

Analysis of the Environmental Justice Compliance of the Chicago Transit Authority (CTA)

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ABSTRACT

Environmental Justice (EJ) derives its principles and foundation from Title VI of the Civil Rights Act of 1964. The Executive Order 12898, issued in 1994 mandated all agencies receiving federal funds to be environmental justice compliant. According to this Order, Environmental Justice compliance ensures that the minorities, ethnic population groups as well as the low-income population in a region are not adversely affected due to the implementation of programs funded with federal dollars.

This paper presents a framework to evaluate the EJ-compliance of the Chicago Transit Authority (CTA), specifically focusing on the CTA's capital program. The CTA has divided its service area into six zones in order to facilitate allocation of capital funds.

It is the objective of this paper to analyze the CTA service area with the help of the decennial census. The analysis will identify the neighborhoods that have a significant percent of the target minority or low-income population, referred to as "EJ neighborhoods". The "EJ neighborhoods" will be compared versus the "non-EJ neighborhoods" to test the equitable allocation of funds.

The criteria for identifying the EJ neighborhoods depend upon the definition of the target population and while there is considerable variation amongst researchers about these definitions, this paper will acknowledge these differences and will make use of the most commonly accepted definitions in identifying these target population groups. The results from this research will help the CTA in ensuring that the needs of the minorities and the low-income are acknowledged and accounted for in the planning process.

INTRODUCTION

The Chicago Transit Authority (CTA) is the transit provider for the City of Chicago and operates both train and bus service in a mature travel market. In 2001, the 134 bus routes provided 303.1 million rides while the rail network provided 151.7 million rides. Ridership has increased for the CTA in each of the last five years as overall service has been improved and expanded. (1) The CTA is constantly refurbishing and renovating its capital assets and there is a need to ensure that the allocation of monies is done equitably and in compliance with the environmental justice mandate of the federal government.

The objective of this research is to develop a framework to evaluate the environmental justice compliance of the CTA. The stated objective entails a series of intermediate steps that need to be completed before one can draw conclusions about the compliance issue. One of the very first steps in this process is to perform a demographic analysis of the CTA service area and compare it to the capital improvement program distribution of the CTA.

This paper traces the history of the legislation of environmental justice and includes a review of environmental justice case studies based on a literature review. The paper sets the stage for the environmental justice analysis with a comprehensive demographic analysis based on data from the 2000 decennial census. The conclusions drawn from the analysis point to future work that needs to be addressed. The following sections present a background of the study area and the environmental justice movement.

Background (2)

The City of Chicago is home to a diverse population with a significant percentage of minority, ethnic, and low-income populations. The minority population in the six-county region that includes Chicago continues to increase at an unprecedented rate. Population in the minority categories (everything except non-Hispanic white only) now represents about 43% of the region's total population compared to less than 35% in 1990. Northeastern Illinois's Hispanic population has grown substantially, from 836,905 in 1990 to more than 1,405,116 in 2000. This represents a 68% increase over the ten years.

While the actual number of people in poverty increased for the region, the poverty rate for the region decreased from 11.3% to 10.6% in the 1990s. However, the City of Chicago realized a decrease of approximately 35,000 residents living in poverty despite a total population growth of 112,290 people during the decade of the 1990s. Suburban Cook County and the five other counties in the region saw an increase of nearly 68,000 residents living in poverty.

Despite increases in ridership for the CTA over the last five years, the percentage of work trips by public transportation declined from 15% to 13% during the 1990s. This can be attributed to the large increase of population and employment in the suburban counties. Public transportation remains a vital part of the transportation network in the region, especially in the densely populated areas of Chicago. It is therefore imperative for the transit providers of the region to ensure that the service caters to the needy and is equitable.

ENVIRONMENTAL JUSTICE

Equity in transportation has been a major concern of transportation planners and lawmakers dating back to the civil rights movement. Environmental justice has progressively gained momentum in the last decade and along with it have attempts to ensure that no target population is disproportionately affected by projects involving federal dollars.

The Federal Transit Administration has issued three principles of environmental justice to guide transit agencies in their compliance efforts:

1. Ensure that new investments and changes in transit facilities, services, maintenance, and vehicle replacement deliver equitable levels of service and benefits to minority and low-income populations
2. Avoid, minimize, or mitigate disproportionately high and adverse effects on minority and low-income populations
3. Enhance public involvement activities to identify and address the needs of minority and low-income populations in making transportation decisions.

Legislative History

Title VI of the 1964 Civil Rights Act required all federal agencies receiving federal financial assistance for a particular program or activity to ensure that no person is excluded from participation in, denied benefit of, or subjected to discrimination on the basis of race, color, national origin, age, sex, disability, or religion. The Civil Rights Restoration Act of 1987 broadened the coverage of Title VI to include all programs and activities of federal-aid recipients, sub-recipients, and contractors whether those programs were federally funded or not. Today, Title VI still provides the legal backing for the majority environmental justice complaints.

President Bill Clinton issued Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This order mandated that every federal agency administer and implement its programs, policies, and activities in a way that will identify and avoid disproportionately high and adverse effects on minority and low income populations. In addition, the order states that each federal agency should use their powers in the greatest extent allowed by law to achieve this goal.

These legislative issues and documents of guidance establish the basis for environmental justice policies. They clearly emphasize the level of importance that the federal government holds to environmental justice issues.

Importance of Compliance

Despite the increased attention on the subject of environmental justice, politicians, planners, and researchers have yet to establish a common methodology for analyzing an agency's compliance. In fact, numerous agencies have taken drastically different approaches in ensuring compliance. The importance of constructing a methodology that will properly assess the unique aspects of an agency is crucial. Projects and policies that agencies implement today are more highly scrutinized than ever before. Agencies that ignore compliance issues are likely to be served with lawsuits. This was the case in the 1990s for the Los Angeles Metropolitan Transportation Authority (MTA). The MTA neglected poor and minority citizens in their funding allocation and as a result spent millions of dollars in lengthy court battles, which they ultimately lost. Their decision not to comply with legislation will have ramifications for the MTA and Los Angeles County for many years to come. (4) Compliance should not only be looked at as a requirement, but also as a means for achieving a better understanding of the public that it serves. Understanding the populations in the service area will lead to more knowledgeable decisions in the future. For this reason, developing an effective methodology for measuring compliance can

potentially give agencies a useful tool that could aid in the decisions to distribute funds and prioritize projects in future years.

OVERVIEW OF THE METHODOLOGY

This section reviews issues related to the boundaries of the CTA service areas, the selection of the geographical unit of analysis, and the selection of areas that are to be considered environmental justice neighborhoods.

Identification of the Study/Service Area

For the purposes of this project, the CTA divided its service area into six geographic zones (Loop, North, Northwest, South, Southwest, and West). The CTA chose to use broad descriptions of the zonal boundaries (e.g. “service limits to the west”) and as a result the demographic figures compiled are approximations. However, we are confident that the approximations are representative of the zone’s true demographic make-up. The inclusion or exclusion of certain populations in this analysis due to broad zonal boundaries is a concern and will be addressed in future months.

The demographic analysis for this research is conducted at two levels: (1) at the zonal level, and (2) at the census tract level. Therefore, our analysis includes all census tracts that have their geographic center located within the six zones. This method has given us realistic approximations of the demographic and economic conditions in each service area. However, these numbers are only approximations and future work on defining the appropriate boundaries will continue in the second half of this study based on discussions with staff at the CTA.

The data sources for this research are the decennial census and the CTA. The release of the Census 2000 data makes this analysis current and timely. Table 1 depicts the zonal populations as well as the number of census tracts within each zone. It should be noted that while Black and White are racial categories according to the census, Hispanic is not and is classified as an ethnic category. To qualify as low-income one’s income must be within 150% of the poverty threshold. The selection of the criteria is discussed in the subsequent section.

TABLE 1. Target Population Demographics

Zones	Number of Census Tracts	Zonal Population	Black Population	Hispanic Population	White Population	Low-Income Population
Loop	6	16,244	3,213	936	10,613	2,204
North	123	479,587	68,970	49,632	338,099	95,039
N-W	274	1,198,257	50,946	357,619	817,015	227,275
South	266	744,923	568,184	64,556	88,756	276,154
S-W	160	689,267	142,902	190,988	417,475	141,644
West	268	942,571	329,562	291,458	408,932	261,637

Table 1 clearly shows the population differences between zones. It also reveals that there appears to be high concentrations of target populations living in the same zones (e.g. Blacks in the south zone)

Environmental Justice Neighborhood Identification

Various researchers have debated the process of identifying an environmental justice (EJ) neighborhood without consensus on the most appropriate method. In this section, various issues pertaining to the development of a compliance methodology are discussed.

Determining the unit of analysis

Agencies must address two issues when determining the specifics of their study area. First, agencies must consider the desired size of the unit of analysis. Size could refer to geographic measures as well as population measures. Secondly, agencies must ensure that data are available at the level of aggregation (disaggregation) of the geographic unit desired. Compromises in selecting a unit of analysis will often be made on account of data availability.

Another tradeoff that must be considered is with regards to the accuracy of the data and the ease of comparison between units of analysis. Using census blocks as a study area provides great accuracy and detail, but may be too overbearing in terms of identifying and comparing millions of blocks, as may be the case in a large metropolitan study area. On the other hand, dividing a large study area into a few zones provides for easy and quick comparisons between zones, however the accuracy and precision of the data will be compromised due to errors in aggregation. Past environmental justice studies have revealed no consistent selection for the level of aggregation to use. However, numerous studies have used census tracts.

Census tracts are apportioned based on population. The population of a tract typically falls between 1,000 and 8,000 residents. This level of disaggregation provides for acceptable accuracy when working with a large study area, such as a metropolitan area. Data accuracy can be improved and errors minimized by using smaller geographical units such as traffic analysis zones or quarter sections. However, the availability of data at the desired level of aggregation is always a cause for concern and hence the biggest reason why planners rely on larger zones for analysis.

Research has revealed problems with using large zones and furthermore recommends using census blocks or block groups. Discrepancies within a zone might cause inaccurate results to be inferred or stated. In a study conducted by David Forkenbrock and Lisa Schweitzer at the University of Iowa Public Policy Center, this issue was discussed in detail. (3) The stated goal in the paper was to make the unit of analysis “small enough to be relatively homogeneous in terms of population characteristics.” However, often times obtaining a homogeneous population requires the use of census blocks, which does not have the same information available to the public for privacy reasons (e.g. income).

Some agencies such as the Southern California Association of Governments (SCAG) have used a different approach for analysis – one based on dividing the study area by demographic distribution rather than spatial units. In their 2001 Regional Transportation Plan SCAG divided the study area into five zones to determine the impacts that the plan would have on low-income individuals. (5) While this approach satisfied the agency’s needs, the transferability and universality of this approach, as well as the accuracy of the analysis, remain inconclusive.

Demographic/Economic criteria for EJ neighborhood identification

Defining an EJ neighborhood also allows for broad interpretation. While there is no prescribed standard for this procedure, the criteria should have some degree of backing from past research and/or government legislation and policies. Multiple criteria could possibly be analyzed in an

environmental justice study, including, but not limited to, race, ethnicity, income-level, disability, and age. For the purposes of this paper, criteria were selected on the basis of minority status, ethnic background, and income levels.

Race and Ethnicity: Race (Black) and ethnicity (Hispanic) are two criteria that are always analyzed in environmental justice studies. There are typically two ways a unit of analysis can qualify as an EJ neighborhood on the basis of race and/or ethnicity. A common way to decide this is through the use of a reference area. For example, if an environmental justice study were being conducted for a city, then the percentage of Blacks and Hispanics, as a total of the entire city population would be calculated. Consequently, any unit of analysis within the city that meets or exceeds this threshold would qualify as an EJ-neighborhood. For example, if a city's population included 15% Hispanic people, then any unit of analysis with a Hispanic population of 15% or higher would be considered an EJ-neighborhood. The reference area technique is becoming increasingly popular with municipalities and metropolitan planning organizations across the nation.

The other method that could be used to determine an EJ neighborhood on the basis of minority or ethnicity is by setting an arbitrary threshold. For example, the Agricultural Advisory Board in the Environmental Protection Agency defines a minority community as a census tract that has a minority group that accounts for greater than 30% of the total population in that census tract. This method is not as common, partly because the percentage chosen is subject to criticism as it typically has little backing by past studies or federal actions. The use of a reference area seems to be more logical, and furthermore it allows for methodologies to evolve smoothly over time and adapt to specific local trends.

Income: The last criteria that must be decided concerns low-income populations. This decision appears to be much more complex than the decision on racial and ethnic populations. In the past, studies have used the reference area technique. In order to use this technique, the percentage of people living at or below the poverty rate (or some other income measure) is calculated for the reference area and any unit of analysis that meets or exceeds the threshold is considered an EJ-neighborhood. The reference area technique is sometimes conducted through use of the median household income. The threshold would be determined by the region's median household income. If a unit of analysis has a median household income of a certain percent of the threshold, then it would be considered an EJ neighborhood. The percent used typically ranges from below 30% up to 80% of the area median household income. The Department of Housing and Urban Development has set four percentages to define lower income, low income, very low income, and extremely low income. In similar fashion, 150% of the poverty line is accepted as a low-income threshold in the poverty/environmental justice arena.

Another technique would be to use a set poverty percentage as the threshold. Numerous poverty research studies have used 20% of poverty as a threshold.

Other techniques such as the one used in the SCAG study where they used quintiles to determine the impacts on low-income citizens are accepted. They used the quintiles to study the impacts that the regional plan had on the poorest fifth of their population, second poorest fifth, etc.

As evidenced in this section, defining an EJ neighborhood on the basis of income is very complex. Numerous variations of the reference area technique could be used, which keeps the local perspective in the project. However, federal guidelines such as a 20% threshold could also be used with little or no adversity. This could be enticing for agencies as they are attempting to prove compliance with federal policies.

In addition to the above discussed methodology concerns, agencies should consider whether the use of varying degrees of EJ neighborhoods is appropriate. For example, should a census tract with a high level of poverty be analyzed in the same manner as a census tract with a high degree of minorities, low-income individuals, and people with disabilities?

The selection of the criteria to be used is very critical to establishing a good methodology. The way that an agency chooses to display the data is critical to what the results of the study will actually reveal.

COMPARISION OF EJ NEIGHBORHOODS AND NON-EJ NEIGHBORHOODS

The importance of adopting an acceptable definition of an EJ neighborhood was underscored in the previous section. Next, we look at the definitions used for this study.

EJ Neighborhood Definitions

The reference area methodology is used in this research for identifying geographic units of analysis (i.e. census tracts) that qualify as environmental justice neighborhoods. The reference area for this analysis is Cook County. Cook County contains both the CTA statutory service boundaries and the City of Chicago. The EJ neighborhood criteria are obtained by computing the appropriate demographic and economic information for Cook County and using that information as the threshold for the individual census tracts. The thresholds for each of the target populations are listed below.

- Black – According to the 2000 Census, 26% of all residents of Cook County are Black. All census tracts with a Black population greater than 26% qualify as EJ neighborhoods.
- Hispanic - According to the 2000 Census, 20% of all residents of Cook County are Hispanic. All census tracts with a Hispanic population greater than 20% qualify as EJ neighborhoods.
- Low-income - All households that are within 150% of the poverty threshold are considered low-income. Using the reference area technique, this population is 21.5% of the total population in Cook County. Accordingly, census tracts which have more than 21.5% of their population within the low-income threshold, qualify as EJ neighborhoods.

A breakdown of EJ census tracts and non-EJ census tracts by zone can be seen below in Figure 1.

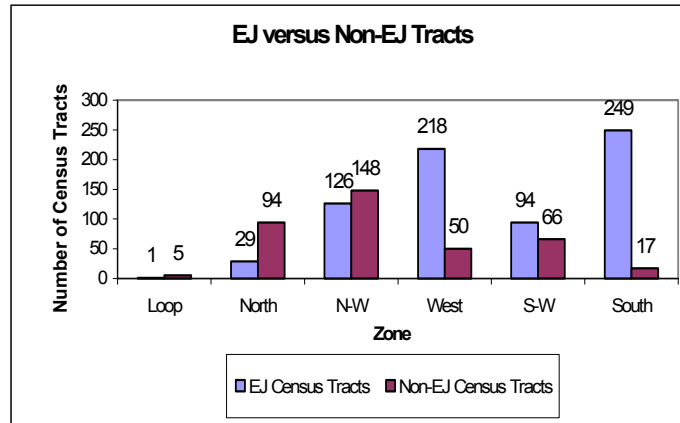


FIGURE 1. EJ and Non-EJ Tracts by Zone

Comparison of EJ Neighborhoods and Non-EJ Neighborhoods

The objective of this comparison is to provide a detailed look at selected demographic differences between the respective populations of people living inside census tracts that are considered EJ neighborhoods and those that are living in census tracts designated non-EJ neighborhoods within each of the six CTA service zones and the service area as a whole.

A census tract may qualify as an EJ census tract on one, two, or all three of the criteria (Black, Hispanic, Low-Income). Consequently an EJ census tract may not contain a comparatively high concentration of one or two the designation criteria. For example, a census tract may have a high concentration of low-income individuals and no Black or Hispanic individuals. This census tract would still be considered an EJ census tract. Comparisons of populations in this report were done between the populations of those living in EJ census tracts (regardless of the criteria of which it qualified) and those populations living in non-EJ census tracts.

We are looking for high concentrations of Blacks, Hispanics, and/or low-income residents and not at individuals themselves. Consequently, nearly all non-EJ census tracts are going to have some individuals who are Black, Hispanic, and/or low-income. However, these demographic populations are not concentrated to the extent that it exceeds the percentage of concentration in our reference area, Cook County. While considering people on an individual basis would be useful, it is unrealistic for a holistic analysis of this magnitude.

A final issue to consider when looking at this data is that one individual can be Black, Hispanic, and low-income. These populations do not have clearly defined borders rather they have overlapping boundaries. Therefore, as more data becomes available through secondary sources we will hopefully be able to systematically reduce or eliminate problems of double counting.

Keeping these crucial underlying concepts in mind, we believe that we have a very useful and realistic snapshot of the populations in EJ census tracts and non-EJ census tracts. Through the use of Census 2000 and geographic information systems we were able to accurately capture the demographics of individuals in EJ census tracts and non-EJ census tracts within each of the six CTA service zones. Comparing these populations within each of the six service zones and the service area as a whole has exposed some interesting statistics.

Results of the Comparison

The study area consists of 1,107 census tracts according to the 2000 decennial census. (Table 1) These tracts qualify as EJ tracts under either the race, ethnic, or low-income categorization. The most striking detail about the distribution is that the study area has more census tracts under the EJ classification (762) as opposed to the non-EJ classification (345), or 69% compared to 31%. An overwhelming majority of these EJ tracts are concentrated in the West and South zones (43% of all census tracts) with the Northwest zone's EJ tracts accounting for another 11% of the total census tracts.

In addition to a strikingly high number of EJ tracts, the data revealed extremely high concentrations of the target populations within the EJ neighborhoods. As previously stated, EJ tracts only have to exceed the Cook County threshold in one or more of the target populations. This means that there is no distinction between EJ tracts that meet the threshold and those that exceed the threshold by two or three times. However, the concentrations of the target populations were evident after running comparisons between EJ neighborhoods and non-EJ neighborhoods. The following statistics clearly show the high concentrations of the target populations in EJ neighborhoods.

- System-wide, 86% of the low-income population is found to live in the EJ tracts, with only 14% living in the non-EJ tracts.
- System-wide, 96% of the Black population is found to live in the EJ tracts, with only 4% living in the non-EJ tracts.
- System-wide, 87% of the Hispanic population is found to live in the EJ tracts, with only 13% living in the non-EJ tracts.
- System-wide, only 11% of the White population is found to live in the EJ tracts, with 89% living in the non-EJ tracts.

Looking at the zones with the greatest population of the target populations the data revealed even higher amounts of concentration.

- The South zone has the largest Black population in the in the study area (586,184) and the EJ tracts in this zone account for nearly all (99.9%) of the Black population in the zone.
- The Northwest zone has the largest Hispanic population in the study area (357,619) and the EJ tracts in this zone account for 83% of the Hispanic population in the zone.
- The South zone has the largest low-income population in the study area (276,154) and EJ tracts in this zone account for slightly over 99% of the low-income population in the zone.

Of the 762 EJ census tracts in the study area, 32 qualify as EJ tracts on all three criteria (i.e. they meet the threshold for race, ethnicity, and low-income). These are critical neighborhoods that need the utmost attention. These 32 census tracts are distributed amongst the six zones with the North, and Northwest having two and four tracts each respectively. The West zone includes nine tracts and the South zone includes ten tracts.

Table 2 depicts the work trips made in the study area by public transportation. This table reveals some interesting details.

TABLE 2. Work Trips by Public Transportation

	Tracts	Low-income population	Total Work Trips	Total Work Trips by Public Transportation	Percent Total by Public Transportation
Loop	6	2,204	10,675	2,724	25.5%
North	123	95,039	283,071	105,045	37.1%
N-W	274	227,275	550,855	92,430	16.8%
South	266	276,154	251,597	69,834	27.8%
S-W	160	141,644	278,256	37,222	13.4%
West	268	261,637	360,322	56,754	15.8%

Source: Census 2000.

The North zone has the highest public transportation trips in the region, both in volume (105,045) and as a percent of the zonal work trips (37%). The Northwest zone produces the largest number of work trips in the region, around 550,000, but only 17% (92,430) of these trips are made by public transportation.

Table 2 shows that each zone is dependent on public transportation, but to varying degrees. Failing to invest equitably in any zone would undoubtedly negatively affect thousands of residents. The zones with the highest low-income population (South, North-West, and West) theoretically need special attention, as access to jobs is probably a large barrier for residents.

CONCLUSIONS

The literature on environmental justice is not expansive and is evolving with time. In the absence of a consensus on proper methodologies or what constitutes an EJ neighborhood, this research has presented a methodology to identify potential EJ neighborhoods for the CTA service area.

The demographic analysis summarized in this paper is only the first step in developing a methodology of compliance for the CTA. However, the sensitivity of data to the chosen methodology (i.e. selection of the units of analysis and criteria for EJ neighborhoods) is a major concern in any study that must be addressed upfront. If inappropriate methods/ criteria are chosen results could become increasingly unrealistic and misleading.

From the demographic analysis we realized that a high percentage of target populations seem to be heavily concentrated amongst themselves. As the minority population is projected to continue on an upward trend it can be expected that the number of EJ neighborhoods will continue to rise.

It is crucial that the CTA becomes familiar with the demographic and economic profiles of its customers. Understanding the communities and how they are evolving will allow for more informed and efficient decisions. Understanding the demographic and economic profiles is only

the first step in this research. A fair amount of work lies ahead in order to develop a completed methodology and analyze the compliance of the CTA.

FUTURE WORK

The research team will next have to tie the capital investments to the demographic information to analyze if there are inequities in the process. The team will make use of ridership information from the CTA as well as identify/develop other performance measures for the transit system to perform an equity analysis.

There is also a need to develop accessibility measures (number of transit users able to access jobs) and mobility measures (number of jobs accessible within certain time) based on data from the census as well as other transportation models developed in-house at the Urban Transportation Center. Finally, in order to gain an increased insight on the state of the various EJ neighborhoods, more economic and social data will be compiled. The increased data will reveal particular issues that plague many of the distressed neighborhoods. Understanding these issues could help the CTA in their project prioritization process.

The geographic realignment of the EJ tracts, based on a comparison of the 1990 census data with the 2000 census data, will also shed light on the trend in the target population. These tasks along with the development of a framework for future environmental justice analyses will equip the CTA with a tool to ensure equitable service investments in the Chicago area.

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