Health Impact Assessment (HIA)

Cargo Atlanta: a Citywide Freight Study
December 2016

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About the Health Impact Project

The Health Impact Project, a collaboration of the Robert Wood Johnson Foundation and The Pew Charitable Trusts, is a national initiative designed to promote the use of health impact assessments (HIAs) as a decision-making tool for policymakers. HIAs use a flexible, data-driven approach that identifies the health consequences of new policies and develops practical strategies to enhance their health benefits and minimize adverse effects. For more information, visit www.healthimpactproject.org.

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Prepared by:

(Principal Investigator) Catherine L. Ross, Ph.D., Harry West Professor
Director of the Center for Quality Growth and Regional Development

(Co-Principal Investigator) Sarah M. Smith, Research Scientist
Alex Karner, Ph.D., Assistant Professor in the School of City & Regional Planning
Amit Kumar, Ph.D., Research Scientist
Peter Hylton, Research Assistant
Margaret Kent, Research Assistant
Elliot Sperling, Research Assistant
Alyas Widita, Research Assistant
Cary Bearn, Research Assistant
Farran Wang, Research Assistant

Karen Minyard, Director and Associate Research Professor, Department of Public Management and Policy, Georgia Health Policy Center

James E. Dills, Research Associate
“Health Impact Assessment (HIA), Cargo Atlanta: a Citywide Freight Study” was created by the Georgia Institute of Technology’s Center for Quality Growth and Regional Development (CQGRD).

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Principal Investigator: Catherine L. Ross, Ph.D., Director of CQGRD and Harry West Professor

Co-Principal Investigator: Sarah Smith

Core Research Team: Amit Kumar PhD, Research Scientist; Peter Hylton, Research Assistant; Margaret Kent, Research Assistant; Elliot Sperling, Research Assistant; Cary Bearn, Research Assistant; Alyas Widita, Research Assistant; Farran Wang, Research Assistant; Alex Karner, PhD, Assistant Professor, School of City and Regional Planning, Georgia Institute of Technology, CQGRD

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Program Advisory Board Members:

Jim Dove, President, Georgia Association of Regional Commissions (GARC)

Luke Fiedorowicz, Ph.D., Director of Science, Research and Academic Affairs, Georgia DPH

Kaycee Mertz, Project Manager, GDOT Office of Planning

Renee Ray AICP, Principal Program Specialist, Area Agency on Aging, Atlanta Regional Commission

Thomas Thompson P.E., AICP, Executive Director, CORE MPO

Zhongze (Wykoda) Wang, Transportation Administrator, CORE MPO

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Executive Summary

Metropolitan Atlanta is a major freight hub for the southeastern United States. Freight movement contributes jobs to the local economy and taxes to local governments, but the noise, air pollution, and accident risks that can accompany trucks and trains can have negative health impacts. Moreover, over the past twenty years, new residential development has sometimes encroached on industrial zones, increasing contact and in some cases conflict between residential and industrial needs. Given the market pressure for additional residential units in the intown Atlanta market, and the freight industry’s projected growth, this HIA analyzes the potential impact of freight movement on the health of the population in the city.

Now is an appropriate time to study the health impacts of freight movement since the City of Atlanta recently completed the Cargo Atlanta: a Citywide Freight Study. This study reviewed the policies guiding freight movement in the city, as well as the preferred truck routes, and includes a freight transportation project list. The study strives to balance the needs of the freight industry (vital to the city’s success) with other land uses.

This Health Impact Assessment (HIA) evaluates the Cargo Atlanta study’s potential impact on human health. The HIA team, led by the Center for Quality Growth and Regional Development, in partnership with the Georgia Health Policy Center, examined demographic, economic, health, and transportation data from numerous sources to understand how the changes in freight movement proposed in the Cargo Atlanta study might impact population health.

The analysis is grounded in a broad review of the academic literature linking freight movement with health outcomes and social and physical health determinants such as poverty and environmental conditions. The literature review and data analysis demonstrated that freight movement sometimes disproportionately affects minorities and low-income people, who have historically faced discrimination or currently have the fewest resources. Therefore, the HIA includes a detailed focus on areas with a high rate of poverty. The HIA project team also solicited stakeholder input to inform the process and findings.

The HIA team identified several key issues, including residential encroachment into industrial areas and a growing population in the city, both of which are likely to increase residential exposure to freight-related health risks, for example - air pollutants and noise. The HIA also examined the economic benefits of freight movement, such as increased employment opportunities.

The HIA team proposes strategies to mitigate health risks through both citywide policy and other more granular interventions targeted to specific areas. Citywide, there is a continuing need for freight projects to be designed with consideration of multiple transportation modes and in ways that are sensitive to the local context. In specific areas where freight routes are very near residences, particularly in areas that are already experiencing a high poverty rate, the HIA team recommends vegetative buffers or noise barriers, with policy and land use changes over time. Implementing these recommendations can maximize the economic benefits of freight movement while minimizing conflicts and negative health impacts.
1. Introduction

Health Impact Assessments (HIAs) have been used in the United States and internationally to understand how policies and projects in non-health sectors are likely to affect public health. An HIA is defined as “a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential positive or negative effects on the health of a population, and the distribution of those effects within the population” (European Centre for Health Policy, 1999). Research over the past decade has investigated, explained, and quantified relationships between social and economic policies and public health across a wide range of issue areas including energy, agriculture, housing, waste, and transportation (WHO, 2016). Often, an HIA can uncover policies or practices that can be implemented to mitigate negative health impacts or to ensure that health benefits are maximized.

Freight movement across Georgia is projected to dramatically increase over the next twenty-five years, as a result of local and statewide policies promoting economic growth (Georgia Department of Transportation, 2012a) and global economic trends, including trade realignment due to the Panama Canal expansion (C. L. Ross & Lee, 2014). Increased freight movement will provide economic opportunities as well as challenges from greater levels of noise, air pollution, and roadway safety. Numerous planning initiatives are underway led by entities that include the Georgia Department of Transportation (GDOT), the City of Atlanta, and Regional Commissions across Georgia to address increasing infrastructure needs to handle freight movements.

The City of Atlanta, Georgia recently completed the Cargo Atlanta: a Citywide Freight Study. This study reviewed the policies guiding freight movement in the city, as well as the preferred truck routes, and includes a freight transportation project list. The study strives to balance the needs of the freight industry (vital to the city’s success) with other land uses.

Though the Cargo Atlanta study effectively considers how to leverage freight movement to best facilitate growth, it does not explicitly address the health impacts of the transportation projects listed in the study. For example, there was no clear connection made between goods movement and air pollution, or a review of the demographics of the populations located along the truck corridors or adjacent to the proposed projects, with corresponding health impacts. Additionally, land use conflicts exist between accommodating freight infrastructure improvements and the surrounding residential areas, which are also sometimes areas of high poverty.

The purpose of this HIA is to assess the potential public health impacts of ongoing planning efforts related to freight movement in Atlanta. Recommendations from this document can be integrated with the transportation planning process to better consider and potentially address transportation health impacts with regards to freight movement. The structure of the transportation planning process requires multi-jurisdictional cooperation between local, state and federal agencies. This structure provides an opportunity to build a collaborative model for integrating health into the decision making process.

1.1 Research Objectives and Methodologies

The Center for Quality Growth and Regional Development (CQGRD) at the Georgia Institute of Technology, in partnership with the Georgia Health Policy Center at the Andrew Young School of Policy Studies at Georgia State University, conducted this HIA. The research methodology used for this HIA is consistent with the best practices in HIA development defined by the National...
Academy of Sciences in their report, *Improving Health in the United States: The Role of Health Impact Assessment* (National Research Council, 2011). Figure 1 illustrates the steps that must be undertaken in an HIA, including:

- **Screening**: Is the particular object of study likely to have significant health impacts and to warrant a full HIA?

- **Scoping**: Which policies and health impacts will be considered?

- **Appraisal**: What are the quantitative and qualitative changes in health that can be expected to result from the policy or practice under investigation?

- **Recommendation**: What steps can be taken to mitigate public health impacts? How can health benefits be maximized?

- **Dissemination**: Distribute the result widely among members of the public, stakeholders, and decision makers.

- **Monitoring and Evaluation**: Assess progress towards the measures outlined in the HIA.

As illustrated in Figure 1, at each step of the process, stakeholder input and involvement are sought so that the HIA recommendations can accurately address the concerns of the community.

### 1.2 Report Organization

This HIA report is organized into five sections. The current Section 1 (Introduction) is followed by Section 2 (Screening) describes the screening process, including why Cargo Atlanta: a Citywide Freight Study was selected for an HIA. Section 3 (Scoping) illustrates the geographic scope of the HIA and describes the populations that are potentially affected by freight movement in Atlanta. A brief overview of the health challenges and existing health statistics for Fulton County is included in this section to provide context. Section 4, Appraisal, includes a literature review detailing the major health impacts of freight movement and an analysis of existing spatial conditions in the county that correspond to these health impacts.

Recommendations drawn from this process comprise Section 5. This set of evidence-based recommendations can inform decision-makers and the general public about the potential health impacts of freight movement and assist decision makers to better consider health in the Cargo Atlanta freight study, and in freight planning more generally.
Section 2

2. Screening

In the screening phase of the HIA, the HIA team determined whether an HIA is both warranted and feasible. For the Cargo Atlanta freight study HIA, a screening matrix was used (Table 1, below) to document the rationale for whether the planning efforts would have potential effects on health outcomes in sufficient magnitude that would warrant further study. The screening process provides the HIA practitioner with an understanding of the potential public health impacts of a decision and the potential pathways to proceed with subsequent steps.

2.1 Freight Planning and Health

Freight planning requires striking a balance between achieving societal and economic goals and minimizing negative impacts on communities. However, most freight planning initiatives led by entities including the Georgia Department of Transportation (GDOT), the City of Atlanta, and regional commissions statewide do not directly consider the health impacts of those decisions.

Freight infrastructure—whether high-volume truck corridors, rail lines, seaports, or airports—sometimes conflicts with surrounding sensitive populations and land uses (such as schools, playgrounds, and homes). In some instances, these conflicts are located in areas where low socioeconomic status (SES) populations reside, also known as Environmental Justice (EJ) communities. EJ communities have higher rates of negative health outcomes for a variety of reasons. Therefore, since these areas are already compromised from a health perspective, ideally they should not be further subjected to the negative health impacts of heavy freight movement (such as air pollution from diesel emissions).

The HIA team therefore wanted to explore the impact of freight planning efforts on health, and specifically how the policies and transportation projects detailed in the Cargo Atlanta freight study. Two research questions guided the HIA process: 1) “What is the impact of freight infrastructure and movement, as well as freight related land uses such as rail yards, on public health?” 2) “Where are the greatest negative health impacts from freight movement and land use conflicts located?”

The HIA project team determined that the Cargo Atlanta: a Citywide Freight Study was a good candidate for an HIA due to the timing and status of the draft of the Cargo Atlanta study, the receptiveness of the decision makers at the City of Atlanta, and the material contained in the report, which offered multiple opportunities for better consideration of health impacts.

The following HIA screening matrix illustrates the selection process used to evaluate this project as a potential candidate for an HIA.

<table>
<thead>
<tr>
<th>Proposal</th>
<th>Cargo Atlanta Study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Is there a decision?</strong></td>
<td>Yes, list of potential transportation projects and policies under consideration for adoption by City Council as a result of the freight study.</td>
</tr>
<tr>
<td><strong>Is the decision likely to substantially affect health or health determinants?</strong></td>
<td>Yes, policy direction resulting from the HIA could potentially impact future development decisions and freight routes which could impact public health. Resulting air pollution and increased accident risk may lead to negative health outcomes like respiratory disease or injuries.</td>
</tr>
</tbody>
</table>
The majority of questions are answered in the affirmative, making the Cargo Atlanta freight study a good candidate for an HIA. Since the project list in the freight study provides a clear opportunity for intervention and greater consideration of health impacts, it became a major data input for the HIA analysis and resulting HIA recommendations.

During the screening process, the HIA project team also noted that the voice of community members affected by freight movement was lacking in the development of the freight study. Because of this, and for the reasons previously mentioned, the project team decided to include a section specifically focusing on EJ communities located along high volume truck corridors.

<table>
<thead>
<tr>
<th>Proposal</th>
<th>Cargo Atlanta Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the timeframe for the decision-making process appropriate?</td>
<td>Yes, there is extensive evidence linking freight transport to health outcomes (e.g. Matsuoka, Hricko, Gottlieb, &amp; DeLara, 2011; THE Impact Project, 2010, 2012; Wargo, Wargo, &amp; Alderman, 2006).</td>
</tr>
<tr>
<td>Is there enough evidence and data for the analysis?</td>
<td>Yes, some neighborhoods in the study area are majority vulnerable populations (environmental justice neighborhoods).</td>
</tr>
<tr>
<td>Is there potential to disproportionately affect vulnerable populations?</td>
<td>Yes, the study objectives are the following two themes: mobility and livability. The livability component should include a consideration of public health impacts.</td>
</tr>
<tr>
<td>Does the current decision-making process fail to adequately address health?</td>
<td>Yes, the study objectives are the following two themes: mobility and livability. The livability component should include a consideration of public health impacts.</td>
</tr>
<tr>
<td>Does the legal framework allow for health to be factored into the decision?</td>
<td>Yes</td>
</tr>
<tr>
<td>Are available staff and resources adequate to complete a successful HIA?</td>
<td>Yes</td>
</tr>
<tr>
<td>Is there major public controversy about the decision?</td>
<td>No</td>
</tr>
<tr>
<td>Is an HIA likely to produce new findings or recommendations?</td>
<td>Yes</td>
</tr>
<tr>
<td>Is there a risk for major catastrophic health consequences?</td>
<td>No</td>
</tr>
</tbody>
</table>
3. Scoping

The scoping process of an HIA includes: determining the geographic limits of the study area, the specific health impacts of greatest concern, and data that is needed. During scoping, the population affected by the program, policy, or project that is the subject of the HIA is also determined. Potential stakeholders are identified. For this HIA, the necessary data were either obtained or (in the case of some geospatial data) created internally and further refined with stakeholder input, both informing the scoping process and serving to shape the HIA appraisal and recommendations.

3.1 HIA Study Area

The Cargo Atlanta study is limited to the City of Atlanta boundary. Therefore, the geographic boundary of this HIA is the City of Atlanta limits. Figure 2 shows the HIA study area within its regional context.

Figure 2: HIA Study Area - Atlanta, Georgia
### 3.2 HIA Context – City of Atlanta Baseline Information

The City of Atlanta has historically played a prominent economic role for the state with shipping and logistics support such as warehouses and cargo transfer facilities. Originally named Terminus, Atlanta’s early position at the end of a rail line helped the city grow into the intermodal trade intermediary of the Southeast that it is today. Now home to the busiest airport in the world, Atlanta plays a major role as the first and last point for shipping high-value cargo both domestically and internationally (City of Atlanta, 2015b).

The City of Atlanta has a population of approximately 456,000 (US Census Bureau, 2015). The City is contained primarily within Fulton County with a small portion located in DeKalb County, and although Fulton County extends beyond the city limits to the north and south, the County Health Rankings offer a benchmark from which to begin to examine existing health conditions. Table 2 below details characteristics of the population of Fulton County which are related to public health and are relevant to this HIA. The Rank column shows that Fulton County ranks 25th in terms of overall health outcomes across the state (i.e. 24 out of 159 counties in Georgia have better health outcomes). Poverty is an issue in Fulton County, with 25% of children living in poverty (US Census Bureau, 2014a, 2014b). Fulton County also has an obesity rate of 22% and a physical inactivity rate of 19% (County Health Rankings, 2016).

<table>
<thead>
<tr>
<th>Table 2: 2016 County Health Rankings, Fulton County, Georgia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fulton County</strong></td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td><strong>Health Outcomes</strong></td>
</tr>
<tr>
<td>Premature death (per 100,000 population)</td>
</tr>
<tr>
<td>Poor or fair health</td>
</tr>
<tr>
<td>Poor physical health days (average in past 30 days)</td>
</tr>
<tr>
<td>Poor mental health days (average in past 30 days)</td>
</tr>
<tr>
<td>Low birthweight</td>
</tr>
<tr>
<td><strong>Health Factors</strong></td>
</tr>
<tr>
<td>Adult obesity</td>
</tr>
<tr>
<td>Physical inactivity</td>
</tr>
<tr>
<td>Motor vehicle crash death rate (per 100,000 population)</td>
</tr>
<tr>
<td><strong>Social &amp; Economic Factors</strong></td>
</tr>
<tr>
<td>High school graduation</td>
</tr>
<tr>
<td>Some college</td>
</tr>
<tr>
<td>Unemployment</td>
</tr>
<tr>
<td>Children in poverty</td>
</tr>
</tbody>
</table>
Section 3  Scoping

Health Impact Assessment (HIA)

Cargo Atlanta: A Citywide Freight Study

<table>
<thead>
<tr>
<th></th>
<th>Fulton County</th>
<th>Top US Performers*</th>
<th>Georgia</th>
<th>Rank (out of 159 Georgia Counties)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income inequality</td>
<td>6.3</td>
<td>3.7</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>(ratio of 80th percentile income to 20th percentile income)</td>
<td>6.3</td>
<td>3.7</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Children in single-parent households</td>
<td>43%</td>
<td>21%</td>
<td>37%</td>
<td></td>
</tr>
<tr>
<td>Violent crime rate</td>
<td>856</td>
<td>59</td>
<td>385</td>
<td></td>
</tr>
<tr>
<td>(per 100,000 population)</td>
<td>856</td>
<td>59</td>
<td>385</td>
<td></td>
</tr>
<tr>
<td><strong>Physical Environment</strong></td>
<td></td>
<td></td>
<td></td>
<td>140</td>
</tr>
<tr>
<td>Air pollution-particulate matter</td>
<td>13.2</td>
<td>9.5</td>
<td>12.8</td>
<td></td>
</tr>
<tr>
<td>(average daily density of PM2.5 in micrograms per cubic meter)</td>
<td>13.2</td>
<td>9.5</td>
<td>12.8</td>
<td></td>
</tr>
</tbody>
</table>

* 90th percentile, i.e., only 10% are better
^ 10th/90th percentile, i.e., only 10% are better.

Note: Blank values reflect unreliable or missing data

3.3 Determinants of Health

The HIA team focused on the following determinants of health, and spatially linked them to health outcomes. The broad categories of social and physical determinants of health were drawn from the Centers for Disease Control and Prevention (CDC) (2014).

1. Social environment
   a. Demographics and Poverty

2. Physical environment
   a. Land Use
   b. Transportation

A literature review was conducted to determine the potential positive and negative health impacts of freight movement - following from the social and physical determinants of health identified above. Four major topic areas connecting freight movement and health emerged from the literature review during the Appraisal phase and provided the framework for the HIA recommendations:

1. Air Pollution
2. Accidents and Safety
3. Noise
4. Economic Impacts

3.4 Stakeholders and Affected Populations

The Cargo Atlanta freight study has many stakeholders and will affect a variety of populations in the City of Atlanta. Within the city, stakeholders include residents of neighborhoods potentially affected by freight related transportation projects, government officials, and representatives from the freight and logistics industry among others. In Guidance and Best Practices for Stakeholder Participation in HIA, a working group of HIA practitioners defines stakeholders as “individuals or organizations who stand to gain or lose from a decision or process. More specifically, stakeholders can be described as people who:
• Are affected by the prospective change (e.g., health or financial)
• Have an interest in the health impacts of the policy or project under consideration because of their position
• Have an active or passive influence on the decision-making and implementation process of the project or policy under consideration
• Have an economic or business interest in the outcome of the decision” (Stakeholder Participation Working Group of the 2010 HIA in the Americas Workshop, 2011)

Some stakeholders may not experience health impacts from freight planning, while other stakeholders belong to vulnerable, affected populations within the study area. Though ideally representatives of all affected populations would be engaged as stakeholders, the HIA appraisal largely relied on census and public health data to analyze effects of freight movement on these affected populations.

For the development of the Cargo Atlanta study, the City of Atlanta conducted the following stakeholder engagement:

“One-on-one interviews were conducted to understand the needs of various stakeholders, as well as which aspects of current plans and regulations for the study area were effective as designed and which aspects needed modification. The City of Atlanta Planning Department identified these organizations, companies, and individuals and encouraged their inclusion and participation at key points throughout the process. Stakeholders interviewed included:

• Members of the freight community (rail providers, trucking providers, trucking associations)
• Atlanta Police Department
• City Council members, their respective aides, and other elected officials"

The HIA project team reviewed the City’s stakeholder engagement process and used this work as a foundation for the stakeholder involvement that the research team conducted for the HIA. Government officials and department representatives provided input which informed the HIA. In addition, community and neighborhood groups and city, county, and state agency staff members were approached for input into the HIA process. The research team conducted both an HIA workshop and individual meetings with stakeholders to gather feedback for the HIA. The HIA project team’s engagement process is detailed in Appendix 2: Stakeholder Engagement Plan.

### 3.5 Equity in HIA Practice

It is important to advance equity in the practice of HIA. Stakeholder engagement is a critical component of achieving this goal. Guidelines regarding how to promote equity are provided in the *Equity Metrics for Health Impact Assessment Practice, Version 1*, which focuses on four outcomes:

• The HIA process and products focus on equity.
• The HIA process built the capacity and ability of communities facing health inequities to engage in future HIAs and in decision-making more generally.
• The HIA resulted in a shift in power benefiting communities facing inequities.
• The HIA contributed to changes that reduced health inequities and inequities in the social and environmental determinants of health. (Society of Practitioners of Health Impact Assessment, n.d.)

Accordingly, a successful HIA process requires careful consideration of vulnerable populations and Environmental Justice (EJ) communities that could be affected by the decision under evaluation by
the HIA. The Environmental Justice (EJ) movement emerged in the late 1970s to address the disproportionate impact of locally undesirable land uses like solid waste landfills and toxic waste disposal facilities on people of color and low-income (McGurty, 2007). The concept was later expanded to include the distribution of the benefits and burdens of transportation infrastructure (Bullard & Johnson, 1997; Bullard, Johnson, & Torres, 2004). The literature and transportation planning history has demonstrated that people of color and low-income populations are often disproportionately burdened by transportation infrastructure while not receiving a fair share of its benefits (e.g. Golub, Marcantonio, & Sanchez, 2013; Rowangould, 2015).

The achievement of meaningful participation in decision making and an equitable distribution of environmental benefits and burdens is supported by federal guidance. In 1994, President Clinton signed Executive Order 12898, making environmental justice an explicit goal of federal agencies by requiring them to identify and address “disproportionately high and adverse” negative health and environmental effects of federal agency actions on “minority populations and low-income populations” (“Executive Order 12898,” 1994). In the years following the executive order, the federal Interagency Working Group on Environmental Justice (EJ IWG) has promoted and coordinated action by federal agencies without prescribing a definition or structured method of identifying environmental justice concerns. Therefore, there remains substantial flexibility among federal agencies for adapting broad EJ principles to specific circumstances, which is appropriate given the very diverse situations in which federal agencies would encounter environmental justice issues.

As the HIA team worked to identify EJ areas, three of the most useful definitions for Environmental Justice came from the Environmental Protection Agency (EPA), the US Department of Housing and Urban Development (HUD), and the U.S. Department of Transportation (USDOT). The EPA definition is one of the most widely cited and incorporates the notion of meaningful participation in decision making, stating that environmental justice requires the fair treatment and meaningful involvement “of all people regardless of race, color, national origin, or income” in environmental issues (EPA, 2016).

The USDOT definition applies the concept of Environmental Justice to transportation by referring to both an equitable distribution of harms as well as access to benefits associated with transportation (Federal Highway Administration, 2012). The Georgia Department of Transportation adopts the definitions laid out in FHWA Order 6640 to “Address Environmental Justice in Minority Populations and Low-Income Populations” (Georgia Department of Transportation, 2012b). EJ populations are defined as:

- **Low-income**: Individuals whose household income is at or below the Department of Health and Human Services poverty guidelines
- **Minority**: Individuals who are Black, Hispanic, Asian American, American Indian, or Alaskan Native

The HIA team focused on areas of low-income for the Cargo Atlanta freight study HIA. Poverty is closely correlated with negative health outcomes. The HIA team therefore relied on the EJ guidelines cited by HUD to identify EJ areas in the HIA. HUD cites the thresholds of poverty that have been established by Galster (2012). These guidelines state that if 0 - 20% of the population is living below the federal poverty level then there is no effect on the overall character and challenges of the area. Once an area or neighborhood exceeds 20% of the population living below
the federal poverty level, there begins to be a negative impact on the overall area. If the percent of
the population living in poverty exceeds 40%, then negative effects are fairly significant and
uniform. Neither GDOT nor the EPA prescribe thresholds to identify low-income or minority
populations, and setting appropriate EJ population thresholds is a challenging issue within
transportation planning more generally (Karner, 2016; Karner & Niemeier, 2013). The HIA project
team identified the neighborhoods along freight routes which exceed the 40% poverty threshold
and included these areas in the EJ section of the recommendations and appraisal.

The poverty threshold approach is supported by the evidence. Galea, Tracy, Hoggatt, DiMaggio,
and Karpati (2011) conducted a meta-analysis of 47 studies of all-cause mortality that considered
social factors as a contributing cause. They found that individuals living in poverty experience a
40% to 75% higher risk of mortality compared to those not in poverty. Those living in areas (census
tracts) with at least 20% poverty rate experienced a 20% higher risk of mortality.
4. Appraisal

During the Appraisal phase, the HIA project team drew from the literature to determine the positive and negative impacts of freight movement on health, and identified both mitigation strategies for negative health impacts, and opportunities to reinforce the positive health impacts of freight movement.

The team narrowed the literature review to focus on four specific ways that freight movement affects health. The list of topics included in the literature review was consistent with the topics and policies included in *Cargo Atlanta*:

1. Freight Air Pollution Emissions
2. Freight Movement, Crashes and Safety
3. Freight Movement and Noise
4. Economic Impact of Freight Movement

Also during the Appraisal phase, the HIA project team collected, created, documented and analyzed data illustrating the existing conditions in the study area to inform HIA recommendations. These data can be grouped into the following topic areas:

1. Demographics
2. Transportation and Air Quality
3. Land Use
4. Health

The HIA project team reviewed the existing conditions of the study area, including the demographic data, to determine locations of Environmental Justice (EJ) communities. A comprehensive high volume truck route spatial layer was created, and EJ areas likely to be subjected to high levels of air pollution emissions relative to the routes were identified. The existing population health conditions in these areas was reviewed and through a series of vignettes which detail areas of high poverty in the study area. This catalogue of vignettes is included as Appendix 1. High poverty areas are also ranked, and scores are tabulated to find the “greatest opportunities for improvement.” The HIA recommendations follow this structure and are organized by both citywide recommendations as well as more detailed recommendations, specifically addressing the highest scoring individual high poverty areas. See Appendix 1 for more detail.

4.1 Literature Review

The following literature review discusses the primary health issues related to freight movement.

**Freight Air Pollution Emissions**

Freight affects air quality in multiple ways. Most forms of freight transportation on roads, rails, or water, release emissions at the engine location. Transfer points such as ports, intermodal terminals, and distribution centers concentrate vehicle traffic in a small area and often use additional cranes
or drayage trucks. Each of these point emission sources degrades local air quality. Effects are strongest when dirtier fuels like diesel or bunker fuel are used, when many vehicles are concentrated close together like at a port or major highway, and when wind pushes pollutants to sensitive nearby land uses.

Roadways, other transportation facilities, freight logistics, and industry can create “hot spots” of locally elevated air pollution levels, which may impact homes and schools and may inequitably impact some citizens more than others (Karner, Eisinger, & Niemeier, 2010; Rowangould, 2015). These sources also contribute to regional levels of six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM 2.5 and PM 10), and sulfur dioxide (SO₂). Proximity to high-volume motor vehicle emission sources, such as major highways and congested areas, appears to significantly influence exposure (Antó, 2012). The following sections detail the air emissions associated with each freight mode or type of freight facility.

### Air Pollution Emissions from Trucks

Air pollution severity and profile depends on the fuel type. Ninety percent of trucks burn diesel fuel (“Diesel at Work: Delivering for America,” n.d.). Diesel exhaust contains dozens of particles and chemicals that can harm human health (Wargo et al., 2006). Diesel exhaust contains carcinogenic chemicals including benzene, formaldehyde, and 1.3-butadiene (Wargo et al., 2006). Diesel exhaust particles also exacerbate irritation caused by other allergens, magnifying those particles’ effect on the body (Pandya, Solomon, Kinner, & Balmes, 2002).

### Air Pollution Emissions from Rail

The vast majority of fuel consumption by freight rail goes toward national and regional freight line-haul (88%) while local freight consumes less than 2% of all locomotive fuel (EPA, 2009). Though trains do use internal combustion engines powered by diesel fuel, trains tend to pollute less than trucks per ton-mile. Transporting goods and materials via rail instead of truck can also provide environmental benefits by reducing highway congestion and taking trucks off the roads (Association of American Railroads, 2015). Furthermore, freight railroads have made great strides in fuel efficiency by moving longer trains over longer distances between interchanges, updated or replaced old machinery, used more innovative materials, and reduced idling time. During that time, revenue ton-mile per gallon consumed rose from 332 to 473 (Federal Railroad Administration, 2015b).

### Air Pollution Emissions from Truck Stops

Truck stops, like rail yards, are problematic in part because of the tremendous number of trucks idling their engines. Truck idling consumes up to one gallon of diesel per hour; this diesel exhaust produces carbon dioxide, NOₓ, particulates, sulfur dioxide, carbon monoxide, hydrocarbons, and other air toxics (US EPA New England, 2002). As previously discussed, idling engines can produce significant amounts of diesel pollutants (Brodrick, Dwyer, Farshchi, Harris, & King Jr, 2002). The exact emissions generated depend on engine model, speed, and load (Brodrick et al., 2002). For example, idling trucks with the air conditioning running can produce 16% the carbon dioxide, 36% as much NOₓ, and 132% as much carbon monoxide as the same truck traveling at 55 mph (Brodrick et al., 2002).
Air Pollution Emissions from Airports

Aircraft engines produce localized air pollution that can affect the region. Pollution’s effect depends on such factors as the airport’s location, geological features such as mountains, and prevailing winds (Moussiopoulos, Sahm, Karatzas, Papalexiou, & Karagiannidis, 1997), as well as airport operations and surrounding land uses.

Aircraft emissions from Atlanta’s Hartsfield Jackson International Airport have been modeled and were found to most affect south Fulton, north Fayette, and west Clayton counties (Unal, Hu, Chang, Talat Odman, & Russell, 2005). Particulate matter is nearest to ground level when aircraft are taking off and landing, so particulate matter is most prevalent at ground level very near the airport. The largest local effect of the airport on particulate matter 2.5 (PM2.5) was 56 parts per billion (ppb), and there was a generalized impact of 5 ppb around the metropolitan area (Unal et al., 2005). The Atlanta airport has also been observed generating plumes of CO and NOx at least 1-minute downwind of taxiways (Herndon et al., 2008). Particulate matter concentrations caused by the Atlanta airport are heavily correlated with low-income, low home value, low educational attainment, and racial minority residential locations, and are predicted to result in approximately 1.4 additional average deaths annually (Rissman, Arunachalam, BenDor, & West, 2013).

Air Pollution Emissions and Health

Poor air quality impacts health in a variety of ways. The presence of pollutants in the air reduces lung function, increases asthma and other respiratory illness rates, cancer, irritation of breathing passages, cardiopulmonary disease, premature and low birth weight babies, infant mortality, and premature death rates (US EPA, 2007). Motor vehicle traffic presents a particularly unique public health risk because of the toxicity of its emissions and its presence within communities. The effects of gaseous and particulate pollutants on health have been found in both short- (acute exposure) and long-term studies (chronic exposure) with effects being seen at very low levels of exposure (Brunekreef & Holgate, 2002).

Particulate matter 2.5 (PM 2.5) is often singled out as the most problematic air pollutant for human health. Researchers distinguish types of particulate matter by their size: PM 0.1, PM 2.5, and PM 10 are commonly used. The smaller the number, the smaller the particle. Smaller particles are generally seen to have greater negative effects on health because the body struggles to filter them out and they are small enough to be absorbed through lung tissue into the bloodstream (Health Effects Institute, 1999, 2001; US EPA, 2009).

Both short- and long-term exposure to particulate matter (PM) have been associated with increased rates of cardio-respiratory morbidity and mortality. PM has been specifically linked to increased lung cancer risk, along with short- and long-term non-cancer health effects such as bronchitis, asthma, and reduced lung function. Children and the elderly are also at a higher risk for adverse impacts than the general population (US EPA, 2007). PM 2.5 is seen to have an adverse effect on lung development in adolescents that can lead to lifelong lung deficiency (Gauderman et al., 2000, 2004). Research has also shown that common emission sources for PM have significant associations with elderly cardiovascular hospital admissions and that modest amounts of air pollutants are associated with small changes in cardiac function in the elderly (Barnett et al., 2006; Mar et al., 2005).
Section 4  Appraisal

Poor Air Quality and Asthma

Asthma affects 7% of adults and 9% of children in the U.S. (Jackson, 2003). Various factors can cause the development of or contribute to the severity of asthma. Among these are outdoor environmental factors such as air pollution, including ground level ozone (O₃) and respirable particulate matter (PM). Aeroallergens (pollen), Sulfur Dioxide (SO₂), Nitrogen Dioxide (NO₂) and Ozone (O₃) are associated with emergency pediatric hospital admissions whereas PM and O₃ are associated with uncontrolled asthma in adults (Antó, 2012).

Asthma hospitalizations and Emergency Room (ER) visits have a strong correlation with regional vehicle miles traveled (VMT), localized traffic volumes, and industrial emissions (English et al., 1999; Gunier, Hertz, Von Behren, & Reynolds, 2003; Lin, Munsie, Hwang, Fitzgerald, & Cayo, 2002; Weisel, 2002). Several research studies have found that socio-economic status and quality of the built environment (housing conditions; internal and external air quality) have a direct impact on triggering asthma symptoms (Miles & Jacobs, 2008). In Georgia, asthma hospitalizations are most prevalent among children, especially those aged 0-4, black children, and boys (Annor et al., 2015).

Air Pollution and Heart Disease

Heart disease is responsible for about one in four American deaths, or over half a million Americans per year (Centers for Disease Control and Prevention, 2015a), and it is marked by a series of maladies negatively affecting blood flow around the body that can take chronic forms (e.g., plaque buildup in the arteries characteristic of coronary artery disease) and culminate in an acute, oftentimes life-threatening episode such as a heart attack or a stroke (Centers for Disease Control and Prevention, 2015b). The primary risk factors for heart disease include other medical conditions (e.g., diabetes, overweight) and behavior choices (e.g., poor diet, physical inactivity, alcohol use) (Centers for Disease Control and Prevention, 2015a), but many studies have shown that air pollution can also promote the development of heart disease over the long term as well as increase the incidence of acute cardiac attacks due to short-term pollution spikes. Air pollution can include particulate matter, nitrogen oxides, sulfur dioxide, and ozone (Brook et al., 2004), and these pollutants are thought to promote heart disease by irritating the lungs. Air pollution promotes the progression of heart disease because lung irritation causes the arteries to harden and plaque to accumulate, ultimately obstructing blood flow (atherosclerosis). At the same time, air pollution can promote immediate cardiac incidents by causing the heartbeat to become irregular (arrhythmia) and can cause plaque in the arteries to rupture, resulting in a portion of the heart being deprived of oxygen (i.e., a heart attack) (Brook et al., 2004). Brunekreef and Holgate (2002) show that air pollution can increase mortality and hospitalization rates, even at low pollution levels.

Freight Movement, Crashes and Safety

Freight accidents and safety refers to the injuries and deaths that can occur when freight vehicles, equipment, or cargo act in unforeseen ways. Accidents are negative externalities in that an individuals’ or a company’s action cause harm to someone who was not or cannot be compensated for the harm. Therefore, non-freight actors bear some of the freight industry’s costs. Accident costs include loss of life and other human suffering, medical expenses, and property damage, and production losses (Lindholm & Blinge, 2014; Matsuoka et al., 2011).
Crashes can be more prevalent and more severe as traffic increases, as residents spend more time in traffic, as travel speeds increase, as travel alternatives for unsafe drivers become less available, when appropriate bicycle and pedestrian facilities are lacking, and other design and operational factors. Road design also influences crash risk, as it determines where and how traffic movements occur. Further, road design can exacerbate conflicts between two or more road users; set changes in speed or direction; influence safety of at-grade rail crossings; and determine road user speeds, visibility, and attentiveness (Ossenbruggen, Pendharkar, & Ivan, 2001).

### Accidents and Safety on Roads

In 2014, crashes involving large trucks killed 3,903 people nationwide, of which 73% were occupants of other vehicles and 10% were non-motorists such as pedestrians or bicyclists. Georgia had 155 truck-involved crashes in 2014, with a nearly identical person-type distribution (National Highway Traffic Safety Administration, 2014). Importantly, traffic collisions involving trucks are associated with a higher severity of injuries (Chang & Mannering, 1999; Roudsari et al., 2004).

Road accidents’ monetary value relative to other freight externalities is subject to some disagreement, due to differing assumptions and contexts. Forkenbrock (1998) found that truck accidents are the majority of truck externalities when they are all monetized, far more than air pollution and noise combined. By contrast, (Beuthe, Degrandsart, Geerts, & Jourquin, 2002) found truck accidents’ external cost to be just slightly above and about half of air pollutants.

### Accidents and Safety at Truck Stops

Having sufficient parking at truck stops or rest areas is important to allow truck drivers to take mandatory rest periods in areas safe from accidental collision. When there are too few safe truck parking areas or drivers do not feel that they can quickly reach them when they are tired, some truck drivers park on highway shoulders or exit ramps, which have a higher accident risk (Chatterjee & Wegmann, 2000). Therefore, adequately spaced, well designed truck parking facilities that are easy to find and are well lit are important for keeping stopped trucks away from travel lanes (Chatterjee & Wegmann, 2000).

### Accidents and Safety on Railroad Lines

The Federal Railroad Administration (FRA) established a goal of zero tolerance for rail safety violations, an initiative requiring collaboration amongst the FRA, the rail workforce, equipment suppliers, contractors, and other government agencies (Federal Railroad Administration, 2012). The FRA categorizes all accidents/incidents into one of the following categories.

- **Train accidents**: Incidents involving on-track rail equipment causing damage that exceeds a specific amount (in 2010, the value was $9,200).

- **Highway-rail grade crossing incidents**: Collision between rail and a user at a crossing.

- **Other incidents**: A death, injury, or occupational illness of a railroad employee not resulting from either of the above categories.

Collisions at highway-rail grade crossings are the most dangerous accident type (Forkenbrock, 1999). Fortunately, collision incidents and number of fatalities have been reduced by 85% and 77%, respectively.
respectively, since the late 1970s. However, just over 2,000 collisions in 2011 still resulted in over 250 fatalities (Federal Railroad Administration, 2013).

### Accidents and Safety at Airports

Airport accidents are a present but minute risk to off-airport properties given U.S. airlines’ very high safety record. There is a slightly larger risk to airport employees. In 2013, some 26,000 non-fatal injuries were reported among air transportation workers (Bureau of Labor Statistics, 2014), the majority of whom are engaged primarily in passenger as opposed to freight transportation. The same year there were 24 air transportation worker deaths on the job, of which 4 were in air freight (Bureau of Labor Statistics, 2014). The deaths and injuries are contrasted against the nearly half a million air transportation employees (Bureau of Labor Statistics, 2015b).

### Freight Movement and Noise

Noise is a potential problem for all freight modes and facilities. Exposure to noise has been associated with a number of negative health effects dating back to the 1960s (Moudon, 2009).

### Noise from Moving Vehicles

Researchers have examined the relationship between vehicle traffic and noise. Highway noise increases with higher speeds, higher traffic volumes, and vehicle weights (FHWA, 2011). Therefore, trucks are louder than most personal cars, and increasing the number of vehicles per hour 10 times approximately doubles the sound intensity (Maryland Department of Transportation, 2015). For example, a single truck at 55 miles per hour is approximately as loud as ten passenger cars at that speed. Moreover, double traffic speed approximately doubles volume (Maryland Department of Transportation, 2015).

### Noise at Truck Stops

Idling trucks and those entering and leaving the truck stop produce noise affecting the immediate vicinity. A team of researchers examined the noise associated with a proposed distribution center in San Jose, California. Their methodology is certainly relevant to truck stops to the extent it is based on noise generated by trucks. They used the following events as producing noise and assigned each a decibel level: truck passby (68 decibels at 30 feet); truck airbrakes (72 dB at 25 feet); truck backup alarm (79 dB at 25 feet); idle before engine shutoff (70 dB at 25 feet); truck engine ignition plus airbrakes (71 dB at 25 feet); and truck acceleration from stop (74 dB at 25 feet) (Salter & Frederick, 2014). San Diego considers most sensitive residential or institutional land uses to require 60 dB or fewer without special noise reduction measures, up to 75 dB with noise reduction measures, and no more than 75 dB under any circumstances because noise mitigation will be insufficient (City of San Jose, 2013).

### Noise from Railroad Lines

Trains’ two major noise sources are the locomotive engines and the wheel/rail interaction (Fath, Blomquist, Heinen, & Tarica, 1974). Common types of noise from rail include wheels squealing on track curves, engine noise from idling trains, engine noise increasing as trains ascend hills, and railcars banging as trains slow down (Transport for New South Wales, 2014). Noise intensity varies based on the type of cars, presence of track crossovers, track characteristics, frequency of cars, speed, surrounding vegetation, and surrounding urban form (HMMH, 2006). Local authorities and
regional planners can use operations data (e.g., train frequency, speed, and size) to obtain rough estimates of the noise that specific line operations generate.

Researchers have completed field studies measuring the general noise levels based on type of car and speed. Measuring 50 feet from the source, a metro train travelling at 50 mph registers an A-weighted sound level of roughly 60 dB(A). Using the same methodology, high speed rail returns a sound level of 40-90 dB(A) (Hanson, Ross, & Towers, 2012). The noise from passing trains is mainly low frequency, ranging from 40-100 Hz with high frequency pitches coming from the friction of the rail against the car wheels (Fath et al., 1974). A joint study with the EPA and the National Standards Bureau found little difference in the low frequency noise from 25 feet from to track to 400 feet to the track (Fath et al., 1974). While passenger and freight trains have different noise profiles, these studies provide a point of departure for understanding freight train noise.

### Noise from Airports

Airport-related noises in surrounding neighborhoods come primarily from jet engines of taxing, taking off, and landing aircraft. Aircraft in the air directly around the airport also spread noise effects.

Aircraft noise tends to have a higher annoyance value than many other noises, partially because of the large sound pressure shift inherent in aircraft noise (Berglund, Lindvall, & Nordin, 1990). Some studies have shown aircraft noise exposure to contribute to poor physical health with conditions such as hypertension (Black, Black, Issarayangyun, & Samuels, 2007; Rosenlund, Berglund, Pershagen, Järup, & Bluhm, 2001), although others did not find an airport noise effect on blood pressure (Goto & Kaneko, 2002). One of the purported vectors for noise's physical manifestations is the body’s release of adrenaline in response to stress, which can raise blood pressure, increase heart rate, and damage arterial linings (Berglund et al., 1990).

Aircraft noise is the late evening has also been shown to disturb sleep among adults and infants (Berglund et al., 1990; Franssen, Wiechen, Nagelkerke, & Lebret, 2004). Berglund et al. (1990) cite a study (Muzet, Naitoh, Johnson, & Townsend, 1974) showing sounds at 80 dB and above to interfere with REM sleep.

### Health Impacts of Noise

Noise impacts can be understood under three categories: psychological, physiological, and mental health (Matsuoka et al., 2011).

**Psychological**

Annoyance or disturbance is the most common and most researched psychological effect of noise. Noise annoyance is characterized by feelings of displeasure or discomfort towards a particular sound and results in interference with thoughts, feelings, or activities (Moudon, 2009; Passchier-Vermeer & Passchier, 2000). Noise annoyance can result in psychosocial and psychosomatic health effects. The most common source of noise disturbance is road traffic. The random but usually constant nature of traffic noise contributes to its ability to annoy along with its intermittent sound level variations caused by motorcycles, for example, or peak and off-peak traffic patterns (Alenius, 2001). There are psychosocial responses of which noise annoyance is the main cause.
Physiological

Physiological impacts include hearing loss and high blood pressure (Matsuoka et al., 2011). Hearing loss or impairment can occur both from short-term exposure to high noise levels or long-term exposure to lower levels. Hearing loss can result in difficulties in communicating and feelings of isolation and depression. At 85 dB(A), roughly equivalent to the sound of a jack hammer, the risk of damage to the ear is about 10 percent. The odds of damage increases as the decibel level rises. A 24-hour exposure to sound levels of 70 dB(A) or less, roughly equivalent to a food blender, is not anticipated to result in any permanent hearing damage (Fath et al., 1974). Children and people who have demonstrated hereditary sensitivity to noise are considered to be the at-risk or sensitive groups (Alenius, 2001) and are more vulnerable to hearing loss.

Mental Health

Mental health impacts include anxiety and disrupted sleep (Matsuoka et al., 2011). Sleep disturbance can impair the normal functions performed by sleep such as brain restoration and cardiovascular respite. It also has an effect on mood, fatigue, performance, cognitive abilities, vigilance, and can boost epinephrine levels which contributes to stress and increased risk of injury (Moudon, 2009; Passchier-Vermeer & Passchier, 2000). Groups that are particularly sensitive to these effects include: the elderly, the sick, and shift workers. For all populations, maximum sound levels should not exceed 45 dB(A) (similar to a refrigerator), but sound levels should ideally remain around 30 dB(A) (Alenius, 2001). Included in psychosocial responses are sleep disturbance, disruption of daily activities, and interference with performance—all subjective responses that pertain to well-being and quality of life. Noise also has physical impacts such as hearing loss, tinnitus, hypertension, ischemic heart disease, and some forms of cardiovascular disease (Alenius, 2001; van Kempen et al., 2002). Stress-related health effects brought on by noise exposure can be psychological (feelings of depression, fear, resentment, discomfort, anger), behavioral (isolation, aggression, abuse of alcohol, drugs, food, and tobacco), or somatic (cardiovascular, gastrointestinal, respiratory illness), and physical (hearing loss, tinnitus) (Porter, Flindell, & Berry, 1999).

Stress-related health effects of noise can give rise to psychological, behavioral, and somatic disorders. Studies are inconclusive in determining whether health effects of noise-related stress have long-term, chronic impacts or if they are transient or reversible in nature. Research has detected some impacts on blood pressure, clinical hypertension, ischemic heart disease and other cardiovascular disorders, biochemical effects, changes in the immune system, and potential effects on the unborn child although the evidence to support effects on unborn children is limited (Porter et al., 1998).

In conclusion, research indicates there is sufficient evidence for a causal association between noise and the following health effects: annoyance, disruptions in performance by school children, sleep disturbance, mood, heat rate, hearing loss, and ischemic heart disease (Porter et al., 1998). There is limited evidence of a causal relationship for the following health effects, although an association between noise and health has been observed: performance in adults, hormones, forms of cardiovascular disease, biochemical effects, and effects on the immune system. One of the purported vectors for noise’s physical manifestations is the body’s release of adrenaline in response to stress, which can raise blood pressure, increase heart rate, and damage arterial linings (Berglund et al., 1990).
Economic Impact of Freight Movement

The movement of freight, and industries supporting this sector, have a number of economic impacts. These industries provide employment opportunities across a range of education levels and abilities. The movement of freight is essential to economic productivity at both a national level as well as a global level. In 2012, spending by the transportation and logistics industry totaled $1.33 million across the US, representing approximately 8.5% of the national gross domestic product (Select USA, n.d.).

Economic Impact of Rail

In the US, a rail network of 140,000 miles delivers goods and services to locations throughout the country (Federal Railroad Administration, 2015a). Class I freight rail includes line haul freight railroad companies with 2013 operating revenue of at least $467 million. The freight companies in this category are BNSF, the Canadian National Railway, Canadian Pacific, CSX, the Kansas City Southern Railway, Norfolk Southern, and Union Pacific (Federal Railroad Administration, 2015a). In addition to Class 1 freight rail, the US freight rail network includes 21 regional railroads and over 500 local railroads. Regional railroads are line-haul railroads operating at least 350 miles of rail and/or earning revenue of $40 million or more. Local railroads are line-haul railroads that don’t meet the regional railroad criteria (Federal Railroad Administration, 2015b).

Regardless of the previously discussed negative externalities, freight rail is an economically critical link in the global supply chain. The rail industry also provides jobs for roughly 180,000 people (Association of American Railroads, 2015) with an average wage near $60,000 dollars (Bureau of Labor Statistics, 2015a). Class I freight railroads spent about $27 billion in investment in 2014 (Association of American Railroads, 2015). Cargo activity is projected to increase threefold by 2030, thus putting strain on existing infrastructure and requiring either expansions or new facilities (Vivar & Vallianatos, 2012). Additionally, freight rail can influence the nearby residential housing market by decreasing property value, on average, between 5-7% (Simons & El Jaouhari, 2004). This means that market forces will push lower-income households to live nearer to freight rail and other potentially polluting disamenities.

In terms of public funding, the Association of American Railroads holds that railroads are favorable over truck transportation because the 140,000 mile network of rail is funded and maintained by private companies instead of public funds. In 2012 and 2013, the railroad network received $25 billion per year in reinvestment (2015).

Economic Impact of Rail Yards

Rail yards are the activity centers where containers are transferred from incoming trains to outgoing trains, or from one mode to another. They are sometimes referred to as "intermodal facilities" if they move freight between modes (e.g., trucks to trains). Rail yards are essential for rail freight operations. They balance several negative externalities such as accident risk, emissions, and noise against economic benefits. Recent projections predict a steady rise in cargo growth, ultimately tripling the current activity by 2030 (Vivar & Vallianatos, 2012). Rail growth will concentrate activity in existing rail yards and require new yards in some places. Both trends will increase rail’s impact on communities. Three rail yards are located in the City of Atlanta: Hulsey Rail Yard, Inman Yard, and CSX-Tilford Yard.
It is widely recognized that freight rail has major economic benefits that often counterbalance the negative impacts of this mode. Rail yards have a greater impact on the local economy compared to line operations because the activity happens in a concentrated location and provides jobs. Rail yards also draw rail industry employees from other regions who support the service economy (Olson, 2015).

### Economic Impact of Trucks

The greatest volume of freight movement occurs on the nation’s roadways. Trucks move approximately two thirds of U.S. freight weight (US DOT BTS, 2013), and even for cargo that is moved primarily by another mode, trucks are often responsible for bridging the first or last miles. Trucking is viable for most land-based trips since it is flexible, uses an almost omnipresent infrastructure, and moves cargo faster than other land modes. As a result of this, shorter trips especially skew towards trucks (US DOT BTS, 2013). Trucking’s volume and extent of use in all cities and types of neighborhood means that it has both a major and a very widespread impact on health.

The trucking industry provides accessible and reasonably well paying jobs. There were over 1.7 million truck drivers in the United States in 2014. This number is expected to grow by 98,800 drivers by 2024, keeping pace with general job growth. Median annual wage for truck drivers was $39,520, or $19.00 per hour, in 2014 (Bureau of Labor Statistics, 2014). Most employers of truck drivers do require them to have a high school diploma or GED. Additionally, many require drivers to attend truck-driving schools; these programs (either privately offered or through a community college) typically take between three and six months to complete. Truck drivers must have a commercial driver’s license (CDL), which is granted by individual states (Bureau of Labor Statistics, 2014).

Regulation does limit how much drivers may work and therefore earn. The Federal Motor Carrier Safety Administration heavily regulates driver work schedules. Drivers may work up to 14 hours straight, divided into 11 driving hours and 3 non-driving work hours (e.g., for loading cargo). Drivers must have at least ten hours off between work shifts. They can drive no more than 60 hours in a 7-day period or 70 hours in an 8-day period; they must then take 34 hours off before starting another 7- or 8-day run. These regulations, however, do nothing to prevent drivers from working nights, weekends, and holidays (Bureau of Labor Statistics, 2014).

### Economic Impact of Distribution Centers

Distribution centers are supply chain nodes that centralize and simplify freight flows and provide an inventory buffer between supply and demand. Distribution centers store goods inventory, arrange transportation to and from customers and suppliers, and sometimes provide services like product customization and packaging. Distribution centers matter for health because large amounts of freight activity occur as goods enter and leave the facility.

The Bureau of Labor Statistics estimates that, as of February 2015, over 750,000 Americans are employed in what it considers the warehousing and storage sector (US Bureau of Labor Statistics, 2015). Average hourly earnings in this sector, as of February 2015, were $18.60, which annualizes to $38,688 (US Bureau of Labor Statistics, 2015). This average, however, is significantly brought up by manager positions in the sector, which average $41.91 per hour (US Bureau of Labor Statistics, 2015).
Access is critical for these types of jobs. Warehousing jobs are most available to those who live near warehouses or have transportation to reach them. The Equal Employment Opportunity Commission found that distribution centers, because they require large amounts of space, are frequently built away from downtown locations and are thus found in less populated areas (EEOC, 2004). As population density decreases, the percentage of women and minorities in relevant job groups (such as operatives and laborers) declines. The EEOC also compared locations of distribution centers in 1982 to their 2002 location, and found that had the distribution centers remained in their previous locations, there would have been 10 - 14% higher minority representation in the local workforce job groups (EEOC, 2004).

Many distribution center jobs are accessible to low- and medium-skill laborers. Jobs – especially non-managerial jobs – typically require no more education than a high school degree or GED, or not even that. For example, job advertisements for a Kroger order worker require a high school education or GED with one year of work experience (Kroger Co., 2015) and an advertisement with CVS Health (CVS Health, 2015) lists no educational requirements at all.

### Economic Impact of Truck Stops

Truck stops provide truck drivers with fuel, food, showers, other goods, and places to rest safely away from traffic and are therefore necessary to the freight industry. The majority of truck stops are privately owned and operated adjacent to highway exits, but many states also provide publicly owned facilities that may have similar facilities. Truck stops need to be located frequently enough for drivers to take rest breaks when required by regulation or when the drivers feel drowsy, and they need to have enough parking spaces so that drivers do not park on highway shoulders or exit ramps instead (Bureau of Labor Statistics, 2014).

### Economic Impact of Airports

Airports produce great economic benefits. A number of studies have been conducted to understand the impact of Atlanta’s Hartsfield Jackson Airport. According to the 2013 Economic Impact Study by Atlanta Hartsfield Jackson Airport, over 63,000 jobs have been directly created on the airport property, and another 183,000 jobs are indirectly created by the airport. Accounting for indirect and induced effects brings the total jobs impacted to nearly half a million. The total direct regional economic impact is estimated at $35 billion annually (Hartsfield-Jackson Atlanta International Airport, 2014).

### Impact of Low Socio-Economic Status (SES) on Health

In 2002, the Institute of Medicine reported that Americans “are healthier, live longer, and enjoy lives that are less likely to be marked by injuries, ill health, or premature death” compared to their fellow countrymen back in 1900 (Institute of Medicine, 2002). However, these gains are not uniformly distributed through the population. There is mounting evidence to support the assumption that poorer people have poorer health because, in part, they live in places that are unhealthy, although the relationship is complex (Baum & Palmer, 2002; Robert, 1998). One study indicated that residents of high poverty neighborhoods live on average eight years less than non-poverty neighborhoods (Bhatia, Rivard, & Seto, 2006).

In contrast, higher SES individuals, as characterized by higher levels of education, high-paying jobs and stable neighborhoods, have on average lower morbidity and mortality rates. Research has shown that there is a consistent inverse relationship between SES and premature death. Overall,
people with lower socioeconomic status tend to die earlier than people of higher socioeconomic status, and health disparities continue to increase.

**Low Socio-Economic (SES) and Poor Birth Outcomes**

Several studies have also shown that census tracts with low education, high unemployment, low-paying jobs, and high poverty are consistently associated with adverse birth outcomes, including higher rates of pre-term birth and low birth weight babies. Neighborhoods can serve both as a source of support and stress for women of child-bearing age (Messer et al., 2006, 2008).

Low SES is also associated with less healthy infants. Poor health at birth is a leading cause of infant mortality. It is associated with poor health later in life, in both children and adults, and with conditions such as diabetes, obesity, and cardiovascular disease (Grady, 2011; Miranda, Messer, & Kroeger, 2012; Tu, Tedders, & Tian, 2012). Goldenberg et al. (2008) note that pre-term birth occurring before 37 weeks of gestation is a factor in 75% of infant mortality cases (Tu et al., 2012). Tu et al. (2012) note that in Georgia, the 2006 low birth weight rate of 9.6% exceeds the national rate of 8.2%. The most recent data in 2015 shows that low weight births comprise 9.5% of all births in the state, while Fulton County's rate is 10.3% and DeKalb County's is 9.8% (Georgia Department of Public Health, 2016). Therefore, the issue of low birth weight and associated negative long-term impacts is a significant issue in the HIA study area.

Research has long suggested that neighborhood socioeconomic characteristics influence birth outcomes. Ellen et al. (2001) summarize research finding that poorer neighborhoods are associated with a range of worse outcomes for infant and child health, including more low-birth weight babies, higher infant mortality in the first year, and higher rates of childhood asthma. In two of the studies reviewed, average income level within a census tract was significantly related to the probability of an infant having a low birth weight, while a third study found that low birth weight was correlated with neighborhoods with more residents receiving public assistance (Ellen et al., 2001). Goldenberg et al. (2008) note that preterm birth is associated with stress and exposure to stressful conditions, including issues such as housing instability, poor housing quality, poverty, and deprivation.

**Employment Improves Health**

Studies have shown that a healthy population supports economic development for a variety of reasons, and that the positive effects are most pronounced when moving from low to moderate levels of health because of decreasing returns (Strauss & Thomas, 1998). Thus, there is a reciprocal relationship between economic development and health. There is also evidence that “employment protects and fosters health” (C. E. Ross & Mirowsky, 1995). The relationship holds up across many types of employment, across genders, and across reasons for unemployment (C. E. Ross & Mirowsky, 1995).

The health of an adult individual and their household significantly improves with satisfying employment at a livable wage relative to the local market (Bhatia & Katz, 2001; Cole et al., 2005). Employment can provide or allow the household to acquire quality housing, nutritious food, education, transportation, medical care or coverage, savings, and many other necessities of a healthful life. Lack of access to employment, under-employment, or jobs which do not pay a living wage or provide sufficient benefits can contribute to stress, depression, malnourishment or obesity, homelessness, and many other negative outcomes.
Doyle, Kavanagh, Metcalfe, and Lavin (2005) provided a comprehensive review on the impacts of employment and, by extension, unemployment on health. According to their findings, unemployment is a stressful event and can have marked negative effects on one's health. These may include but are not limited to premature mortality; poverty due to long-term unemployment may result in individuals having less healthy lifestyles and being exposed to more unhealthy environments; financial strains may contribute to one being more depression prone; affects psychological well-being which might result in anxiety, self-harm or even suicide; individuals might be more likely to undertake unhealthy practices such as drinking and smoke; increased risk of coronary heart disease due to increased stress; etc.

### Land Use Conflicts

Industrial land supports an economic sector that provides employment through physical processing. Parcels with this land use designation house a variety of activities which are of varying levels of compatibility with other uses. In the City of Atlanta, according to stakeholders, new residential uses sometimes encroach on and interfere with established industrial areas that the city would like to maintain, for a stable tax base. Air pollution, noise, heavy truck traffic, and other externalities resulting from industrial land have an adverse effect on the health and quality of life for nearby residents.

Freight activity needs operational freedom to function efficiently and maintain the economic benefits that this sector provides. Leigh and Hoelzel (2012) argue that planners have struggled to address the problem of industrial displacement. Some cities do see a need to protect industrial land to provide employment opportunities for workers of varying levels of education and skills (Howland, 2010). Another problem is that industrial land policies are often separated from land use planning for other uses, which can cause disjointed or inconsistent action (Leigh & Hoelzel, 2012).

### Freight Impact Mitigation Strategies - Buffers

Buffers spatially separate sensitive land uses from the infrastructure that when within close proximity generates negative health impacts. Another way to think of a buffer is as a Freight Impact Zone. Currently many City of Atlanta residents live within these impact zones, but when buffers are properly used—when community facilities are located away from sensitive land uses—noise and pollutants dissipate and people living in the area face significantly less exposure. The following subsections propose advisory buffer distances based on the literature.

#### Buffers – Rail Corridors

The HIA project team selected a buffer of 500 feet along railroad corridors to examine the positive and negative impacts of noise from freight movement via rail. Trains operating in horn-free zones, electric locomotives, or infrequently used track could potentially impact a smaller area, whereas multi-track trunk lines with many diesel powered trains per day will impact a larger area. EPA suggests a buffer of 25 to 400 feet from the rail corridor (Fath et al., 1974). Although specific impacts will vary based on freight volume and train type, the 500 foot buffer distance is great enough to capture the largest range of conditions.

#### Buffers – Rail Yards

The HIA project team selected a buffer of 1,000 feet around rail yards to capture the range at which negative externalities are evident. This buffer is consistent with a 2014 study by the Environmental
Protection Agency (EPA), which indicates air quality degradation in residential neighborhoods around rail yards up to 300 meters (984 feet) from the yard (US EPA, 2014). Wind may even push pollutants beyond 300 meters from the yard in the prevailing downwind direction (US EPA, 2014). The buffer is also consistent with the California Air Resources Board’s recommendation for siting sensitive land uses (California Air Resources Board & California Environmental Protection Agency, 2005). It is more expansive than the 250 to 500 foot buffers recommended by Envision Freight (Envision Freight, n.d.).

Buffers – Roads and Highways

The literature on road buffers is very detailed and diverse. The HIA project team selected an ‘ideal buffer’ of 400 meters based on studies showing that air pollution reaches background levels approximately 400 meters from a high volume road (Karner et al., 2010). Ideally sensitive uses such as “residences, schools, day care centers, playgrounds, and medical facilities” should be located at least 400 meters away from highways and other high volume roads according to the California Air Resources Board and California Environmental Protection Agency (2005). Air pollutants become even more concentrated closer to the roads. Therefore, the HIA project team recommends an additional buffer to compensate for acute effects within 200 meters. Particulate matter is often most concentrated within 200 meters from major diesel roadways, and is associated with potentially increasing the occurrence of cardiac diseases, respiratory diseases, and some cancers (Fischer et al., 2000; Houston, Wu, Ong, & Winer, 2006; Fischer et al., 2000; Houston, Wu, Ong, & Winer, 2006).

Buffers – Truck Stops

The HIA project team selected a buffer of 500 feet to account for truck stop externalities, particularly idling, noise and light pollution. The literature does not recommend a buffer that is specific to truck stops. Five hundred feet corresponds with the buffer recommended in California for some high-traffic roadways, and is half the buffer recommended for large distribution centers, which have a large number of truck movements (California Air Resources Board & California Environmental Protection Agency, 2005).

Buffers – Airports

There is not a specific buffer prescribed in the literature for sensitive land uses around airports. Health impacts depend largely on flight frequency, patterns, schedule, and local geological and meteorological characteristics. Regarding noise, sensitive land uses directly under frequent flight paths merit the most consideration, and prevailing wind directions matter for evaluating local pollution effects in regional air pollution models.

There are three caveats to studying air freight’s health impact. The first is that freight makes up a small portion of the activity at most airports. Air freight tends to have a high dollar-to-weight value, meaning that a relatively small number of aircraft are needed to transport large values of air freight. Moreover, air freight is typically carried in the cargo holds of passenger aircraft that are already scheduled. Secondly, local and state governments have limited control over aircraft operations. Flight patterns are regulated by the Federal Aviation Administration, and airport planners address environmental impacts and long-term plans separately from local governments. Airports can regulate their own operations, for instance by limiting nighttime flying, although nighttime flight limitations normally lead to lower cargo volumes (Gardiner, Humphreys, & Ison, 2005). Finally, a
significant portion of airport freight-related health effects come not from the aircraft themselves but from the concentration of trucks (and occasionally trains) servicing airport cargo terminals. Truck effects should be considered in trucking analysis, as should rail effects for the first cities with on-airport freight rail access (Charlotte - Douglas International Airport, n.d.; Port of Huntsville, 2015).

### Summary of Advisory Buffers for Freight Facilities

Based on the review of health literature, the HIA team recommends the following advisory buffer distances around all freight transportation infrastructure and freight facilities (Table 3).

**Table 3: Buffer Recommendations around Transportation Infrastructure and Freight Facilities**

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Specifications</th>
<th>Buffer</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail Corridors</td>
<td>All active</td>
<td>500 feet</td>
<td>Primarily related to noise. Depends on train frequency.</td>
</tr>
<tr>
<td>Rail Yards</td>
<td>All active</td>
<td>1,000 feet</td>
<td>Primarily related to air pollution.</td>
</tr>
<tr>
<td>Roads and Highways</td>
<td>Major freight corridors</td>
<td>Ideal buffer: 1,312 feet (400 meters) Acute effects buffer: 656 feet (200 meters)</td>
<td>Related to air pollution and noise.</td>
</tr>
<tr>
<td>Truck Stops</td>
<td>All active</td>
<td>500 feet</td>
<td>Primarily related to air pollution.</td>
</tr>
<tr>
<td>Seaports</td>
<td>All active</td>
<td>1,500 feet</td>
<td>Primarily related to air pollution.</td>
</tr>
<tr>
<td>Airports</td>
<td>All active</td>
<td>Dependent on flight patterns (greatest at ends of most heavily trafficked runways)</td>
<td>Related to air pollution and noise.</td>
</tr>
</tbody>
</table>


### 4.2 Spatial Data

The HIA team compiled or internally created the spatial data needed for this HIA, (informed by the literature review) then overlaid and analyzed this information comprehensively. Results of this analysis were coordinated with input gathered from stakeholders to craft the HIA recommendations.

**Obtained from local and regional sources**

- City Truck Routes (City of Atlanta)
- Regional Truck Routes (ARC)
- Roadside emissions data (PM concentrations from Atlanta Roadside Emissions Exposure Study – AREES) (ARC)
- City and county boundaries (City of Atlanta, Fulton County)
- Neighborhood boundaries (City of Atlanta)
- Land parcels (City of Atlanta)
- Zoning designation (City of Atlanta)
- Land use (future) (City of Atlanta)
- Parks and greenspace (City of Atlanta)
- Trails and sidewalks (City of Atlanta)
- Public transit stops (Metropolitan Atlanta Rapid Transit Authority – MARTA)
- Rail yards (City of Atlanta)
Obtained from Georgia Department of Transportation (GDOT)

- Crash data
  - Pedestrian crash locations
  - Bicycle crash locations
  - Commercial vehicle crash locations

Obtained from U.S. Census Bureau

- Demographic data – 2010 Decennial Census and American Community Survey 2010 - 2014
  - Total population
  - Individuals living below the federal poverty level
  - Communities of color (individuals other than those identifying as non-Hispanic white)

Obtained from the Georgia Department of Public Health (DPH)

The following data for the HIA study area were obtained from the Georgia Department of Public Health. The data were at the census tract level, for deaths, discharges, and ER visits due to the reasons indicated below from 2005 to 2014. These variables were chosen because they are correlated with high rates of diesel emissions, or other health outcomes related to freight movement. However, to avoid the confounding effects of smoking, physical activity levels, and other personal lifestyle choices, the HIA team utilized only asthma and low birth weight data for the analysis.

- Mortality (death) incidents:
  - Asthma
  - Chronic Lower Respiratory Disease
  - Leukemia
  - Major Cardiovascular Diseases
  - Malignant Neoplasm of Esophagus
  - Malignant Neoplasms of Lip, Oral Cavity and Pharynx
  - Malignant Neoplasms of Meninges, Brain, and other pts of CNS
  - Malignant Neoplasms of the Trachea, Bronchus and Lung
  - Pneumonia

- Hospital Discharge (number of occurrence):
  - Asthma
  - Chronic Lower Respiratory Disease
  - Leukemia
  - Major Cardiovascular Diseases
  - Malignant Neoplasm of Esophagus
  - Malignant Neoplasms of Lip, Oral Cavity and Pharynx
  - Malignant Neoplasms of Meninges, Brain, and other pts of CNS
  - Malignant Neoplasms of the Trachea, Bronchus and Lung
  - Pneumonia

- ER Visits:
  - Asthma
  - Chronic Lower Respiratory Disease
  - Leukemia
  - Major Cardiovascular Diseases
  - Malignant Neoplasm of Esophagus
  - Malignant Neoplasms of Lip, Oral Cavity and Pharynx
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- Malignant Neoplasms of Meninges, Brain, and other pts of CNS
- Malignant Neoplasms of the Trachea, Bronchus and Lung
- Pneumonia

- Percent of Low Birth Weight Births

Created or Modified by CQGRD

- Comprehensive high volume truck corridor spatial layer created by merging four datasets:
  - Federally designated primary freight network (PFN) established by the Federal Highway Administration
  - Georgia’s Statewide designated freight corridors, which were adopted in 2013 following the creation of the Georgia Statewide Freight & Logistics Plan (Georgia Department of Transportation, 2012a)
  - Freight Analysis Framework 3 (FAF3) network file, which is derived from National Highway System Version 2009-11 and contains the National Highway System (NHS) and the National Network (NN)
  - The American Transportation Research Institute’s (ATRI) database of truck Global Positioning System (GPS) position readings

- Active rail corridors were mapped using the Bureau of Transportation Statistics’ National Transportation Atlas Database rail lines GIS file containing active and abandoned rail lines; this file was manually modified to visually match FRA’s Railroad Geographic Information web map tool
- Land parcels of concern due to high emission levels, incompatible uses, and vulnerable populations
- Truck stop locations (public and private)
- CARGO Atlanta transportation project locations
- Freight impact zones (advisory buffer distances)

4.3 Existing Conditions

The existing conditions, at the citywide scale, and by individual EJ area, were analyzed by five topic areas: Demographics, Transportation, Air Quality, Zoning and Land Use, and Health Conditions. The final section, Freight Impact Zones, integrates several topic areas.

Demographics

The HIA team identified EJ areas based on three criteria: poverty rates, proximity to freight corridors, and presence of residential land uses. Specifically, the HIA team identified residential block groups with a poverty rate exceeding 40% according to the 2010-2015 5-year American Community Survey (ACS) data from the U.S. Census Bureau. Neighborhood boundaries were laid over census block groups, and neighborhoods (or groups of adjacent neighborhoods), and those containing a majority of block groups exceeding the 40% threshold were selected as candidate EJ areas. These neighborhoods were reviewed for existing land uses, specifically to verify residential use, and anomalies, such as university campuses, were removed.

Note that regional and city-designated truck routes were not used to select EJ areas. Only EJ candidate areas with a high volume truck route (as evidenced by GPS data) passing through them or adjacent were designated as EJ communities; high-poverty areas not bordered by a high volume truck corridor were eliminated from the analysis. Other freight facilities such as rail yards were not included; had they been, the HIA team likely would have included neighborhoods near rail yards.
such as Monroe Heights, Brookview Heights, and Carver Hills. The final EJ selection is not intended to communicate that other neighborhoods are not affected by freight movement; rather, the HIA focuses on those affected by the highest-volume truck facilities. In addition, the EJ areas do not necessarily correspond to Neighborhood Planning Unit (NPU) boundaries; future research should take these into account.

The ten EJ areas selected for this HIA are overlaid with the truck corridors and poverty rates in Figure 3. All of them are located in the city’s central, southern, or western quadrants, and most are adjacent to Interstate Highways and have a major freight corridor passing through them. The EJ Communities are numbered on the maps and named in Table 4.

![Figure 3: EJ Communities Designated Based on Poverty Level and Freight Corridor Proximity](image)
Table 4: EJ Communities

<table>
<thead>
<tr>
<th>EJ Area No.</th>
<th>Neighborhood(s) Name(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fairburn Heights, Adamsville, Oakcliff</td>
</tr>
<tr>
<td>2</td>
<td>Penelope Neighbors, Dixie Hills</td>
</tr>
<tr>
<td>3</td>
<td>Mozley Park, Westview, West End</td>
</tr>
<tr>
<td>4</td>
<td>Grove Park</td>
</tr>
<tr>
<td>5</td>
<td>English Avenue</td>
</tr>
<tr>
<td>6</td>
<td>Downtown, Oakland, Capitol Gateway</td>
</tr>
<tr>
<td>7</td>
<td>Greenbriar</td>
</tr>
<tr>
<td>8</td>
<td>Betmar LaVilla, Amal Heights</td>
</tr>
<tr>
<td>9</td>
<td>Pittsburgh, Peoplestown, Summerhill, Mechanicsville</td>
</tr>
<tr>
<td>10</td>
<td>Hammond Park, Perkerson, Glenrose Heights</td>
</tr>
</tbody>
</table>

Since Environmental Justice also focuses on impacts to communities of color, data for racial and ethnic concentrations were mapped in relation to the selected EJ areas. The spatial distribution of Atlanta’s communities of color follows a similar pattern, with majority-minority areas coinciding with high-poverty areas in the southern part of the city (Figure 4).
In addition to the truck routes used to designate EJ communities, the HIA team also examined other transportation modes as well as crash locations relative to the projects proposed in the Cargo Atlanta freight study. The following figures and explanations detail the state of transportation in Atlanta with regard to freight infrastructure, Cargo Atlanta proposed project locations, transit, bicycle, and pedestrian networks and crash locations.

### Freight Infrastructure

Figure 6 shows the existing truck and rail facilities for freight movement. The dashed black lines represent major truck routes based on the national network and GPS tracking of actual truck movement. The light blue lines show the regional truck network adopted as part of the ARC’s Regional Freight Mobility Plan of 2008. Note that additional smaller volume routes designated by the City of Atlanta as part of Cargo Atlanta are not shown due to lack of GIS data for these routes. The HIA project team focused on routes serving large volumes of freight movement as indicated...
by GPS data. Four truck stops are located at or beyond the periphery of the city, and five rail yards are located within the city boundary.

The city's western side has traditionally had a major industrial presence, much of which is maintained today. The western side's industrial orientation is reinforced by the presence of two major rail intermodal yards: CSX's Tilford Yard and Norfolk Southern's Inman Yard. The projects proposed in the Cargo Atlanta freight study are primarily located on the western side of the city.

The project list includes a number of intersection improvements, as well as road widenings and bridge improvements. The HIA project team reviewed the project locations relative to low income EJ communities. There is a road widening and roadway redesign proposed along the freight corridor on Donald Lee Hollowell Parkway that passes through several EJ communities. There are also projects in south Atlanta near EJ communities, namely an intersection realignment, new connection, and rail bridge update. Figure 7 below shows each proposed project's location.
Public Transit

Atlanta’s transit system is primarily operated by the Metro Atlanta Rapid Transit Authority (MARTA). MARTA routes provide access to many of the city’s job centers, including downtown, midtown, and the airport. Figure 8 shows that thirteen MARTA rail stations (labeled) are located within 1,000 feet of freight corridors. Additionally, many bus routes run along high volume freight routes. The proximity of transit to freight facilities on the one hand facilitates job access, but on the other hand
has the potential to expose transit riders to pollution and unsafe pedestrian conditions upon exiting a station or alighting from a bus.

Figure 7: Atlanta Transit Network

Freight Movement, Crashes and Safety

The variety and ubiquity of freight infrastructure throughout the city and its proximity to transit facilities, residential neighborhoods, and other people-centered, as opposed to goods-centered, land uses can create safety risks. Cargo Atlanta does include a robust truck crash analysis that identifies nine unsafe intersections and eight problematic local roadways. Therefore, the HIA project team did not analyze truck crash locations; instead, the team compared the Cargo Atlanta crash analysis to the project list. The study states: “The project recommendations included in Appendix B identify capital, safety, and operational projects that draw, in part from review of crash data.” However, Table 4 shows that, in fact, few of these crash locations contained projects.
Table 5: Truck Crash Locations versus Proposed Project Locations

<table>
<thead>
<tr>
<th>Intersections identified in Cargo Atlanta</th>
<th>Proposed projects in truck crash areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-285 interchange with DL Hollowell Pkwy</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>I-285 interchange with Langford Pkwy</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Hollywood Rd at Hightower Rd</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Northside Pkwy at West Paces Ferry Rd</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Ponce de Leon Ave at Moreland Ave</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Roswell Rd at Peachtree Rd</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Roswell Rd at Piedmont Rd</td>
<td>No project proposed in plan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Local roadways identified in Cargo Atlanta</th>
<th>Proposed projects in truck crash areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolton Rd</td>
<td>5 proposed projects in plan</td>
</tr>
<tr>
<td>Chattahoochee Ave</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Cleveland Ave</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Joseph E Lowery Blvd</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Marietta Blvd</td>
<td>2 proposed projects in plan</td>
</tr>
<tr>
<td>Monroe Drive</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Perry Blvd</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Southside Industrial Pkwy</td>
<td>1 proposed project; road widening</td>
</tr>
<tr>
<td>S River Industrial Blvd</td>
<td>No project proposed in plan</td>
</tr>
<tr>
<td>Sylvan Rd</td>
<td>2 projects in the vicinity*</td>
</tr>
</tbody>
</table>

Source: Cargo Atlanta, pg. 16 and Appendix B

*There are two projects along a rail corridor within a half mile to the east of Sylvan Road.

This examination suggests that the resulting project list did not necessarily address the safety concern areas referred to in the study. In addition, truck crashes were the only type analyzed in Cargo Atlanta. Therefore, the HIA project team analyzed locations of crashes involving people walking or biking in the City of Atlanta along freight corridor routes, recognizing that though many bicycle and pedestrian crashes may not involve a freight vehicle, the design of roadways that facilitate efficient freight movement may put non-motorized road users at greater risk for crashes with any type of motorized vehicle.

Figure 9 shows the locations of crashes involving these road users in relation to freight infrastructure and Cargo Atlanta proposed projects. Freight corridors where a pedestrian or bicycle crash occurred within 100 feet of a major freight truck corridor or a regional (ARC-designated) truck route are highlighted in pink. One hundred feet was used to select the crashes to account for any error in the GPS coordinates of crash locations. Crashes involving pedestrians that occurred on limited access highways were removed, since recommendations cannot be made for pedestrian facilities on these types of roadways. Except for the Cargo Atlanta projects on Donald Lee Hollowell Parkway, the crashes do not coincide with proposed Cargo project locations.
While many crashes occurred in Downtown and Midtown Atlanta where non-motorized travel is more prevalent, 29% and 16% of all crashes from 2011 to 2014 involving people walking or biking, respectively, occurred on truck routes (Table 5). The vast majority of crashes involving people walking or biking result in injuries, with crashes occurring near a freight route even more likely to result in injury (91% of pedestrian crashes near freight routes compared to 87% of crashes in general, and 88% of bicycle crashes near freight routes compared to 76% in general). Of crashes with pedestrians occurring along freight routes, over a fifth (22%) were located in an EJ area. The crash data comes from GDOT crash reports.
Table 6: Crashes Involving People Walking and Biking (2011 - 2014)

<table>
<thead>
<tr>
<th></th>
<th>Crashes Involving People Walking</th>
<th>Crashing Involving People Biking</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Citywide</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatalities</td>
<td>10</td>
<td>49</td>
</tr>
<tr>
<td>Injuries</td>
<td>274</td>
<td>37</td>
</tr>
<tr>
<td><strong>Along Truck Routes</strong></td>
<td>93</td>
<td>8</td>
</tr>
<tr>
<td>% of citywide total</td>
<td>29%</td>
<td>16%</td>
</tr>
<tr>
<td>Fatalities</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Injuries</td>
<td>85</td>
<td>7</td>
</tr>
<tr>
<td><strong>Along Truck Routes in or bordering EJ Areas</strong></td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>% of crashes along truck routes</td>
<td>22%</td>
<td>13%</td>
</tr>
<tr>
<td>Fatalities</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Injuries</td>
<td>17</td>
<td>1</td>
</tr>
</tbody>
</table>

Though there were fewer collisions with people on bicycles, the growth of bicycling as a mode for transportation in Atlanta means that the opportunities for conflict with freight vehicles will likely increase over time. Neither Cargo Atlanta nor the city’s bicycle plan, Cycle Atlanta, explicitly address the reduction of conflicts between bicycles and freight vehicles.

The physical design and usage of a freight corridor route may be a major factor in explaining crash potential. Since comprehensive examination of roadway conditions at all crash locations near freight routes was out of the scope of this HIA, this HIA project team focused on pedestrian and bicycle crashes along truck routes in or bordering EJ areas, as shown in Figure 10. The crash dataset lacked detail about the cause of each crash, so the HIA project team only examined the roadway characteristics of each crash site to look for patterns that point to an issue with the roadway design, whether it is the pavement markings, signage, or an excessive design speed in relation to the speed limit on the roadway facility.
Figure 9: Crashes Involving People Walking or Biking Along Freight Routes in EJ Areas

These areas were viewed at the street level using Google Earth and Google Streetview to see if safer roadway design, signage, and pavement markings could potentially prevent pedestrian, bicycle, and vehicle conflicts. Several common issues emerged from the examination of the nineteen pedestrian crash locations detailed in Appendix 2: Analysis of Pedestrian or Cyclist Crash Locations in EJ Areas.

- **Road width**: Almost every crash occurred along a multi-lane roadway of four to seven lanes. The width of the road not only makes it difficult for people to cross quickly enough, but also encourages drivers to speed, even if the posted speed limit is 35 mph or less. Though multiple lanes are expected given that these corridors are freight routes, all of them had sidewalks and many of them had bus stops, so they are also multimodal corridors.
• **Presence of transit:** The majority of the locations were along freight routes that are also transit routes. Therefore, pedestrians are at risk when crossing the street. Many crash locations in EJ areas had bus stops on both sides of the road.

• **T-intersections:** Six out of nineteen crash locations in EJ areas were at T-intersections. Four of these were signalized. Though the data is inconclusive, this intersection configuration could encourage drivers to speed along the main line. Thus, maximizing the visibility of pedestrians at this type of crossing is critical.

• **Lack of marked crossing:** Eight out of nineteen crash locations did not have a crosswalk at all or appeared to be a mid-block crossing. In some areas, such as Ralph David Abernathy Boulevard at West Whitehall St SW, a crosswalk should accompany the existing pedestrian walk signals shown in Figure 11.

![Ralph David Abernathy Boulevard at West Whitehall St SW](image.png)

**Figure 10: Lack of Crosswalk at Crossing with Pedestrian Walk Signals**

In other areas, such as along Route 41 and Donald Lee Hollowell Parkway, the potential need for a marked crossing requires an engineering study. Research has shown that unmarked crossings can have lower crash rates than marked crossings because pedestrians are not given a false sense of security when crossing at unmarked locations (Fitzpatrick et al., 2006). For unmarked crossings across multilane freight corridors, a full suite of treatment options, including signals, beacons, pavement markings, warning signs, and roadway design improvements should be evaluated for each site’s specific needs.

• **Faded crosswalks:** Restriping of existing crosswalks was observed to be necessary at several locations. Well-maintained crosswalks are important for maximizing the visibility of pedestrians. Figure 12 shows a faded crosswalk along a freight routes passing through an Atlanta neighborhood.
Channelized right turns: In a few instances, the presence of a channelized right turn could put pedestrians or people bicycling at risk, as this type of roadway design allows for turning at higher speeds. Well-defined refuge islands, crosswalks, and signage can all help to mitigate the risk of collisions at intersections from channelized right-turn movements.

Zoning and Land Use

The HIA project team reviewed the zoning designations for the selected EJ areas within the buffer zones. The goal of the zoning and land use analysis was to examine how current and planned designations may affect vulnerable populations and to make recommendations for future zoning updates. As shown in Figure 11, the majority of the designated EJ communities contain multifamily residential, high-density residential, or medium-density residential, and many contain commercial and/or industrial land.
Figure 12: Land Use Designations
Air Quality

In the past, the Atlanta area has exceeded National Ambient Air Quality (NAAQS) standards, but is now in compliance. A non-attainment zone designates geographic boundaries within which the concentration of air pollutants exceed the standards set by the National Ambient Air Quality Standards (NAAQS) established by the Clean Air Act to reduce pollutants that harm human health. In 2016, the U.S. Environmental Protection Agency re-designated the Atlanta metropolitan region from non-attainment to attainment for both particulate matter (PM 2.5 – 1997 standard) and ozone concentration levels (Atlanta Regional Commission, 2016a; US EPA, 2017).

Though the metropolitan region’s annual average PM 2.5 concentration meets the NAAQS limit of 12 micrograms per cubic meter, pollution concentrations vary over time and space. The transportation system can contribute to time-of-day, seasonal, and neighborhood-level variation in pollution levels, pushing concentrations higher than the regional average. According to the ARC:

“An entire region can meet its transportation conformity goals, but pockets of the region may still face an added burden of emissions exposure due to localized conditions” (D’Onofrio, 2015).

A higher level of exposure to PM2.5 can exacerbate respiratory health challenges, particularly for those with existing health issues, like asthma and other respiratory conditions (Brook et al., 2004; Brunekreef and Holgate, 2002).

To estimate the amount of pollution generated by cars and trucks in the Atlanta region, the ARC, in collaboration with Georgia EPD and researchers at Georgia Tech, undertook the Atlanta Roadside Emissions Exposure Study (AREES). The AREES analysis fed travel demand data (traffic volumes, speeds, types of vehicles on the road, and fuel usage) into a pollution emissions model; the output from that was fed into a dispersion model that uses wind direction and other meteorological data to predict how pollution spreads from its source. The final results allow the ARC to estimate the PM 2.5 concentrations attributable to the Atlanta region’s roadway emissions at a local scale (D’Onofrio, 2015).

As shown in Figure 5, many of Atlanta’s high PM 2.5 concentrations from roadway sources are along freight routes. National Ambient Air Quality (NAAQS) standards measure total PM2.5 levels in areas of the region with constant monitoring stations. Though the Atlanta metropolitan region is currently in compliance with the Clean Air Act PM2.5 standards, pollution concentrations along high-volume roadways are higher than the levels of concentration found away from these facilities.

According to the AREES data, the average concentration of PM2.5 generated by roadway sources is 1.83 micrograms per cubic meter across the City of Atlanta. The HIA team then examined the portions of the EJ areas in the City of Atlanta with double the average PM2.5 concentration from roadway emission sources, or 3.65 micrograms per cubic meter. Recent analysis by Delfino et al. (2015) in modeling traffic-related pollutant concentrations found statistically significant positive association between the risk of hospital encounters due to asthma and increases in PM levels during cool seasons only. Residents of neighborhoods with lower socioeconomic status were found to be at greater risk. The study shares a generalized conclusion that residents living within 500 meters of high traffic roadways are more likely to suffer from asthma-related morbidity (Delfino, Kleeman, Gillen, Wu, & Nickerson, 2015).
The HIA project team placed spatial buffers along the high volume truck routes to compare estimated pollution concentrations with buffer distances and air quality. The literature has established that pollution concentrations can affect vulnerable populations located within 400 meters from high volume roadways (Karner et al., 2010). As expected, these impact buffers largely align with the air quality data, with some inconsistencies due to variation in traffic volumes, wind directions, and other factors influencing PM 2.5 emission and dispersion. The air quality analysis is presented in Appendix 1. This analysis demonstrates where high poverty vulnerable populations and schools are located relative to higher levels of roadway emissions.

Figure 13: Roadway Source Emissions PM2.5

Data Source: ARC AREES
Health Conditions

The HIA project team reviewed health data specifically linked to air pollution and low SES, including:

- Number of ER visits due to asthma at the census block level (citywide estimated average of 7.6 visits per census block from 2005 to 2014) and number of ER visits normalized by census block population
- Rate of low birthweight babies at the census tract level (citywide estimated average of 8.04% of all births from 2005 to 2014, though this appears to be a conservative estimate based on more recent data from DPH, as mentioned in the Literature Review)

Both asthma and low birthweight incidence closely correlate with the city’s poverty rates, with the greatest levels of all three rates spatially occurring in the city’s southern and western quadrants. Although downtown Atlanta also has high poverty rates, its low residential population, given a much higher worker population, is attributed with a lower incidence of asthma-related emergency room visits. The Downtown population also includes Georgia State students, whose low incomes or lack of income skews the poverty rate upwards. Asthma-related emergency room visits are depicted in Figure 14 and Figure 15, and the rate of births with low birthweight shown in Figure 16. In each map, the darkest three shades represent block groups with above-average incidences or rates.
Figure 14: Emergency Room Visits Due to Asthma in Atlanta, Georgia

ER visits due to asthma were also normalized by block population to account for population differences between blocks. The per-capita map (number of asthma visits in each block group divided by the block group population) shown in Figure 15: Per-Capita Emergency Room Visits Due to Asthma in Atlanta, Georgia exhibits a pattern similar to the spatial distributions for poverty, race, low birthweight, and access to health insurance.
Figure 15: Per-Capita Emergency Room Visits Due to Asthma in Atlanta, Georgia
Health insurance coverage rates within the City of Atlanta are also closely correlated with the percentage of low birth weights, asthma emergency room visits, and poverty rates. Tract level data from the American Community Survey 2011-2015 was used to examine the percentage of population without access to health care insurance based on the most recent data available. A majority of the southwest portion of the City of Atlanta have in excess of twenty percent of the population without any health insurance coverage, even after the implementation of the Patient Protection and Affordable Care Act. A lack of healthcare insurance coverage is a substantial burden to those needing to access healthcare options to treat even common illnesses like asthma. Asthma-caused emergency room visits reported by each block group population (in Figure 14) closely correlates with tracts that have a higher percentage of the population without health insurance coverage, as noted in Figure 17 below.
Figure 17: Percentage of the Population that Lacks Healthcare Coverage in Atlanta, Georgia

**Freight Impact Zones**

Freight impact zones, which consist of the advisory buffers around all truck routes (major, regional, and local), truck stops, rail lines, and rail yards, make up over 50% of the City of Atlanta’s land area. Within these freight impact zones, shown in Figure 18, reside over 236,000 people – over 57% of the city’s population (Table 7).
Figure 18: City of Atlanta Residents Living in Freight Impact Zones

Table 7: City of Atlanta Residents Affected by Freight Movement

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Population</th>
<th>Residents in Poverty</th>
<th>Residents of Color</th>
<th>ER Visits due to Asthma (2005 – 2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>Freight Impact Zone</td>
<td>236,847</td>
<td>61,115</td>
<td>26%</td>
<td>136,321</td>
</tr>
<tr>
<td>Outside of Freight Impact Zone</td>
<td>182,296</td>
<td>46,459</td>
<td>25%</td>
<td>122,153</td>
</tr>
<tr>
<td>Total Area</td>
<td>419,143</td>
<td>107,575</td>
<td>26%</td>
<td>258,474</td>
</tr>
</tbody>
</table>

Sources: Census 2010 block-level data (population, race); Census ACS 2010-2014 block-group level data (poverty) disaggregated to block-level; Georgia Department of Public Health
Of residents living in freight-affected areas, over a quarter (26%) are living in poverty and over half (58%) are people of color. These numbers do not indicate disproportionate representation of these vulnerable groups in freight-affected areas (citywide, 26% of all residents live in poverty, and 62% are people of color). However, the data still show that 60,000 poor people and over 135,000 people of color are affected by freight every day. (Note that these population counts do not capture overlap between communities of color and communities living in poverty.)

Over half of ER visits due to asthma between 2005 and 2014 originated in areas impacted by freight. This data does not establish a causal link, and on its surface, disparity of asthma outcomes does not appear to exist in relation to freight impact zones. However, vulnerable social groups are more likely to be negatively affected by the combination of poverty, lack of healthcare coverage, and a living environment negatively affected by pollution and noise from freight movement. Given the City of Atlanta’s relatively small land area and density of freight facilities within city boundaries, a regional analysis would likely reveal greater disparities in the number of vulnerable communities living within freight impact zones as well as health outcomes compared to the regional population.

### 4.4 EJ Focus Area Findings

The catalog of existing conditions and analysis for the EJ focus areas located in the City of Atlanta is detailed in Appendix 1. Though poverty and proximity to freight corridors were the criteria used to identify EJ areas for this report, it turns out that every single area contains hotspots of high roadway-emissions source pollution concentration of fine particulate matter (PM 2.5) and census blocks with above average (worse) rates of incidence for asthma emergency room visits and births with low birthweight. Other areas of Atlanta, particularly in the south and southwest, show similar health and environmental disparities, but the ten EJ areas identified are potentially more vulnerable due to the compounded effects of poverty and roadway-source emissions from large volume roadways that also move large freight volumes, along with other factors including higher uninsured populations with lower healthcare access.

### 4.5 Stakeholder Input

Stakeholder input was gathered through a number of methods including direct interaction during individual and small group meetings with government officials and department representatives. An HIA workshop was also held to gather input for stakeholders and decision makers. A summary of these activities as well as the issues brought forward during these activities is provided in the Stakeholder Engagement Plan, found in Appendix 3. The HIA team attempted to contact neighborhood representatives for areas potentially impacted by freight movement, as well as other community leaders, and was not successful in engaging these individuals.

### 4.6 Conclusion: Major Issues Affecting Atlanta, Georgia

Through the analysis of the baseline health, demographic, socio-economic, and spatial data of existing conditions, and the stakeholder involvement process, the HIA team identified a range of social, environmental, and economic issues that pose potential health risks along freight corridors in the City of Atlanta HIA study area. The freight planning process provides an opportunity to incorporate policies and programs that could begin to maximize positive health outcomes while mitigating any potential negative health impacts. These issues are related to the following topics and subcategories:
## Table 8: Health Determinants and Issues Examined

<table>
<thead>
<tr>
<th>Society</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerable Populations</td>
<td></td>
</tr>
<tr>
<td>Low Socio-economic Status (SES)</td>
<td>and Educational Attainment</td>
</tr>
<tr>
<td>Minority Status</td>
<td></td>
</tr>
<tr>
<td>Poor Birth Outcomes</td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td></td>
</tr>
<tr>
<td><strong>The Natural Environment</strong></td>
<td></td>
</tr>
<tr>
<td>Air Quality</td>
<td></td>
</tr>
<tr>
<td><strong>The Built Environment</strong></td>
<td></td>
</tr>
<tr>
<td>Pedestrian and Bicyclist Safety</td>
<td></td>
</tr>
<tr>
<td>Transportation and Transit</td>
<td></td>
</tr>
<tr>
<td><strong>The Economy</strong></td>
<td></td>
</tr>
<tr>
<td>Land Use Conflicts and Encroachment</td>
<td></td>
</tr>
<tr>
<td>Access to Employment</td>
<td></td>
</tr>
<tr>
<td>Revitalization and Redevelopment</td>
<td></td>
</tr>
</tbody>
</table>
5. Recommendations

The following recommendations for Cargo Atlanta: a Citywide Freight Study seek to mitigate any potentially harmful freight-related impacts while maximizing the benefits of freight movement in alignment with the four major topic areas that are the focus of this report (i.e., air emissions, accidents and safety, noise, economic impact). These recommendations are structured around several categories of mitigating strategies that may each address one or several of the four major topic areas. Specifically, these strategies are (1) Natural and Built Environment, (2) Land Use, (3) Economics, and (4) Policy and Process. These strategies are then applied to the HIA study area. The recommendations have been synthesized from the review of evidence related to critical issues identified during the appraisal phase, data collection and analysis of existing conditions and health characteristics of the study area, and stakeholder input.

5.1 Cargo Atlanta Project List

The following subsections detail recommendations.

RECOMMENDATION 1: FREIGHT PROJECTS SHOULD CONSIDER SURROUNDINGS COMPREHENSIVELY

When freight projects are planned, surrounding population demographics, existing land use, and population health characteristics should be considered at the earliest stages possible.

If surrounding existing conditions are considered holistically and comprehensively, negative health impacts of potential projects can be more easily mitigated. In addition, the positive economic benefits of the freight and logistics industry can be fully realized. Freight reliant industry can remain in specific areas of the City with comprehensive supportive zoning to enhance growth and competitiveness. Lower-income communities can benefit from freight and logistics employment opportunities, if workers can access transportation options to these concentrated industrial employment clusters.

RECOMMENDATION 2: FREIGHT PROJECTS SHOULD CONSIDER ALL MODES

Freight related infrastructure projects should consider all transport modes in the design process.

When freight supportive transportation projects are planned in urbanized settings, the safety of pedestrians and cyclists should be considered at the beginning of the design process. Sidewalk connectivity should be improved with project development where possible. A review of adjacent land uses should be included in this process to inform these decisions. Capacity enhancements and improvements on roadways should be context-appropriate, particularly in areas adjacent to transit dependent residential neighborhoods or where there are bus routes and stops.

5.2 Citywide Recommendations

Recommendations for mitigation strategies to address the potential negative health impacts described in this report follow the three major sections discussed below.

- Freight Air Pollution Emissions, Noise, and Land Use Conflicts
- Freight Movement Crashes and Safety
Section 5  Recommendations

**Freight Air Pollution Emissions, Noise, and Land Use Conflicts**

Though air quality and noise have differing effects on health, they can often be addressed simultaneously. Land use conflicts can be addressed mainly through zoning and development plans. The following recommendations address one, both, or all three of these challenges.

**RECOMMENDATION 3: ENCOURAGE LOW-POLLUTION FREIGHT RETROFIT**

---

Encourage Atlanta freight facilities to adopt low-pollution on-site drayage trucks, locomotives, and equipment handlers to reduce on-site air pollution emissions.

---

Freight facilities such as warehouses and rail yards use motorized equipment to move freight on and around their sites. Emissions from these vehicles can create local pollutant concentrations affecting nearby residential neighborhoods, if they are located adjacent to industrial land. Innovative programs have been developed to encourage these facilities, especially the large ones, to adopt low-pollution handling equipment. For example, Norfolk Southern participated in an initiative at their rail yard located in northwest Atlanta (Inman Yard) that was funded in part by a grant from the federal Congestion Mitigation and Air Quality (CMAQ) program to operate over ten low-pollution switching locomotives in Atlanta (Norfolk Southern, 2015). This program could potentially serve as a model for other rail yards in the city.

**RECOMMENDATION 4: DISCOURAGE RESIDENTIAL ENCROACHMENT**

---

Encourage industrial activity clustering in established industrial zones, and discourage more residential development near industrial clusters and along the freight routes that connect these areas with Interstate Highways.

---

Residential encroachment into industrial land, particularly in northwest Atlanta, has created conflicts. This new development has increased the number of residents that are exposed to truck and rail yard air and noise pollution, while also increasing intermixing of passenger vehicles with much larger commercial trucks. Cargo Atlanta addresses this by focusing many of its intersection improvements in this area of western Atlanta, where they will ostensibly address conflicts between trucks and passenger vehicles. However, the roadway projects cannot address air and noise pollution, which require land use planning that encourages residential development to be located away from industrial land and the truck routes that serve these areas.

**RECOMMENDATION 5: CREATE PHYSICAL SEPARATION WHERE POSSIBLE**

---

Establish buffers to separate sensitive land uses from freight activities where conflicts exist - through land use permitting, planning, and zoning.

---

Buffers are a tested means to mitigate negative noise and air pollution effects of freight infrastructure, and are almost universally practiced around airports and adopted locally around many other infrastructure forms. Buffers to mitigate freight impacts are created through separation of sensitive land uses in ways that are often site-specific. They can be created through the combination of general land use planning, zoning, and land use permitting. The HIA project team recommends the following:

- Incorporate a zone of non-active green space (as opposed to active, recreational uses) along freight corridors and around freight facilities.
• When new freight facilities are developed, require conditional use permits to include larger property setbacks from freight facilities.
• Proactively ensure in permitting decisions that future sitings of schools, playgrounds, hospitals, nursing homes and other uses housing sensitive populations, as well as neighborhoods, are located an adequate distance from high volume roads and freight facilities.

In cases where new industrial or freight generating facilities will be located near existing sensitive land uses and populations, additional land use restrictions can be implemented to ensure that negative health impacts are minimized, for example:

“Even if a project is sited properly in a designated zone, a land use agency may require a new source to mitigate potential localized environmental impacts to the surrounding community below what would be required by the local air district. In this case, the land use agency could condition the permit by limiting or prescribing allowable uses including operating hour restrictions, building standards and codes, property setbacks between the business property and the street or other structures, vehicle idling restrictions, or traffic diversion” (California Air Resources Board & California Environmental Protection Agency, 2005)

**Challenges of Implementing Buffers**

The HIA team is cognizant that implementing buffers, especially in the City of Atlanta, is not an easy task. As shown in Figure 19: Ideal Freight Buffers, hypothetical implementation of advisory buffers for rail lines, rail yards, and major and regional truck facilities would take up a substantial area of land in the city. Including city truck routes (not shown below) would increase the land area to over half of the city. Much of this land has already been developed, making retroactive creation of buffers a challenge. Residential encroachment exacerbates this challenge.
As an illustrative case, we examined the ideal buffered area around the Tilford and Inman Yards, where rail lines and truck routes converge. As shown in Figure 20, existing residential developments are located in the poor air quality zone, in some cases less than 200 feet from the rail yards. The image in the lower left hand corner shows Boyd Elementary School, which is situated within the rail yard and rail corridor advisory buffers with multifamily housing between it and the rail lines.

Figure 19: Ideal Freight Buffers
Since it is difficult to create additional buffer space once the area around a freight facility is developed, it is especially imperative that decisions about future land use and zoning changes and development of new residential areas and sensitive uses account for advisory buffers before encroachment occurs. It is also important for new freight facility siting to incorporate advisory buffers. With existing buffers around many of Atlanta’s freight facilities being less than ideal for the health of residents, we turn to other mitigation strategies that are more adaptable to existing facilities.

**RECOMMENDATION 6: PLANT URBAN TREES IN BUFFERS TO FILTER AIR**

*Mitigate freight pollution by planting tree species that are effective at removing pollution and align with local recommended tree lists.*

The link between air quality and urban trees has been demonstrated since the 1990s. A study of urban trees in the two-county Chicago metro area by the U.S. Forest Service found that in 1991,
Chicago’s estimated 50.8 million trees removed 6,145 tons of air pollutants such as carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, and PM10 (McPherson, Nowak, & Rowntree, 1994). The air quality benefits translate to health benefits. Trees in urban areas may reduce asthma, as Lovasi et al. (2008) found that children exposed to increased density of street trees experienced a lower prevalence of asthma, although hospitalizations for asthma did not decline.

On the whole, air quality levels are strongly influenced by transportation and land use plans that govern motorized vehicle miles traveled (VMT) and location of mobile source emissions, energy efficiency of structures and operations, and pollution sinks (such as tree cover) (Frank et al., 2006). Improving air quality will potentially have a positive effect on asthma and respiratory disease rates in the City of Atlanta.

Utilizing urban trees as an air quality mitigation measure requires:

1) Consideration of the effectiveness of particular tree species at removing pollution.
2) Compliance with county and local tree ordinances.

Characteristics such as tree size, canopy texture, leaf surface area, and growth habits influence a tree’s ability to remove pollutants from the air. Yang et al. (2015) used these characteristics to rank the top 100 common urban tree species by their effectiveness at removing PM2.5. Though the study was global in scope, North American tree species were well-represented. They found that conifer species, in particular, were effective at removing PM2.5 due to “year round foliage, dense and fine-textured canopies, and high leaf area index” (Yang et al., 2015). The authors also ranked tree species by their urban suitability and potential negative impacts, such as allergenic pollen. For example, “eastern red cedar (J. virginiana) was ranked as a top species in PM2.5 removal efficiency but its pollen is also highly allergenic. Therefore, male trees of eastern red cedar should be avoided in planting programs in cities [emphasis added]” (Yang et al., 2015).

The Move Atlanta report (City of Atlanta, 2015a) specifies trees for the City of Atlanta along residential, commercial, and urban core corridors. The team went through each type of tree species to determine those that are optimal for removing PM2.5 from the air. As demonstrated in the air quality section of this report, fine particulates can cause adverse impacts on health, particularly for vulnerable populations with less access to care. The tree species specified in Table 9 work in different types of urban environments within the City of Atlanta, and each are based on the research of Yang et al. (2015) on tree species that are optimal for removing fine particulates (PM2.5) from the air. Near freight corridors, PM2.5 concentrations are higher than background areas when accounting for on-road emissions. Trees planted that remove higher amounts of PM2.5 can potentially help to reduce the higher levels of fine particulate concentrations along corridors.

<table>
<thead>
<tr>
<th>COMMON NAME</th>
<th>BOTANICAL NAME</th>
<th>MAX HT</th>
<th>MAX SPREAD</th>
<th>COMPATIBLE WITH OVERHEAD POWER LINES</th>
<th>MIN SOIL SPACE</th>
<th>URBAN GROWTH ENVIRONMENT</th>
<th>PM 2.5 REMOVAL EFFICIENCY (YANG ET AL., 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Redcedar</td>
<td>Juniperus virginiana</td>
<td>30-40'</td>
<td>10-20'</td>
<td>3' wide strip</td>
<td>Commercial Corridor</td>
<td>EXTREMELY HIGH</td>
<td></td>
</tr>
<tr>
<td>Bald Cypress</td>
<td>Taxodium distichum</td>
<td>50-80'</td>
<td>20-25'</td>
<td>5’ x 8’ well or larger</td>
<td>Urban Core/Downtown</td>
<td>VERY HIGH</td>
<td></td>
</tr>
</tbody>
</table>
Common Name | Botanical Name | Max HT | Max Spread | Compatible With Overhead Power Lines | Min Soil Space | Urban Growth Environment | PM 2.5 Removal Efficiency (Yang et al., 2015)
--- | --- | --- | --- | --- | --- | --- | ---
Dawn Redwood | Metasequoia glyptostroboides | 75-100' | 15-25' | 5' x 8' well or larger | Very High
American Elm | Ulmus americana | 80-100' | 40-80' | 5' x 8' well or larger | Urban Core/Downtown | Very High
Deodora Cedar | Cedrus deodara | 70-80' | 40-50' | 5' x 8' well or larger | Commercial Corridor | Very High
Sycamore | Platanus occidentalis | 70-100' | 60-80' | 5' x 8' well or larger | Commercial Corridor | Very High
Zelkova | Zelkova serrata | | | | Residential Corridor | Very High
Fig | Ficus carica | 15-30' | 15-30' | X | 3' wide strip | Residential Corridor | High
Ginkgo | Ginkgo biloba (Male) | 100' | 60'+ | 5' x 8' well or larger | Urban Core/Downtown | High
Cottonwood | Populus deltoids | 75-100' | 50-75' | 5' x 8' well or larger | Residential Corridor | High
White Oak | Quercus alba | 80-100' | 50-90' | 5' x 8' well or larger | Residential Corridor | High
Northern Red Oak | Quercus rubra | 60-80' | 60-80' | 5' x 8' well or larger | Commercial Corridor | High
Black Locust | Robinia pseudoacacia | 45-60' | 25' | larger than 3' strip | Commercial Corridor | High
Japanese Pagoda Tree | Sophora japonica | 40' | 30-45' | larger than 3' strip | Commercial Corridor | Very Good
Japanese Maple | Acer palmatum | 15'-25' | 10'-25' | open lawn | Parkland | Good
European Hornbeam | Carpinus betulus | 30-50' | 20-30' | 3' wide strip | Urban Core/Downtown | Good
Eastern Redbud | Cercis canadensis | 20-30' | 30' | X | 3' wide strip | Commercial Corridor | Good
Flowering Dogwood | Cornus florida | 20-30' | 20' | X | larger than 3' strip | Residential Corridor | Good
Black Tupelo/Blackgum | Nyssa sylvatica | 55'-75' | 50' | larger than 3' strip | Commercial Corridor | Good

**Recommendation 7: Require Noise Barriers Along Highway Freight Corridor Next to Residential Development**

*Adopt a policy that sets a maximum acceptable level for noise on freight-designated highway corridors proximate to residential development.*

Noise barriers reduce the negative health impacts of traffic noise, however, there are no federal noise reduction standards. Federal regulations do contain criteria for assessment of noise impacts, but only require “reasonable effort” to reduce noise. Furthermore, these regulations only apply to projects receiving federal funding. Construction of noise barriers along existing roadways is at the discretion of state and local agencies on a voluntary basis (Code of Federal Regulations, Title 23, Part 772; Federal Highway Administration, 2011). Georgia DOT adopts federal noise abatement criteria in its policy for federal-aid projects and assesses noise reduction measures on the basis of dB(A) reduced and cost effectiveness (Georgia Department of Transportation, 2011). In short, the public health impacts of noise are not explicitly considered.

The HIA team did find models in other places where control of excessive noise was a consideration in the design of development projects. The City of Calgary, Canada, has a noise barrier program...
that uses both a top-down approach in which the city works with developers and a bottom-up approach in which residents can make a noise barrier request through the city’s 311 online form. The program is undergirded by the city’s Surface Transportation Noise Policy, which sets a noise standard of 60 db(A) L_{eq} (24) for outdoor leisure areas in residential zones. The units dB(A) L_{eq} (24) condense the noise impact over 24 hours into single measure. Developers are responsible for noise abatement measures to meet the standard for all new residential developments next to transportation noise sources, including future road facilities that will be built within 10 years. The city is responsible for noise abatement when constructing or upgrading roadways near existing residential developments (City of Calgary, 1988).

Calgary’s Noise Barrier Retrofit Program addresses existing residential locations. City Council allocates about $900,000 annually to the program, which is enough for one to two projects per year. The process is initiated by property owners who fill out a traffic noise investigation request form via an online form. Requests are determined eligible based on the following:

- Existing residential area adjacent to major roadway (Canadian functional classes differ slightly)
- Site test shows that traffic noise level is above the design standard in the Surface Transportation Noise Policy. For truck routes, the acceptable noise level is raised to 65 dB(A) L_{eq} (24).

Calgary’s program, because of its limited resources, uses a cost-benefit ratio for prioritizing projects and typically builds concrete walls (City of Calgary, 2016). However, it is possible to use vegetation to act as a noise barrier, providing that it is dense and forms a 200 foot buffer to audibly reduce traffic noise (Washington State Department of Transportation, 2015). It is also possible for earthen berms and walls to reduce noise much more substantially than vegetation (Keep San Diego Moving, n.d.).

### Freight Movement, Crashes and Safety

The HIA project team reviewed crash data from the Georgia Department of Transportation (GDOT). The team reviewed commercial crash data point locations, and pedestrian crashes. The team also focused on the spatial patterns of injuries and deaths.

**RECOMMENDATION 8: REDIRECT TRUCK TRAFFIC AWAY FROM RESIDENTIAL NEIGHBORHOODS**

Reduce the occurrence of trucks cutting through neighborhoods and other unsuitable areas. Use the Connect Atlanta Plan to distinguish what routes are more appropriate for moving freight versus those envisioned to focus chiefly on moving people.

Commercial vehicle crash data from GDOT between the years of 2011 to 2014 indicated that several local streets are used currently as a through-route for trucks that are off of the major freight corridor network and the City of Atlanta’s truck routes. These facilities are major connection points for local residents to use and many of these local streets are not suitable routes for through truck-traffic.

The HIA team also observed that in some locations, trucks are leaving the major freight routes to travel through residential neighborhoods. This activity could potentially be avoided if truck route connectivity was improved. For example, some bridges have weight restrictions, which can force...
truck drivers to take more roundabout routes to and from the Interstate Highways. New projects which would likely reduce the occurrence of trucks cutting through neighborhoods should be prioritized to minimize the negative impacts of truck movement on city residents.

There are also routes currently used by trucks that are planned to be Complete Streets corridors under the Renew Atlanta bond and the Connect Atlanta Plan. Some of these corridors may become better suited over time to handle only local truck traffic, while other corridors would accommodate through truck traffic movements.

GDOT data for commercial crash locations, shown in Figure 21, suggest that the road segments highlighted in orange could be cut-through routes for trucks. These routes include Pharr Road in Buckhead, Collier Road north of Atlantic Station; Perry Boulevard, Hollywood Road, Johnson Road by Inman Yard; and Sylvan Road north of Langford Parkway.
One corridor appearing to have truck cut-through traffic is Joseph E. Lowery Boulevard (Figure 22). As a mainly residential corridor with commercial establishments, MARTA rail access, sidewalks, a marked bike route, and connections to two area universities, Spelman College and Clark Atlanta University, the corridor is better suited to handle local traffic than through-truck movements. A more suitable route for trucks is the parallel north-south route of Northside Drive. Another route that appears to serve as truck cut-through is MLK Jr. Drive between Joseph E. Lowery Boulevard and

Figure 21: Examination of Possible Cut-Through Routes on Local City Streets
I-20. It is possible that truck drivers are using the combinations of Joseph E. Lowery Boulevard and the highlighted segment of MLK Jr. Drive to avoid congestion while accessing I-20.

Joseph E. Lowery Boulevard

Google Street View, 2016

Figure 22: Truck Conflict with Adjacent Land Use

McDaniel Street is on the City’s truck network, but reevaluation of this route as part of the City’s freight network could be considered. According to the 2011 to 2014 GDOT crash database, a cluster of crashes involving commercial vehicles occurred along this route (Figure 21). The corridor serves as a vital connection for residents in adjacent multi-family housing. Therefore, this multimodal corridor is less suited for accommodating through-truck traffic (see Figure 23 below).

McDaniel Street between Fulton Street and Crumley Street

Google Street View, 2016

Figure 23: Housing Along Truck Route

The Connect Atlanta Plan Street Design Guide provides sample roadway templates by type for Complete Streets projects, including industrial roadway facilities. The Design Guide provides direction for the city to achieve the dual goals of efficient freight movement and context sensitivity.
Finally, increasing enforcement to prohibit trucks from using streets not part of a designated freight route network may be necessary to keep trucks out of residential neighborhoods. Before this point, discussions should occur between freight shippers and the City of Atlanta to determine which routes not currently part of the freight network are actually necessary for truck movement due to bridge weight restrictions or other limitations of roadway geometry.

**Recommendation 9: Improve Pedestrian and Bicycle Crossings at Freight Routes**

*Increase safety by maximizing the visibility of pedestrians and bicyclists, particularly along freight corridors that are also multimodal.*

Safe pedestrian and bicycle crossings should be provided where freight activity is present with other uses. Corridors with commercial land use on both sides, residential land use on one side and commercial/institutional on the other, and anywhere where there are transit stops on both sides of the road should have well-marked and signed crossings. The importance of multimodal...
considerations along freight routes like Donald Lee Hollowell Parkway, in particular, cannot be understated, as it has been the site of multiple crashes involving pedestrians and is also the site of two proposed Cargo Atlanta projects to widen the roadway and re-align an intersection with James Jackson Parkway. These projects have the potential to have a positive impact on the safety of transit users, pedestrians, and cyclists.

Based on the review of nineteen crash locations along freight corridors in EJ areas, the HIA project team recommends the following considerations for various contexts. Note that engineering studies and plans would need to be undertaken to adopt appropriate treatments along specific roadway corridors.

### Context 1: Unmarked crossing at unsignalized intersection with multi-lane roadway

This context is admittedly challenging, because pedestrian volumes are not high enough to warrant certain treatments such as pedestrian signals or beacons. In addition, the roadway may not have enough space to install curb extensions to reduce pedestrian crossing distances. However, bus stops on both sides of the road do generate pedestrian activity. In the example shown in Figure 25, Donald Lee Hollowell Parkway at Gertrude Place, the closest crosswalks are 900 feet away in each direction. Therefore, an evaluation of the need for a crosswalk and other treatments such as advance warning signs should be undertaken for these types of contexts.

![Donald Lee Hollowell Parkway at Gertrude Place](Google Streetview, 2016)

*Figure 25: Unmarked Crossing*

### Context 2: Mid-block crossing on multi-lane roadway with institutional, commercial, and residential land use and transit stops on both sides of the road

Evaluate the potential of installing a Rectangular Rapid Flash Beacon (RRFB) or a HAWK (High-intensity activated crosswalk) Beacon where there have been pedestrian crashes along high volume freight routes. For example, Donald Lee Hollowell Parkway at S. Elizabeth Place was the site of a crash involving a pedestrian in 2011; since then a HAWK beacon has been installed (Figure 26). Along with the user-actuated HAWK signal, a crosswalk, stop bar, and advance warning signs have also been installed.
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RRFBs are lower-cost alternatives to HAWK beacons, as they do not involve overhead equipment, as shown in Figure 27. The MUTCD has granted interim approval for use of these newer devices in certain circumstances; the City of Atlanta has been approved for use (FHWA, 2016).

Context 3: Channelized right turn on multi-lane roadways

Channelized right turns allow vehicles to turn at higher speeds. For pedestrians, channelized right turns make crossing an intersection more difficult (more time is needed to walk across, faster traveling vehicles, and drivers in the right lane that can yield rather than coming to a full stop at an intersection). Safer crossing conditions can be created by providing a raised, concrete refuge island...
for pedestrians and re-orienting crosswalk markings to lead to the refuge island as shown in Figure 28, which depicts Route 41/Northside Drive and Allen Ivan Jr Blvd NW.

Figure 28: Re-orientation of Crosswalks to Refuge Island

A street level view of the existing conditions is shown in Figure 29.

Figure 29: Opportunity to Create Safer Pedestrian Refuge Space to Allow for Easier Crossing
Where concrete refuge islands do exist, ensure that there is a clear crossing to reach it, whether in the form of zebra-stripe crosswalk, or a raised crosswalk that decreases turning speeds, as shown in Figure 30. Provide signs that inform drivers that they need to yield to pedestrians to increase compliance rates among drivers.

Intersection re-alignment projects with a high volume of pedestrian or bicycle traffic should potentially eliminate channelized right turns or configurations that allow for similar turning behavior. This reflects a context sensitive approach to the design of the roadway which considers other modes and surrounding land use.

### Economic Impact of Freight Movement

Stakeholders identified access to jobs through improved transportation connections as an economic development issue and challenge to be addressed. Research has shown that having fulfilling employment, with a wage that is sufficient to live off of, contributes to positive health outcomes.

**Recommendation 10: Maintain Industrial Tax Base**

*Preserve industrial land and strengthen transportation infrastructure connections to industrial facilities while limiting non-industrial land uses in industrial areas.*

Providing that land use conflicts are managed and mitigated, the presence of industrial facilities and economic development measures that increase employment rates at these facilities could potentially improve health outcomes for city residents.

Leigh and Hoelzel (2012) examined 13 American cities, all of which were attempting to preserve industrial land, and identified the following strategies:

- restrict non-industrial land uses in the area;
- curtail market-driving overpricing of industrial land by encouraging an industrial business climate and limiting other land uses in the area;
- establish stricter rezoning criteria;
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- create better workforce training and improve the quality of local industrial jobs;
- redevelop brownfields for industrial use;
- integrate public capital and infrastructure priorities with industrial protection;
- address negative perception of urban industry to policymakers and the public.

To leverage industrial land uses for potentially better health outcomes, the City of Atlanta should:

- Strengthen transportation (particularly transit, vanpool, and carpooling) connections between residential areas and industrial/logistics facilities to facilitate job access;
- Continue to build programs and connections between industrial facilities and community development efforts with economic development approaches (incentives, tax breaks to provide subsidized services) and programmatic efforts (education, health literacy programs, chronic disease management support, mental health support, indigent care).

**RECOMMENDATION 11: STRENGTHEN WORKFORCE DEVELOPMENT OPPORTUNITIES**

Connect employers that will benefit from improved freight transportation with regional workforce development organizations to allow local residents to be trained to fill new jobs.

Companies that move freight, store freight, or provide ancillary services stand to benefit from freight transportation improvements. These companies need to strengthen collaboration with workforce development agencies to ensure that the economic benefits of transportation investments translate to local jobs. Transportation improvement projects (and projects to mitigate their impacts) could result, directly and indirectly, to jobs for:

- Construction workers – transportation infrastructure
- Landscaping crews – urban tree planting and green space maintenance
- Traffic signal technicians – as signal timing is coordinated along freight corridors
- Truck drivers
- Logistics and warehousing workers

Training is necessary to allow residents to fill these jobs. For example, most employers of truck drivers require them to have a high school diploma or GED. Additionally, many require drivers to attend truck-driving schools; these programs (either privately offered or through a community college) typically take between three and six months to complete (Bureau of Labor Statistics, 2014).

**RECOMMENDATION 12: REVIEW ZONING CODE UPDATES TOGETHER WITH FREIGHT PROJECT LIST AND EXISTING INDUSTRIAL LAND USE LOCATIONS**

Establish Zoning Guidelines that Consider Truck Routes and Potential Land Use Conflicts

There are different ways to address industrial-residential land conflicts. Carefully considered zoning code can reduce the occurrence of such land use conflicts. Overlay districts have been employed in several cities to protect industrial land by explicitly banning land uses that might conflict. For example, the city of Baltimore has established a maritime industrial zoning overlay district to ensure that maritime industrial land is protected. Hotels, offices, restaurants, and other conflicting land uses are prohibited in the maritime district. Any land use changes proposed for the district are reviewed to ensure that they are compatible with and protect the maritime industry (Zoning Code of Baltimore City, 2015). The program in Baltimore has generally succeeded in protecting industrial land (RESI, 2008). While Atlanta has no maritime industrial land, there are large industrial areas in
the southwest portion of the City of Atlanta that could be protected through similar overly districts. As another example, the city of Chicago has a “planned manufacturing district,” which is a zoning overlay severely restricting industrial rezoning when the rezoning would produce incompatible land uses (Chicago Zoning and Land Use Ordinance, n.d.). This program has allowed businesses to grow, although its success is mixed since manufacturing’s share of employment has fallen (Rast, 2005). In the City of Atlanta, large amounts of previously light industrial land are being converted to multifamily residential, particularly in the area of the BeltLine. It is important to protect certain industrial corridors that are essential to Atlanta’s employment opportunities, tax base, and overall economy.

Lester, Kaza, and Kirk (2014) created an index aimed at predicting the vulnerability of industrial land to conversion to some other land use, relying on data from Chicago and Charlotte. They found that municipal policies matter. For example, parcels located within a designated industrial corridor (such as the Chicago industrial protection designation) were significantly less likely to convert than other areas. This was in fact the single most important factor. Other policies designed to support industrial land uses had similar, though less strong, effects: location inside a federal empowerment zone and location in an “industrial center” in Mecklenburg County were both negatively associated with land conversion.

In areas with active industrial uses and strong residential demand, Howland recommends creating buffers between industrial and non-industrial land and adjusting truck routes to avoid residential areas (Howland, 2010). Many of Atlanta’s truck routes are already clearly defined, and in future freight planning efforts it is important to implement strategies that protect freight corridors critical to efficient goods movement.

**RECOMMENDATION 13: CHANGES TO THE OVERALL POLICY-MAKING AND PLANNING PROCESS**

*Collaborate Across Disciplines in the Freight Planning Process, and Engage a Diverse Group of Stakeholders Early in the Process*

Collaboration between a variety of stakeholders, including community members, engineers, planners, private industry, and public health professionals can result in both a better final transportation project list and better policies. By representing a variety of perspectives throughout the process, design solutions can be crafted that maximize the economic benefits of freight movement while minimizing negative impacts to community health and quality of life.

Engaging community members throughout the freight planning process is especially critical to ensure that there is community support and buy-in for the projects. Community members can also engage in the design process, and sometimes find new and better solutions drawing from their detailed knowledge of the unique characteristics of a project site. A robust public involvement process can also benefit private industry and DOTs by minimizing controversy later.

**5.3 EJ Focus Area Specific Recommendations**

This section identifies opportunities based on each EJ area’s specific appraisal results. The project team identified four EJ areas that scored highly on the vulnerability scoring assessment using demographics, air quality, land use, transportation, and health indicators (Table 10). While the projects proposed in the Cargo Atlanta freight study are not located within the boundaries of these neighborhoods, each of the identified areas has proposed projects nearby that could potentially
effect these communities. Following this scoring methodology, the HIA team examined the Cargo Atlanta projects located either within or near the EJ areas.

### Table 10: EJ Areas Identified as Having Highest Health Vulnerabilities

<table>
<thead>
<tr>
<th>Final EJ Selection Area</th>
<th>Top 4 – Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 – Mozley Park-Westview-West End</td>
<td>10 / 10</td>
</tr>
<tr>
<td>4 - Grove Park</td>
<td>9 / 10</td>
</tr>
<tr>
<td>9 - Pittsburgh-Peoplestown-Summerhill-Mechanicsville</td>
<td>10 / 10</td>
</tr>
<tr>
<td>10 - Hammond-Perkerson-Glenrose</td>
<td>10 / 10</td>
</tr>
</tbody>
</table>

Transportation projects from the freight study were examined in order to provide recommendations to improve health, safety, and livelihoods for vulnerable populations living near the Cargo Atlanta project locations and along the high volume truck corridors.

For each of the EJ areas examined in more detail below, the following data are presented:

- Freight, passenger, and public transportation facilities and routes
- Proposed Cargo Atlanta projects
- Crash locations for crashes involving commercial vehicles and people walking or biking
- Current designated land use
- Public parks containing active uses such as playgrounds or sports field. Other public parks are not shown, since we focus on the health effect of physical activity occurring near major freight routes.

Numerous planning studies have previously focused on these areas. Further research is needed to review and integrate elements from these other planning efforts comprehensively to determine how freight movement, health, and previously proposed design solutions could be integrated most effectively. For each EJ area, we list past plans and studies relevant those neighborhoods, including Livable Centers Initiative (LCI) plans for which local governments and non-profits have received a competitive award from the Atlanta Regional Commission.

### Area 3 | Mozley Park-Westview-West End

EJ Area 3 includes Mozley Park to the north, Westview to the south, and West End to the west. All three are historic neighborhoods, with Mozley Park and West End listed on the National Register of Historic Places. Though all three neighborhoods are recovering from the mortgage crisis of the 2000s, West End’s recovery, in particular, is entangled with the possibility for residential displacement to occur, particularly among renter households, as the Atlanta BeltLine West End Trail is developed ("Historic West End," n.d., "Neighborhood History," n.d.).

Though no Cargo Atlanta freight projects are within the boundaries of these neighborhoods, the area is bisected by I-20 and freight rail lines (Norfolk Southern and CSX) as well as passenger heavy rail (MARTA Red, Gold, and Blue) lines (Figure 31). One of the Cargo Atlanta projects improves connection in the area south of Adair Park, where a freight rail line currently restricts travel between University Avenue and Avon Avenue. The Atlanta BeltLine, upon its completion, will pass through this area and through much of the EJ area. Given the likely future shift towards greater
pedestrian and cyclist activity in this area as a result of the Beltline, the Cargo Atlanta project south of Adair Park should incorporate bicycle and pedestrian facilities in the design where possible.

Figure 31: Mozley Park, West View, West End – Transportation and Cargo Atlanta Projects

Much of the industrial zoned land in this area is situated in former rail facility areas (Figure 32). Along I-20 the future land use should emphasize lower residential density and a greater buffer between future development and the I-20 corridor. However, in an effort to promote transit-oriented development near the West Lake transit station, high density zoning classes should remain. Close to the West End Station future zoning can emphasize even greater residential density and a mix of uses, including commercial.
Use mixed-use commercial and residential zoning around West End station, and increase the residential zoning mix in this area

Figure 32: Mozley Park, West View, West End – Zoning/Land Use

Future planning for Mozley Park, West View, and West End neighborhoods should take into account past and current plans including but not limited to:

- Westview Master Plan 2011
- BeltLine Master Plan Subarea 10 (Mozley Park)

Area 4 | Grove Park

EJ Area 4 includes the Grove Park neighborhood (Figure 33). Route 78, or Donald Lee Hollowell Parkway NW, is a major transportation thoroughfare that passes through the neighborhood. While no Cargo Atlanta projects are planned within the Grove Park EJ Area, two projects are recommended directly west. One is a redesign of right-turn lanes at Hamilton E. Holmes Drive NW. Pedestrian accommodation is critical for the redesign of this intersection given that the intersection was the site of a previous crash involving a pedestrian, as noted in Appendix 2. A roadway widening is also being planned to improve mobility to I-285 along Donald Lee Hollowell Parkway from Hamilton Holmes Drive / James Jackson Parkway to I-285. This project is outside the EJ area boundary. Less pedestrian traffic is visible over this segment, but a large apartment complex is situated in the area where the road widening is proposed. The road widening should be context...
sensitive, involving community support and voice in the project, to minimize disruption, particularly in sections of the roadway facility that parallel existing residential development.

A number of plans have been developed in the past which included concepts to improve this corridor. Freight planning along the corridor should be coordinated with these previous studies.

Figure 33: Grove Park – Transportation and Cargo Atlanta Projects

Existing zoning emphasizes a mix of residential, commercial, and community activities and uses along the freight route (Figure 34. Given the existing development, transition zoning for freight-intensive uses lacks feasibility. New development along this corridor should incorporate urban design strategies to minimize street noise and create improved connectivity for existing residents utilizing services within the immediate boundaries of Grove Park.
Future planning for the Grove Park area should take into account past and current plans including but not limited to:

- Connect Atlanta 2008, which envisions a Hollowell Parkway Transit concept involving frequent bus service and walkability upgrades
- DL Hollowell Parkway/Veterans Memorial Highway LCI Study 2010
- BeltLine Master Plan Subarea 9

### Area 9 | Pittsburgh-Peoplestown-Summerhill-Mechanicsville

EJ Area 9 encompasses the neighborhoods of Pittsburgh, Peoplestown, Summerhill, and Mechanicsville (Figure 35). The area is divided by multiple large highways and rail facilities. Interstate 75/Interstate 85 and I-20 intersect the EJ area, and Norfolk Southern tracks and a rail yard are also located within the EJ area. The Atlanta BeltLine extends just to the south of this EJ area, which will eventually provide greater connectivity and opportunities for physical activity. The CSX rail bridge over metropolitan parkway is also slated for replacement. This bridge replacement project could potentially incorporate improvements to the sidewalks below the bridge along Metropolitan Parkway. The new connection between University Avenue and Avon Avenue is also
an important project to improve accessibility between the EJ area and Oakland City. Improved pedestrian and bicycle accommodation should be a component of this project if possible. As noted in Appendix 2, restriping of existing crosswalks should be considered along Route 41.

Largely, the zoning designations found in this EJ area appear appropriate, since they are located adjacent to designated freight corridors (Figure 36). Industrial and commercial land uses near the planned BeltLine route should potentially be reevaluated over time due to the likely increase in residential development along the Beltline as well as increased pedestrian and bicycle activity.

Figure 35: Pittsburgh, Peoplestown, Summerhill, Mechanicsville - Transportation and Cargo Atlanta Projects

Improving existing sidewalks below bridge superstructure

Include non-motorized (bicycle and pedestrian elements) along new connection
Future planning for the neighborhoods of Pittsburgh, Peoplestown, Summerhill, and Mechanicsville should take into account past and current plans including:

- BeltLine Master Plan Subarea 2 (Pittsburgh, Peoplestown)
- Turner Field Stadium LCI Study 2016 as well as ongoing efforts by the Turner Field Community Benefits Coalition to shape the future of these neighborhoods

**Area 10 | Hammond-Perkerson-Glenrose**

EJ Area 10 encompasses the neighborhoods of Hammond Park, Glenrose Heights, and Perkerson (Figure 37). The high volume freight routes of I-75, I-85, and Langford Parkway all intersect the EJ area. Two Cargo Atlanta projects border or are within close proximity of the EJ Area, the intersection realignment at Browns Mill Road, Ruby Harper Boulevard, and Macedonia Road, and a roadway widening along Southside Industrial Parkway, respectively. The intersection realignment at Browns Mill Road, Ruby Harper Boulevard, and Macedonia Road is within close proximity to a MARTA bus stop, and currently the intersection provides no pedestrian refuge. Enhanced pedestrian facilities could potentially be included in the design for this project. Extending the sidewalks to the intersection and adding crosswalks are suggested improvements. The Southside Industrial Parkway widening will expand the road from 2-lanes to 4-lanes. Given that it is part of the

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*Transition land uses from industrial and commercial to mixed-use residential and commercial*

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*Figure 36: Pittsburgh, Peoplestown, Summerhill, Mechanicsville - Zoning/Land Use*
MARTA bus route, sidewalks are suggested for transit users, to provide a first/last-mile pedestrian connection. Additionally, the need for marked pedestrian crossings at MARTA bus stops should be evaluated along Route 41 through Perkerson Park, as indicated in Appendix 2.

**Figure 37: Hammond Park, Perkerson Park, Glenrose Heights – Transportation and Cargo Atlanta Projects**

Near the high volume freight corridors, buffers should be considered or expanded where sensitive populations are located along or near the corridor, including residential and institutional land uses (schools, libraries, community centers, etc.). Land uses in the southern part of the EJ area are context-appropriate, but sensitive land uses are located near freight routes in the northern portion of the EJ area (Figure 38). Greater buffers between residential and institutional land uses are suggested where allowable.
Establish greater residential and institutional buffers in less developed portions of freight corridor routes.

Figure 38: Hammond Park, Perkerson, Glenrose Heights – Zoning/Land Use

Future planning for the neighborhoods of Hammond Park, Perkerson, and Glenrose Heights should take into account past plans including but not limited to:

- Connect Atlanta 2008 (Sylvan Road Corridor Complete Street Project includes area just north of Perkerson Park at Perkerson Road/Langston Ave)
- NPU Z Redevelopment Plan of 2007 (Glenrose Heights)
- NPU X Comprehensive Plan of 2005 (Perkerson and Hammond Park)

Since many of these plans are over a decade old, engaging with current residents should be a priority for all freight planning processes that may affect EJ communities across the City of Atlanta.
6. Conclusions

This HIA documents the potential health impacts of freight activity in Atlanta in the context of freight infrastructure improvements proposed in the Cargo Atlanta freight study adopted in September, 2015. The Cargo Atlanta study provides an opportunity to positively influence health outcomes because the majority of the proposed projects are long term and thus the details of the project design are still fluid. The City of Atlanta can also implement complementary policies mitigating potential health risks related to freight movement.

The HIA team reviewed the academic literature, to link Atlanta’s freight activity with health determinants and ultimately health outcomes, and together with stakeholder input and the analysis of transportation, demographic, land use, and health data crafted the HIA recommendations. The analysis shows that freight growth, particularly truck traffic, has the potential to exacerbate the social, environmental, and built environment health determinants, which have been linked with outcomes such as asthma, heart disease, low birthweight births, and truck accident risks. The severity of risks associated with air quality and noise depends largely on proximity to truck corridors, and their intensity of use, although infrastructure design can mitigate accident risks. The analysis also highlights environmental justice neighborhoods near freight corridors. These areas should be prioritized for mitigation strategies, because they already face a higher rate of poor health outcomes. The HIA team proposes strategies to mitigate health risks, including targeted buffers where intensive freight corridors pass near residential neighborhoods, multimodal infrastructure improvements to reduce conflict risk, and operational changes that can reduce air pollution.

Implementing the recommendations will depend largely on the city of Atlanta’s project design process and enactment of complementary policies. Moreover, the city should consider policies which address the situation found in northwest Atlanta where new residential development is encroaching into industrial areas. The zoning and permitting processes can encourage a mutually beneficial separation between truck-generating uses and residences (either new or existing). Truck corridors do not end at the city boundaries, so adjacent cities can benefit from similar policies, which the Atlanta Regional Commission can continue to coordinate and encourage in future iterations of the Atlanta Regional Freight Mobility Plan and the Atlanta Strategic Truck Route Master Plan (ASTRoMaP). Progressive implementation of the recommendations in Atlanta and surrounding jurisdictions can help secure and equitably share the economic benefits of freight movement.
7. References


References


Envision Freight. (n.d.). *Permit Permission Considerations*.


### Appendix 1: Existing Conditions in Environmental Justice (EJ) Areas

This appendix contains 5 maps for each of the following EJ areas:

<table>
<thead>
<tr>
<th>EJ Area No.</th>
<th>Neighborhood(s) Name(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fairburn Heights, Adamsville, Oakcliff</td>
</tr>
<tr>
<td>2</td>
<td>Penelope Neighbors, Dixie Hills</td>
</tr>
<tr>
<td>3</td>
<td>Mozley Park, Westview, West End</td>
</tr>
<tr>
<td>4</td>
<td>Grove Park</td>
</tr>
<tr>
<td>5</td>
<td>English Avenue</td>
</tr>
<tr>
<td>6</td>
<td>Downtown, Oakland, Capitol Gateway</td>
</tr>
<tr>
<td>7</td>
<td>Greenbriar</td>
</tr>
<tr>
<td>8</td>
<td>Betmar LaVilla, Amal Heights</td>
</tr>
<tr>
<td>9</td>
<td>Pittsburgh, Peoplestown, Summerhill, Mechanicsville</td>
</tr>
<tr>
<td>10</td>
<td>Hammond Park, Perkerson, Glenrose Heights</td>
</tr>
</tbody>
</table>

Maps include:

- Poverty Rate
- Air Quality
- Land Use
- Transportation
- Health – Asthma
- Health – Low Birth Weight
1 | Fairburn-Adamsville-Oakcliff

Geography of EJ Area 1

Contains the neighborhoods of Adamsville, Oakcliff, and Fairburn Heights, and is adjacent to and intersected by I-20 and I-285.
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

1. Fairburn-Adamsville-Oakcliff

Air Quality

Criteria (✓ = 1 point) | ATL – EJ Area 1 | Score
--- | --- | ---
EJ area contains fine particulate matter concentrations (PM2.5) levels for fine particulate matter for roadway source emissions above 3.65 µg/m³ (micrograms per cubic meter) – twice the citywide average. | ✓ | 1
A school facility is located near the EJ area with PM2.5 average concentrations from roadway emissions sources above 3.65 µg/m³. | ✓ | 1
Air Quality Total | 2

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### Criteria (✓ = 1 point)

<table>
<thead>
<tr>
<th>Criteria (Are zoning changes recommended? (Are there residential parcels or other sensitive land uses located in the EJ area within 400 meters of a freight route))</th>
<th>ATL – EJ Area 1</th>
<th>Score</th>
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</thead>
<tbody>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria (Is a park with active uses (playground, sports facilities) located here?)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

**Land Use Total**

2
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

1 | Fairburn-Adamsville-Oakcliff

Transportation

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 1</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a Cargo Atlanta project located in the area?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did at least one crash involving a pedestrian or bicyclist occur on a roadway in or bordering the EJ area, according to the 2011-2014 GDOT data?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a bus route located on a freight route within close proximity to the EJ area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>If yes, have crashes with pedestrians occurred along these bus routes?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td><strong>Transportation Total</strong></td>
<td></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

Fairburn-Adamsville-Oakcliff

Health – Asthma

Criteria (✓ = 1 point)  |  ATL – EJ Area 1  |  Score
---|---|---
Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits?  | ✓  | 1

(Health Total on the next page)
### 1. Fairburn-Adamsville-Oakcliff

#### Health – Low Birth Weight

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 1</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have a higher rate of low birth weight births than the citywide estimated average of 8%?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Health Total

| 2 |

#### Existing Conditions Summary

**GRAND TOTAL (out of 10 points)**

| 9 |
Geography of EJ Area 2

Contains the neighborhoods of Dixie Hills and Penelope Neighbors, and is adjacent to Interstate 20 and a Class I freight rail line.
### Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

#### Health Impact Assessment (HIA)

**Cargo Atlanta: A Citywide Freight Study**

#### Penelope-Dixie

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 2</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>EJ area contains fine particulate matter concentrations (PM2.5) levels for fine particulate matter for roadway source emissions above 3.65 µg/m³ (micrograms per cubic meter) – twice the citywide average.</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>A school facility is located near the EJ area with PM2.5 average concentrations from roadway emissions sources above 3.65 µg/m³.</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td><strong>Air Quality Total</strong></td>
<td></td>
<td><strong>2</strong></td>
</tr>
</tbody>
</table>

---

**Health Impact Assessment (HIA)**

_Cargo Atlanta: A Citywide Freight Study_
### Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

#### Health Impact Assessment (HIA)

**Cargo Atlanta: A Citywide Freight Study**

---

### Penelope-Dixie

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 2</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are zoning changes recommended? (Are there residential parcels or other sensitive land uses located in the EJ area within 400 meters of a freight route)</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a park with active uses (playground, sports facilities) located here?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td><strong>Land Use Total</strong></td>
<td><strong>2</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Criteria ($✓ = 1$ point)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>ATL – EJ Area 2</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a Cargo Atlanta project located in the area?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did at least one crash involving a pedestrian or bicyclist occur on a roadway in or bordering the EJ area, according to the 2011-2014 GDOT data?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a bus route located on a freight route within close proximity to the EJ area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>If yes, have crashes with pedestrians occurred along these bus routes?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

**Transportation Total** 3
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

Health Impact Assessment (HIA)

Cargo Atlanta: A Citywide Freight Study

2 | Penelope-Dixie

Health – Asthma

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 2</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

(Health Total on the next page)
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

## Health – Low Birth Weight

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 2</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have a higher rate of low birth weight births than the citywide estimated average of 8%?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

**Health Total**

| GRAND TOTAL (out of 10 points) | 8 |

---

**Existing Conditions Summary**
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

3 | Mozley Park-Westview-West End

Geography of EJ Area 3

Contains the neighborhoods of Mozley Park, Westview, and West End, and is adjacent to Interstate 20, a Class I freight rail line, and Whitehall Street.
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

### Mozley Park-Westview-West End

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 3</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>EJ area contains fine particulate matter concentrations (PM2.5) levels for fine particulate matter for roadway source emissions above 3.65 µg/m³ (micrograms per cubic meter) – twice the citywide average.</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>A school facility is located near the EJ area with PM2.5 average concentrations from roadway emissions sources above 3.65 µg/m³.</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td><strong>Air Quality Total</strong></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
Criteria (✓ = 1 point) | ATL – EJ Area 3 | Score
--- | --- | ---
Are zoning changes recommended? (Are there residential parcels or other sensitive land uses located in the EJ area within 400 meters of a freight route) | ✓ | 1
Is a park with active uses (playground, sports facilities) located here? | ✓ | 1
Land Use Total | 2
### Mozley Park-Westview-West End

#### Transportation

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>PW – EJ Area 3</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a Cargo Atlanta project located in the area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Did at least one crash involving a pedestrian or bicyclist occur on a roadway in or bordering the EJ area, according to the 2011-2014 GDOT data?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a bus route located on a freight route within close proximity to the EJ area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>If yes, have crashes with pedestrian occurred along these bus routes?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

**Transportation Total** 4
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

3 | Mozley Park-Westview-West End  

Health – Asthma

---

Criteria (✓ = 1 point) | ATL – EJ Area 3 | Score
--- | --- | ---
Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits? | ✓ | 1

(Health Total on the next page)
### Mozley Park-Westview-West End Health – Low Birth Weight

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 3</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have a higher rate of low birth weight births than the citywide estimated average of 8%?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

**Health Total** 2

**Existing Conditions Summary**

**GRAND TOTAL (out of 10 points)** 10
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

4 | Grove Park

Geography of EJ Area 4

Contains Grove Park neighborhood, which is intersected by Route 78 / Donald Lee Hollowell Parkway.
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

4 | Grove Park

Air Quality

Criteria (✓ = 1 point) | ATL – EJ Area 4 | Score
--- | --- | ---
EJ area contains fine particulate matter concentrations (PM2.5) levels for fine particulate matter for roadway source emissions above 3.65 µg/m³ (micrograms per cubic meter) – twice the citywide average. | ✓ | 1
A school facility is located near the EJ area with PM2.5 average concentrations from roadway emissions sources above 3.65 µg/m³. |  | 

Air Quality Total | 1
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

Grove Park

Criteria (✓ = 1 point) | ATL – EJ Area 4 | Score
--- | --- | ---
Are zoning changes recommended? (Are there residential parcels or other sensitive land uses located in the EJ area within 400 meters of a freight route) | ✓ | 1
Is a park with active uses (playground, sports facilities) located here? | ✓ | 1
Land Use Total | 2

Health Impact Assessment (HIA)
Cargo Atlanta: A Citywide Freight Study
### Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

#### Cargo Atlanta: A Citywide Freight Study

**Grove Park**

<table>
<thead>
<tr>
<th>Criteria （✓ = 1 point）</th>
<th>ATL – EJ Area 4</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a Cargo Atlanta project located in the area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Did at least one crash involving a pedestrian or bicyclist occur on a roadway in or bordering the EJ area, according to the 2011-2014 GDOT data?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a bus route located on a freight route within close proximity to the EJ area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>If yes, have crashes with pedestrian occurred along these bus routes?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td><strong>Transportation Total</strong></td>
<td></td>
<td><strong>4</strong></td>
</tr>
</tbody>
</table>
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

Health Impact Assessment (HIA)

Cargo Atlanta: A Citywide Freight Study

Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits?

Criteria (✓ = 1 point) | ATL – EJ Area 4 | Score
--- | --- | ---
Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits? | ✓ | 1

(Health Total on the next page)
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

4 | Grove Park  

Health – Low Birth Weight

Criteria ($✓ = 1$ point) | ATL – EJ Area 4 | Score
--- | --- | ---
Do any census blocks in the area have a higher rate of low birth weight births than the citywide estimated average of 8%? | ✓ | 1

Health Total | 2

Existing Conditions Summary

GRAND TOTAL (out of 10 points) | 9
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

5 | English Avenue

Geography of EJ Area 5

Contains the neighborhood of English Avenue, which is intersected by Route 78 / Donald Lee Hollowell Parkway, North Avenue, and Northside Drive, as well as Class I freight rail lines.

Health Impact Assessment (HIA)
Cargo Atlanta: A Citywide Freight Study
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

5 | English Avenue

Criteria (√ = 1 point)

<table>
<thead>
<tr>
<th>ATL – EJ Area 5</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>EJ area contains fine particulate matter concentrations (PM2.5) levels for fine particulate matter for roadway source emissions above 3.65 µg/m³ (micrograms per cubic meter) – twice the citywide average.</td>
<td>✓</td>
</tr>
<tr>
<td>A school facility is located near the EJ area with PM2.5 average concentrations from roadway emissions sources above 3.65 µg/m³.</td>
<td></td>
</tr>
</tbody>
</table>

Air Quality Total

1
5 | English Avenue

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 5</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are zoning changes recommended? (Are there residential parcels or other sensitive land uses located in the EJ area within 400 meters of a freight route)</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a park with active uses (playground, sports facilities) located here?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Land Use Total 1
## English Avenue

**Transportation**

Criteria (✓ = 1 point) | ATL – EJ Area 5 | Score
--- | --- | ---
Is a Cargo Atlanta project located in the area? | ✓ | 1
Did at least one crash involving a pedestrian or bicyclist occur on a roadway in or bordering the EJ area, according to the 2011-2014 GDOT data? | ✓ | 1
Is a bus route located on a freight route within close proximity to the EJ area? | ✓ | 1
If yes, have crashes with pedestrian occurred along these bus routes? | ✓ | 1

**Transportation Total** | 3

---

**Health Impact Assessment (HIA)**

**Cargo Atlanta: A Citywide Freight Study**

---

---
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

5 | English Avenue

Criteria (✓ = 1 point) | ATL – EJ Area 5 | Score
--- | --- | ---
Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits? | ✓ | 1

(Health Total on the next page)
## Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

### Health Impact Assessment (HIA)

### Cargo Atlanta: A Citywide Freight Study

#### 5 | English Avenue

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 5</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have a higher rate of low birth weight births than the citywide estimated average of 8%?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

**Health Total** 2

### Existing Conditions Summary

<table>
<thead>
<tr>
<th>GRAND TOTAL (out of 10 points)</th>
<th>7</th>
</tr>
</thead>
</table>
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

6 | Downtown-Oakland-Capitol

Geography of EJ Area 6

Contains the neighborhoods of Downtown, Capitol Gateway, and Oakland, which is crossed by or adjacent to I-20, I-75/I-85, and several Class I freight rail lines.
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

6 | Downtown-Oakland-Capitol

**Air Quality**

Criteria (✓ = 1 point) | ATL – EJ Area 6 | Score
--- | --- | ---
EJ area contains fine particulate matter concentrations (PM2.5) levels for fine particulate matter for roadway source emissions above 3.65 µg/m³ (micrograms per cubic meter) – twice the citywide average. | ✓ | 1
A school facility is located near the EJ area with PM2.5 average concentrations from roadway emissions sources above 3.65 µg/m³. | ✓ | 1

**Air Quality Total** | 2

---

Health Impact Assessment (HIA)
Cargo Atlanta: A Citywide Freight Study

133

Georgia Tech Center for Quality Growth and Regional Development
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

### 6 Downtown-Oakland-Capitol

#### Land Use

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 6</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are zoning changes recommended? (Are there residential parcels or other sensitive land uses located in the EJ area within 400 meters of a freight route)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is a park with active uses (playground, sports facilities) located here?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

**Land Use Total**

1
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 6</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a Cargo Atlanta project located in the area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Did at least one crash involving a pedestrian or bicyclist occur on a roadway in or bordering the EJ area, according to the 2011-2014 GDOT data?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a bus route located on a freight route within close proximity to the EJ area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>If yes, have crashes with pedestrian occurred along these bus routes?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

Transportation Total: 3
### Criteria (✓ = 1 point)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>ATL – EJ Area 6</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have an incidence of ER visits due to</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>asthma greater than the citywide estimated average of 8 ER visits?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Health Total on the next page)
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

Downtown-Oakland-Capitol  Health – Low Birth Weight

<table>
<thead>
<tr>
<th>Criteria</th>
<th>ATL – EJ Area 6</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have a higher rate of low birth weight births than the citywide estimated average of 8%?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

Health Total 2

Existing Conditions Summary

GRAND TOTAL (out of 10 points) 8
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

7 | Greenbriar

Contains the neighborhood of Greenbriar, which is crossed by I-285 and Campbellton Road and Langford Parkway.

Geography of EJ Area 7

Poverty

<table>
<thead>
<tr>
<th>Greenbriar</th>
<th>Poverty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains the neighborhood of Greenbriar, which is crossed by I-285 and</td>
<td></td>
</tr>
<tr>
<td>Campbellton Road and Langford Parkway.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

7 | Greenbriar

Air Quality

Criteria \( (√ = 1 \text{ point}) \)

<table>
<thead>
<tr>
<th>ATL – EJ Area 7</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>EJ area contains fine particulate matter concentrations (PM2.5) levels for fine particulate matter for roadway source emissions above 3.65 µg/m³ (micrograms per cubic meter) – twice the citywide average.</td>
<td>✓</td>
</tr>
<tr>
<td>A school facility is located near the EJ area with PM2.5 average concentrations from roadway emissions sources above 3.65 µg/m³.</td>
<td></td>
</tr>
</tbody>
</table>

Air Quality Total | 1
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

### Greenbriar

**Land Use**

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 7</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are zoning changes recommended? (Are there residential parcels or other sensitive land uses located in the EJ area within 400 meters of a freight route)</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a park with active uses (playground, sports facilities) located here?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td><strong>Land Use Total</strong></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

7 | Greenbriar

Transportation

Criteria (✓ = 1 point)

<table>
<thead>
<tr>
<th>Question</th>
<th>ATL – EJ Area 7</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a Cargo Atlanta project located in the area?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did at least one crash involving a pedestrian or bicyclist occur on a roadway in or bordering the EJ area, according to the 2011-2014 GDOT data?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a bus route located on a freight route within close proximity to the EJ area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>If yes, have crashes with pedestrian occurred along these bus routes?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

Transportation Total

3
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

**Health – Asthma**

### Criteria (✓ = 1 point)

Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits?

<table>
<thead>
<tr>
<th>Criteria</th>
<th>ATL – EJ Area 7</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

(Health Total on the next page)
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

**Greenbriar**

### Health – Low Birth Weight

<table>
<thead>
<tr>
<th>Criteria</th>
<th>ATL – EJ Area 7</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have a higher rate of low birth weight births than the citywide estimated average of 8%?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

**Health Total**

| GRAND TOTAL (out of 11 points) | 8 |
Geography of EJ Area 8

Contains the neighborhoods of Amal Heights and Betmar LaVilla, which are adjacent to Interstate 75.
### Criteria (✓ = 1 point)

| EJ area contains fine particulate matter concentrations (PM2.5) levels for fine particulate matter for roadway source emissions above 3.65 µg/m³ (micrograms per cubic meter) – twice the citywide average. | ✓ | 1 |
| A school facility is located near the EJ area with PM2.5 average concentrations from roadway emissions sources above 3.65 µg/m³. | | |

**Air Quality Total**

1
### Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

#### 8 | Betmar-Amal

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 8</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are zoning changes recommended? (Are there residential parcels or other sensitive land uses located in the EJ area within 400 meters of a freight route)</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a park with active uses (playground, sports facilities) located here?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Land Use Total</strong></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
## Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

### Health Impact Assessment (HIA)

**Cargo Atlanta: A Citywide Freight Study**

### Criteria (✓ = 1 point)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>ATL – EJ Area 8</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a Cargo Atlanta project located in the area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Did at least one crash involving a pedestrian or bicyclist occur on a roadway in or bordering the EJ area, according to the 2011-2014 GDOT data?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a bus route located on a freight route within close proximity to the EJ area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>If yes, have crashes with pedestrian occurred along these bus routes?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td><strong>Transportation Total</strong></td>
<td><strong>3</strong></td>
<td></td>
</tr>
<tr>
<td>Criteria (✓ = 1 point)</td>
<td>ATL – EJ Area 8</td>
<td>Score</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>-------</td>
</tr>
<tr>
<td>Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

(Health Total on the next page)
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

Health Impact Assessment (HIA)
Cargo Atlanta: A Citywide Freight Study

8 | Betmar-Amal

Health – Low Birth Weight

Criteria (√ = 1 point) | ATL – EJ Area 8 | Score
--- | --- | ---
Do any census blocks in the area have a higher rate of low birth weight births than the citywide estimated average of 8%? | ✓ | 1

Health Total

2

Existing Conditions Summary

GRAND TOTAL (out of 10 points)

7
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

**Geography of EJ Area 9**

Contains the neighborhoods of Mechanicsville, Summerhill, Pittsburgh, and Peoplestown, and is crossed by or adjacent to I-75/I-85, I-20, and several Class I freight rail lines.
### Pittsburgh-Peoplestown-Summerhill-Mechanicsville | Air Quality

#### Criteria (✓ = 1 point)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>ATL – EJ Area 9</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>EJ area contains fine particulate matter concentrations (PM2.5) levels for fine particulate matter for roadway source emissions above 3.65 µg/m³ (micrograms per cubic meter) – twice the citywide average.</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>A school facility is located near the EJ area with PM2.5 average concentrations from roadway emissions sources above 3.65 µg/m³.</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

| Air Quality Total | 2 |
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

### Pittsburgh-Peoplestown-Summerhill-Mechanicsville

#### Land Use

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 9</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are zoning changes recommended? (Are there residential parcels or other sensitive land uses located in the EJ area within 400 meters of a freight route)</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a park with active uses (playground, sports facilities) located here?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Land Use Total</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
## Pittsburgh-Peoplestown-Summerhill-Mechanicsville

### Transportation

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 9</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a Cargo Atlanta project located in the area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Did at least one crash involving a pedestrian or bicyclist occur on a roadway in or bordering the EJ area, according to the 2011-2014 GDOT data?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a bus route located on a freight route within close proximity to the EJ area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>If yes, have crashes with pedestrian occurred along these bus routes?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

### Transportation Total

4
Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits? ✓ 1

(Health Total on the next page)
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

9 Pittsburgh-Peoplestown-Summerhill-Mechanicsville

Health – Low Birth Weight

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 9</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have a higher rate of low birth weight births than the citywide estimated average of 8%?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

Health Total 2

Existing Conditions Summary

GRAND TOTAL (out of 10 points) 10
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

10 | Hammond-Perkerson-Glenrose

Contains the neighborhoods of Glenrose Heights, Hammond Park, and Perkerson, and is crossed by I-75 and I-85.
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

10 | Hammond-Perkerson-Glenrose

Air Quality

Criteria (√ = 1 point)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>ATL – EJ Area 10</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>EJ area contains fine particulate matter concentrations (PM2.5) levels for fine particulate matter for roadway source emissions above 3.65 µg/m³ (micrograms per cubic meter) – twice the citywide average.</td>
<td>√</td>
<td>1</td>
</tr>
<tr>
<td>A school facility is located near the EJ area with PM2.5 average concentrations from roadway emissions sources above 3.65 µg/m³.</td>
<td>√</td>
<td>1</td>
</tr>
<tr>
<td>Air Quality Total</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

10 Hammond-Perkerson-Glenrose

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 10</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are zoning changes recommended? (Are there residential parcels or other sensitive land uses located in the EJ area within 400 meters of a freight route)</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Is a park with active uses (playground, sports facilities) located here?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Land Use Total</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Health Impact Assessment (HIA)
Cargo Atlanta: A Citywide Freight Study
### Cargo Atlanta: A Citywide Freight Study

**10 | Hammond-Perkerson-Glenrose**

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 10</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a Cargo Atlanta project located in the area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Did at least one crash involving a pedestrian or bicyclist occur on a roadway in or</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>bordering the EJ area, according to the 2011-2014 GDOT data?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is a bus route located on a freight route within close proximity to the EJ area?</td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>If yes, have crashes with pedestrian occurred along these bus routes?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

**Transportation Total**

4
Health Impact Assessment (HIA)
Cargo Atlanta: A Citywide Freight Study

Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

10 Hammond-Perkerson-Glenrose

Health – Asthma

Criteria (✓ = 1 point) | ATL – EJ Area 10 | Score
---|---|---
Do any census blocks in the area have an incidence of ER visits due to asthma greater than the citywide estimated average of 8 ER visits? | ✓ | 1

(Health Total on the next page)
### Appendix 1. Existing Conditions in Environmental Justice (EJ) Areas

#### Cargo Atlanta: A Citywide Freight Study

---

### Hammond-Perkerson-Glenrose

#### Health – Low Birth Weight

<table>
<thead>
<tr>
<th>Criteria (✓ = 1 point)</th>
<th>ATL – EJ Area 10</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do any census blocks in the area have a higher rate of low birth weight births than the citywide estimated average of 8%?</td>
<td>✓</td>
<td>1</td>
</tr>
</tbody>
</table>

**Health Total**

| 2 |

---

**Existing Conditions Summary**

| GRAND TOTAL (out of 10 points) | 10 |

---

---

---
## Appendix 2: Analysis of Pedestrian or Cyclist Crash Locations in EJ Areas

<table>
<thead>
<tr>
<th>Location</th>
<th>Neighborhood</th>
<th>Year</th>
<th># Injuries</th>
<th>Road Width</th>
<th>Predominant Land Use</th>
<th>Transit at Site of Crash</th>
<th>Pedestrian Environment</th>
<th>Main Issue</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rt 41 north of Mt Zion Rd SW</td>
<td>Hammond Park</td>
<td>2011</td>
<td>1</td>
<td>2 lanes</td>
<td>commercial</td>
<td>bus stops</td>
<td>sidewalks, no marked crossing</td>
<td>No marked crossings near transit stops</td>
<td>Evaluate need for treatment including pavement markings, signs, signals, beacons, or roadway design changes.</td>
</tr>
<tr>
<td>Rt 41 south of Connell Ave SW</td>
<td>Perkerson</td>
<td>2013</td>
<td>1</td>
<td>5 lanes</td>
<td>commercial</td>
<td>bus stops</td>
<td>sidewalks, no marked crossing</td>
<td>No marked crossings near transit stops</td>
<td>Evaluate need for treatment including pavement markings, signs, signals, beacons, or roadway design changes.</td>
</tr>
<tr>
<td>Rt 41 @ Connell Ave SW</td>
<td>Perkerson</td>
<td>2013</td>
<td>1</td>
<td>5 lanes</td>
<td>commercial</td>
<td>bus stops</td>
<td>sidewalks, no marked crossing</td>
<td>No marked crossings near transit stops</td>
<td>Evaluate need for treatment including pavement markings, signs, signals, beacons, or roadway design changes.</td>
</tr>
<tr>
<td>Rt 41 @ Pegg Rd SW</td>
<td>Perkerson</td>
<td>2013</td>
<td>1</td>
<td>4 lanes</td>
<td>commercial</td>
<td>bus stops</td>
<td>sidewalks, crosswalk at T intersection. Crosswalk is faded. Ped warning sign recommended.</td>
<td>T intersection could encourage speeding, faded crosswalk</td>
<td>Restripe crosswalk, add ped warning sign</td>
</tr>
<tr>
<td>Lee St @ White St SW</td>
<td>West End</td>
<td>2011</td>
<td>1</td>
<td>5 lanes</td>
<td>commercial on one side, MARTA rail on the other</td>
<td>rail line to the east</td>
<td>sidewalks, signalized crosswalk at T intersection with push buttons</td>
<td>T intersection could encourage speeding, faded crosswalk</td>
<td></td>
</tr>
<tr>
<td>Rt 41 @ Lillian Ave</td>
<td>Pittsburgh</td>
<td>2013</td>
<td>1</td>
<td>4 lanes</td>
<td>residential, institutional</td>
<td>bus stops</td>
<td>sidewalks, signalized crosswalk at T intersection with push buttons. Crosswalk is faded.</td>
<td>T intersection could encourage speeding</td>
<td>Restripe crosswalk</td>
</tr>
<tr>
<td>Ralph David Abernathy Blvd @ Lee St SW</td>
<td>West End</td>
<td>2011</td>
<td>0</td>
<td>4 lanes</td>
<td>commercial</td>
<td>MARTA parking lot</td>
<td>sidewalks, channelized right turn with new ADA ramps (improved since 2011), pavers at 4-way crossing. Crosswalk and yield to peds sign recommended at channelized right turn.</td>
<td>Channelized right turn</td>
<td>Add crosswalk from sidewalk to refuge island and Yield to Peds sign</td>
</tr>
</tbody>
</table>
## Appendix 2. Analysis of Pedestrian or Cyclist Crash Locations in EJ Areas

<table>
<thead>
<tr>
<th>Location</th>
<th>Neighborhood</th>
<th>Year</th>
<th># Injuries</th>
<th>Road Width</th>
<th>Predominant Land Use</th>
<th>Transit at Site of Crash</th>
<th>Pedestrian Environment</th>
<th>Main Issue</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ralph David Abernathy Blvd @ W Whitehall St SW</td>
<td>West End</td>
<td>2013</td>
<td>1</td>
<td>4 lanes</td>
<td>commercial</td>
<td>bus stops down the street</td>
<td>sidewalks, ramps, ped signal but no crosswalk across W Whitehall St - sidewalks continue under bridge</td>
<td>No marked crossing</td>
<td>Add crosswalk</td>
</tr>
<tr>
<td>McDaniel bridge over 1-20</td>
<td>Mechanicsville</td>
<td>2014</td>
<td>0</td>
<td>5 lanes</td>
<td>N/A - bridge</td>
<td>no</td>
<td>sidewalks</td>
<td>Unclear</td>
<td></td>
</tr>
<tr>
<td>Northside Dr NW @ Mitchell St SW</td>
<td>Vine City / Downtown</td>
<td>2011</td>
<td>1</td>
<td>6 lanes</td>
<td>commercial, residential</td>
<td>bus stop down the street</td>
<td>sidewalks, signalized crosswalk at T intersection with push buttons. Crosswalk is faded.</td>
<td>T intersection could encourage speeding</td>
<td>Restripe crosswalk, add ped warning sign</td>
</tr>
<tr>
<td>Northside Dr NW between Foundry &amp; Spencer Sts NW</td>
<td>Vine City / Downtown</td>
<td>2011</td>
<td>1</td>
<td>7 lanes</td>
<td>commercial, residential</td>
<td>no</td>
<td>sidewalks, no crossing - approx - 0.2 mile (3 blocks) between crosswalks</td>
<td>No marked crossing</td>
<td>Evaluate need for treatment including pavement markings, signs, signals, beacons, or roadway design changes.</td>
</tr>
<tr>
<td>Northwide Dr NW and Ivan Allen Jr Blvd / JE Boone Blvd</td>
<td>Vine City / Downtown</td>
<td>2013</td>
<td>1</td>
<td>6-7 lanes</td>
<td>commercial</td>
<td>bus stops</td>
<td>4-way intersection with sidewalks, crosswalks, ped signals, channelized right turn. Painted triangle instead of concrete refuge island.</td>
<td>Channelized right turn</td>
<td>Create concrete refuge island, add crosswalk from sidewalk to refuge island and Yield to Peds sign</td>
</tr>
<tr>
<td>W Peachtree St NW and Lindon Ave NW</td>
<td>Downtown</td>
<td>2011</td>
<td>1</td>
<td>5-6 lanes</td>
<td>commercial</td>
<td>no</td>
<td>1-way thoroughfare, sidewalks, crosswalks, ped signals</td>
<td>Road width and speed</td>
<td>Traffic calming</td>
</tr>
<tr>
<td>North Ave NW @ Northyards Blvd NW</td>
<td>English Avenue</td>
<td>2013</td>
<td>1</td>
<td>5 lanes with median</td>
<td>institutional, commercial</td>
<td>bus stops</td>
<td>sidewalks, no marked crossing</td>
<td>No marked crossing</td>
<td>Evaluate need for treatment including pavement markings, signs, signals, beacons, or roadway design changes.</td>
</tr>
<tr>
<td>DL Hollowell @ Chappell RD NW</td>
<td>Grove Park/Bankhead</td>
<td>2011</td>
<td>1</td>
<td>4-5 lanes</td>
<td>commercial</td>
<td>bus stops</td>
<td>sidewalks, signalized crosswalk at T intersection with push buttons. Crosswalk is faded.</td>
<td>T intersection could encourage speeding, faded crosswalk</td>
<td>Restripe crosswalk, add ped warning sign</td>
</tr>
</tbody>
</table>
### Appendix 2. Analysis of Pedestrian or Cyclist Crash Locations in EJ Areas

<table>
<thead>
<tr>
<th>Location</th>
<th>Neighborhood</th>
<th>Year</th>
<th># Injuries</th>
<th>Road Width</th>
<th>Predominant Land Use</th>
<th>Transit at Site of Crash</th>
<th>Pedestrian Environment</th>
<th>Main Issue</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL Hollowell @ Echo St NW</td>
<td>English Avenue</td>
<td>2013</td>
<td>1</td>
<td>4 lanes</td>
<td>commercial</td>
<td>no</td>
<td>sidewalks, no marked crossing - closest crosswalk 0.11 mile (2 blocks) to the west</td>
<td>No marked crossing</td>
<td>Evaluate need for treatment including pavement markings, signs, signals, beacons, or roadway design changes.</td>
</tr>
<tr>
<td>DL Hollowell @ Gertrude Pl NW</td>
<td>Grove Park</td>
<td>2011</td>
<td>1</td>
<td>4 lanes</td>
<td>residential</td>
<td>bus stops</td>
<td>T intersection, sidewalks, no crosswalks across main line even though there are bus stops on either side</td>
<td>T intersection could encourage speeding, no marked crossing</td>
<td>Evaluate need for treatment including pavement markings, signs, signals, beacons, or roadway design changes.</td>
</tr>
<tr>
<td>DL Hollowell @ S Elizabeth Pl NW</td>
<td>Grove Park</td>
<td>2011</td>
<td>1</td>
<td>4 lanes</td>
<td>institutional, residential</td>
<td>bus stops</td>
<td>sidewalks, crosswalks - after 2013 a HAWK beacon was installed</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>DL Hollowell @ Wood ST</td>
<td>Grove Park</td>
<td>2013</td>
<td>1</td>
<td>4 lanes</td>
<td>commercial, institutional</td>
<td>bus stops</td>
<td>sidewalks, crosswalks, ped signal, ped crossing warning sign</td>
<td>Unclear</td>
<td>Evaluate need for treatment including pavement markings, signs, signals, beacons, or roadway design changes.</td>
</tr>
</tbody>
</table>
Appendix 3: Stakeholder Engagement Plan

This Plan summarizes the stakeholder engagement for the Cargo Atlanta: a Citywide Freight Study Health Impact Assessment (HIA) program led by the Center for Quality Growth and Regional Development (CQGRD), with assistance from the Georgia Health Policy Center (GHPC).

Introduction

Engaging with a wide variety of stakeholders is a defining component of practice in intermediate or comprehensive scale HIAs. In Guidance and Best Practices for Stakeholder Participation in HIA, a working group of HIA practitioners defines stakeholders as “individuals or organizations who stand to gain or lose from a decision or process. More specifically, stakeholders can be described as people who:

- are affected by the prospective change (e.g., health or financial),
- have an interest in the health impacts of the policy or project under consideration because of their position,
- have an active or passive influence on the decision-making and implementation process of the project or policy under consideration,
- have an economic or business interest in the outcome of the decision.”

That same guidance notes that stakeholder participation “can improve the efficacy of an HIA by helping to:

- identify important stakeholder concerns,
- bring important reflections of experience, knowledge, and expertise,
- ground truth findings and recommendations by ensuring that the lived reality matches priorities, data, and analysis,
- support the value of equity and democracy within the HIA,
- create more support for the implementation of HIA recommendations,
- shape communication and dissemination methods.”

Each of these are goals for stakeholder engagement for the Cargo Atlanta Freight Study HIA.

In regards to advancing equity through HIA, stakeholder engagement is also viewed through the lens of the Equity Metrics for Health Impact Assessment Practice, Version 1, which focus on four outcomes:

- The HIA process and products focus on equity.
- The HIA process built the capacity and ability of communities facing health inequities to engage in future HIAs and in decision-making more generally.
- The HIA resulted in a shift in power benefiting communities facing inequities.
- The HIA contributed to changes that reduced health inequities and inequities in the social and environmental determinants of health.

---


Appendix 3. Stakeholder Engagement Plan

**Cargo Atlanta: a Citywide Freight Study HIA**

The Cargo Atlanta HIA informs the ongoing planning efforts in the freight study recently completed by the City of Atlanta. This study includes both general policies and a detailed transportation project list to facilitate more efficient freight movement through the city.

The HIA describes potential community health impacts that are otherwise not explicitly considered in the freight planning study. The HIA includes recommendations to minimize potential negative community impacts while still accomplishing the goal of efficient goods movement in the city.

**Primary Goals of Engagement**

The stakeholder engagement is intended to—

- Contribute additional local perspective to the final scope of the HIA,
- Ground truth findings and recommendations by ensuring that the lived reality matches priorities, data, and analysis,
- Create support for the implementation of HIA recommendations, including monitoring and evaluation,
- Support the values of equity and democracy within the HIA process.

**Identification of Stakeholder Communities, Organizations and Individuals**

Engagement for the Atlanta HIA relied on existing relationships between the HIA project team and stakeholders in the local planning community. Beginning with stakeholders already participating in the freight planning process conducted by the City of Atlanta during the freight study, engagement for the HIA built on existing outreach with an aim for broader representation of voices in the affected communities.

In available materials from and early communications with the City, it appears that the major focus during the City’s engagement process was on stakeholders from industry, public safety, and elected positions. The Cargo Atlanta study states the following:

“One-on-one interviews were conducted to understand the needs of various stakeholders, as well as which aspects of current plans and regulations for the study area were effective as designed and which aspects needed modification. The Office of Planning identified these organizations, companies, and individuals and encouraged their inclusion and participation at key points throughout the process. Stakeholders interviewed included:

- Members of the freight community (rail providers, trucking providers, trucking associations)
- Atlanta Police Department
- City Council members and their respective aids and other elected officials”

Direct follow up with the City yielded the names of several elected officials, officers, and employees who were consulted in the development of the study, as listed in Table 11.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kathleen Kingsbury</td>
<td>Aide to Councilmember Felicia Moore</td>
<td>Atlanta City Council – District 9</td>
</tr>
</tbody>
</table>
Appendix 3. Stakeholder Engagement Plan

Health Impact Assessment (HIA)  
Cargo Atlanta: A Citywide Freight Study

The HIA sought to enhance the contribution of local community perspectives, especially from areas identified by the HIA appraisal phase as particularly vulnerable to the impacts of freight movement. As an additional resource towards this goal, the research project team reviewed other freight plans to assist with the identification of stakeholders and environmental justice community representatives. The research team initially built upon the following list of stakeholders identified in the Environmental Justice section (Appendix F) of the 2015 Georgia Department of Transportation (GDOT) Georgia State Rail Plan. The 2015 GDOT State Rail Plan defines Environmental Justice as “…the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income.” The consultants developing the GDOT Rail Plan conducted interviews with “…community leaders, officials and neighborhood activists from around the state.”

### Table 12: List of Environmental Justice Stakeholders Interviewed for the Georgia Department of Transportation (GDOT) Rail Plan Update

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown, Dr. C. McGill</td>
<td>Pastor</td>
<td>Second African Baptist Church</td>
</tr>
<tr>
<td>Butler, Helen</td>
<td>Director</td>
<td>Georgia Coalition for the People's Agenda</td>
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<td>Gayle, Aisha</td>
<td>TDM Technology Administrator, Mobility Service Division</td>
<td>Atlanta Regional Commission</td>
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<tr>
<td>Gruner, America</td>
<td>President</td>
<td>Coalition of Latin Leaders</td>
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<td>Smith, Nathaniel</td>
<td>Chief Executive Officer</td>
<td>Partnership for Southern Equity</td>
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<td>Tucker, Roz</td>
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<td>Area Agency on Aging</td>
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<td>Ustrud, Kelsey</td>
<td>Executive Director</td>
<td>Disability Resource Center</td>
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<td>Velez, Eli</td>
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<td>Latin American Association</td>
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<td>Williams, Sherry</td>
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<td>Wong, Lani</td>
<td>Chair of Board of Directors</td>
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<tr>
<td>Yuen, Joshua</td>
<td>President</td>
<td>Organization of Chinese Americans</td>
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</table>

### Strategies to Engage Stakeholders

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Appendix 3. Stakeholder Engagement Plan

Stakeholders with technical knowledge and expertise were brought into the HIA process through meetings, phone conversations, and workshops, as the following subsections detail.

Technical Experts

The technical experts are key individuals familiar with the Cargo Atlanta planning process. They served as a resource for questions about the Cargo Atlanta study, its process, and how new health-focused information may (or may not) be relevant. Engagement at this level aimed to leverage existing relationships between stakeholders and the project team, and included the following:

- Johnathan Lewis, Assistant Director – Transportation Planning, City of Atlanta
- Stosh Kozlowski, Urban Planner – Department of Planning and Urban Development, City of Atlanta
- Daniel Studdard, Principal Planner – Transportation Access and Mobility Division, Atlanta Regional Commission (ARC)

Community Members

Community members and leaders represent interests and values of residents potentially impacted by freight movement. The HIA team attempted to incorporate community voices into the HIA, for example by reaching out to neighborhood planning units (NPUs) affected by freight projects. Community representatives proved difficult to engage, so the final stakeholder engagement focused on technical representatives.

Stakeholder Engagement Activities

Due to personnel changes within the City of Atlanta, engagement for the Atlanta HIA shifted somewhat to focus more on engaging representatives from the Atlanta Regional Commission (ARC), who were receptive to requests for information and meetings. This only slightly skews the effectiveness of the HIA, as the ARC works closely with the City in planning infrastructure to efficiently move freight. In addition to attempts at direct engagement with community stakeholders, three significant points of engagement occurred as part of the HIA process. While the initial stakeholder engagement plan for this HIA laid out a general framework for engagement activities based on existing relationships, the actual engagement was more adaptive and iterative than initially expected. The following subsections summarize community stakeholder discussion questions and the three key engagement activities.

Freight Planning Data Workshop

In March of 2016, members of the HIA research team were invited to participate in a day-long “Fundamentals of Freight Data Workshop” led by USDOT. Attending this meeting presented both an opportunity to learn more about how freight planners develop and manage data and to engage with Atlanta-area stakeholders. The content of this workshop influenced initial scoping activities for the HIA, especially in regard to the framing of the concept of health in all policies for freight audiences. Workshop attendees included several key stakeholders from the City of Atlanta, ARC, and GDOT. Community-level stakeholders were absent from this meeting, which is understandable given the technical nature of the content.

Atlanta Freight HIA Stakeholder Workshop

In late March 2016, a workshop was held that focused on the HIA and also included a more general overview of the concept of health in all policies. The stated purpose of this meeting was to inform stakeholders about the ongoing freight planning HIA, engage them to provide input on preliminary findings, and translate preliminary ideas into actionable recommendations. Several key stakeholders from both the
freight and health sectors participated in this workshop and provided valuable feedback and guidance. However, multiple community partners that had initially accepted the invitation did not attend, leading to attempts to follow up with them directly.

**Targeted Conversations with ARC**

In November 2016, the HIA research team had direct conversations with the ARC freight planner to share and validate final results. These conversations emphasized the usefulness of the HIA findings, but noted that much work remains to be done in terms of fully realizing a vision of community-informed freight planning decisions. Initial strategies for using the HIA findings and recommendations as part of ongoing regional planning efforts were also discussed at these meetings.

**Conclusion: Achieving Stakeholder Engagement Goals**

Based on the definition of stakeholders, the goals of engagement, and the related equity goals included in the introduction, the engagement for this HIA was merely sufficient to move the project forward and did not fully achieve many of the stated goals. There is substantial room for improved engagement between freight, health, and community members around these issues is acknowledged, and it is hoped that the results of the HIA will be used to fill this space. The extent to which engagement addressed these topics is summarized thematically in the following subsections, addressing stakeholders’ makeup, engagement goals, and equity in stakeholder engagement.

**Definition of “Stakeholders” as People Who:**

- **Are affected by the prospective change (e.g., health or financial)** – Attempts to engage with representatives of affected communities were made, but proved mostly unsuccessful. This was likely a result of the need to build relationships and trust with stakeholders slowly, and the amount of time needed to find and engage with other community members able to act as “gate-keepers” to the most impacted communities. In the broad sense, all residents of the Atlanta region are impacted by the Cargo Atlanta freight study decisions in some way, so engagement with the various professionals, organizations, and groups met this definition. Having the findings and results of the project should help in future attempts to reach more people affected by freight planning decisions.

- **Have an interest in the health impacts of the policy or project under consideration because of their position** – The HIA engagement was successful in facilitating communication between public health professionals and professionals from other disciplines. The HIA process served to promote the concept of health in all policies.

- **Have an active or passive influence on the decision-making and implementation process of the project or policy under consideration** – Several of the stakeholders engaged have direct involvement in decisions regarding transportation projects.

- **Have an economic or business interest in the outcome of the decision** – While private business interests were included in the City of Atlanta’s engagement for their freight study, representatives of these interests could have been better included in HIA activities.

**Goals for Stakeholder Engagement:**

- **Contribute additional local perspective to the final scope of the HIA** – Professional/technical stakeholders helped to ground the HIA in local planning needs, but the lack of direct input from affected communities is a shortcoming of this project.
- **Ground truth findings and recommendations by ensuring that the lived reality matches priorities, data, and analysis** – The engagement with decision makers and technical experts did confirm the assumptions of the HIA team regarding local conditions.

- **Create support for the implementation of HIA recommendations** – Engaged stakeholders indicated a willingness to assist in the implementation of recommendations as part of their ongoing activities.

- **Support the value of equity and democracy within the HIA** – The engagement strategy offered multiple opportunities for the community members affected by the decision to participate in the HIA process; though there was less community participation than hoped for. The spirit of these values was included, but work remains to fully achieve them. In a broad sense, one of the driving forces behind this HIA is a recognized need to create a more actionable space for community participation in the freight planning process.

### Equity-focused Goals for Stakeholder Engagement:

- **The HIA process and products focus on equity** – The focus of the HIA is on environmental justice communities and the impact of freight movement therein. The technical perspective and process of this HIA may foster necessary policy contexts for more empowerment of the communities of concern.

- **The HIA process built the capacity and ability of communities facing health inequities to engage in future HIAs and in decision-making more generally** – The aim is for a subset of recommendations to help achieve this, but the current HIA process was not able to fully realize this goal.

- **The HIA resulted in a shift in power benefiting communities facing inequities** – It is unclear the extent to which the HIA led to any shifts in power, but if recommendations are adopted that help communities participate more fully in freight planning processes, that would begin this process.

- **The HIA contributed to changes that reduced health inequities and inequities in the social and environmental determinants of health** – The impact in this space is unknown at this time, but recommendations aim to mitigate some of the underlying conditions in vulnerable communities directly impacted by freight movement decisions.
Appendix 4: Health Data Processing Method

Analyses in this study were largely conducted at block-level geographies. However, not all variables of interest are available from the Georgia Department of Health at this scale and level of detail. Therefore, the HIA team transformed variables not immediately available at block-level to fit into the primary geographic level of interest of this study. This table of variables shows the data transformation. Here it is imperative to mention an important limitation of this study. As the health data (for example Asthma) at block-level is estimated using census tract level absolute data in the study area, the analyses and recommendations of this study are subjected to the limitations of data disaggregation.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Name</th>
<th>Description</th>
<th>Geographic Level†</th>
<th>Source</th>
<th>Calculation</th>
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<tr>
<td>Pop</td>
<td>Population</td>
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<td></td>
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<td>HH</td>
<td>Household</td>
<td>Block</td>
<td></td>
<td></td>
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<tr>
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<td>White alone</td>
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<td></td>
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<tr>
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<td>Black or African American alone</td>
<td>Block</td>
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<td>Rc_IndN</td>
<td>American Indian and Alaska Native alone</td>
<td>Block</td>
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<td>Rac_Asn</td>
<td>Asian alone</td>
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<tr>
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<td>AgeVI_15</td>
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<td>Under 5 years</td>
<td>Block</td>
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<td>AgeVI_65</td>
<td>65 years and older</td>
<td>65 and 66 years</td>
<td>Block</td>
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<td>MedINcm</td>
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<td>In 2010 inflation-adjusted dollars</td>
<td>Block group</td>
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<td>PPvrtrt</td>
<td>Population poverty rate -- Ratio of income to poverty level in the past 12 months</td>
<td>Selected ratios: 1) Under .50 and 2) .50 to .99</td>
<td>Block group</td>
<td>Ratio of Income to Poverty Level in the Past 12 Months / Total Population (Block group)</td>
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### Variable Name Description

<table>
<thead>
<tr>
<th>Variable</th>
<th>Name</th>
<th>Description</th>
<th>Geographic Level†</th>
<th>Source</th>
<th>Calculation</th>
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<td>HHvrtRt</td>
<td>Households poverty rate – Poverty status in the past 12 months by household</td>
<td>Block group</td>
<td>Poverty Status in the Past 12 Months by Household / Total Households (Block group)</td>
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<td>PpPvrty</td>
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<td>Block</td>
<td>Total population (block) * PpPvrty</td>
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<tr>
<td>HHvrtRt</td>
<td>Households poverty rate (Block level)</td>
<td>Block</td>
<td>Total households (block) * HHvrtRt</td>
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<td>ABS_Asthma</td>
<td>Absolute # Population with Asthma</td>
<td>Census tract</td>
<td>(ER_Asthma / Total Population 2010 (Census Tract)) * Pop (Block)</td>
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†) Geographic level of original data

‡) Procedural variables, not to be used as variables representing block-level data
Appendix 5: HIA Process and Impact Evaluation

The HIA project team completed a Process and Impact Evaluation for the CORE MPO Freight Study HIA. It's based on the requirements outlined in the Minimum Elements and Practice Standards for Health Impact Assessment, Version 3, originally published by the North American HIA Practice Standards Working Group in April 2009 and revised in November, 2010 (Bhatia et al., 2014).

Process Evaluation

According to the Minimum Elements and Practice Standards,

“Process evaluation attempts to determine the effectiveness of how the HIA was designed and undertaken, including preparation, research, reporting, participation, and follow-up. Process evaluation may be conducted either after the completion of the HIA, or during the course of the HIA to facilitate adaptations that will improve HIA process.”

The process evaluation therefore included a self-assessment of the process of completing the HIA including:

- Analytic methods used,
- Ways in which stakeholders were engaged,
- Challenges and opportunities for improvement,
- Effectiveness of the training and
- Technical assistance and lessons learned.

Analytic Methods Used

The HIA team considered a wide variety of health determinants drawn from the Centers for Disease Control and Prevention (2014). The HIA team ultimately focused on: the social environment (specifically demographics and poverty) and the physical environment (specifically land use and transportation). A literature review was conducted to determine the potential positive and negative health impacts of freight movement in a large urban center, following from the social and physical determinants of health identified above. The HIA team concentrated on health impacts resulting from air pollution, crashes and safety, noise, and economic impacts. These four major topic areas emerged during the Appraisal phase from the literature review and provided the framework for the HIA recommendations. Health equity is also a guiding thread throughout the analysis, with low socioeconomic-status environmental justice communities receiving additional analysis and subsequent recommendations.

The HIA analysis identified communities with historic disadvantage and/or high poverty rates. Data on the health outcomes and socioeconomic conditions of these populations was also collected and analyzed. The HIA team documented infrastructure conditions at crash locations, noting areas where crashes involving pedestrian and bicyclists occurred along freight routes and where commercial crashes may indicate truck cut-throughs on local streets and proximity to proposed freight transportation projects. The team mapped all major freight facilities in the City of Atlanta and used demographic data to tally the total number of residents living within freight impact zones near these facilities. Land uses were also noted. Finally, the HIA team profiled the current health outcomes most closely linked to air pollution and low socioeconomic status, including emergency room visits due to asthma and the rate of low birthweight births.
Appendix 5. HIA Process and Impact Evaluation

The HIA combines the academic literature review with data analysis to show how the transportation projects and policies included in the Cargo Atlanta freight plan could potentially change the social and physical health determinants related to air quality, crash rates, noise, and economic opportunity. The HIA links each health determinant to health outcomes with literature-based community profiles that highlight areas of concern with accompanying recommendations. The detailed analysis of environmental justice communities includes recommendations to potentially mitigate the negative health impacts of freight movement on these populations and to promote health equity. The data sources are numerous and are cited in Section 4.2 of the Appraisal. Appendix 4 ("Health Data Processing Method") provides additional methodological details. Likely health and equity impacts are documented, along with data sources and analytic methods, while assumptions, limitations, and quality of evidence used are omitted.

Stakeholder Engagement

Stakeholder engagement is central to a successful HIA process. While some HIAs are initiated from stakeholder concerns that emerge during the HIA screening process, the Cargo Atlanta freight study HIA was initiated from knowledge that the project team had from prior research. Specifically, the HIA project team was interested in the impact of freight movement on the health of surrounding populations in a large urban center, particularly within low income communities.

Stakeholder engagement occurred through numerous phone calls and an HIA workshop, and it included meetings and phone conversations with freight planners from the City of Atlanta and the Atlanta Regional Commission. Appendix 3 ("Stakeholder Engagement Plan") fully documents methods used to enlist stakeholders.

Challenges and Opportunities

Stakeholder engagement is necessary to understand what the data collection and analysis means for the people living in the areas highlighted in the HIA. The stakeholder engagement process for the Cargo Atlanta freight study was fairly challenging. Staff turnover at the city was one reason for the challenges. Initial contact with the city established a support for the HIA from the city. Once the primary contact left, the HIA process became more difficult.

Effectiveness of Training

The HIA process did not include a significant training component. A workshop, "A Collaborative Model for Healthy Freight Planning: Atlanta Stakeholder Health Impact Assessment (HIA) Workshop" was held on March 28, 2016, which included an educational component for the participants on the basics of the HIA process as well as an overview of the larger concept of health determinants and incorporating health in all policies. The workshop concluded with direct feedback from participants on the HIA direction and potential recommendations.

Technical Assistance and Lessons Learned

The primary lesson learned was related to the restructuring of the HIA grant process and timeline. Stakeholder engagement was much more resource intensive than originally anticipated and needed to occur earlier in the process. More effective engagement efforts would have included neighborhood level outreach, which could have included the HIA team attending neighborhood meetings, and talking to local residents in their community. Neighborhood level outreach would also allow researchers to gain a better qualitative understanding of the impacts of externalities for which data is less available, such as noise. The project did not include a technical assistance component. However, a number of conversations late in the
HIA process focused on HIA implementation and next steps. The HIA project team could potentially serve in a technical assistance role to facilitate the implementation of HIA recommendations in the future.

### Impact Evaluation

According to the Minimum Elements and Practice Standards,

“The HIA may also be evaluated in terms of its impact. Impact evaluation seeks to understand the impact of the HIA itself on the decision and the decision-making process. Impact evaluation assesses the extent to which the HIA influenced various stakeholders and the extent to which the HIA recommendations were accepted and implemented.”

The impact evaluation therefore included a self-assessment of the process of completing the HIA including:

- an assessment of the success of the HIA according to the stated HIA objectives,
- any additional impact of the HIA beyond the stated HIA objectives, and
- the impact of the HIA on decision making up to the time that the impact evaluation is conducted.

#### Success of HIA according to stated objectives

The stated objectives of the HIA were captured in the following two research questions:

1) “What is the impact of freight infrastructure and movement, as well as freight related land uses such as rail yards, on public health?”

2) “Where are the greatest negative health impacts from freight movement and land use conflicts located?”

These questions guided the project. The HIA was successful relative to these questions because the HIA brought together land use, transportation, and health data in a new way. The team identified the high volume truck routes, as well as proposed freight project point locations, then reviewed the existing land use and development along those routes, and overlaid this information spatially with the population health outcomes. Thus the HIA team was able to analyze these existing conditions through a health lens. The HIA recommendations were then informed and guided by this analysis.

#### Additional Impact of the HIA beyond the stated objectives

The HIA report will be publicly available as a model for similar freight planning efforts, and it documents purpose, findings, and recommendations. The HIA also facilitated the process of different entities communicating and working together. For example, the HIA workshop allowed the freight planner for the Atlanta region to interact with individuals from the local health department, and to consider the health impacts of freight projects. The HIA also provides a model for connecting land use, transportation, and health to make policy decisions and to influence transportation project design.

#### Impact of the HIA on decision making

The Cargo Atlanta HIA provided an opportunity to better consider the health impacts of freight movement on surrounding communities. The HIA report will also be shared with decision makers, stakeholders, and be made publicly available online which will potentially further the impact of the HIA.