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A MODEL IN WAITING: HOW LINCOLN NEBRASKA COULD BE THE IDEAL CITY FOR RECYCLING PROGRESSIVISM

Caleb Greenfield

University of Nebraska-Lincoln

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A MODEL IN WAITING:
HOW LINCOLN NEBRASKA COULD BE THE IDEAL CITY FOR RECYCLING
PROGRESSIVISM

By

Caleb Greenfield

AN UNDERGRADUATE THESIS

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Abstract:

Lincoln Nebraska currently has a recycling diversion rate of only 18.4% lagging far behind the national average of 34% and alarmingly low when compared to San Francisco, California with a rate of 80%. This study was to determine the forces that propelled California and San Francisco to the highest diversions rates in the nation from a policy, waste collection process and management standpoint. Then look at what forces there are in Lincoln, Nebraska and what could be done to improve its diversion successfully. This study was conducted primarily through the literature review process.

The results were that California was not a model of recycling perfection as recent as 20 years ago, what propelled them was diversion goals mandated in their modernizing of waste management policies. While Lincoln and Nebraska set no goals with their waste management changes. Lincoln however is still poised to make rapid gains in diversion; successful yard waste organics diversion shows the public is able to divert waste, while an estimated 24% of households are currently paying for private curbside recycling programs, with many companies showing interest in growing and expanding.

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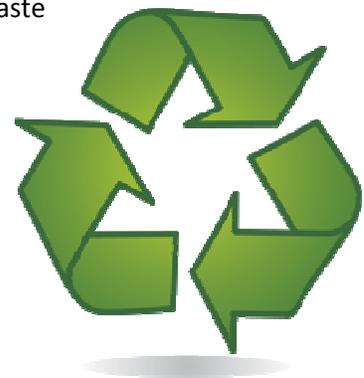
Introduction

Currently the Environmental Protection Agency (EPA) estimates the Municipal Solid Waste (MSW) diversion rate, the amount of trash that does not end up in traditional landfills or incinerators and is intended for recycling, at 34% nationally (EPA, 2012). Lincoln Nebraska touts a diversion rate of a mere 18.4% (Solid Waste Plan 2040, 2012), well below the national average and alarmingly low when compared to many other cities. The rate is low due to many factors but the primary is that there is very little policy adding incentives or mandating that citizens or waste haulers recycle. In recent years it is common to see the city of Lincoln near the top of most rankings when it comes to well being, happiness, fitness and many others; yet, while the city is thriving, it continues to rely on mid-20th century policy when it comes to how it handles its MSW. There is no better time to instate progressive recycling policy than during today's local economic success. This thesis is intended to show that with proper progressive recycling policy coupled with the current situation in Lincoln it stands to become a national leader in recycling.

History of Recycling:

Recycling has been performed in some way throughout human history; but, modern residential based recycling did not come about until the Green or Environmental movement in the late 1960's and 1970's, when it took foothold in the public psyche. Concerns with rising and somewhat unstable energy costs coupled with increases in the price of raw materials and an increase in public awareness of pollution issues began to force the average person to look at their own waste and what could be done about it.

This is the time in which Gary Anderson (Nebraska Native) designed a symbol as a submission to the Container Corporation of



America to help raise environmental awareness in the days leading up to the first Earth Day. Today, one of the most widely recognizable symbols in the world, the three arrows forming a never ending mobius strip is now graced upon nearly every product available stating its ability to be recycled.

Federal Laws:

At the Federal level the Environmental Protection Agency (EPA), the governing body of Municipal Solid Waste (MSW), does not require that states/cities to recycle. This leaves the responsibility at the state and local level. With a lack of national laws, and no ability to make them, all the EPA can do is publish information, provide technical support, educational materials, and some grants. The EPA does, however, encourage recycling with incremental goals and waste reduction. To assist the state and local level of regulation the EPA also has a guide book, Measuring Recycling: A Guide for State and Local Governments (EPA, 1997), that helps municipalities with questions they may have about setting up, operating, and measuring the effectiveness of a city-level recycling program.

Federal laws include the Solid Waste Disposal Act of 1965 (SWDA) that was later amended by the Resource Conservation and Recovery Act of 1976 (RCRA). These Acts define exactly what waste is and classify it in to different categories, e.g. hazardous or municipal solid waste (MSW). RCRA is to ensure proper management of hazardous waste generation to final disposal, accurately thought of as a cradle to grave law. SWDA primarily ended open air landfill burning. It also regulates how facilities are designed and managed to prevent future problems (e.g. superfund sites). Beyond this these acts are very vague and do nothing more than spell out the views of the general public, such that less waste and proper disposal is the ideal and recycling that waste is even better.

There are several federal level laws that are related specifically to recycling, in that they force proper disposal, but are relatively specific to individual products or contaminants. One such law is the Mercury-Containing and Rechargeable Battery Management Act (1996), commonly referred to as the

Battery Act. This is primarily directed at the manufacturers of batteries, aiming to keep batteries that contain harmful pollutants out of landfills, standardizing labeling, phasing out mercury, and education (MERCURY-CONTAINING BATTERY MANAGEMENT ACT, 1996). This Act still relies on consumers to be knowledgeable about the products they buy and then do the proper thing when disposing of them. Most major retailers like Wal-Mart and Best Buy have large green cardboard bins upon entering the store that are for such products and are ultimately a result of this act. The Battery Act also leaves the development of an actual recycling system up to the states, and imposes no penalty upon consumers for improper disposal; arguably causing it to fall short of its intended purpose (Wikipedia, 2012).

Other States Laws:

Most states have some laws that could be considered “recycling laws.” These, most commonly, are to ensure proper disposal of specific products, or to keep them out of inadequate landfills/incinerators. Most common of these are: Waste oil, white goods (refrigerators, washers, and dryers), automobiles, whole tires, wet paint, and materials that contain hazardous waste like asbestos.

Some of the earliest recycling laws arose in the 1970s; many of these laws were container-recycling incentives. These so called “Bottle Bills” required that a consumer pay a deposit on each bottle that they bought, typically five to ten cents, but upon return of these bottles to a participating redemption location (often where they were bought in the first place) the customer receives this deposit back. This financial incentive ensures that a high percentage of bottles are returned, usually in the 70-95% range, the average being 76%, compared with a rate of just 24% in states without deposit legislation. Michigan, with a higher deposit



of \$0.10, enjoys the highest redemption rate at 97% (Wright, 2012). Once collected, the bottles can be washed and reused as in the past or recycled as raw material to possibly make containers again.

Currently, though, only 10 states have bottle laws; the oldest including Oregon and Vermont dating back to the early 1970s and the more recent, Hawaii's, enacted in 2005 (Bottle Bill Resource Guide).

California Laws:

California is considered the national leader in recycling; several main pieces of legislation guide recycling and help set it apart. AB 2020, California Beverage Container Recycling and Litter Reduction Act of 1986, is simply California's "Bottle Bill." Its goal was to encourage recycling and reduce litter; wanting an 80% recycling rate of containers covered by the bill. Since implementation, recycling rates on containers have increased significantly, from 52% in 1988 to 82% in 2011 (Bottle Bill Resource Guide). From 2006 to 2011, California went from recycling 13 billion containers per year to 16.7 billion containers per year. The increase of 3.7 billion containers per year accounts for 1.7% of the nation's 224 billion containers that are sold annually (Bottle Bill Resource Guide).

AB 939, California Integrated Waste Management Act of 1989, came at a time when only 10% of waste was being diverted statewide. This act made available grants and loans to develop a recycling industry as well as encouraged new markets for recycled goods. It also cleaned up polluted sites, regulated landfills and promoted environmentally friendly ways of handling waste oil and electronic and medical waste. The law went a step further and mandated a 50% diversion rate by 2000, which was achieved and then surpassed by 2005.

AB 341, the California Commercial Recycling Law 2011, requires all commercial properties, schools, colleges and apartment buildings (five or more units) to recycle. It amended AB 939 and set the new goal of statewide diversion at 75%.

With the Electronic Waste Recycling Act of 2003 consumers pay a fee to the state when they purchase electronics covered by the law. This money is used to make payments to companies that collect and dispose of the items in a way that is “environmentally sound” to the state. This type of program is commonly referred to as an extended producer responsibility take back program.

The Rigid Plastic Packaging Container Law 1991 (RPPC) requires manufacturers of products sold in RPPC's to ensure that they meet at least one of several product specific criteria that follow the three R's of reduce, reuse, or recycle. Ways that manufactures can comply with this law include: Post consumer material content of at least 25%, source reduction/concentration of 10% or greater, containers regularly reused/refilled at least five times, a product specific recycling rate of 45%, and other case by case alternatives available

Nebraska Laws:

The state of Nebraska has passed several laws similar to RCRA and SWMA. One of the first was the Litter Reduction and Recycling Act (1979), which passed to fund programs to reduce, clean up, and recycle litter to conserve natural resources. More modern examples include LB163, the Waste Reduction and Recycling Incentive Grants Bill (1990), and LB1257, the Integrated Solid Waste Management Act (1992).

The Waste Reduction and Recycling Incentive Grants Bill forced the Nebraska Department of Environmental Control (NDEC) to develop a comprehensive Solid Waste Management (SWM) plan. It then goes further and sets up a grant program for local SWM programs. Some of the intended uses for these grants are to: Set up recycling and waste reduction programs, composting, technical assistance, modernizing disposal sites, household hazardous waste management programs, and to help find and develop markets for recyclables. In addition, it charges a one dollar fee on every new tire sold in the

state and a \$25 or \$50, based on size, to retailers of tires; proceeds go to the fund municipal waste reduction and recycling programs. This bill does not set a diversion goal.

The Integrated Solid Waste Management Act imposes a \$1.25 per ton tipping fee that goes to the NDEQ, which allots 50% to go to the Waste Reduction and Recycling Incentive Fund. It also banned the land filling of leaves and grass clippings by 1994 and lead-acid batteries, whole tires, and waste oil by 1995. Once again, this act did not impose a diversion goal.

Local Laws:

At the municipal level, San Francisco is the nation's leader in recycling, touting a diversion rate of 80%, far higher than any other city. The city has been very progressive with its recycling policy. The 1988 Solid Waste Management Plan set solid waste goals through reduction, recycling, and composting; these goals were 32% in 1992 and 43% by 2002. After California enacted AB 939 the city changed these goals to match the new statewide legislation. The city then went further in 2002, requiring a diversion rate 75% by 2010 and to "zero waste" by 2020.

To achieve the zero waste goal more had to be done, and a voluntary system could not ensure this. In 2009 the Mandatory Recycling and Composting Ordinance was passed, requiring all of San Francisco to separate recyclables, compostables and landfill trash using the 3-bin system and to participate in recycling and composting programs. This was the first such ordinance in the nation. The entire city is under contract with Recology to do both waste and recycling collection.

Recycling in Lincoln:

Recycling in Lincoln is completely voluntary. The Lincoln Recycling Office was created in 1987; it was the first full-time municipal recycling coordinator position in the state of Nebraska. The recycling office was created at the same time as the new Bluff Road landfill. The mission of the Recycling Office is

to divert waste from the landfill in an economically and environmentally sound manner in full partnership with the private sector (City of Lincoln). The program consists of 23 sites located throughout the city. They will accept: Aluminum cans, cardboard, residential mixed paper, glass bottles and jars, newspaper, #1 thru #5 plastic containers and tin cans. An additional three locations accept newspapers only (City of Lincoln). This program is funded by the tipping fee that is paid for every ton of trash that is dumped at the Bluff Road landfill. This \$21 fee is split into a \$14 fee that goes to operate the landfill and a \$7 fee that goes to the recycling program.

Lincoln requires yard waste to be separated for most of the year from April 1 to November 30, the majority of the growing season. Residents can either compost their own yard waste on their property, haul the waste to the Bluff Road Landfill themselves, or contract with their MSW hauler to pick it up separately. The disposal fee for yard wastes and brush at the Bluff Road Waste Composting facility is \$15.75 per ton, with no non-organic material (plastic bags) permitted as well as any sticks larger than one inch in diameter. The organic waste is then composted and made available to the public for free certain times of the year and sold at local businesses the rest of the year. Though this program doesn't sound like much it makes up 55% of residential MSW diverted and 28% when including diverted waste from commercial sources (Solid Waste Plan 2040, 2012). Lincoln is thought to be ahead of the curve on yard waste recycling, few municipalities have of yard waste diversion requirements, let alone a program that is as mature as Lincoln's.

Lincolnites have further options to curb-side recycle using privately run companies that include: Journal Star Recycling, Midwest Refuse, Recycling Enterprises, RecycleLink (RecycleBank), Star City Recycling, Palmer & Sons, Schaaf, and Refuse Service. The last two companies offer curbside pick-up to their regular trash collection customers. In Lincoln, any firms providing source separated recycling collection are not required to license their collection vehicles, unlike garbage trucks, which are required to license, if they are only used for this practice. As a result, the exact number of waste haulers providing

recyclables collection is not currently known. Similarly not known is the exact number of households participating in a curbside recycling program, the best estimate that the city has is only 24% (Solid Waste Management Plan for Lincoln and Lancaster County, 2012). In addition, citizens can also use private recycling facilities that take more specific products like aluminum cans or scrap metal. This includes companies like Alter Metal Recycling or Mid-City Recycling.

Collection Types:

MSW collection, which may or may not include curbside recycling collection, is not as simple as it sounds. It is often pictured as just the large compactor truck driving down the street or alley emptying cans, though this is what happens, there are many more complicated forces behind this relatively simple action. These forces determine, among other things: Who performs the duty, how much they are paid, what they pick up and where it goes once it is collected. These aspects can vary greatly from city to city and even within the same city. MSW collection can be loosely identified by the processes it comprises.

The first major division is whether the MSW is collected by a private company or by a public entity. Private companies can vary greatly, some may be family owned and operate single trucks while others are large nationwide companies that have fleets of thousands and upwards of 45,000 employees. Public run collection should be thought of similarly to police departments or fire departments, where employees are paid and managed by the city as well as the trucks and other equipment that is needed, the same way the city owns the police cars and fire trucks.

Typically, pertaining to private companies, the next issue is how MSW in a municipality is allowed to be collected. Some municipalities divide a city up into districts and then bid out contracts to companies to provide service. Other municipalities may contract the city as a whole, allotting the entire municipality to a single company, but then allowing sub-contracting to be determined by the contract winner. Other municipalities, like Lincoln, take a laissez faire (hands-off) approach and allow private

companies to compete for the business of customers on an individual basis. This means that neighbors on the same street may have different companies collecting waste. To add to this situation, some cities have a combination of these scenarios. On the recycling side, it is the exact same situation, with some companies or public collectors also offering or doing the recycling collection, while others don't and different entities are required to do the recycling collection.

Billing:

The payment system for collection has just as many variables. For some, residents essentially don't pay anything for trash collection; that is, they never receive a bill as it is paid for out of property taxes. This type of payment works well for either public run collection or for companies that won city mandated collection contracts.

Another method is billing the individual customer, typically on a monthly or multi-monthly cycle, similar to the utilities of gas and electric. This payment is most commonly a flat rate for the individual, but is not necessarily the same for each customer as price may vary significantly company-to-company and neighborhood-to-neighborhood, as shown by a 2010 survey done in Wichita, Kansas. Though the median in this example was \$18.20 per month for MSW collection some respondents were paying as much as \$36 or as little as \$7 per month (LAVIANA, 2010). The same scenario is found in Lincoln according to the baseline assessment/survey conducted in preparation of the SWMP2040.

The next method is known as Pay As You Throw (PAYT), in which a customer is charged for the amount of trash that they are discarding. Those that throw out more pay more and those that throw less are rewarded with a smaller bill. A PAYT system can be measured by many different methods, which can be characterized by their level of technicality. An example of a low tech system, based on volume, is simply having different trash container sizes (30, 60, or 90 gallons) and charging incrementally more for each, this system is used in effectively Seattle Washington. Another low-tech system example

is either counting the number of standard sized bags, such as a standard 13-gallon kitchen bag or the larger 30-gallon, and charging for each. A similar way is to collect only a specific type of bag, which are required to be purchased at specific retailers; this is the case in Chicago, where recyclables are placed in separate blue bags. Still others require stickers to be bought, and then placed on each trash bag, working the same way as postage stamps on mail, used in many cities, including Springfield, Illinois. Higher tech, weight based systems are now gaining in feasibility and are a popular choice in many European cities. In a weight-based system, typically standardized cans are fitted with a Radio Frequency Identification chip (RFID) containing address information read by a sensor on the truck and linked to a billing system and, commonly, the GPS on the collection truck. The trash bin is then lifted by the truck and, while doing so, the truck records the weight, dumps the contents, and then notes the weight of the empty trash bin, subtracting the difference and billing the customer

Management Issues:

Who owns and operates the landfill, waste-to-energy facility, or Material Recovery Facility is also a source of variation. In some cases the state or municipality will run the facilities while also doing the collection, essentially having a closed loop system. Others will receive MSW from private companies while still keeping the facilities under public control; such is the case in Lincoln. The more controversial operating style is having a private company own and operate the facilities, possibly doing the collection also. The concern here rises from the fear of the long term management of the facility, particularly landfills. For decades following the closure of a large landfill there is still management that needs to be done, not limited to capping the landfill, leachate management and methane issues. If the owner goes out of business or is unable to do proper management a large environmental, not to mention legal mess, will arise with taxpayers ultimately paying the bill.

Recycling Process:

Solid waste that is collected as recyclables takes a very different path from regular MSW. Recyclables head to a Materials Recovery Facility (MRF) often housed in a large warehouse-type building with an open floor plan. This is where the raw recyclables are sorted, separated, bailed, sold, and ultimately shipped to a buyer that makes them into new products. The process by which the recyclables are separated varies greatly, just as the collection system did; the largest difference starts at the source.

Truly there are only four main types of MRF systems: Sources separated, dual/multi-stream, single stream, and mixed waste (Kessler Consulting inc, 2009). The first, source separated, is the oldest form of recycling. With this style, recyclables are separated at the point of generation, such as newspaper/telephone book drop-off locations or facilities that pay for aluminum cans. Very little in the way of additional sorting is generally needed.

Dual or multi-stream source separated recycling is the most common form of recycling as it has been in practice for a long period of time and ensures that there is very little contamination of unwanted material in the final products. In a source separated system the people that are generating the recyclables are the ones that separate them. This is typically done in a multi-bin scenario, with separate bins for paper, plastic, glass, cans, organics, and waste, though this is usually only divided into a three to four bin system, whether to save space or because some of the divisions, like products made from glass commonly don't generate large volumes in most locations; or, as in the case of separating ferrous metals, it is easy to do at the MRF. More generally though, recyclables are separated in two categories, fiber (paper products) and containers (glass, metal, plastic) (Kessler Consulting inc, 2009).

Once the recyclables are separated into their respective bins they are taken to the MRF where they are sent through a machine that separates them into different grades and by composition, for example, newspaper from magazine slicks or steel from aluminum cans. Older MRF's often include and

rely on humans to do some manual sorting, but this is continually being phased out. Once the recyclables go through their final separations they are compacted and bailed to make handling easier during the shipping process, then they're loaded onto semi-tractor trailers or rail cars and sent away to markets across the nation and often overseas, particularly to Asia.

Single-stream recycling has been gaining in popularity in recent years. This form of recycling is a more recent adaptation as it relies more heavily on technology at the MRF to do separation. This process is not all that different from multi-stream collection; all recyclables are sent in to the same separation machine where they are quickly separated into the two categories of fiber and containers before continuing on the same process as explained before with multi-stream (Kessler Consulting inc, 2009).

The final type of MRF configuration is Mixed Waste (Dirty MRF). This occurs when unsegregated waste is sent through a single-stream separation process, possibly with modification to remove organic waste. This is not typically done to all waste, only waste high in recyclables or low in "wet" organic waste that can contaminate the end process. An example would be commercial waste from an office building (Kessler Consulting inc, 2009) or, in the case of Chicago's blue bag program, all waste is sent to and sorted at the MRF.

Recommendations/Discussion:

With no leadership from the federal government to make and implement recycling laws it requires more effort from states to form their own. This problem is further compounded when states don't form laws, leaving it up to counties and municipalities. Large municipalities may have enough public support, pressure and subsequent resources to develop one on their own, while a small city may find it easy for most citizens to get together and support a single issue. A mid-sized city, similar to

Lincoln, has the odds stacked against it when forming a mandate without the support and pressure of higher government and preceding laws.

When comparing Nebraska to California and then Lincoln to San Francisco I found that up until the early 1990's there were nearly no differences in state or city policy related to recycling. All policy that was implemented since then has only varied by the fact that California and San Francisco set diversion goals and Nebraska and Lincoln have not. Without looking deeper into how policies may have been funded or implemented differently, or looking at socio/political and demographic differences, I can only assume that it was the diversion goals that have propelled California and San Francisco to the high diversion rates they have achieved, leaving Nebraska and Lincoln without such goals behind.

To my dismay, every person that I discussed my thesis with had nearly the same response when I asked what cities to use as case study examples of what is logically feasible for a recycling program to achieve in Lincoln. The advice was as follows: "Look at what other mid-sized Midwestern cities have achieved, such as the other Big Ten cities." Though, with little exception, none of the Big Ten cities, nor many in the Midwest, tap into the elite status of recyclers, that is very small to begin with in the USA. The other common response was that larger cities have more successful recycling programs because of economies of scale; meaning that they can collect, process and find markets (local and overseas) for recyclables more effectively than smaller cities and have a better location in relation to these markets. The more I researched the more I disagreed with this advice.

Recycling Rates Vary Widely Among Cities

Houston, the nation's fourth largest city, has the worst recycling rate among the 15 largest American cities, according to a 2008 study by Waste News, a trade magazine.



THE NEW YORK TIMES

To start with, state and local forces seemingly affect the diversion rate of a city more than just its population size. If population was a strong factor for determining the diversion rate then one would expect to find a descending percentage in the preceding chart, but it is easy to see that the rates vary wildly with some, like Houston, the fourth largest city in America, reportedly having the worst diversion rate of the 30 largest cities in the US, an appalling 2.6% in 2008 (Ellick, 2008).

The theory of economies of scale and location for recycling was harder to deny. West Coast cities have left little room for doubt, higher rates of diversion than most of their counterparts in the Midwest or East Coast. This could be explained as a location phenomenon, as the West Coast has the best access to hungry Asian markets (probably true to some extent as it may have helped shaped laws related to recycling there) (MacBride, 2012). The problem is that cities on the Gulf Coast and the East Coast are still major import and export hubs, and should have had some of the same benefit of location over inland counterparts; if this is true the results don't jump off the page. To further the doubt of scale and location, the population size and density of the American northeast, particularly the New York - Washington D. C. corridor, should have found it easier to find local markets than most scenarios.

In the case of New York City all diverted paper was sent to one consumer, Visy Paper. When given exclusive rights to all paper to be recycled in New York City, Visy Paper still had to export its specific end product as the local market was not large enough. Visy Paper also had issues with quality that was coming from the cities MRFs as it was often contaminated with glass, plastic, or different grades of paper that wouldn't be present in virgin feed stocks (MacBride, 2012). Another company Utility Plastics Corporation also located in NYC made police barriers and road cones from plastic bottles sourced from the city; though the end product was as good as its mass produced counter parts its slightly higher cost and the difficulties of a small company to find customers though located in Americas largest city, ultimately spelled doom for the company (MacBride, 2012). It is easy to understand that

even with the largest source of separated high quality recyclables; having companies that specialize in the multitude of products that are needed in the daily economy, it is not economically feasible to have them located near every city; the economies of manufacturing at scale on most products, prove the short comings of a closed loop local recycling system, while showing the strength of a global market system this is not to say that local markets do not exist or shouldn't have some interest expressed in developing them, but it may be foolish to rely on that market alone; though one exception to a global market may be found with organic waste composting

It is common that organic waste comprised primarily of lawn clippings, leaves, wood mulch, food scraps, and some "wet" paper to make up the largest portion of diverted waste (Solid Waste Plan 2040, 2012) the best part is that most is composted and provided back to the community as free compost/wood chips, given to local parks departments, or sold locally for profit; such is the case in Lincoln. Organic diverted material would have a whole slew of issues if it tried to follow the same path of its plastic or aluminum counterparts to overseas buyers. Not only is it frowned upon to transport wood, seed or fruits and vegetables across state lines but it is downright illegal to do it across international boundaries, the ecological consequences of doing so could be endless. Compost is also quite bulky requiring lots of space to ship while also fetching a low price when sold; the cost of long distance transport would only narrow the profit margin that might already be slim. Most likely due to these factors in my research I haven't stumbled upon any mention of a global market for organic compostable waste, keeping at least one recyclable on the ideal local closed loop path.

I would like to see Lincoln expand its current organics diversion program, whether this is to include a year round ban on yard waste, or to also include a program to get households and restaurants to divert organic waste for composting, even with this effective yard waste ban, food waste comprises 16.02% by weight of the Bluff Road landfill waste stream (Engineering Solutions & Design, Inc., 2009)

showing room for improvement; both of these suggestions could have a larger effect of increasing non-food waste recycling; as paper still comprises over 40% and plastic nearly 20% of the landfill waste-stream respectively. The ban hopefully would remove more contaminants in the recycling stream before they even get to the MRF, possibly ensuring higher quality that may fetch more at market in the end.

After my research I would like to recommend that Lincoln set a PAYT policy with a minimum service ordinance that requires all customers of MSW haulers to be provided access to curbside recycling, with an incremental increase in diversion rate goals. If diversion rate goal are not met city-wide more drastic changes should be used such as mandatory recycling that would include penalties for the MSW haulers as well as the individual customers for noncompliance.

The next step to encourage compliance by MSW collectors is to increase the Bluff Road landfill tipping fee incremental, though significantly, as it is relatively cheap by national rates. This gradual change, coupled with the increase in recycling, should offset much of any cost change to consumers. The rate increase would be a strong incentive to waste haulers to quickly adopt recycling to stay competitive. On the customer side, enforcement of recycling compliance not only by waste haulers threatening to drop them as a customer, but ticketing by the city, should result in high rates of compliance. Lincoln is a great environment for a recycling policy. Its existing laissez faire approach to MSW would allow each of the more than 30 different collection companies in Lincoln to choose the system that would be easiest and most cost effective to adopt, or the system that is most easily adapted to keeping their customers happy.

I am against a state wide bottle bill, this may seem like an odd thing to state, but the more I've learned the more truth there is behind this statement. Whenever a state expresses interest in bottle bill legislation it is met with such fierce opposition from the bottle, soft drink, and beer industries that I don't think is worth the trouble and tax money to discuss this issue for it to not pass. The other reason

came as a surprise to me; it is no secret that the containers, particularly aluminum cans, are the highest valued commodities of a typical recycling stream. Bottle Bills all but ensure that the majority of high valued cans and bottles will be returned to (state run) redemption centers, this leaves the average curbside recycling program with only low valued commodities to be collected. It is hard enough for many curbside programs to eke out a profit; when robbed of the most profitable commodities, it may be impossible. I feel that increasing the total diversion rate not just the rate of bottle and cans is a wiser choice and could spur more private investment in recycling knowing that they have a greater chance at return.

I find that the perfect example of why recycling laws are need is found in the completely unrelated case of automotive seat belts. Originally automobiles did not have any seat belts the results were that even the smallest of accidents would result in injury. As time passed seat belts became a luxury item that only the wealthy or the very safety conscience would pay for; before long the rest of society and then the government also saw the benefit to the greater social good that seat belts provide by limiting injuries and deaths in accidents. The government then made it law requiring all automobiles to have seatbelts and soon after enforced passengers to wear them by ticketing. This required only a small amount of intrusion to passengers and automobile manufacturers for a large benefit to society and the individual passenger. If we look at recycling in America not long ago there was no recycling, more recently only the wealthy and eco-conscience would pay for curbside recycling collection. In the past decade government and society in some places, have realized the greater good that recycling provides having begun mandates and enforcing the practice; all with only minor intrusiveness to the private citizen and to the waste hauling industry. Hopefully some benefit to the individual recycler and a big gain to society in the long term.

Works Cited

Adam S. Weinberg, D. N. (2000). *Urban Recycling and the Search for Sustainable Community Development*. Princeton, New Jersey: Princeton University Press.

Bottle Bill Resource Guide. (n.d.). Retrieved 2012 йил 26-10 from bottlebill.org:
<http://www.bottlebill.org/>

City of Lincoln. (n.d.). Retrieved 2012 йил 10-October from Recycling and Solid Waste Operations:
<http://www.lincoln.ne.gov/city/pworks/waste/sldwaste/recycle/history.htm>

Ellick, A. B. (2008 йил 29-July). *NYTimes.com*. Retrieved 2013 йил 31-3 from Houston Resists Recycling, and Independent Streak Is Cited:
http://www.nytimes.com/2008/07/29/us/29recycle.html?pagewanted=all&_r=0

Engineering Solutions & Design, Inc. (2009). *State of Nebraska Waste Characterization Study*. Lincoln: State of Nebraska Department of Environmental Quality.

EPA. (2012 йил 15-11). *Environmental Protection Agency*. Retrieved 2013 йил 5-4 from Municipal Solid Waste: <http://www.epa.gov/epawaste/nonhaz/municipal/index.htm>

EPA. (1997). *Measuring Recycling: A Guide for State and Local Governments*. Washington D.C.: EPA.

Kessler Consulting inc. (2009). *Material Recovery Facility Technology Review 2009*. Pinellas County Department of Solid Waste Operations : Kessler Consulting inc.

LAVIANA, B. D. (2010 йил 19-12). *The Wichita Eagle*. Retrieved 2012 йил 15-10 from Eagle survey shows huge disparity in cost of trash service in Wichita: <http://www.kansas.com/2010/12/19/1639968/eagle-survey-shows-huge-disparity.html>

MacBride, S. (2012). *Recycling Reconsidered: The Present Failure and Future Promise of Environmental Action in the United States*. Cambridge, Massachusetts: MIT Press.

(1996). *MERCURY-CONTAINING BATTERY MANAGMENT ACT*. Washington D.C.

Solid Waste Managment Plan for Lincoln and Lancaster County. (2012). *Solid Waste Plan 2040: Collection Systems*. Lincoln.

Solid Waste Plan 2040. (2012). *How is the 18 percent recycling rate calculated%*. Retrieved 2013 йил 12-3 from Solid Waste managment Plan for Lincoln and Lancaster County:
<http://www.lincoln.ne.gov/city/pworks/waste/sldwaste/solidwasteplan2040/pdf/ac-20130212-handout6.pdf>

The Economist. (2007 йил 7-June). *Case Histroy: The truth about recycling*. Retrieved 2012 йил 28-October from www.economist.com: <http://www.economist.com/node/9249262>

Wikipedia. (2012 йил 24-6). Retrieved 2013 йил 20-3 from Mercury-Containing and Rechargeable Managment Act: http://en.wikipedia.org/wiki/Mercury-Containing_and_Rechargeable_Battery_Management_Act

Wright, S. (2012 йил 1-2). *Update: Bottle deposit laws create jobs, study finds*. Retrieved 2013 йил 1-4 from Waste & Recycling News: <http://www.wasterecyclingnews.com/article/20120201/NEWS02/302019996/update-bottle-deposit-laws-create-jobs-study-finds>