main issues relating e-waste to geopolitics between the United States and Mexico are drug violence and the North American Free Trade Agreement (NAFTA). The e-waste issue is viewed as a less immediate problem when juxtaposed to these two highly studied and visible issues affecting both the United States and Mexico. The global electronics industry generally has close relations with governments but manages to resist regulation whenever possible. This lack of regulation in the electronics industry has allowed e-waste to spread without much accountability. Looking at the e-waste issue from a geopolitical perspective allows those responsible to be brought to light. Unfortunately, we begin to see that responsibility encompasses a vast network made up of consumers, manufacturers, economies, and governmental policies. Connections of this sort lay the groundwork for globalization and economic development projects but can also cause harm to nations not yet able to sustain the necessary infrastructure involved with development. Sufficient infrastructure should include a governing body designed to regulate and enforce environmental protection, facilities operating in accordance with environmental and labor safety standards, and financial institutions to allocate necessary project funding. Modern society changes with the pace of its technology making it hard to pinpoint low-visibility violence perpetrated by what are thought to be innocuous products. The structural violence brought on by consumerism and e-waste does exist in Mexico but becomes overshadowed by more severe problems.

Visible vs. Non-visible Violence

When discussing violence in Mexico it is impossible to ignore highly visible narcoterrorism activity. The three main border regions associated with violent drug-related activity

are in the vicinities of San Diego/Tijuana, Tucson/Nogales, and El Paso/Ciudad Juárez. For this analysis, I will remain focused on the San Diego/Tijuana border region. The visibility of drug-related violence is overshadowing the less immediate concerns of slow or structural violence and pollution brought on by industrialization.\footnote{Id.} E-waste becomes a quality of life issue rather than a detrimental environmental and biological health risk when juxtaposed with homicide, assault, rape, torture, and kidnapping. I will briefly discuss the role of visible violence in relation to slow violence within Tijuana. Recent crime statistics for Tijuana will be analyzed in relation to political authority.

Historically speaking, violence in Mexico has gone through periods of fluctuation. Drug trafficking within North America began in 1914 because of American legislature banning the free-trade of narcotics such as opium, heroin, and cocaine.\footnote{David Shirk & Joel Wallman, “Understanding Mexico’s Drug Violence,” \textit{Journal of Conflict Resolution} Vol. 59, 8. (2015): 1356.} Documented violence dropped after the 1910 revolution, until post-revolutionary political violence erupted during the 1920s and 30s.\footnote{Shirk & Wallman, “Understanding Mexico’s Drug Violence,” 1348.} The 1960s and 70s saw increased state orchestrated violence against leftist guerrillas in what became known as Mexico’s Dirty War.\footnote{Jorge Mendoza Garcia, “Reconstructing the Collective Memory of Mexico’s Dirty War: Ideologization, Clandestine Detention, and Torture,” \textit{Latin American Perspectives} 43, 6. (2016): 126-27.} Violence abruptly increased in the 1980s due to the destabilization of Colombian drug cartels. The “war on drugs” campaign led by the United States and Colombian governments predominately focused on removing Pablo Escobar from power. This destabilization process led smaller drug trafficking groups in Mexico to start battling for territorial control of key areas such as Tijuana. Country-wide homicide rates in Mexico dropped in 1995
from 16.9 per 100,000 to 8.1 per 100,00 in 2007 until drastically increasing in 2008, which resulting in an estimated 60,000-70,000 killings nation-wide since.  

2015 saw the highest homicide rate on record in Tijuana according to the Overseas Security Advisor Council (OSAC), created by the United States Department of State Bureau of Diplomatic Security. There were 670 known homicides in 2015, an increase of 45 percent compared to 2014, mainly perpetrated by Transnational Criminal Organizations (TCOs) connected to the Sinaloa Cartel. The Sinaloa Cartel is locked into power struggles with rival trafficker organizations such as Nueva Generación. Prior to this current territorial conflict, the Arellano Félix Organization (AFO, Tijuana Cartel) was forced out of power by the Sinaloa Cartel between 2007 and 2010. Violence in the region is exacerbated by these types of power struggles and further induced by dismantling corrupt officials within the Mexican government. The U.S.-led “war on drugs” plays a key role in establishing order or sometimes stirring up chaos pertaining to the handling of warring drug factions.

According to OSAC reports, Tijuana’s current overall crime rating is critical with a high possibility of increased political violence in reaction to TCO violence. These statistics in relation to political order, fall into crime frequency evaluations described by (Durán-Martínez 2015), in which variables between state security cohesion and drug trade competition determine the amount

of visible violence. Studies pertaining to illegal drug trades have focused on economics, international policy, and structural/socioeconomic effects. These same societal components have similarities to how the e-waste industry functions. For example, socioeconomic aspects in Mexico create the necessity for selling drugs or collecting e-waste as a means of survival. Both are destructive to an individual over time and produce further harm from structural effects felt by those with personal connections to the drug dealer or e-waste collector.

Drug addicted individuals make up a demographic portion of scrap collectors in Tijuana. Their health risks are exacerbated by the combination of drug use and e-waste scrapping. Because the e-waste accumulations are less visible than the drug problem it is easily seen by most policy makers as a minor concern. The main concerns for e-waste in Mexico should be analyzed from a long-term perspective. Massive amounts of obsolete electronics are constantly being discarded and exponentially growing in numbers. Like most developing countries, Mexico needs a localized infrastructure to deal with the ever-growing strain of e-waste streams. Though the refurbishing sector is strong, it cannot sustain this type of constant growth pattern. In all likelihood, Mexico is adopting the strategies used by the United States in relation to exporting excess e-waste to other developing countries. Material that is not sold on secondary Mexican markets either ends up in landfills/incinerators or is exported. This may seem like a viable solution for Mexico, but it continues the cycle of exporting toxic material to other parts of the world.

**Geopolitical Forces in Relation to “Homo Sacer/Bare Life” and Meta-Frontiers**

A series of key processes tied to geopolitical relations with the United States can help explain Mexico’s current economic climate. The Bracero Program was established by the United

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States in 1942 as a foreign worker program that employed millions of Mexican agricultural laborers until its abolition in 1964.\textsuperscript{58} During 1965, the Mexican government started the Border Industrialization Program in response to massive unemployment.\textsuperscript{59} Though relatively ineffective throughout the 1970s, the Border Industrialization Program did open up domestic Mexican markets previously closed off to foreign investors.\textsuperscript{60} The 1980’s ushered in an economic plan to decrease high tariffs on electronic components assembled in Mexico and sold in the United States.\textsuperscript{61} U.S. manufacturing companies quickly took advantage of this new frontier of free-trade and deregulation to maximize profits for U.S.-based electronics companies. On January 1\textsuperscript{st}, 1994, the North American Free Trade Agreement (NAFTA) went into effect. NAFTA created a future of tariff reductions, deregulation, privatization, and reductions in consumer subsidies thought to be beneficial to a developing country such as Mexico.\textsuperscript{62} The following day a group of indigenous farmers calling themselves Zapatistas declared war on the Mexican administration.\textsuperscript{63} It was clear that Mexico’s plan for economic liberalization would not come without consequences to the natural environment and human well-being. Economists have argued that trade liberalization and

\textsuperscript{58} Joan B. Anderson and James Gerber, \textit{Fifty Years of Change On the U.S.-Mexico Border: Growth Development, and Quality of Life} (The University of Texas Press, 2008). 3.

\textsuperscript{59} Anderson and Gerber, \textit{Fifty Years of Change On the U.S.-Mexico Border: Growth Development, and Quality of Life}, 3.

\textsuperscript{60} Anderson and Gerber, \textit{Fifty Years of Change On the U.S.-Mexico Border: Growth Development, and Quality of Life}, 3, 4.


\textsuperscript{63} Chomsky, \textit{Profits Over People: Neoliberalism and Global Order}, 122.
technological change had worsened economic inequality and decreased income for most Mexican workers. As seen in many maquiladoras studies, the tendency for larger multinational electronics companies is to take advantage of border regions, set up factories, pay low wages, offer little safety training, and hire supervisors who exploit worker fears.

As of 2013 it was estimated that within the next twenty years $12-20 billion dollars will be needed to invest in sustainable environmental infrastructure near the U.S.-Mexico border. Upon signing NAFTA into law former President Bill Clinton of the United States attached two supplements to the trade agreement, the North American Agreement on Labor Cooperation (NAALC) and the North American Agreement on Environmental Cooperation (NAAEC). Both were designed to mimic the active policies of the United States and Canada in relation to labor and environment. Mexico was expected to comply with these policies in the following years. Both policies can be analyzed in relation to homo sacer/bare life and meta-frontiers.

**Homo Sacer/Bare Life**

The North American Agreement on Labor Cooperation (NAALC) was designed to provide oversight of the mechanisms involved in enforcing labor laws pertaining to companies using

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NAFTA for transnational trade with the United States, Canada, and Mexico. This policy has done little to protect against the exploitation of Mexican workers and unfair labor practices, especially in maquiladora regions along the border. Under the NAALC workers have the right to organize, strike, protest unfair minimum wage, and collect injury compensation. However, due to the fear of losing their jobs, workers are often harshly discouraged from demanding better working conditions. Without representation it becomes futile for the poverty-stricken worker to navigate the overwhelming bureaucracy of the justice system. Many e-waste/scrap collectors live on the fringe of Mexican society, which discourages them from attaining legal representation.

Agamben’s concept of a “homo sacer/bare-life” individual comes into focus when analyzing marginalized individuals in Mexico due to deregulated industrialization. E-waste workers move away from this theoretical concept and into reality. Like the agrarian Zapatistas before them, the e-waste workers would also fall under the category of homo sacer. E-waste collectors are cast from society because of economic forces while at the same time they remain a necessary cog in the infrastructure of Mexico’s secondary electronics and refurbishing economy. Hence, the e-waste worker sacrifices his/her health while remaining on the fringe of Mexican society without protection from the state. This lack of protection echoes the original Roman homo sacer’s plight as a person able to be killed but not sacrificed in religious ritual. The homo sacer individual remains essential to a small portion of the country’s economy while being looked over

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70 Id.

by any form of welfare system. Over half of Mexico’s population lives under the poverty line, much of this demographic live on $2.00 or less per day, and 63 percent of the entire population lacks even basic healthcare coverage.\(^7\)

While interviewing e-waste collectors it became obvious that they felt abandoned by Mexican society. They exist in a world all their own in which self-reliance is the only assurance they have for survival. The informal scrap collector has the potential to earn around $11.00 per day but with a high level of inconsistency. These individuals generally fall into the poverty demographic of $2.00 or less per day when collection is slow. The variations in metal prices must also be considered when determining the overall collection value on any particular day. Sick individuals are further marginalized because they lack socialized healthcare. Drug addicted individuals who collect e-waste are literally dying from the mixture of untreated medical conditions and exposure to harmful toxins.

The paradox to examine is that secondary market businesses need the informal collectors to maintain a profit. Most of these businesses are also self-reliant and have no means to offer help to informal collectors. In addition, the state-run recycling facilities profit from e-waste and other scrap collectors yet the state does nothing to improve worker wellness. In most situations, each tier of e-waste collection is conducted out of a bare life survival model. The NAACL in terms of geopolitical relevance has done little to help the marginalized individual. It has however, allowed an influx of e-waste to be discarded in the Tijuana region. This perpetuates the cycle of poverty and does little to improve the lives of individuals struggling for survival. The only foreseeable way out of poverty for numerous Mexican citizens is for their government to start investing more in educational opportunities and less on free-trade agreements. Without higher education,

socioeconomic inequality will continue to erode the fabric of any potential middle-class development in Mexico.

**Meta-frontiers**

I describe areas at risk or in the process of becoming polluted by e-waste as meta-frontiers. This concept can also apply to areas such as Agbogbloshi, Ghana or Guiyu, China, which are both overrun by e-waste pollution. These areas may not have the same qualities as past frontiers such as exploitable resources or arable land. Meta-frontiers usually arise in areas deemed unwanted or unused by governments and individual land ownership. However, they tend to be surrounded or near areas of habitation. The destructive forces of meta-frontier pollution can leach into surrounding ground water, air quality, and food sources. They are created due to the inner workings of economic policy and geopolitical relations. Tijuana is a prime example of how and why local government, secondary electronics market, and informal recyclers knowingly or unknowingly work together to create the conditions for meta-frontiers to form.

The main issue regarding the NAAEC policy was that Mexico’s infrastructure was not able to function at the same level as the United States and Canada. This fact is relevant by comparing the governing structures of Mexico and the United States. Though both countries operate around federalism, Mexico’s governing dynamics are more centralized which causes fewer resource allocation to state and local tiers. The United States, while having a centralized government, also places significant power in each individual State and provides the allocation of funding to areas that need more assistance. Federalism in Mexico continuously ran the risk of creating fiscal deficits

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73 Id.

as opposed to the U.S. strategy of blocking states from running up deficits. Without proper funding for environmental clean-up most polluted areas remain stagnant or run the risk of further contamination.

The ability for developed countries to legally dump hazardous waste in developing countries was a major concern near the U.S.-Mexico border especially after the implementation of NAFTA. Data shows that ten years after NAFTA went into effect air pollution grew by 97 percent, Mexican government spending on the environment dropped by 45 percent, and environmental degradation has cost Mexico $36 billion dollars annually. How could this have happened? One provision in NAFTA states that hazardous material originating in the United States but used for industry in Mexico must be repatriated to the United States after use. This was a responsible safeguard put in place to protect Mexico until its environmental protection infrastructure reached a respectable standard. The Environmental Protection Agency (EPA) set up a hazardous waste tracking system to ensure this policy would be upheld but receded the programs necessary funding. This failure of policy resulted in a massive amount of hazardous material to be continuously dumped within Mexico. The La Paz Agreement was designed to safeguard border regions and guarantee that hazardous material manufactured in maquiladoras would be sent back to its country of origin. Sadly, this policy was never actualized and hazardous material, including e-waste, continues to plague Mexico’s environment.

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75 Fukuyama, *Do Defective Institutions Explain the Development Gap between the United States and Latin America?*, 211.


Tracking hazardous material is an essential first step in the alleviation of e-waste exports. The grassroots organization Basil Action Network (BAN) and the Massachusetts Institute of Technology tested a new strategy for tracking e-waste leaving the United States. They placed GPS tracking devices in a small percentage of donated electronics.\textsuperscript{79} This method gave those outside the U.S. government a visual means of tracking the flow of e-waste. Tracking data showed that around one-third of donated e-waste was sent overseas and to Mexico.\textsuperscript{80} Methods such as the above example produce critical data to otherwise surreptitious flows of e-waste. The tracking of e-waste would be much better suited for organizations such as BAN to standardize rather than relying on for-profit companies or governments to do so. At the current moment e-waste management systems, do not match the complexity of human cultural systems, which emphasize the inclusion of technology into daily life.\textsuperscript{81} This is of course further exacerbated by current trends in technological consumerism. For a truly sustainable ecosystem, humans need some form of balance between the number of products produced and discarded e-waste material.


Conclusion

My findings conclude that non-refurbishable e-waste originating in San Diego is being exported to other countries. It remains difficult to determine how much e-waste originating in San Diego is sent to Mexico. E-waste originating in Tijuana is first circulated through secondary markets and the remainder is sold as scrap, which is later exported to foreign countries. Whether e-waste that originated in Tijuana is being shipped to Central American countries remains speculative and deserves further investigation. The United States and Mexico use e-waste as a framework for profitability that spreads among a multitude of local sectors. This thesis unraveled the interconnectedness of those local sectors while also analyzing the aspects that make them function. These aspects and dimensions include geopolitical relations, economic policy, environmental policy, and slow/structural violence analysis. The societal process of speed mixed with constantly upgradable electronics are certainly adding to the e-waste problem. Understanding how the e-waste industry functions allows for the problems it creates to be addressed and eventually resolved. Consumerism is an essential marketing tool for electronics companies. The relationship between consumers and the electronics industry is distressing due to the amount of waste produced. Similarly, the informal e-waste worker and the secondary markets are interdependent. The sustainability movement fuels non-profit collection, while the for-profit e-waste recyclers sell what remains. All sectors involved influence a symbiotic reliance on one another. Taking one sector away might cause this complex system to collapse.

The collected data from my fieldwork adds pertinent information to e-waste studies and border region analysis. I would urge anthropologists examining the structural effects of development to further investigate the e-waste issue. E-waste has relevant ties to development studies because it provides direct evidence of how geopolitical commerce, overconsumption, and
poverty are connected. I believe E-waste can be a catalyst for the use of biopower by governing forces. The subjugation of sovereign bodies is orchestrated by the biopolitical power of multinational corporations embedding themselves within developing countries and their governments.\(^{82}\)

I’ve classified informal e-waste workers as homo sacer/bare life individuals to show, in part, how history often repeats itself.\(^{83}\) The concept stems from ancient times were individuals were broken down to nothing but their bare life.\(^{84}\) Centuries later poverty and marginalization continue to plague society. Constrained agency of the marginalized is exacerbated by ever-growing elitism. My hope is that the marginalized subjects in this study will be further discussed in anthropological discourse.\(^{85}\) To alleviate e-waste worker marginalization attention should be focused on the invisible, yet present, aspects affecting them, such as toxic exposure and poverty. Rob Nixon’s concept of slow violence is a helpful tool to expose the undiagnosed health issues informal e-waste workers suffer from.\(^{86}\) Medical anthropologists can use these findings as a starting point for gathering a larger sample of e-waste workers along the U.S.-Mexico border. The ideal scenario would involve creating some form of healthcare assistance to e-waste and scrap collectors working in Tijuana. Field research in Ghana by E. F. Amankwaa illustrates the effectiveness of taking blood and urine samples from e-waste workers to determine toxin exposure.

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\(^{83}\) Agamben’s concept of homo sacer/bare life was adopted from ancient times during the Roman Empire.

\(^{84}\) Agamben, *Homo Sacer: Sovereign Power and Bare Life*, 1998.

\(^{85}\) Id.

\(^{86}\) Id.
levels and detect lead poisoning.\textsuperscript{87} This same method can be used in maquiladora studies to help protect factory workers in danger of toxic exposure by the computer industry.

My meta-frontier concept can be applied to further environmental studies were toxic material has impacted land, food, water, and human biology. The slow violence caused by e-waste in Mexico could increase over time. Legal anthropologists can contribute by exposing the loopholes that exist within many international/national laws, treaties, and conventions pertaining to e-waste import/export practices. I have outlined many avenues of approach for further policy analysis pertaining to various institutions such as the United Nations, the International Monetary Fund, the World Trade Organization, and the Environmental Protection Agency.

Setting up NGOs such as C2SDK in every U.S. city could help bridge the digital divide in American society while also providing a valuable service to local businesses and consumers. Opening facilities like the USD Electronics Recycling Center on more college campuses would be beneficial in promoting sustainability. In addition, the United States government should allocate funding to construct e-waste collection and recycling facilities in municipalities with pre-existing solid-waste facilities. This would enable residents to easily recycle electronics as they would plastic, metal, and paper. This would also decelerate the amount of e-waste being dumped in developing countries. Another option is to generate funding for developing countries most in need of e-waste facilities. It is crucial that these facilities do not become susceptible to corruption and unfair labor practices. Labor practices to avoid are: discrimination based on age, gender, ethnicity, health, and education level. These types of facilities should remain void of outside foreign multinational influence and operate under each country’s sovereign jurisdiction.

\textsuperscript{87} Amankwaa, “E-waste Livelihoods, Environment and Health Risks: Unpacking the Connections in Ghana,” 11.
In conclusion, the end goal is to develop effective e-waste management solutions without further marginalization of the poor. Bridging the digital divide is crucial for individuals striving to transcend the oppressive limitations of poverty. Technology provides the necessary tools to navigate modern society but can also inflict great harm when the consequences of overconsumption are not understood. Public campaigns for e-waste awareness and management should be readily available, especially in Global North countries. The e-waste industry and local government must be involved in this process. To alienate any of these interconnected industries and institutions would create more tension between all. A pragmatic solution can be reached through a combined effort of electronics manufacturers, policy makers, and laborers.
**Glossary of Acronyms:**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>BAN</td>
<td>Basil Action Network</td>
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<tr>
<td>BFRs</td>
<td>Brominated-flame retardants</td>
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<td>C2SDK</td>
<td>Computers 2 San Diego Kids</td>
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<tr>
<td>CEPS</td>
<td>Customs Excise and Preventive Services</td>
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<td>CITI</td>
<td>Collaborative Institutional Training Initiative</td>
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<td>CRT</td>
<td>Cathode ray tube</td>
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<tr>
<td>DART</td>
<td>Department of Anthropology Research and Training</td>
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<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
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<tr>
<td>E-waste</td>
<td>Electronic waste</td>
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<tr>
<td>GER</td>
<td>Global Electronics Recycling</td>
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<tr>
<td>ICESCR</td>
<td>International Covenant on Economic, Social, and Cultural Rights</td>
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<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<tr>
<td>IMS</td>
<td>Industrial Metal and Salvage</td>
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<tr>
<td>LCD</td>
<td>Liquid crystal display</td>
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<tr>
<td>NAAEC</td>
<td>North American Agreement on Environmental Cooperation</td>
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<tr>
<td>NAALC</td>
<td>North American Agreement on Labor Cooperation</td>
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<tr>
<td>NAFTA</td>
<td>North American Free Trade Agreement</td>
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<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
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<tr>
<td>OSAC</td>
<td>Overseas Security Advisor Council</td>
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<tr>
<td>PVC</td>
<td>Polyvinyl chloride plastics</td>
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<tr>
<td>R2</td>
<td>Responsible Recycling Practices Standard</td>
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<tr>
<td>RCRA</td>
<td>Resource Conservation and Recovery Act</td>
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<tr>
<td>SEC</td>
<td>Secure Electronics Solutions</td>
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<tr>
<td>TCOs</td>
<td>Transnational Criminal Organizations</td>
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<tr>
<td>UABC</td>
<td>University Autonomous of Baja California</td>
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<tr>
<td>U.N.</td>
<td>The United Nations</td>
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<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<tr>
<td>UNICOR</td>
<td>Trade name for Federal Prison Industries, Inc.</td>
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<tr>
<td>USD ERC</td>
<td>The University of San Diego Electronics Recycling Center</td>
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<tr>
<td>WB</td>
<td>World Bank</td>
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<tr>
<td>WTO</td>
<td>World Trade Organization</td>
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