THE CITY OF STONECREST GEORGIA

FREIGHT CLUSTER PLAN

BEST PRACTICES REVIEW

IN COOPERATION WITH ARC

FINAL REPORT

APRIL 2024

PREPARED BY

METRO ANALYTICS

KB PEQ

ATLAS

Stonecrest Freight Cluster Plan

Best Practices Review: Final Report

Prepared by

METRO ANALYTICS

For

THE CITY OF STONECREST GEORGIA

In cooperation with

ARC ATLANTA REGIONAL COMMISSION

April 2024

Table of Contents

1 Overview, Purpose, and Organization 3
1.1 Overview 3
1.2 Purpose of Report 3
1.3 Organization of Report 3
1.4 Summary of Issues and Best Practices 3
2 Identification of Issues Relevant to Freight 6
2.1 Identification Process 6
2.2 Context and Relevant Issues 6
2.3 Relevant Issues 8
2.4 Relationship of the Best Practices with Freight Cluster Plan 10
3 Trends, Challenges, Opportunities 11
3.1 Sustainability, Resilience, and Equity 11
3.2 Industrial and Land Development and Redevelopment 11
3.3 E-Commerce 13
3.4 Technologies 15
3.5 Freight Planning and Logistics 16
4 Sustainable Industrial Development Best Practices 19
4.1 Innovative Zoning for Freight 19
4.2 Mixed-Use Industrial Zoning 20
4.3 Redevelopment and Warehouse/Freight Design 24
4.4 Relevance and Implication for SFCSA 25
5 Best Practices for Accommodating Freight Mobility and Facilities 26
5.1 Truck Routing 26
5.2 Truck Parking/Staging/Loading 28
5.3 State of Good Repair and Safety 31
5.4 Freight Micromobility 33
5.5 Traffic Operations and Control 34
5.6 Alternative Fuels, Electrification, and EV Charging 35
5.7 Relevance and Implication for SFCSA 37
6 Best Practices for Multimodal Access and Mobility 39
6.1 Description 39
6.2 Problems and Prospects 39

6.3 Efforts/Practices 40
6.4 Relevance and Implication for SFCSA 41
7 Cross-Cutting Best Practices 42
7.1 Stakeholder Engagement 42
7.2 Resilience 43
7.3 Equity 45
7.4 Relevance and Implication for Stonecrest 48
8 Key Takeaways from Relevant Best Practices for SFCSA 49

List of Figures

Figure 4-1: Areas of potential residential-industrial conflict 22
Figure 4-2: Tools to address potential conflict problems. 23
Figure 5-1: Existing Truck Parking Lots 29
Figure 5-2: Types of Electric Vehicles 35
Figure 7-1: Community Programs to Support Disaster Recovery 45

List of Tables

Table 1-1: Best Practices in Previous FCPs/Freight Studies in ARC Region 4
Table 2-1: Recent Federal Programs 8

1 Overview, Purpose, and Organization

1.1 Overview

The City of Stonecrest has embarked on developing a Freight Cluster Plan (hereafter, referred to as Stonecrest Freight Cluster Plan (SFCP)) that is responsive to its present and future needs and challenges. Best practices gleaned from multiple sources can inform the City's policies, plans, programs, and projects to achieve a sustainable and safe balance among economic development, industrial development, transportation infrastructure design and operations, and community needs.

1.2 Purpose of Report

This report collates and compiles relevant best practices for the identified issues and challenges faced by the Stonecrest Freight Cluster Study Area (SFCSA) to address freight mobility and related land use, safety, efficiency, regulations/ordinances, and sustainable industrial development concerns. It is intended to present and discuss how this collection of best practices informs and helps form recommendations for the SFCP.

1.3 Organization of Report

The report is divided into eight sections and includes end notes. This introductory section summarizes key issues and best practices. The next section discusses the process used to identify the issues and their high-level examination and is followed by key trends, challenges, and opportunities. The subsequent three sections introduce a specific issue and that issue's related best practices from national, regional, and local sources, and their appropriateness for the City of Stonecrest. The concluding section provides key takeaways from best practices and implications for the type and nature of recommendations.

1.4 Summary of Issues and Best Practices

A literature review of freight cluster plans, reports, papers, and other relevant sources, including analysis of policies, regulations, and initiatives that government agencies have implemented, led to the identification of the best practices in Georgia and elsewhere for three key issue categories each of which has its own chapter: sustainable industrial development (Chapter 4), accommodating freight mobility and facilities (Chapter 5), and multimodal access and mobility (Chapter 6).

The best practices provide insights that are useful to policymakers, industry leaders, and other stakeholders looking to promote sustainable development in Georgia, particularly in the SFCSA – an area characterized by a mix of land uses, a network of roadways of various types (primarily arterials, collectors, and local streets), distribution centers, manufacturing facilities, food processing centers, stone quarries, established warehouse districts, as well as trails, bus routes, and residential areas.

Table 1-1 below shows best practices relevant to these three issues that were addressed in prior freight cluster plans or studies conducted under the umbrella of the Atlanta Regional Commission (ARC) freight program.

Table 1-1: Best Practices in Previous FCPs/Freight Studies in ARC Region

No.	BEST PRACTICES (Issue)	Previous ARC FCPs/Freight Studies						
		NW ATL IAFS	AEROTROPOLIS CID FCP	MSCID FCP	SPALDING COUNTY FCP	GATEWAY85 CID FCP	TSCID FCP	FIBID FCP
01	Innovative Zoning Codes for Freight (industrial dev)	●			●		●	
02	Mixed Use Industrial Zoning (industrial dev)	●	●			●		●
03	Redevelopment and Warehouse Freight Design (industrial dev)	●	●		●	●		
04	Truck Routing (freight mob & fac)			●		●		
05	Truck Parking/Staging/Loading (freight mob & fac)		●	●	●	●	●	●
06	State of Good Repair and Safety (freight mob & fac)							●
07	Freight Micromobility (freight mob & fac)		●	●		●		
08	Traffic Operations and Control (freight mob & fac)		●	●	●	●	●	
09	Alternative Fuels, Electrification, and EV Charging (freight mob & fac)		●					
10	Multimodal Access and Mobility (multimodal access & mob)							
11	Stakeholder Engagement (cross cutting)	●			●	●		●
12	Resilience (cross cutting)	●					●	
13	Equity (cross cutting)	●						

Note: NW ATL IAFS = Northwest Atlanta Industrial Area Freight Study (IAFS)[1]; AEROTROPOLIS FCP = Aerotropolis Atlanta Community Improvement Districts (CID) Freight Cluster Plan (FCP)[2]; MSCID FCP = Metro South CID FCP[3]; SPALDING COUNTY FCP[4]; GATEWAY85 CID FCP[5]; TSCID FCP = Tucker Summit CID FCP[6]; FIBID FCP = Fulton Industrial Boulevard Improvement District FCP[7]

[1] *(DCP) Department of City Planning (2022). Freight ATL: Northwest Atlanta Industrial Area Freight Study. Review of Best Practices.*

[2] *Gresham Smith, Modern Mobility, and PEQ (2019). Aerotropolis Atlanta CIDs Freight Cluster Plan – Freight Best Practices Technical Memorandum.*

[3] *Metro Analytics, HNTB, Blue Cypress Consulting, PEQ, and KB Advisory Group (2021). Metro South Community Improvement District (MSCID) Freight Cluster Plan– Best Practices Report.*

[4] *Metro Analytics (2019). Spalding County Freight Cluster Plan – Best Practices Review Technical Memorandum.*

[5] *Cambridge Systematics, Inc. (2019). Best Practices in Subregional Freight Planning (Literature Review) for Gateway85 Gwinnett Community Improvement District.*

[6] *Metro Analytics, Bleakly Advisory Group, Gresham Smith, CNT & PEQ (2020). Tucker Summit Community Improvement District (TSCID) Freight Cluster Plan – Best Practices Report.*

[7] *WSP, ATLAS, Cambridge Systematics, and URBANTRANS (2022). Fulton Industrial Boulevard Improvement District (FIBID) Freight Cluster Plan – Best Practices Report.*

The review of best practices is also intended to inform and guide the SFCSA to think holistically about the relationship between land use, zoning, real estate, industrial development, freight mobility, the overall roadway network, and other community needs. Key findings from this report shed light on potential opportunities and challenges that may be useful in carrying out other plans, zoning reform efforts, and future updates to the Stonecrest Comprehensive Development Plan[8] and Stonecrest Transportation Master Plan[9]. A review of best practices can inform recommendations for improving freight mobility and safety in the City of Stonecrest and retain and attract industrial businesses and jobs.

[8] *City of Stonecrest (2019). Comprehensive Development Plan 2038.*

https://www.stonecrestga.gov/Assets/Files/Departments/ComprehensivePlan/Comp-Plan-2038.pdf

[9] *City of Stonecrest (2020a). City of Stonecrest Transportation Master Plan.*

https://www.stonecrestga.gov/Assets/Files/TransportationPlan/stonecrest-transportation-master-plan-report-draft-08112020.pdf

2 Identification of Issues Relevant to Freight

There are several issues relevant to the goods movement confronting the City of Stonecrest. These issues were identified through a process involving examination of several sources of information and interacting with stakeholders. They are discussed in this section and their relevance to the Freight Cluster Plan is highlighted.

2.1 Identification Process

The process for identifying relevant issues included:

- A review of the context and conditions of the City of Stonecrest;
- A review of several past freight cluster plans within the Atlanta Regional Commission (ARC) region for their context, issues, challenges, and best practices;
- Input from the Engineer of the City of Stonecrest;
- Input from the Steering Committee for Stonecrest Freight Cluster Plan development;
- Information from other tasks, particularly related to Inventory and Assessment; and
- A broad scan of related trends, guidance, information sources, and case applications.

The identification process results have been presented and discussed from the lens of the compatibility of the study region's industrial development and freight needs with related goals, plans, policies, and programs of the community.

2.2 Context and Relevant Issues

2.2.1 Context

By 1900 Pine Mountain, first quarried in 1883, was supplying large quantities of cobblestone, curb stone, road ballast, railroad track crushed stone, and dimension stone[10]. Today, Pine Mountain is the source of Hanson Aggregates' (the city's largest private landowner) crushed stone operations in the City of Stonecrest. By 1964 there were eleven planned industrial districts in DeKalb County. The Lithonia planned industrial district was one of them. The subdivision plat for what is now Lithonia Industrial Park was recorded on October 5, 1965[11]. Lithonia Industrial Park was built in the Lithonia planned industrial district, and Lithonia Industrial Boulevard was designed as its central artery[12].

There are two major employment centers in the southeast quadrant of DeKalb County (see Table 1-1). The Lithonia planned industrial district, also known as the Lithonia Industrial Cluster, is one of them. Types of industry in the Lithonia industrial district include granite aggregate production (quarry), manufacturing, construction, food processing, used auto parts, metal, rubber & plastic recycling, warehouses, freight shipping, truck repair, and truck parking. Collectively, these industries sustain the economy of SFCSA.

---

[10] *(SICI) Stonecrest Industrial Council Incorporated (2022). The Past, Present and Future of the Lithonia Planned Industrial District. Presented to the Stonecrest CID Advisory Committee.*

[11] *Ibid*

[12] *Ibid*

Stonecrest was founded in 2016, creating a city that's now about 94% African American. With easy access to I-20, the Lithonia-Stonecrest area has been an industrial corridor for more than half a century, which include rock quarries, landfills and trucking facilities, generate tax revenue and employ thousands.[13] In Stonecrest, industrial land makes up more than 13% of the city's acreage.[14]

The Stonecrest Industrial Council was incorporated February 1, 2021[15]. It Is an IRC 501(C)(6) private membership nonprofit corporation. It is designed to serve as an intermediary between the industrial community and the city of Stonecrest and its residents, as well as to strengthen and improve the local industrial ecosystem. The Stonecrest Industrial Council includes a network of concerned and civically engaged industrial stakeholders that is organizing the Stonecrest /Lithonia Industrial Park community improvement district (CID).

Two distinct industrial areas serve the SFCSA: 1) Lithonia Industrial District (north of the Lithonia City Limits) and 2) the Park Central/Panola Road Corridor. Both are distinctive in character and development patterns. Each of the areas has its unique challenges, but both share the common issue of the proximity of residential land to industrial uses.

The Lithonia Industrial District presents the most challenges of the two industrial districts. This area is comprised of heavy industrial uses such as quarries and junk yards and there are multiple truck storage areas. Collectively, these uses frequently present challenges from an aesthetic perspective. A key issue for this district is that many of the roadways in this area carry a great deal of freight (i.e., Marbut Road, Chapman Road, etc.) and are not designed to accommodate large trucks. This area is part of the Arabia Mountain National Heritage Area, which has a robust planned trail network, and given the number of older industrial sites in the area, there is great potential for redevelopment.

The Park Central/Panola Road Corridor is primarily characterized by light industrial uses and two major freight generators – the Marshalls Distribution Center and Swift Transportation Terminal. To maintain the competitiveness of industrial businesses in this area, access into and out of the district must be maintained at entryways to US 278/Covington Highway and Snapfinger Woods Drive.

The freight activities within SFCSA are influenced by land, business, and economic development at surrounding cities and clusters in DeKalb County and Atlanta, within ARC region, across Georgia and at regional, national, and global levels. The connectivity to a multimodal freight network and facilities is critical and requires partnerships and collaborations with public and private stakeholders. Recognizing these interdependencies necessitates the need to tie into numerous plans and programs at all these levels to leverage resources and support to make the SFCP more effective and responsive.

In addition to connecting to and incorporating the interdependencies noted above, several new federal funding programs provide opportunities for cities and counties to plan and develop safe, efficient, sustainable, and resilient infrastructure and increase their economic competitiveness. Those programs are shown in Table 2-1.

---

[13] *Hansen, Z. (2021). Stonecrest grapples with industrial facilities near neighborhoods. The Atlanta Journal Constitution. 10/04/2021.*

[14] *Ibid*

[15] *Ibid*

Table 2-1: Recent Federal Programs

Program	Purpose
FHWA-Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT)[16]	Promote resilience planning, strengthen and protect evacuation routes, and enable communities to address vulnerabilities and increase the resilience of surface transportation infrastructure from the impacts of sea level rise, flooding, wildfires, extreme weather events, and other natural disasters.
FHWA - National Electric Vehicle (EV) Program[17]	Provide funding to States to strategically deploy electric vehicle (EV) charging infrastructure and to establish an interconnected network to facilitate data collection, access, and reliability.
FHWA - Charging and Fueling Infrastructure Program[18]	Strategically deploy publicly accessible electric vehicle charging infrastructure, hydrogen fueling infrastructure, propane fueling infrastructure, and natural gas fueling infrastructure along designated alternative fuel corridors or in certain other locations within communities that will be accessible to all drivers of electric vehicles, hydrogen vehicles, propane vehicles, and natural gas vehicles.
FRA - Consolidated Rail Infrastructure and Safety Improvement (CRISI) Grants[19]	Improve the safety, efficiency, and reliability of intercity passenger and freight rail
FRA - Railroad Crossing Elimination Grant[20]	Fund rail crossing improvements that focus on improving safety and freight mobility.

2.3 Relevant Issues

The identification of issues started with reviewing and documenting the context of the SFCSA, as presented above. This was supplemented with a review of notes from meetings with the Steering committee and the City Engineer. In addition, examining the Inventory and Assessment Report (IAR) provided understanding and insights. Reviewing past freight cluster plans developed under the ARC freight program provided regional context and understanding. Lastly, a scan of other literature and information sources, particularly the City's Comprehensive Plan and Transportation Plan, provided additional understanding.

---

[16] *(FHWA) Federal Highway Administration. (2022). Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program. Fact Sheet. https://www.fhwa.dot.gov/bipartisan-infrastructure-law/protect_fact_sheet.cfm*

[17] *(FHWA) Federal Highway Administration. (2022b). National Electric Vehicle Infrastructure Formula Program. Fact Sheet. https://www.fhwa.dot.gov/bipartisan-infrastructure-law/nevi_formula_program.cfm*

[18] *(FHWA) Federal Highway Administration. (2022c). Charging and Fueling Infrastructure Discretionary Grant Program. Fact Sheet. https://www.fhwa.dot.gov/bipartisan-infrastructure-law/charging.cfm*

[19] *(FRA) Federal Railroad Administration. (2022a). Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program. https://railroads.dot.gov/grants-loans/competitive-discretionary-grant-programs/consolidated-rail-infrastructure-and-safety-2*

[20] *(FRA) Federal Railroad Administration. (2022b). Railroad Crossing Elimination Grant Program. https://railroads.dot.gov/grants-loans/competitive-discretionary-grant-programs/railroad-crossing-elimination-grant-program*

Issues affecting the SFCSA are:

- Nexus of sustainable, innovative industrial developments, freight, and land use
- Accommodating Freight Mobility and Facilities
- Multimodal Access and Mobility

The nexus of sustainable, innovative industrial developments, freight, and land use area best addressed by the below practices. They are influenced and guided by emerging freight trends (especially related to e-commerce) and technologies, economic development opportunities, conflicts with residential areas and livability considerations, zoning ordinances, nature of business activities, needs of freight shippers and carriers, the impact of freight on land use and value, and various regulations, policies, plans, and programs.

1. Innovative Zoning Codes for Freight
2. Mixed Use Industrial Zoning
3. Redevelopment and Warehouse Freight Design

Accommodating freight mobility and facilities involves several considerations. Truck corridor and truck parking development plans have been instituted or undergone substantial changes. It is necessary to restrict truck movements to certain routes without constraining and increasing the circuity of freight mobility. Cities are challenged by truck movements on non-truck routes and struggle to prevent violations, enforce laws, and deal with costly state-of-good repair issues. Truck parking scarcity has been seen along major corridors at national and state levels as well as in first/last mile segments in local communities. The need for loading/unloading of delivery trucks has influenced curb redesigns. The best practices for this issue are:

4. Truck Routing
5. Truck Parking/Staging/Loading
6. State of Good Repair and Safety
7. Freight Vehicle and Control Technologies
8. Traffic Operations and Control
9. Alternative Fuels, Electrification, and EV Charging

The best practices for multimodal access and mobility balances freight needs with the needs of other users in the community, particularly those using active transportation and the study area is part of the Arabia Mountain National Heritage Area, which has a robust planned trail network. The principles of complete streets and shared mobility are relevant and can inform this SCFP and the ongoing update of the City's pedestrian and bike plan.

10. Multimodal Access and Mobility

The best practices of stakeholder engagement, resilience, and equity cut across all issue areas and are essential goals for public and private sectors at local, state, and federal levels.

11. Stakeholder Engagement
12. Resilience
13. Equity

2.4 Relationship of the Best Practices with Freight Cluster Plan

The SFCP will serve as a strategy to improve freight mobility and enhance the economic vitality of the SFCSA. The best practices in this report will support the SFCP in identifying and promoting sustainable industrial development practices throughout the SFCSA. They will help develop roadway improvements to better accommodate freight and maintain or increase the economic competitiveness of the City's industrial areas, promote area aesthetics, mitigate conflicts with nearby neighborhoods and new residential development, and promote the upcoming Arabia Mountain National Heritage Area Trails Plan.

3 Trends, Challenges, Opportunities

The below key trends, challenges, and opportunities influenced the identification of effective practices and their inclusion in the SFCP.

3.1 Sustainability, Resilience, and Equity

The key challenge, at state and local levels, is understanding the requirements related to resilience and equity and incorporating it into policies, plans, and programs.

There are sustainability efforts underway globally and in the US that emphasize reducing consumption, reusing, and conserving resources to protect the environment, health, and life. These efforts include sustainable plans, designs, materials, operations, construction/manufacturing, and maintenance of civil infrastructure and commercial/industrial products and processes.

There is a big push from the federal government toward use of non-fossil fuel sources for energy and related needs to reduce carbon footprint. This is prompted by preparedness and adaptation for climate change concerns and plans, programs, pilot projects developed at national, regional, state, and local levels. Electrification is given more importance as a strategy, which has led to innovations and transformations in vehicle manufacturing and new strategic plans at federal and state levels, particularly related to charging infrastructure.

Emphasis on resilience and equity has surfaced as essential goals at all levels of government. New federal programs and funding are promoting these efforts and have requirements related to these emerging emphasis areas. These efforts are supported through emergency preparedness, response, and recovery plans; hazard mitigation plans; continuity of operations plans; emergency operation plans and centers, traffic incident plans, smart work zone plans, HAZMAT plans, and road weather management plans. These plans have improved the availability of data, communication of information, and the identification of roles, responsibilities, protocols, and resources to make the network more resilient.

Equity in transportation planning and freight programs is essential to ensure that the benefits of a robust freight industry are shared by all in the communities, and that the negative impacts are minimized for vulnerable populations. Such initiatives can contribute to a more sustainable, inclusive, and just transportation system.

3.2 Industrial and Land Development and Redevelopment

Cities constantly grapple with the issue of whether to separate industrial, commercial, and residential areas or have mixed-use developments. Limited land availability, combined with high land values and strong demand for non-industrial uses, challenge development and preservation of affordable industrial space[21].

Preservation of industrial land: Preservation of industrial land and properties is important for freight clusters in cities and counties. Industrial land preservation policies can be an effective tool to stem

[21] *(DCP) Department of City Planning (2022). Freight ATL: Northwest Atlanta Industrial Area Freight Study. Review of Best Practices.*

urban industrial land losses in cities facing land use conversion pressures due to high rents, cost-prohibitive repurposing, and market pressures for residential and commercial space due to growth in population and employment. Such policies need to create more robust linkages with economic development planning objectives[22].

Redevelopment or repurposing older buildings: The strong support system—the distribution centers, repair shops, infrastructure, policy, and workforce—that urban manufacturing requires to thrive can be called the "industrial commons," which eroded through a decades long decline of American manufacturing[23]. The supply chain crisis and "bring back manufacturing" advocacy after COVID 19 has brought renewed attention to manufacturing. Redevelopment and reuse of older, smaller industrial buildings has historically been limited due to the extraordinary development costs associated with modernizing functionally obsolete space, as manufacturing buildings were often constructed for specific uses and do not meet modern requirements[24]. In addition, environmental remediation needs resulting from legacy uses can be cost-prohibitive for business owners and developers attempting to retrofit industrial properties.

Mixed-use developments: Some types of mixed-use developments are more suitable to be sited alongside or in combination with residential uses than others, especially when considering the primary industrial use and needs of companies which operate those sites. Industrial uses are becoming more commonly associated with mixed-use developments to promote infill development in cities which suffer from urban sprawl and, consequently, lost or unrealized economic productivity[25].

Design or redesign of warehouse and distribution buildings: Warehouse and distribution buildings often fulfill various purposes and require new, diverse building specifications and locations depending on urgency (time to market) and consumption of goods (business-to-business or business-to-consumer). In urban areas, the proliferation of last-mile facilities has also led to larger last-mile carrier workforces, expanded hours of operations, and the proliferation of more convenient, flexible, and diverse fleets of delivery vehicles including trucks, vans, personal automobiles, and bikes. Often the focus is on cost-effective solutions, improving reliability, and reducing waste.

Aligning investments: Activities and investments across Georgia, the nation, and the globe have contributed to increased demand for land and transportation. With the expansion of both the Panama Canal and the Port of Savannah, truck routes that connect the port to facilities across the Piedmont Atlantic Megaregion need better parking facilities to reduce long hauls and collaboration across jurisdictional boundaries involves strategic land use and positioning of freight facilities to allow for

---

[22] *Davis, J. & Renski, H. (2020) Do Industrial Preservation Policies Protect and Promote Urban Industrial Activity? Journal of the American Planning Association, 86:4, 431-442, DOI: 10.1080/01944363.2020.1753563*

[23] *Leigh, N.G., Hoelzel, N.Z., Kraft, B.R. and Dempwolf, C.S. (2014). Sustainable Urban Industrial Development. APA PAS Report 577.*

[24] *(DCP) Department of City Planning (2022). Freight ATL: Northwest Atlanta Industrial Area Freight Study. Review of Best Practices.*

[25] *Amekudzi, A. A.; Meyer, M. D.; Ross, C. L. (2011). Transportation Planning for Sustainability Guidebook. URL : https://rosap.ntl.bts.gov/view/dot/41618*

economical movement and delivery of goods[26]. The resulting integration and clustering of warehouses, distribution centers, residential property, and retail into strategically located areas benefit delivery times and ensure better scheduling on part of the freight industry and is especially successful for warehousing operations in urban areas and close to retail operations.

Globalization and freight villages: Freight villages are master-planned sites where activities relating to the transport, logistics, and distribution of goods are carried out by various organizations and handlers, resulting in specialized industrial complexes which attract companies that require logistics services and can cluster to improve their competitiveness as is found at Alliance Intermodal Facility near Fort Worth, Texas[27]. Globalization and the clustering of warehouses into large logistics centers is a trend designed to prevent "freight sprawl" across urban metropolitan areas. Smart growth policies geared towards the integration of land uses are being considered in areas with high freight intensity and those which incentivize brownfield and gray field redevelopments are especially attractive in moving towards economical utilization of land and spatial resources. The Atlanta Regional Commission (ARC) plays a vital role in promoting smart growth in the region through various strategies including the Livable Centers Initiative (LCI) and by aiding member local governments and CIDs[28].

Vertical expansion: In areas with compact land space or land that is limited in terms of potential expansion directions, one potential approach is to develop multiple-story facilities. In an area as dense as New York and with limited land available to build traditional warehouses, developers have approached this problem by constructing facilities that are multiple stories. A good example is Brooklyn's Red Hook neighborhood with 336,500 square foot and three stories[29].

3.3 E-Commerce

Transition from traditional shopping trips to virtual shopping trips has fundamentally transformed transportation and logistics systems.

The most important trend impacting freight traffic generators and attractors is e-commerce related to buying or selling goods online. E-commerce lowers the overhead cost for businesses, eliminates the time spent on traveling to stores by customers, and provides customers with wider choices of products and the ability to buy anytime. The transformations in delivery efficiency, warehousing logistics, and delivery modes have increased demands for distribution facilities, generated more trips for parcel

[26] *(DCP) Department of City Planning (2022). Freight ATL: Northwest Atlanta Industrial Area Freight Study. Review of Best Practices.*

[27] *Gresham Smith, Modern Mobility, and PEQ (2019). Aerotropolis Atlanta CIDs Freight Cluster Plan – Freight Best Practices Technical Memorandum.*

[28] *Atlanta Regional Commission (2008). Atlanta Regional Freight Mobility Plan:*

Community & Environmental Impact Scan and Assessment, p. 4-5. https://cdn.atlantaregional.org/wp-content/uploads/tp-community-assessment-report-8-16-07.pdf

[29] *Gresham Smith, Modern Mobility, and PEQ (2019). Aerotropolis Atlanta CIDs Freight Cluster Plan – Freight Best Practices Technical Memorandum.*

delivery trucks, increased truck travel on highways and local streets, caused congestion, capacity, and safety concerns, and led to premature failure of road infrastructure[30, 31].

Shifts and growth in e-commerce: Electronic commerce (i.e., e-commerce) is the use of electronic devices and technologies to conduct commerce and trade, including purchasing goods and services on the internet and electronic banking. E-commerce increased from about 4 percent of total retail activity in 2010 to approximately 16 percent in 2020. Businesses with a physical distribution network, a 'brick and mortar presence' are adapting to omni-channel or 'click and mortar' that augments their physical stores with a digital presence and enables consumers to order online and pick up at their stores. Online retailers and omni-channel retailers are adopting multi-channel retailing meaning they exercise multiple online channels (e.g. a web store, marketplaces, and social media) to reach their customers. Even before the global COVID-19 pandemic, the retail and industrial sectors were experiencing dramatic shifts with growth in e-commerce; COVID-19 pandemic accelerated the trend. This has impacted freight traffic and land use patterns in metropolitan regions, large and small. The evolving e-commerce landscape and changing consumer expectations are driving shifts in last-mile delivery strategies, influencing the flow of goods within freight clusters.

Reconfiguration of supply chains: E-commerce businesses rely on a network of distribution facilities and warehouses that now dominate the industrial market. With the increasing consumer demand for next-day and same-day at-home delivery, as well as increased demand for meal delivery services, competition is increasing for urban industrial space suitable for logistics and distribution. These forces have also increased workforce needs, hours of operation, and the number and types of delivery vehicles sharing city streets with commuters and pedestrians, leading to additional conflicts.

Paradigm shifts in inventory strategy: Just-in-time (JIT) inventory was standard, acceptable practice for decades since 1970s, but COVID 19 demonstrated that it is particularly vulnerable to supply chain disruptions. As a result, many companies are reviewing their inventory strategy due to political pressures, concerns of security, and increased emphasis on resilience.

Surge of delivery vehicles: To improve last-mile delivery efficiency and costs there is focus on new freight mobility options such as autonomous delivery vehicles, parcel delivery drones, and motorized tricycle delivery vehicles. Typically, e-commerce centers are outside traditional transit service areas. As a result, their employees will generate a large number of vehicle commute trips. While businesses still use traditional delivery service providers, such as FedEx and UPS, some businesses collaborate with independent contractors who use personal vehicles to deliver goods, converting more non-commercial trips to commercial trips. The growth in delivery vehicles sharing city streets with commuters and pedestrians has increased competition for curb space. Uber Eats, a transportation network company, delivers other goods and products, not just food. Other models of last-mile delivery such as bicycle fleets, personal mobility devices, unmanned or robotic delivery vehicles are evolving and changing the way goods are delivered.

---

[30] *(DCP) Department of City Planning (2022). Freight ATL: Northwest Atlanta Industrial Area Freight Study. Review of Best Practices.*

[31] *Gresham Smith, Modern Mobility, and PEQ (2019). Aerotropolis Atlanta CIDs Freight Cluster Plan – Freight Best Practices Technical Memorandum.*

3.4 Technologies

Across the United States, the manufacturing industry is at a critical turning point, referred to as the "fourth industrial revolution." Growth in e-commerce, new technologies, automation, and artificial intelligence have shifted the modern industries to favor smaller, more flexible, and specialized industrial processes.

"Fourth Industrial Revolution" has transformed customer habits, manufacturing, supply chains, inventory decisions, product design, distribution, and delivery with growth in e-commerce, new technologies, automation, and artificial intelligence. Smaller, more flexible, and specialized processes influence the location and design of industrial and commercial buildings.

Trucks with GPS and two-way radios as well as other newer technologies and digital tools are becoming more common. Logistics industry is automating and optimizing tasks with algorithms and digital platforms, vehicle manufacturers and traffic operations professionals are enhancing communication techniques, finding ways to push out notifications about weather and traffic incidents, increase driver's awareness of their surroundings, and even give priority to certain kinds of vehicles approaching traffic signals. Data management and integrated marketplaces – online portals where shippers and carriers connect via interactive platforms and broker deals – are helping the industry increase efficiency and reduce delivery time.[32] GPS, mobile devices, and real-time tracking have also made it possible for shippers and carriers to manage expectations and improve communications about shipments.

Emerging technologies address problems common in freight and transportation planning. Allowing capabilities to streamline logistics management and the fulfillment of local, state, and federal regulations through innovative technology will improve the efficiency of numerous operations which utilize freight to distribute goods. With growth expected to continue both on a regional and national scale, the availability of technology will be critical in regulating freight corridors and other public space impacted by freight each day. Safety and competitiveness should both be priorities in the planning of freight clusters, and technology must have a large role in this process. Technological developments with respect to autonomous vehicles, alternative fuels, smart communities, non-traditional delivery methods, and parking availability should each be considered for implementation in the short-term or long-term. Technology that helps businesses gain a competitive advantage in managing and distributing cargo and goods for delivery in the cities and beyond is an important component to the planning and development of freight clusters. Rapid technological advancements, including automation and digitalization, are reshaping logistics and supply chain management, leading to increased efficiency and automation in freight operations.

[32] *Guajardo, C. (2021). Freight Technology: How Emerging Tech is Reshaping the Logistics Industry. Food Logistics, https://www.foodlogistics.com/transportation/fleet-management/article/21354911/forager-group-inc-freight-technology-how-emerging-tech-is-reshaping-the-logistics-industry*

3.5 Freight Planning and Logistics

There are innovations in freight planning with new data, effective stakeholder engagement, master plans, cluster plans, programs, and specific projects at national, regional, state, sub-area, and local levels.

Nationally, the Federal Highway Administration (FHWA) has provided guidance and initiatives that have improved freight considerations at national and multi-regional levels as well as helped states with framework and policies. The American Planning Association (APA) adopted an addendum to the organization's Policy Guide on Surface Transportation in April of 2016 and promoted "a sustainable multimodal freight system that facilitates the efficient movement of freight and people, supports a thriving economy, and protects the natural and human environment," further specifying that "a sustainable freight system should meet the needs of the present without compromising the ability of future generations to meet their own needs."[33]. The APA encourages embracing best practices and innovative technologies to improve performance of the freight network while mitigating negative impacts of freight movement on communities, fostering partnerships with public and private sector stakeholders, increasing competitiveness, and taking a context-sensitive approach to freight planning – particularly in areas experiencing redevelopment of former industrial areas with residential and commercial uses in close proximity to active freight rail lines. The organization also encourages deploying freight technology in ways that remove barriers to entry and increase competition and embracing of new technologies like real-time routing and automation of vehicles.

At state levels, with increased attention to freight, numerous freight advisory committees, programs, policies, plans, and projects have been developed which are freight-specific or have integrated freight considerations within overall land use or transportation plans and programs.

At city level, numerous innovations in freight logistics and supply chains have resulted in response to the changing demographic, economic, manufacturing, business, political, health conditions at global, megaregional, regional, state, and local levels. A good example is the Seattle Department of Transportation (SDOT) which has a Freight Master Plan that includes a data-driven prioritization framework focused on safety, mobility, and equity, as well as economy, state of good repair, and environment[34]. Seattle's Comprehensive Plan establishes curb use priorities to manage interactions between delivery vehicles, parking, bicyclists, and pedestrians. Specifically, it designates a "flex zone" that serves multiple purposes – parking, bus stops, passenger, and freight loading, which are prioritized based on predominant land uses in the area. In industrial and commercial areas, the Flex Zone prioritizes access for commerce over people, but in residential areas, it prioritizes access for people over commerce. Their freight program[35] has freight connectivity projects, a Final 50 Feet Program to improve delivery at the end of the supply chain, and a Truck Streets route network, along with special location-specific projects. Through its Urban Freight Lab – a partnership with the University of Washington –

---

[33] *(APA) American Planning Association. (2016). APA Policy Guide on Freight. Retrieved from https://www.planning.org/policy/guides/adopted/freight/.*

[34] *SDOT (2016). Freight Master Plan. https://www.seattle.gov/Documents/Departments/SDOT/About/DocumentLibrary/FMP_Report_2016E.pdf*

[35] *Seattle Department of Transportation (2022). Freight Program. https://www.seattle.gov/transportation/projects-and-programs/programs/freight-program*

Seattle became the first city in the U.S. to comprehensively map commercial vehicle loading and unloading space and its curb space in the downtown core and uses Curb Occupancy Toolkit to examines the types of vehicles parked in commercial vehicle loading zones and where commercial vehicles parked in unauthorized zones, enabling the city to better plan for, design, and manage curb space to reduce negative impacts on surrounding communities[36].

Changing on-demand economy: On-demand economy has changed from businesses using it for transportation and delivery in cost-effective, scalable, and efficient way to convenience logistics of consumers choosing goods, comparing prices, and receiving items with little inconvenience on 24 hour/7 days a week basis and businesses incurring major share of the overall delivery cost in the last mile trying to use multiple routes with low parcel size and exploring new options for new routes and times.

Sourcing transformations: There have been transformations from the business practice of hiring a third party to perform services and create goods (outsourcing) in 1990s to having the location of operations near the location where end projects are sold with shorter supply chain, rapid response, and much reduced shipping and labor costs (near-sourcing) to using internal resources to perform services and create goods and moving production locally (insourcing) to have less vulnerability to disruptions and a better ability to respond to customer needs[37]. The shortening of the supply chain has created smaller and more frequent deliveries between manufacturers and selling locations. Insourcing will change where raw materials are shipped, creating additional freight movements into the manufacturing location, mostly by trucks.

Omni-channel commerce has emerged and is a multichannel sales approach that provides an integrated experience to customers across online and offline methods and within the manufacturing space, it is a collaborative effort between suppliers, vendors, and distributors whereby online orders fulfilled by sending the purchase directly to purchaser's home, to a brick-and-mortar store, or through an eRetail channel (like Amazon), and to provide in store purchases of out-of-stock items for delivery to the store of purchaser's home at a later time[38].

Amazon Flex and delivery service partners: In 2015, Amazon launched its package delivery service, Amazon Flex, allowing individuals to provide Amazon package deliveries and in 2018 Amazon Delivery Service Partners (DSPs) was launched, allowing small businesses the opportunity to launch their own delivery service[39]. Evening, weekend, and holiday deliveries were considerably enhanced as this service supplemented those by UPS, FedEx, and USPS. Both services address the last mile management issues and provide goods on time and safely.

---

[36] *University of Washington (2019). The Final 50 Feet of the Urban Goods Delivery System: Tracking Curb Use in Seattle. https://depts.washington.edu/toolkit/sites/default/files/toolkit_downloads/Final-50-Feet-Tracking-Curb-Use-in-Seattle_0.pdf*

[37] *Gresham Smith, Modern Mobility, and PEQ (2019). Aerotropolis Atlanta CIDs Freight Cluster Plan – Freight Best Practices Technical Memorandum.*

[38] *Ibid*

[39] *Ibid*

Improved vehicle utilization: Improving vehicle utilization improves freight efficiency by limiting freight deliveries that are less than full or using dynamic routing, which looks at all of the stops for a day and optimizes their sequences, which reduces the number of vehicles on the roadways and cuts millions of tons of emissions, and results in billions of dollars in saving to freight industry[40]. The National Academies of Sciences Engineering Medicine's 2012 Review of the 21st Century Truck Partnership report noted that the infrastructure trucks operate on affects their fuel consumption through speed fluctuations and congestion. The report emphasizes optimization of packaging as a method for fuel reduction through increased vehicle utilization, noting that companies like Walmart have placed considerable efforts towards packaging optimization and using sustainable packaging materials that reduce the size, energy, and natural resources needed to produce the packaging.

Reverse logistics is defined as the process of transporting returned, damaged, or unwanted products from their current location to one for their reuse, repair, or disposal[41]. With annual volumes of returns in billions, this shift in delivery has created challenges for many businesses and many are outsourcing this effort to third-party logistics (3PLs) companies to improve speed and accuracy within the return process. Reverse logistics adds additional vehicles to the roadway network, increasing fuel consumption and polluting emissions.

Supply chain resiliency: Supply chain resiliency through its redundancy is the creation or storage of excess capacity/ backup over the entire supply chain to maintain regular functions to address disruptions and is a component of supply chain resiliency, which aids management of risks[42]. Supply-chain disruptions are not new; however, in the past they were usually the result of an event that took place in one location, one country, or between trading partners[43]. The supply-chain disruptions from 2020 through 2022 were on a scale not seen before as the result of COVID-19 being a global pandemic. Weather events, human factors, trade issues and global pandemics can bring just-in-time supply chains to a grinding halt because there is no slack and no resiliency built into a system designed for speed. While redundancy may seem counterintuitive to the method of driving out waste and creating an efficient system, it is one way to create leaner operations by avoiding significant waste of time, effort, and money when a system breaks down. By being flexible on routes and modes, the freight industry can better respond to changes in the transportation networks (i.e. weather, unexpected congestion).

---

[40] *Mathers, J. (2015). Improve Freight Capacity Utilization to Reduce Truck Emissions.*

[41] *Ibid*

[42] *Gresham Smith, Modern Mobility, and PEQ (2019). Aerotropolis Atlanta CIDs Freight Cluster Plan – Freight Best Practices Technical Memorandum.*

[43] *Sheffi, Yossi & Rice, James B. A Supply Chain View of the Resilient Enterprise. MIT Sloan Management Review, 10/15/2005*

4 Sustainable Industrial Development Best Practices

This section presents the relevant best practices for the SCFP in sustainable and innovative industrial development. These practices include guidance at global, national, regional, and local levels in the form of research, education, policies, plans, programs, projects, new data, emerging technologies, and/or implementations.

4.1 Innovative Zoning for Freight

Incorporating freight in public decisions and building and zoning codes provides mechanisms to include such considerations into land development decisions.

4.1.1 Description

Innovative Zoning includes considering freight in building and zoning codes and in utilizing zoning to preserve or maintain industrial land uses or to create buffers. Stonecrest's zoning code includes a 75 to 150 feet buffer between industrial and residential properties, depending on the specific industrial use.

4.1.2 Prospects and Problems

Industrial development provides jobs and other economic benefits to communities. Market pressures to convert under- or non-utilized industrial space to residential, office, or other purposes has increased because the conversion increases land value and demand for additional non-industrial development. So, there needs to be concerted effort to preserve land for industrial and freight infrastructure through effective use of zoning.

4.1.3 Efforts/Practices

Using zoning tools and incentive programs to preserve and catalyze industrial infill development necessitates a balance or trade-off between supporting industrial uses and restricting other uses that generate economic activity, attract, and serve the industrial workforce (restaurants, retail, etc.) or meet other municipal development goals (such as affordable housing).

The Urban Manufacturing Alliance[44] is a national coalition of organizations and individuals focused on ensuring that cities and towns continue to be home to manufacturing facilities. Based on research and work in several cities, including Boston, Indianapolis, and Nashville, they have developed a suite of best practices for retaining maker and manufacturer industries.

Examples from large cities can provide lessons for smaller cities. In Milwaukee, WI, Industrial-Commercial Districts have been utilized to control the encroachment of more intensive commercial uses that require large footprint buildings such as indoor sports facilities and doggie daycares. Employment-oriented districts have been utilized in Eugene, OR and St. Petersburg, FL, to allow various compatible uses with high employment density of higher-paying, good jobs. St. Paul, MN's IT Transitional Industrial districts allow commercial, office, and light industrial uses if compatible with neighboring residential or

[44] *Foggin, M. (2019). The State of Urban Manufacturing. National Report. Urban Manufacturing Alliance.* *https://www.urbanmfg.org/wp-content/uploads/2017/11/SUM-National-Report-Final.pdf*

traditional neighborhood districts. These practices can be scalable for small cities as the intensity of diverse residential, commercial, and industrial activities increases there.

The City of Baltimore's Maritime Industrial Zoning Overlay District (MIZOD)[45] is an example of an effective zoning tool that preserves current freight-intensive land uses. This overlay district preserves waterfront land adjacent to the Port of Baltimore for industrial uses in the face of speculative commercial real-estate development activity that applied considerable pressure to convert waterfront industrial properties to mixed-use. The City enacted the MIZOD in 2004 to preserve maritime properties with deep water, rail, and highway access to protect maritime-dependent uses and intermodal freight movement. The goal was to balance the needs of both mixed-use and maritime shipping. The City categorized its waterfront into two general districts: Mixed-Use and Maritime Industrial. In the first, mixed-use would be allowed, while in the second, the MIZOD would protect maritime uses by prohibiting land conversion to non-industrial uses.

In addition, the Maritime Industrial District preserved these areas for industrial use by[46]:

- Disallowing planned unit developments;
- Prohibiting hotels, motels, and taverns;
- Allowing offices and restaurants only as accessory uses; and
- Creating a 20-year moratorium on rezoning.

4.2 Mixed-Use Industrial Zoning

4.2.1 Description

Industrial zones include heavy industrial, light industrial, distribution centers, fulfillment centers, and data centers. Mixed-use industrial zoning developments combine different land uses and industrial buildings. Improving technology and efficiency in producing goods and the environmental implications of this production have made mixed-use developments more desirable in communities nationwide. The cities must examine their zoning code and comprehensive plans to determine if and how mixed-use developments incorporating residential and industrial uses can be applied within their jurisdictional boundaries.

4.2.2 Prospects and Problems

Increased e-commerce has led to more orders requiring more packages and freight on roadways and storage sites for these items and vehicles. Recent developments like Amazon Flex, Hitch, and Deliv have led to this increase in freight traffic and private automobiles of drivers who deliver packages for hire. This has strained existing industrial areas where these centers are typically clustering.

---

[45] *Lemke, J.M. (2010). Maritime Industrial Zoning Overlay District (MIZOD): Summary & Evaluation, 2009-2010. Department of Planning, City of Baltimore.* https://planning.baltimorecity.gov/sites/default/files/MIZODREPORT2010_1.pdf

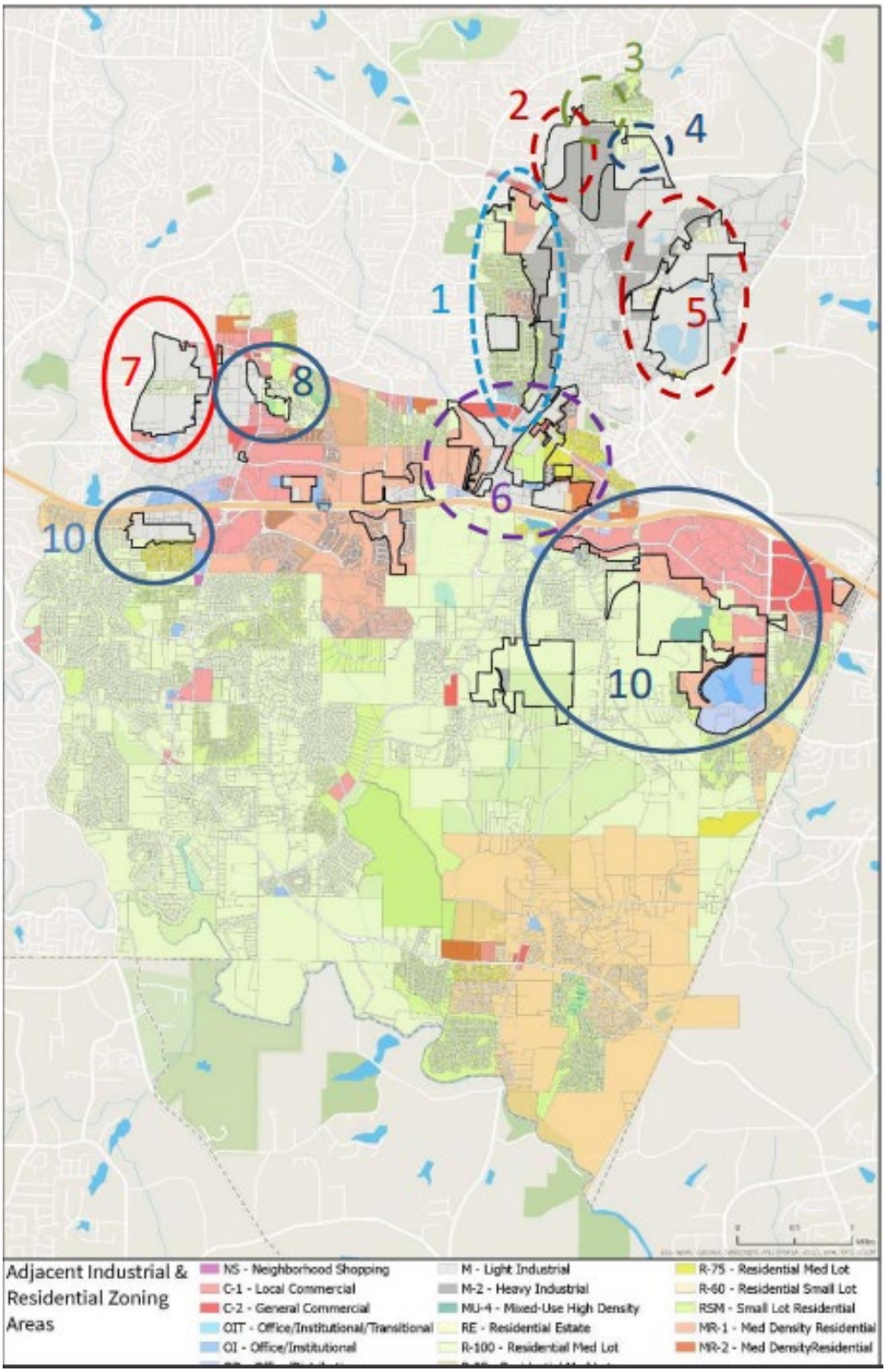
[46] *Maryland Port Administration, Partnerships to Address Urban Freight Challenges at the Port of Baltimore, Presentation to the 2019 METRANS International Urban Freight Conference, October 16, 2019.* https://www.metrans.org/assets/upload/ss-1%20fhwa%20ppt-0.pdf

While most of the land in Stonecrest is used for residential purposes, the city's second most prevalent use is industrial. More acres are zoned for industrial use than commercial within Stonecrest's city limits. Several places, such as Coffee and Maddox roads, are now primarily dilapidated houses surrounded by gravel parking lots for trucks.[47] Some residential properties appear to be parking for dump trucks or other construction vehicles. City leaders are considering reverting some of those properties back to industrial. The city also considered removing several obnoxious industrial uses from the city's code such as dry-cleaning plants, explosives manufacturing, radioactive materials, and metal smelting.

At the same time, the logistics, manufacturing, and trucking industries continue to expand in Stonecrest. Home Depot recently opened a massive distribution center in the city. Figure 4-1 shows areas of conflict between industrial and residential areas in Stonecrest. Figure 4-2 outlines tools to deal with potential problems.

[47] *Hansen, Z. (2021). Stonecrest grapples with industrial facilities near neighborhoods. The Atlanta Journal Constitution. 10/04/2021.*

Figure 4-1: Areas of potential residential-industrial conflict.[48]



[48] *Summerbell, J. (2021). Review of Zoning Ordinance Update Process. Mayor and City Council Special Called Work Session. October 22, 2021.*

Figure 4-2: Tools to address potential conflict problems. [49]

– Remove residential and unwanted uses from the list of permitted uses in industrial areas

– Remove industrial uses by right in the Stonecrest Area Overlay, Tier 3

– Require Transitional Buffers

– Offer Conservation Subdivision Option

– Reversion of parcels which were zoned from industrial to residential

– Add Special Land Use Permit requirements for residential uses adjacent to Industrial

Allowing for a variety of compatible land uses in industrial mixed-use districts helps relieve pressure from other land uses while preserving some land for light industrial uses. Managing land use conflicts will result in a safer, more aesthetically pleasing environment, and more livable situation.

4.2.3 Efforts/Practices

Maintaining industrial land uses in mixed-use areas or adjacent to incompatible land uses can be challenging. There are three relevant practices to manage land use conflicts in mixed-use industrial zones. They are buffer zones, shared drop-offs, and Zoning or land development regulations (LDR).

***Buffer zones**:* With careful planning, industrial lands can be protected. Buffer zones can be an important tool for preserving freight-intensive land uses as they help to mediate some of the negative externalities experienced by neighboring communities. Buffer zones are the City of Stonecrest's primary tool for separating industrial and residential properties. Stonecrest's zoning code includes a 75 to 150-foot buffer between industrial and residential properties, depending on the specific industrial use. However, industrial facilities that have been around for decades often don't have buffers in place.

Shared Drop-Off Points for Freight in Local Communities - As online shopping continues to grow, urban freight deliveries are expected to grow apace, which in turn creates congestion in the county. One solution is mandating shared freight drop-off points to be included in new buildings. This allows truck drivers to deliver all parcels to one building rather than delivering to individual buildings.[50]

***Zoning or land development regulations (LDR)**,* in combination with neighborhood plans and public facility plans, may dictate if or where mixed-use developments are suitable for a given area. Approaches to zoning include traditional or Euclidean zoning, form-based zoning, performance zoning, and incentive zoning. Some developments are planned development or planned unit development (PUD). These approaches to zoning each have their strengths and weaknesses with respect to mixed-use developments. Frequently, this concept is applied by combining residential land uses with something that benefits the economy or greater community, such as commercial, institutional, or industrial.

[49] *Ibid*

[50] *CDM Smith (2017). Will County Community Friendly Freight Mobility Plan. https://www.willcountyfreight.org/Home/FileId/3650*

4.3 Redevelopment and Warehouse/Freight Design

4.3.1 Description

Leading companies actively seek partnerships, not only along their own value chain but also with players from other industries, in utilizing or repurposing existing infrastructure, such as warehouses and retail stores currently available[51]. Sharing infrastructure brings synergies (e.g. costs and risk are split) and enables better customer service and delivery times. Some cities in Europe and Japan have effectively reduced local traffic and emissions by setting up urban consolidation centers (UCCs)[52]. As same-day and next-day delivery is commonplace for e-commerce transactions, retailers are sensitive to the impacts of distance, congestion, and poor travel time reliability for meeting customer demands. As a result, a common practice is to position fulfillment centers close to population centers with good access to major highways. This contrasts with previously observed trends of industrial land use generally sprawling away from city centers.

4.3.2 Prospects and Problems

Re-purposing or rehabilitating existing urban infill industrial facilities is being considered to meet modern e-commerce logistics needs. As a result, cities, developers, and logistics companies across the country are embracing new technologies, alternative building designs, outsourced delivery couriers and third-party logistics companies to address the issue.

Distribution centers and warehouses have historically had a presence in industrial centers and cities across the United States due to their importance in retail trade. These forms of industrial buildings are increasing in many metropolitan areas, including the Atlanta region, but other forms of industry that are becoming more common with the advent of the Internet, e-technology, and online platforms include fulfillment and data centers.

4.3.3 Efforts/Practices

***In-fill Logistics Facilities*:** Developing urban infill logistics facilities to support e-commerce is an innovative supply chain practice. To accommodate distribution facilities in areas with limited land availability, cities have embraced new building designs and typologies. Additionally, cities have implemented curb management strategies to minimize conflicts between increased delivery courier traffic and pedestrians, cyclists, and vehicles. The strong demand for smaller warehouse facilities closer to the urban core conflicts with increasingly constrained inventory, and warehouse users have struggled to find affordable space.

***Redesigns*:** Requirements of distribution facilities include capacity and reliability, adequate loading and staging areas, proper security, parking availability and regulations, and efficient supply chain logistics. Site design guidelines for distribution and fulfillment centers should be mindful of landscaping that contributes to a region's tree canopy, driveways that allow for easy access to facilities without negatively impacting congestion on roads, proper signage, and building setbacks. With respect to

---

[51] *Aryapadi, Manik; Dekhne, Ashutosh; Fleischer, Wolfgang; Graf, Claudia; and Lange, Tim. 'Supply chain of the future: Key principles in building an omnichannel distribution network. McKinsey Article. 01/15/2020*

[52] *Teter, Jacob, et al. "The future of trucks: Implications for energy and the environment." (2017): 1-167.*

transportation, site and geometric design should be coordinated with transportation demand management strategies regarding access to these facilities. The range of needs for different types of distribution facilities, particularly last-mile facilities, requires cities and developers to explore innovative strategies to facilitate the efficient distribution of goods. Companies have been able to raise the roofs of older properties and make other improvements so that they may serve e-commerce demand.

***Green buffer*:** A strategy offered by the Seattle plan is to work with communities impacted by goods movement to reduce long-term truck parking on residential streets, increasing the tree canopy to improve air quality, implementing 'green buffers' along freight network roadways, mitigating stormwater runoff with green infrastructure, and tracking the impacts of increased home-delivery services in neighborhoods to identify whether actions are needed to mitigate negative impacts.

***Parking as redevelopment option*:** Vacant or underutilized sites within industrial districts, particularly those that may have existing brownfield issues or other redevelopment challenges, can be great targets for additional truck parking facilities. For example, The City of Weed, CA created municipal truck parking for about 30 trucks on two pieces of city owned land zoned for industrial use. Moreno Valley, CA allows commercial truck parking on designated roadways in the city. Elmira, NY created a municipal truck parking area from an existing industrial-zoned lot adjacent to a carpool parking lot, reducing complaints from residents about trucks parking in the community.

Funding redevelopment: Industrial tax districts could be used to fund pooled parking on these sites in areas with heavy concentrations of terminals, distribution centers and other industrial sites. This would support the demand for parking off the highway system and could reduce parking impacts on local streets. This approach may involve changes to local zoning requirements and agreements among industrial users and developers to provide offsite parking that meets the staging needs and zoning requirements for groups of industrial properties.

4.4 Relevance and Implication for SFCSA

For most of the current industrial buildings in the SFCSA, 75% of all industrial space in the area by square footage are old, constructed in the 1970s and 1980s. The only new significant warehouse capacity was built in 2021[53]. There are opportunities for new industrial development or redevelopment. While exploring application of best practices, SFCSA should:

- recognize increased demand for daily deliveries using a mix of traditional and new freight vehicles;
- enhance infrastructure for fueling stations, cleaning stations, and truck parking;
- support development of light industrial and flex spaces with limited noise and flexible operating hours;
- encourage commercial uses such as eateries, convenience stores, etc.; and
- modify and utilize zoning and building codes to prevent illegal and incompatible uses.

[53] *Metro Analytics (2023d). Stonecrest Freight Cluster Plan – Inventory and Assessment Report.*

5 Best Practices for Accommodating Freight Mobility and Facilities

This section presents the best practices in accommodating freight mobility and facilities. These practices include guidance at global, national, regional, and local levels in the form of research, education, policies, plans, programs, projects, new data, emerging technologies, and/or implementations.

Accommodating freight mobility and facilities involves considering several important factors. It is necessary to restrict truck movements to certain routes without constraining and increasing the circuity of freight mobility. Cities are challenged by truck movements on non-truck routes and struggle to prevent violations, enforce laws, and deal with costly state-of-good repair issues. Truck parking scarcity has been seen along major corridors at national and state levels as well as in first/last mile segments in local communities. The need for loading/unloading of delivery trucks has influenced curb redesigns.

5.1 Truck Routing

5.1.1 Description

National guidelines establish truck designated routes on national and state highways. In addition, each local area designates or restricts truck routes to preserve infrastructure, improve safety, improve freight efficiency, and ensure compatibility with community needs.

Most Difficult Challenges for Truck Routing

- **Understanding of what a designated truck route is (14%)**
- **Lack of designated truck routes within the County (21%)**
- **Lack of knowledge about which roads are designated truck routes (50%)**
- **Signage on designated truck routes (7%)**
- **Political difficulty in designating truck routes (7%)**

Will County, Illinois

5.1.2 Prospects and Problems

Truck routing is an issue in big-, medium-, and small-cities across the country. Nearly all streets in cities, whether designated for freight or not, are used by trucks picking up or delivering goods. Trucks using non-truck routes can pose various challenges and issues for both the drivers of the trucks and the communities through which they are traveling.

5.1.3 Efforts/Practices

Design and safety of truck-designated roads, access and egress to truck parking areas, and truck parking areas and internal circulation are important considerations in accommodating freight mobility. The use of trucks on non-designated trucks has costly implications due to premature road damage and repair. The use of GPS tracking and routing systems sometimes wrongly route truckers on routes not designated for trucks. Use of a combination of strategies, such as collaboration with the trucking industry and adjacent jurisdictions, technology, and enforcement, would be needed to avoid this situation.

Providing education and outreach to truck drivers about local regulations, truck routes, and potential consequences for violations can help improve compliance.

Engaging with the community to understand their concerns and exploring solutions may involve community meetings, discussions with local government officials, and collaboration with trucking companies to find mutually agreeable routes.

Communicating Designated Routes: Will County in Illinois, with significant freight activity, found that 50% of trucking industry stakeholders lacked knowledge about which roads were designated as truck routes.[54] There is a clear need to communicate this information to truckers going through small urban areas (counties and cities) possibly through collaboration with private entities providing GPS-based route information. Encouraging the use of alternative transportation modes or rerouting through less populated areas can also help reduce environmental impact.

Local authorities, transportation agencies, and law enforcement agencies can play a significant role in addressing the issue of trucks using non-truck routes. By implementing and enforcing regulations, maintaining appropriate infrastructure, and engaging with the community and the trucking industry this can be addressed. If routes are not on national network, a holistic examination, early in a design or planning process, can help minimize or mitigate negative health impacts and reduce the likelihood of trucks cutting through neighborhoods and other undesirable locations by identifying routes that are more suitable for freight traffic and create a connected network. Seattle's Freight Master Plan[55] considers safety, equity, and how to mitigate impacts of freight in minority neighborhoods as part of its freight route designation process, along with making recommendations for updating the freight network based on where trucks are traveling in relation to other modes and priorities. Local authorities can facilitate compliance with truck designated routes through better signage.

The Atlanta Strategic Truck Route Master Plan (ASTRoMaP), was developed in collaboration with state and local government bodies, including the GDOT, to address the critical need for an efficient truck route system that balances the movement of truck traffic with community and environmental considerations. Key strategies and recommendations included truck-friendly roundabout design, signage practices, addressing at-grade rail crossings, optimizing intersection geometrics, bridge replacement, creating pullouts, enhancing capacity, and implementing grade separation for rail crossings.

The DeKalb County Code of Ordinances Article XXI, Sec. 17-361 designates several key roads, including Chapman Road, Covington Highway, Evans Mill Road, Klondike Road, Lithonia Industrial Boulevard, Panola Road, Redan Road, Rock Chapel Road, Rock Mountain Road, Marbut Road, and Rogers Lake Road, as established truck routes in and around the study area. Although previously identified as a truck route in the 2050 DeKalb County Comprehensive Plan, Panola Road south of I-20 has recently been reclassified as a "No Truck Route" at the specific request of the City of Stonecrest. Given the recent nature of this adjustment, it is advisable for both the city and the county to actively monitor truck utilization along this route to assess the effectiveness of the implemented changes. Additionally, it is noteworthy that, while Snapfinger Woods Drive and Hillandale Drive/Chupp Road are not explicitly designated as truck routes, their substantial truck traffic volumes merit attention.

---

[54] *CDM Smith (2017). Will County Community Friendly Freight Mobility Plan. https://www.willcountyfreight.org/Home/FileId/3650*

[55] *Seattle Department of Transportation (2022). Freight Program. https://www.seattle.gov/transportation/projects-and-programs/programs/freight-program*

5.2 Truck Parking/Staging/Loading

Within and beyond Georgia, truck parking studies from other locations with notable practices are informative to the development of the facilities within SFCSA.

5.2.1 Description

Truck parking shortages are a national crisis. Within City of Stonecrest the entrepreneurial use of gravel truck parking areas generated a source of revenue for many developers in recent years but created a chaotic development of truck parking lots as well as use and performance to and from these lots and within the parking lots. This requires an examination of the appropriateness of design standards, wayfinding signs, and the use of ITS and other technologies.

5.2.2 Prospects and Problems

Lack of adequate truck parking is both a capacity and safety issue at every stage of the supply chain, from receiving points to intermodal facilities, and along long-haul routes. A shortage of truck parking leads to drivers parking on expressway on-ramps, closed inspection stations or rest areas, retail parking lots or even along local streets. These options create safety concerns for truck drivers as well as for motorists who must maneuver around the parked vehicles. Sometimes, truck drivers travel out of their way to find parking which puts unnecessary pressure on the transportation network and drivers' hours of service requirements.

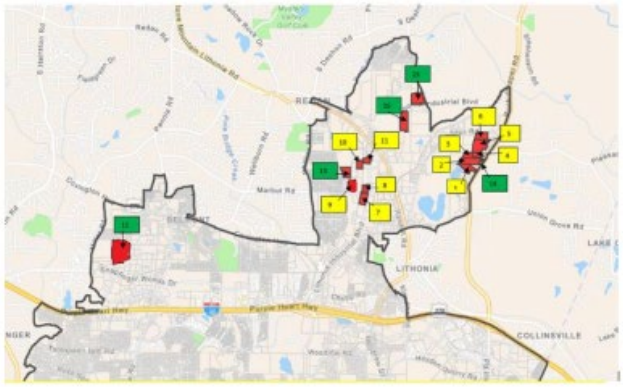
Truck parking challenges in freight clusters, in general, are driven by both long-term parking and short-term staging needs. The lack of overnight parking and the region's congestion contribute to short-term staging challenges in freight clusters. Without dedicated staging areas, trucks arriving early to their destinations must stage on streets, parking lots of nearby businesses, or other, potentially unauthorized areas that contribute to localized congestion and safety challenges.

In many cities or business centers, streets are too narrow to handle on-street parking, especially for delivery trucks, and the cost for buildings to open truck parking spaces are high, which result in the shortage of truck parking spaces. Truck drivers often have no choice but to double-park at the curb or spend a lot of time looking for or waiting for a parking space. To save time and costs, truck drivers may choose to park and load at the curb.

In SFCSA, a general assessment of existing commercial (truck) parking facilities revealed three primary categories of truck parking:

- Reserved/Private Lots: exclusively used by dedicated fleets (45 lots – 2225 spaces),
- Authorized Gravel Parking Lots: commercially operated and comply with the city's regulations regarding the requisite business licenses and land disturbance permits (5 – 710 spaces), and
- Unauthorized Gravel Parking Lots: commercially managed and operated without the necessary permits (53 lots – 3695 spaces).

Figure 5-1: Existing Truck Parking Lots[56]



Location No	Address	Zone	Acreage	paving material
1	2071 Rock Chapel Road Lithonia, GA 30058	M	10.77	Gravel
2	1985 Rock Chapel Road Lithonia, GA 30058	M	14.73	Gravel
3	1979 Rock Chapel Road Lithonia, GA 30058	M	8.65	Gravel
4	1965 Rock Chapel Road Lithonia, Ga 30058	M	5.14	Gravel
5	1901 Rock Chapel Road Lithonia, GA 30058	M	21.54	Gravel
6	7301 Maddox Road Lithonia, GA 30058	M	10.97	Gravel
7	2129 Lithonia Industrial Boulevard Lithonia, GA 30058	M	9.12	Gravel
8	6630 Marbut Road Lithonia, Ga 30058	M	5.97	Gravel
9	6500 Marbut Road Lithonia, GA 30058	M-2	19.27	Gravel
10	1950 Jabco Court Lithonia, GA 30058	M-2	6.06	Gravel
11	6595 Marshall Boulevard Lithonia, Ga 30058	M-2	6.04	Gravel
12	5250 Truman Drive Lithonia, Ga 30058	M	55.46	Not Gravel
13	1933 Jabco Court Lithonia, Ga 30058	M-2	10.51	Not Gravel
14	1913 Rock Chapel Road	M	0.54	Not Gravel
15	1617 Rogers Lake Road Lithonia, Ga 30058	M	16.78	Not Gravel
16	1600 Lithonia Industrial Boulevard Lithonia, Ga 30058	M	17.8	Not Gravel

In the City of Stonecrest, currently there are no publicly owned truck parking facilities, and it was observed that trucks were not utilizing street parking. A substantial number of large warehouses within the SFCSA have established their private/reserved parking spaces for freight. These dedicated spaces cater specifically to their logistical needs. Furthermore, it's noteworthy that the light industrial zones situated west of Panola Road lack commercial truck parking availability. However, the industries in this area have demonstrated a proactive approach by providing ample private/reserved truck parking spaces for their operations. In addition to these private truck parking spaces, the region has a substantial number of commercial parking options, particularly in the form of gravel parking lots, many of which are unauthorized and lack needed amenities. These unauthorized lots, predominantly situated along key roadways such as Maddox Road and Rogers Lake Road, have raised concerns due to their unregulated nature, overcrowded conditions, and their failure to comply with prescribed parking design specifications.

5.2.3 Efforts/Practices

Curb Management: Successfully managing the curb will bring multiple benefits to urban transportation networks, including both reduced congestion and increased safety. Trucks often produce more curbside congestion than personal vehicles due to their size. When off-street parking spaces, docks or loading/unloading zones are unavailable, truck drivers are forced to park and load at the curb. This usually blocks surrounding sidewalks and roadways, and even bicycle lanes when present. This typically results in increased traffic congestion, especially in urban settings. In urban areas, streets are often narrower and more compact. When trucks park on the roadside, they may extend to sidewalks or roadways, which increases the conflicts with vehicles, pedestrians, and cyclists.

***Parking and Freight Studies*:** The Atlanta Regional Truck Parking Assessment Study (ARTPAS), conducted by GDOT and the regional Freight Advisory Task Force (FATF), and Atlanta Regional Truck Parking Assessment Study (2018) have resulted in addition and expansion of truck parking supply, particularly in

[56] *City of Stonecrest (2023c). Planning Commission Meeting Minutes Summary. July 18, 2023.*

I-20 East corridor. Similarly, through future update of Comprehensive Transportation Plans (CTPs) and current SFCP such needs are being assessed and will result in developing more effective truck parking policies, fostering partnerships, improving information sharing.

Lessons from The NYC Smart Truck Management Plan: The plan utilizes many of the truck parking, staging and loading best practices and is worth reviewing. New York has undertaken significant planning work to explore truck and curbside management strategies and policies through city- and state-wide initiatives. The State's Complete Streets Considerations for Freight and Emergency Vehicle Operations outlines common challenges facing freight and emergency vehicle operations and identified design, regulatory, and operational strategies to address these challenges.[57] The New York City Department of Transportation (NYCDOT) completed a Smart Truck Management Plan in May 2021 in response to 1.5 million daily package deliveries within the city and a forecasted freight traffic growth of 68% through 2045.[58]

***Truck Parking Technologies*:** A notable practice observed in some plans was the identification (and in some plans the conceptual development) of ITS technologies to improve the utilization and efficiency of truck parking. These technologies were conceived as part of state and/or regional ATMS and aimed to deliver to motor carriers' information on the location and quantity of available truck parking. The exploration of these types of truck parking solutions is a best practice for freight clusters because there may be opportunities for local applications of truck parking ITS concepts that could eventually be folded into a broader regional and/or statewide system.

Anti-idling ordinances can limit the time and place where drivers are allowed to leave vehicles running, helping reduce air pollution and improve environmental and community health. Environmental Protection Agency (EPA) has a compilation of state, county, and local anti-idling regulations.[59] There are five types of verified IRTs that EPA has found to reduce emissions on long-haul, Class 8 trucks when compared to the truck's baseline emissions.[60]

- Auxiliary Power Units and Generator Sets (APU/GS)
- Fuel Operated Heaters (FOH) aka Direct Fired Heaters (DFH)
- Battery Air Conditioning Systems (BAC) (Battery operated heating and/or cooling system)
- Thermal Storage Systems (TSS)
- Electrified Parking Spaces (EPS) / Truck Stop Electrification (TSE)

---

[57] *Conway, A. (2018). Complete Streets Considerations for Freight and Emergency Vehicle Operations. NYSDOT. Report Number: NYSERDA Project 83178.* https://rosap.ntl.bts.gov/view/dot/68714

[58] *74 New York City Department of Transportation (2021). Delivering New York: A Smart Truck Management Plan for New York City, p. 3.* https://www1.nyc.gov/html/dot/downloads/pdf/smart-truck-management-plan.pdf

[59] *(EPA) Environmental Protection Agency (2006). Compilation of State, County, and Local Anti-Idling Regulations.* https://www.epa.gov/sites/default/files/documents/CompilationofStateIdlingRegulations.pdf

[60] *(EPA) Environmental Protection Agency (2023).* https://www.epa.gov/verified-diesel-tech/learn-about-idling-reduction-technologies-irts-trucks-and-school-buses

***Green Buffers*:** Seattle Department of Transportation (SDOT)[61] uses green buffers and seeks to increase tree canopy in industrial and manufacturing areas to reduce air pollution and screen communities from facilities such as truck routes, truck stops, and industrial facilities.

***Location-based smart loading zones*:** Smart commercial loading zones, or "smart zones," are coordinated through an app that provides drivers for delivery and service providers like UPS and Uber Eats incentive to load in designated locations where it is safe, efficient, and legal — all while collecting data for the city.[62] Omaha, Nebraska, which already has some innovative parking programs in place, and five other cities to partner with curb management platform Coord on "smart zones." The Omaha pilot, Coord's first, launched last September. Drivers use the Coord Driver app to reserve smart zones along their routes. The app is free, with no outlay costs for participating cities. It also makes it possible for cities to monetize the curb. While Omaha is not currently charging a fee for its smart zones, other pilot cities plan to start at $0.50 to $1.00 for a 15-minute loading trip, a share of which goes to Coord.

5.3 State of Good Repair and Safety

5.3.1 Description

Roadway segments, especially major corridors like Panola Road, I-20, SR-124, and Lithonia Industrial Boulevard, experience substantial congestion and capacity limitations. Freight traffic in the SFCSA is anticipated to increase, particularly along key routes such as I-20 and Lithonia Industrial Boulevard. Many roadway segments within the SFCSA study area (Panola Road, Snapfinger woods, DeKalb Medical Parkway, Fairington Road, and Hillandale Drive) exhibit “poor” to “failed” pavement conditions, particularly in segments with high freight traffic.

Lack of adequate design and safety of access to/egress from truck parking lots within the SFCSA and the organizing of spaces within the lot, has created capacity, safety, and aesthetics concerns for the City of Stonecrest. Design and safety of truck-designated roads, access and egress to truck parking areas, and truck parking areas and internal circulation are important considerations in accommodating freight mobility in general and truck movements in particular. Authorities can also enforce truck weight limits and use fines to deter non-compliance.

5.3.2 Prospects and Problems

Well-constructed and safe roads benefit freight and community. Non-truck routes are not designed to withstand large trucks and can get severely damaged when wrongly used by trucks and affect the state of good repair. Increased and diverted truck traffic, especially oversize, overweight vehicles, can even prematurely damage roads on truck-designated routes to unserviceable levels.

Trucks that are OS/OW are any truck that is over the legal dimensions or weight (typically 80,000 pounds) and are required to get permits from all jurisdictions they must travel across to move their shipment. There is uniformity along state routes. The difficulty comes typically in the first and last mile

[61] *SDOT (2016). Freight Master Plan.* https://www.seattle.gov/Documents/Departments/SDOT/About/DocumentLibrary/FMP_Report_2016E.pdf

[62] *Hammon, M. (2021). Manage the Curb with Smart Loading Zones.* https://www.planning.org/planning/2021/winter/manage-the-curb-with-smart-loading-zones/

of the truck movement, where the OS/OW truck needs to obtain permits from multiple local governments to reach its origin or destination. Often, these local governments have different forms that require various levels of information and varying staff capacity to fulfill requests and field questions.

5.3.3 Efforts/Practices

***Access and Connectivity*:** A key parameter for sustaining a competitive industrial sector and vibrant economy is access and connectivity. The condition of streets and roads, height and weight restrictions, connectivity of truck routes, and travel time reliability, and access to information about incidents, closures, or truck routes are all key to ensuring drivers can get where they need to go, delivering goods on-time and safely. Timely maintenance can improve longevity of road pavements.

***Traffic and Condition Prediction*:** Good practices of traffic and pavement condition data and ability predict truck traffic and assess loss of serviceable life of roads can help make cos-effective decisions at right time and improve longevity of infrastructure.

Infrastructure Improvements: Roadway segments with poor pavement conditions need substantial investments. Better forecast, designs, and materials will be important. There are also bridge weight and height restrictions, tight turning radii, or a lack of commercial loading zones. Strategies for improving routing, connectivity, and efficiency include maintenance of and improvements to physical infrastructure, communication, and technology tools. Guides on pavement design, pavement maintenance, asset management, bridge design, bridge maintenance bridge management, and highway safety manual put out by Federal highway Administration (FHWA), American Association of Highway and transportation Officials (AASHTO), GDOT will be important best practice guides for state of good repair as well as safety.

OS/OW Vehicles: The Best Practices in Permitting Oversize and Overweight Vehicles[63] is the summary of a research study completed on State oversize – and overweight-permitting practices, including automated vehicle routing and escort driver certification and identifies the areas of best practices. This report is intended to fulfill a recommendation by the U.S. Government Accountability Office (GAO).

***Safety*:** "Safe System" approach will be the best safety practice. It is a systems-based strategy to eliminate roadway fatalities and serious injuries through safer urban street design, speed management, and other tailored transportation safety strategies. It differs from traditional efforts in that it recognizes traffic deaths as preventable, follows a systems approach, and views infrastructure investments as appropriate to mitigate fatalities and injuries. Technologies such as Autonomous Vehicles and Advanced Driver Assistance Systems (ADAS), Connected Vehicle Systems, Pedestrian Detection and Collision Avoidance, and geofencing and obstacle detection that help prevent drones from flying into restricted or dangerous areas have the potential to significantly improve safety across various domains. However, their adoption often requires careful consideration of ethical, legal, and regulatory challenges, as well as ongoing monitoring and refinement to ensure their effectiveness and safety.

[63] *Schaefer, R. and Todd, S. (2018). Best Practices in Permitting Oversize and Overweight Vehicles. Federal Highway Administration. https://ops.fhwa.dot.gov/publications/fhwahop17061/fhwahop17061.pdf*

5.4 Freight Micromobility

5.4.1 Description

New freight mobility options have the potential to relieve congestion in first/last mile segments and improve safety in local communities. These options come under the umbrella of Micromobility, which refers to the use of small, lightweight vehicles for short-distance trips. These vehicles are typically powered by electric motors and are designed for one or a few passengers. Micromobility includes modes of transportation such as electric cargo bicycles, electric cargo scooters, electric cargo trikes: electric cargo, microvans, autonomous delivery robots, electric scooters, electric bicycles (e-bikes), electric skateboards, and electric kick scooters. These vehicles are often available for rent through smartphone apps.

5.4.2 Prospects and Problems

Micromobility can help reduce congestion, lower emissions, and provide a convenient and cost-effective transportation option for short trips. It can also improve first-mile and last-mile connectivity to public transit.

Governments, cities, and companies are increasingly exploring and implementing innovative solutions to address the challenges associated with urban freight delivery and promote more sustainable and efficient transportation in urban areas.

5.4.3 Efforts/Practices

Implementing freight micromobility will involve best practices in the form of strategies and investments to realize sustainable, efficient, and safe urban logistics.

***Infrastructure Planning and Investment*:** This will require innovations in design and maintenance of infrastructure that accommodates micromobility vehicles (e.g., dedicated bike lanes, scooter parking zones, loading/unloading areas for cargo bikes and scooters, etc.) and development and management of safe and accessible routes for micromobility vehicles to navigate through urban areas, especially in dense and congested city centers. Drones could also be helpful.

Regulatory Framework: There is a need to develop clear and comprehensive regulations for freight micromobility, addressing issues like vehicle safety standards, rider behavior, parking, and speed limits. In addition, local authorities and other stakeholders must collaborate to establish licensing, permitting, and insurance requirements for operators and riders of freight micromobility vehicles.

Public-Private Partnerships: among public and private agencies and logistic providers will help integrate freight micromobility into the broader urban transportation ecosystem and fund and operate shared micromobility programs that include freight options.

***Safety Measures*:** Safety programs need to expand to increase safety awareness among micromobility users and ensure that they adhere to safety guidelines, such as wearing helmets and respecting traffic rules and for implementing safety features on micromobility vehicles, such as lights, horns, and collision avoidance systems.

Sustainability Considerations: such as encouraging the use of electric-powered micromobility vehicles to reduce emissions and environmental impact and using recyclable and eco-friendly materials in the design and construction of cargo containers and vehicles will be important.

***Accessibility and Inclusivity*:** Ensuring that freight micromobility services are accessible to and loading and unloading are easier for all members of the community, including those with disabilities or mobility challenges.

5.5 Traffic Operations and Control

This includes adaptive signal control and railroad-highway grade crossing operation and safety.

5.5.1 Description

Several signalized intersections are critical in traffic management along Panola Road, Snapfinger Woods, and Lithonia Industrial Boulevard. Effective signal management and corridor studies are essential for optimizing traffic and ensuring road safety. These corridors also have the potential for exploring Intelligent Transportation Systems options. Adaptive signal control will make operation of intersections and railroad-highway grade crossings responsive and safe.

5.5.2 Prospects and Problems

Segments of corridors having signals in close proximity and those with multiple ingress and egress points can have excessive delays with truck operations and impact effectiveness of signal timings. Traffic signal control systems are becoming “smarter” with focus on relieving recurrent congestion and reducing emissions.

5.5.3 Efforts/Practices

Trucks have lower speeds, larger size, require longer acceleration and deceleration time and distance, longer headways, lower saturation flows. Adaptive signal control at intersections (especially on signalized arterials) and railroad-highway grade crossings (especially for preemption) can improve capacity, reduce delays, and minimize traffic blockage.

The Regional Traffic Operations Program (RTOP) in metro Atlanta is managed by GDOT, aiming to efficiently control signal timing and alleviate traffic congestion and emissions across the entire Atlanta region. Within the program, each RTOP corridor, including sections of Covington Highway and Evan Mills Road within the SFCSA, undergoes continuous monitoring and signal plans are adjusted for daily commute, special events, and incidents. DeKalb County has responsibility for managing and coordinating all other signals in the SGCSA.

Travelers on major corridors (e.g. I-20) in SFCSA benefit from GDOT supported ITS applications such as the Georgia 511 information network that uses vehicle detection systems, closed-circuit television cameras, environmental sensor stations, Changeable Message Signs, and others that provide real-time information to travelers about road and travel conditions, weather alerts, incidents, and closures. GDOT’s Office of Traffic Operations operates the SigOps program, collaborating closely with state and local traffic engineers to improve traffic flow, reduce vehicle emissions, and ultimately enhance the overall transportation experience for residents and visitors in Stonecrest and beyond.

The study area encompasses a total of 12 at-grade crossings and 2 grade-separated crossings. Effective management of these at-grade crossings is of paramount importance in freight planning, as it directly impacts the flow of both freight and passenger traffic, while also significantly influencing safety considerations. The Guide to Best Practices and Resources for Grade Crossing Safety is an important resource.[64]

5.6 Alternative Fuels, Electrification, and EV Charging

5.6.1 Description

One effective strategy to reduce petroleum consumption is to displace petroleum use with alternative fuels, which include (but are not limited to)[65]: E85 (a blend of 85% ethanol and gasoline), neat (100%) biodiesel, neat (100%) renewable diesel (R100), hydrogen, CNG, LNG, and LPG. Each gasoline gallon equivalent (GGE) of alternative fuel used in agency vehicles provides the equivalent (or higher for electricity) GGE reduction in petroleum use. To enable and accommodate this transition, existing service stations will need to be converted to provide for storage and delivery of alternative fuels and more refueling infrastructure will be required to meet the increasing requirements.

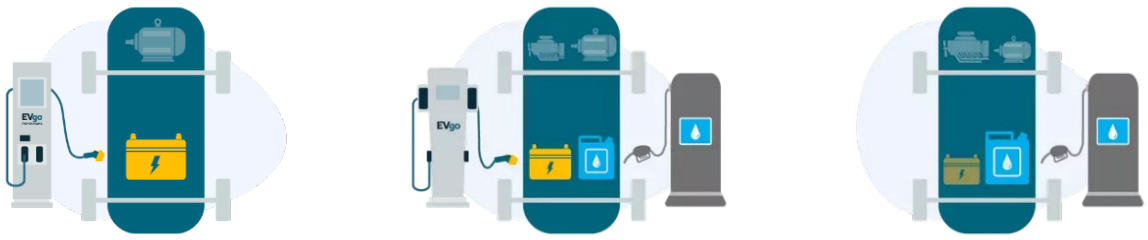
There are three different types of electric vehicles (EVs) being explored.

Battery Electric Vehicles (BEVs): Powered solely by an electric battery, with no gas engine parts. Most BEVs are capable of fast charging and L2 charging. Zero emissions.

Plug-in Hybrid Electric Vehicles (PHEVs): Like a Hybrid, but with a larger battery and electric motor. Has a gas tank and a charging port. Can charge by using L2 chargers.

Hybrid Electric Vehicles (HEVs): Low-emission vehicles that use an electric motor to assist gas-powered engines. All energy comes from gasoline. Cannot charge with EVgo.

Figure 5-2: Types of Electric Vehicles[66]



(a) BEV *(b) PHEV* *(c) HEV*

[64] *(FRA) Federal Railroad Administration. (2023). Guide to Best Practices and Resources for Grade Crossing Safety.* https://railroads.dot.gov/sites/fra.dot.gov/files/fra_net/15663/Guidance%20for%20Law%20Enforcement-final.pdf

[65] *(FEMP) Federal Energy Management Program (2023). Federal Fleet Requirements Resource Center: Alternative Fuel.* https://www.energy.gov/femp/federal-fleet-requirements-resource-center-alternative-fuel

[66] *EVgo (2023). Types of Electric Vehicles - A brief overview of EV options.* https://www.evgo.com/ev-drivers/types-of-evs/

5.6.2 Prospects and Problems

The use of alternative fuels, especially electricity, ethanol, biodiesel, and biomethane, also known as clean fuels, can reduce the emissions of greenhouse gases and air pollutants, which could significantly slow down the pace of climate change.

Electric vehicles have quieter engines, and this could potentially lead to better community favorability of freight and other high-capacity vehicles in high-density urban areas. This also means that electric trucks can operate at times when traditional diesel trucks cannot. Electric vehicles can lower greenhouse gas emissions that are attributed exclusively to transportation as well as improve air quality, especially in urban areas such as Atlanta.

More electric charging infrastructure will be required to meet the demand as well, including short- and long-term truck parking facilities and staging areas. This could impact the placement of new truck parking facilities, which in turn, could impact travel patterns. The size, shape, and weight of freight fleets will change to maximize the efficiency of alternative fuels. This may impact the capacity and ultimately the design of roadways over time, as well as the long-term impact of freight on pavement and bridge conditions.

Since electric vehicles do not consume gasoline, the transportation revenue obtained from gas taxes will decline as electric vehicles become more common. Government agencies will need to estimate the gas tax lost and employ a method to generate revenues from electric vehicles to maintain long-term funding for transportation projects.

5.6.3 Efforts/Practices

Federal Energy Management Program (FEMP) offers resources and best practices for alternative fuel use[67]:

- EISA Section 142 Alternative Fuel Consumption
- EPAct 2005 Section 701 Alternative Fuel Use in Dual-Fueled Vehicles
- EISA Section 246 Alternative Fuel Infrastructure.
- Optimizing Cost-Effective Alternative Fuel Use

As part of this strategy, fleet managers should maximize deployment of vehicles capable of using alternative fuel or biodiesel blends (Alternate Fuel Vehicles (AFVs) and diesel vehicles) at those locations that have existing alternative fuel or biodiesel infrastructure or are candidates for new infrastructure:

- EVs, including BEVs and PHEVs, and their charging infrastructure are suitable for most fleet locations, especially those without access to other alternative fuels.
- AFVs that use E85, CNG, hydrogen, and other alternative fuels that require dedicated infrastructure should be placed at fleet locations where alternative fuel is available or at high-use locations where alternative fuel sites are planned in the near-term.
- Section 701 of EPAct 2005 requires Federal agencies to use only alternative fuel in its dual-fueled AFVs, except where the vehicles have received a waiver from DOE due to the local

[67] *(FEMP) Federal Energy Management Program (2023). Federal Fleet Requirements Resource Center: Alternative Fuel. https://www.energy.gov/femp/federal-fleet-requirements-resource-center-alternative-fuel*

unavailability of alternative fuel or fuel that is unreasonably more expensive than gasoline. This means, for example, that if E85 infrastructure is available at or near a fleet location, fleet E85 FFVs operating at that location are required to refuel solely with E85 using that infrastructure.
- Biodiesel blends, which require dedicated infrastructure but can be used in conventional diesel vehicles, are ideal for locations with high diesel fuel use.

To maximize petroleum reduction, agencies should support strategies to increase alternative fuel use by:

- Acquiring AFVs in or near areas with existing or planned alternative refueling sites (agencies should ensure alternative fuel infrastructure, including charging infrastructure and the associated fuel necessary to support dedicated AFVs, is in place before accepting delivery of vehicles), and by running dual-fueled vehicles on alternative fuel.
- Installing alternative fuel infrastructure (including charging infrastructure) in fleet locations with the highest AFV concentrations that use that fuel type.
- Communicating and coordinating with nearby fleets (both public and private sector) to aggregate demand for alternative fuel.

Alternative Fuel Readiness Guide[68] was designed with fleets in mind to help make the transition to alternative fuels manageable and safe while avoiding mistakes that can occur in the absence of guidance. The guide covers topics to consider and checklists to review when taking on alternative fuel projects. When determining whether to switch to an alternative fuel vehicle, fleets should keep in mind the fueling infrastructure that may be needed.

Fleets/agencies can approach this in one of three ways:

- Install on-site fueling infrastructure.
- Utilize third-party, on-site fueling delivery services.
- Use public stations. Locations of many public stations can be found at: www.afdc.energy.gov/locator/stations or through use of this locator's mobile app.

Planning considerations on stations for each applicable fuel type for medium and heavy-duty vehicles are discussed in detail in this guide, with special attention given to on-site fueling infrastructure.

5.7 Relevance and Implication for SFCSA

The City of Stonecrest has substantial freight generators and attractors that contribute to significant freight activity and make considerable contributions to its economy. Accommodating freight mobility and facilities requires connected, safe, and durable infrastructure and environmentally compatible and community friendly freight movements and activities. There are several opportunities for enhancing freight mobility and facilities. While exploring application of best practices, SFCSA should:

- recognize corridors and segments in poor or unsafe condition make appropriate investments and apply best design, management, and materials for infrastructure improvements;
- enhance its multimodal and intermodal access and connectivity;

[68] *(ICCC) Iowa Clean Cities Coalition (2023). Alternative Fuel Vehicle Readiness Guide for Medium- and Heavy-Duty Fleets. https://www.iowaeda.com/UserDocs/AFV-ReadinessGuide2018.pdf*

- promote and encourage freight operators to use truck designated routes and comply with truck restrictions;
- resolve issues with gravel truck parking and explore providing public truck parking; and
- explore opportunities related to transportation operations, safety, and alternate fuel technologies.

6 Best Practices for Multimodal Access and Mobility

This section presents the best practices in multimodal access and mobility. Multimodal access and mobility refer to the ability of individuals to easily and efficiently navigate through an urban environment using a variety of transportation modes. It emphasizes the integration of different transportation options to create a seamless and convenient travel experience. Here are key aspects of multimodal access and mobility:

Multimodal and intermodal connectivity is essential. SFCSA must balance freight mobility and community needs. Mixed land uses, especially where industrial and residential coexist, should promote multimodal systems through improved walkability and access to public transit. These land uses require connections to freight facilities and routes. The growing economy and increased population, particularly in cities, have caused congestion and delays along major corridors, including truck routes.

Complete Streets and Shared Mobility principles will improve connectivity and access and will better balance freight mobility with community needs.

6.1 Description

Multimodal access involves the availability of various transportation modes, including walking, cycling, public transit (buses, trams, subways), private vehicles, carpooling, ridesharing, micromobility options (e-scooters, e-bikes), and even emerging technologies like autonomous vehicles.

Complete Streets, as a design approach, prioritizes the safety, accessibility, and convenience of all users, recognizing the diverse transportation needs within a community. This means incorporating features such as sidewalks, bike lanes, safe crosswalks, transit stops, and efficient traffic flow for freight vehicles.

Shared mobility is a transportation model where multiple users share a single vehicle or use a vehicle on a short-term basis. It often involves vehicles that are not privately owned but rather accessed through various sharing models. Shared mobility includes services like ridesharing (e.g., Uber and Lyft), carsharing (e.g., Zipcar), bike-sharing, scooter-sharing, and peer-to-peer car rental services (e.g., Turo). It can also encompass shared autonomous vehicles when they become more prevalent.

6.2 Problems and Prospects

Sometimes growth or changes in development outpace changes in infrastructure, resulting in traffic congestion where smaller streets were not designed to handle large volumes of traffic or places where people now walk and bike despite a lack of sidewalk or dedicated bike lanes. Another challenge is the increasing mix of people, activities, and modes of travel in growing and changing areas, which can sometimes result in uncomfortable situations, especially for vulnerable road users, or potential conflicts between people and vehicles.

By strategically designing streets that accommodate various modes of transportation, including freight, the streets can be a safer and more accessible environment for both commuters and freight operators. The overall need for freight design consideration is high in areas where most of the intersections were constructed to accommodate smaller trucks than many on today's roadways.

A significant concentration of work commutes originates from the North-West direction within the SFCSA, and approximately one-third of the workforce commutes from DeKalb County. Additionally, 13.4%, 7.9%, 6.4%, and 6.0% of work trips to the SFCSA originate from Gwinnet County, Fulton County, Rockdale County, and Newton County, respectively. It is noteworthy that approximately 18% of the work commute trips to the SFCSA originate from regions outside the neighboring counties, underscoring the area's significance as a regional employment hub.

6.3 Efforts/Practices

Seamless Integration: The goal is to make the transition between different modes of transportation as smooth as possible. This may involve well-planned transportation hubs where commuters can easily switch from one mode to another, such as from a train to a bus. A special consideration is the long-distance commute of workers, especially those using transit.

Mobility as a Service (MaaS): MaaS platforms provide a unified and digital approach to planning, booking, and paying for various transportation services. Users can access real-time information and plan their journeys using multiple modes through a single app or platform.

Transportation Hubs: Well-designed transportation hubs, such as bus terminals, train stations, and airports, play a critical role in facilitating multimodal access. These hubs should have facilities and services that cater to various transportation options.

Last-Mile Connectivity: Often, the challenge in multimodal transportation is addressing the "last mile" problem, where commuters/freight operators struggle to reach their final destination from a transit station. Solutions may include pedestrian-friendly infrastructure, bike-sharing, and shuttle services.

Infrastructure Investment: Investments in infrastructure are necessary to support multimodal access, such as bike lanes, pedestrian pathways, transit stations, and secure bike parking facilities.

Traffic Management and Signal Coordination: Traffic management systems and signal coordination can help ensure smooth traffic flow for all modes, including prioritizing buses at traffic signals to reduce delays or prioritizing pedestrians and bicyclists for access and safety.

Safety and Accessibility: Ensuring the safety of pedestrians and cyclists, as well as providing accessibility for individuals with disabilities, is essential to promoting multimodal access for all residents through innovative designs and controls. Traditional measures of access management like consolidating access points, redesigning intersections, improving driveway geometry, and installing median barriers will improve operations and safety.

Environmental Considerations: Multimodal access and mobility support sustainability goals by reducing individual car use and greenhouse gas emissions. Encouraging the use of electric or low-emission vehicles within the multimodal framework can further enhance environmental benefits.

Public Engagement: Engaging the community and gathering feedback on transportation needs and preferences is critical in planning and implementing effective multimodal access strategies.

Regulation and Policy: Local governments and transportation authorities play a key role in shaping policies and regulations that promote multimodal access and mobility, including zoning regulations, parking policies, and public transit funding.

Education and Promotion: Public awareness campaigns can encourage residents to embrace multimodal transportation options and promote the benefits of reduced congestion, improved air quality, and enhanced quality of life.

The "***National Complete Streets Coalition***" advocates for the incorporation of Complete Streets policies at the state and local levels, promoting safer, more accessible streets. The "Freight Advisory Committee" guidelines provide insights into effectively incorporating freight considerations into transportation planning processes, emphasizing seamless freight flow while considering the needs of other users. Furthermore, policies from the Federal Highway Administration (FHWA), such as the "Everyday Counts" initiative, underscore the importance of innovative solutions, including Complete Streets and Shared Use strategies, to enhance the safety, efficiency, and sustainability of transportation networks.

6.4 Relevance and Implication for SFCSA

The City of Stonecrest has trails, emphasizes active transportation, and has issues with inadequate travel options for workers. Multimodal access and mobility are a priority. Environmentally compatible and community friendly freight movements and activities will provide the needed balance in SFCSA. There are several opportunities for enhancing multimodal access and mobility. While exploring application of best practices, SFCSA should:

- Apply complete streets principles and guidelines;
- Encourage micromobility as well as shared mobility opportunities and provide needed infrastructure;
- Explore additional travel options and access for commuting workers going to employment hubs;
- Use buffers between land uses and between trail and freight corridors; and
- Better balance freight mobility with active transportation and trail users.

7 Cross-Cutting Best Practices

This section presents best practices in cross-cutting practices in stakeholder engagement, resilience, and equity. Cross-cutting practices are important in addressing all the three key issues in SFCSA.

7.1 Stakeholder Engagement

Outreach and engagement practices have evolved over the years to include in-person activities, electronic surveys, online maps for commenting, intercept surveys, and interviews. One key lesson learned that is evident is the importance of creative and multiple avenues for engaging stakeholders.

A common theme of nearly all the studies, plans, and initiatives included in this review is the importance of stakeholder engagement. Outreach and engagement practices have evolved over the years with a recent focus on reaching people traditionally left out of such processes. Most of the plans and initiatives reviewed had significant outreach to identify and prioritize investments. This provided the dual benefit of improving the quality of the finished products and making them actionable and implementable so that real-world improvements could be made. This best practice has already been integrated into the SFCP as part of the project scope of work.

7.1.1 Description

Public and stakeholder engagement in transportation planning is a well-established and often required practice. Talking with local community members allows planners to better understand conditions, challenges, and concerns and to tailor and improve upon their proposed designs or recommendations to better meet the needs of people who will live with them.

7.1.2 Prospects and Problems

Communities across the country are grappling with effective community engagement dealing with a range of complex issues related to land use, housing affordability, freight planning, and other issues.

7.1.3 Efforts/Practices

All freight cluster studies featured multiple outreach efforts including electronic surveys, online maps for commenting, and interviews, among others. These types of efforts for engaging stakeholders will be critical for any FCP. Over the past decade or so, many planners and agencies have stuck with traditional in-person activities, in part, because not everyone has access to internet service or is technologically savvy. However, that has changed, due, in large part, to the COVID-19 pandemic. One key lesson learned that is evident is the importance of creative and multiple avenues for engaging stakeholders.

Freight planning is a complex issue. Stakeholder outreach and engagement is critical to successful freight planning decisions, but quite often, freight planning focuses on private sector stakeholder engagement and does not include the broader community and area residents. Some communities are beginning to rethink their approaches to freight planning when it comes to engagement and outreach.

The APA encourages embracing best practices and innovative technologies to improve performance of the freight network while mitigating negative impacts of freight movement on communities, fostering

partnerships with public and private sector stakeholders, increasing competitiveness, and taking a context-sensitive approach to freight planning.[69]

The 2040Freight plan of Portland[70] emphasizes making it easy for community members to learn about and understand urban freight movement. From simple graphics and handouts to an interactive web-based map and 'freight perspectives' and 'how goods move' videos, Portland is using a variety of approachable communication tools to share information about the study and communicate the important role freight plays in our daily lives. In addition to traditional tools like fact sheets and the project website, the study team developed a series of short videos and blog posts that explore freight issues through storytelling. Although most of the resources are made for online consumption – digital flyers, videos, and surveys – they are effective ways of communicating with a variety of people in a convenient manner.

7.2 Resilience

Integrating resilience into the transportation systems, networks, plans, designs, operations, maintenance, and project delivery is ongoing. Economic and community resilience involving all critical infrastructure, including transportation, energy, communication, businesses, and people is important for cities and counties.

Communities across the US, and even globally, are facing more varied, severe, and frequent disruptions and need to plan for better readiness. These disruptions impact people, properties, businesses, critical functions, and the economic viability of the communities in the short term and sometimes have long-term effects. There is a need to identify and detect disruptions quicker and be better prepared for response and recovery. Improvements in resiliency planning, freight resiliency, transportation resiliency, system resilience, and community resilience are needed.

7.2.1 Description

Historically, the SFCSA has grappled with natural hazards such as flooding, hurricanes, and storms. In addition, manmade hazards, including traffic crashes and ongoing work zones, disrupt traffic flow, including freight mobility. Furthermore, being an industrial hub, the area has potential hazards related to fire and explosions. These threats disrupt community and freight mobility and impact many critical infrastructure, services, people, and businesses. Being resilient is a necessity for SFCSA.

7.2.2 Prospects and Problems

The SFCSA has faced hazards such as flooding, hurricanes, and storms. The area was impacted by hurricanes in 1900, 1903, and 1911, 2004, 2021, and 2022, affecting transportation, energy, and communication infrastructure. Roads, bridges, and railroad crossings near creeks and rivulets are vulnerable during flooding. Disruptions have also been caused by numerous traffic incidents and work

[69] *(APA) American Planning Association. (2016). APA Policy Guide on Freight. Retrieved from https://www.planning.org/policy/guides/adopted/freight/.*

[70] *https://www.portland.gov/transportation/planning/2040freight*

zones, causing backups, or requiring full- or partial- closures and detours, resulting in considerable delays and safety concerns.

For Hazardous Materials Transportation (HMT) cities/counties should avoid conflicts between hazardous materials routes and residential and environmentally sensitive areas and regularly review and update route designations with partners as well as ensure emergency management plans are reviewed and updated.[71]

7.2.3 Efforts/Practices

Accessible Resources for SFCSA: The SFCSA benefits from many plans and initiatives for emergency preparedness and response as well as resilience. The SFCSA currently relies on Dekalb County for all the emergency services including police, medical, and fire protection operations in accordance with the Inter-Governmental Agreement (IGA). The DeKalb County Emergency Management Agency (DEMA), the Emergency Operations Center (EOC), the Emergency Operations Plan (EOP), Hazard Mitigation Plan (HMP), and Continuity of Operations Plan (COOP) provides guidance, information, coordination, and resources during emergencies (Metro Analytics 2023d). GDOT's statewide freight plan (GDOT 2023) describes the emergency response initiatives such as Highway Emergency Response Operators (HERO) and the Coordinated Highway Assistance & Maintenance Program (CHAMP) and prioritizes supply chain resilience through collaborative coordination among DOTs, Port Authorities, and stakeholders during extreme weather events, traffic disruptions, or construction work detours. The best practices reviewed and outlined here can further enhance capabilities of SFCSA in freight resilience, including response and recovery.

Federal Resources: FHWA has developed numerous guidance materials, toolkits such VAST, and supported numerous pilot programs across the US. These provide good instructions, framework, and lessons that can be applied to SFCSA.

City Level Resource: Dougherty County and the City of Albany, Georgia, were devastated by two high-wind incidents (showers, thunderstorms, tornadoes) just three weeks apart in 2017 (January 2 and 27). These catastrophes caused massive damage to infrastructure, hundreds of residents lost their homes, and five people lost their lives. Nearly 400 homes were completely destroyed, which resulted in over 21 million in construction costs. Over 30,000 households were without power. Temporary power to the entire grid was not fully restored until 11 days after the event. Businesses suffered 6 million in revenue losses with 85% having no power for 4 days, 30% suffering damage to equipment and inventory, and 50% having catastrophic damage to operational capacity. Damage to the Marine Corps logistics base was close to $ 300 million. In addition, there was close to $ 16 million in damage to public facilities and infrastructure. Direct damage to police and fire infrastructure led to the inability to provide certain emergency services. In 2017 Dougherty County-City of Albany, GA developed a Long-Term Recovery & Resiliency Plan.[72] This plan provides insights into the considerations that are important and relevant and would serve as an important starting point for the development of the Resiliency Plan for Albany, GA.

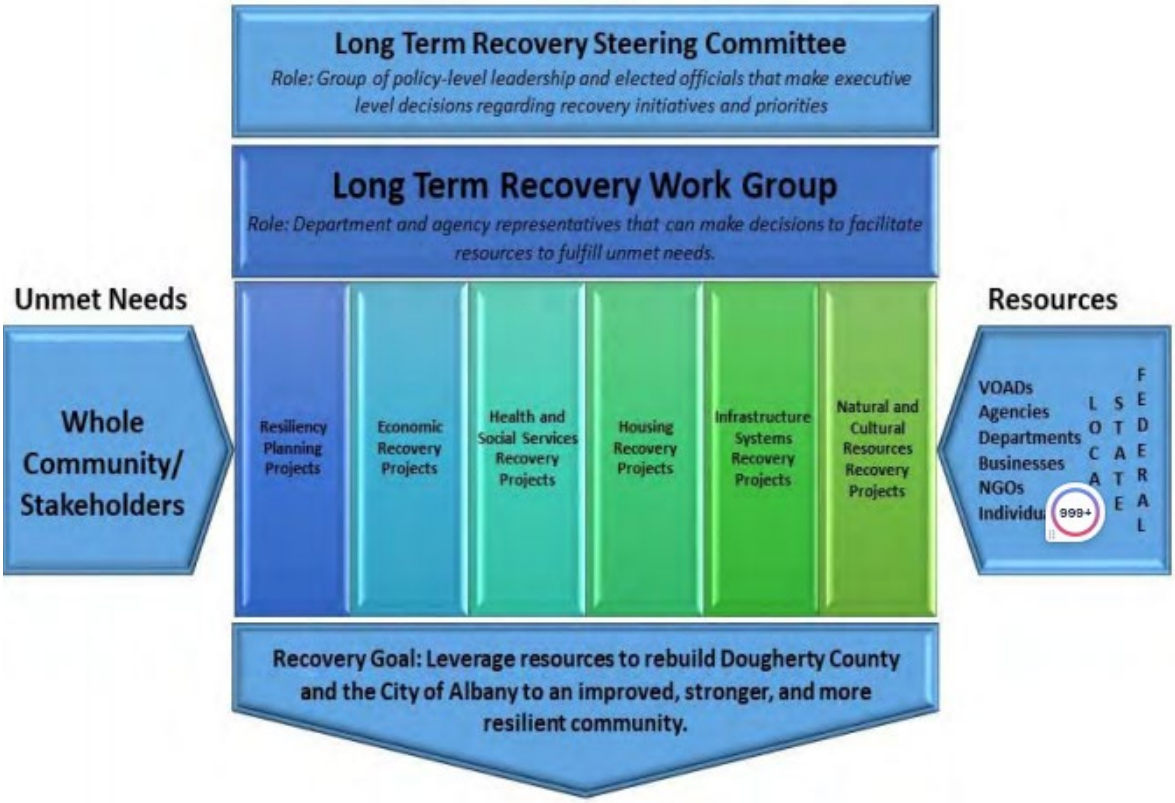
---

[71] *CDM Smith (2017). Will County Community Friendly Freight Mobility Plan.* https://www.willcountyfreight.org/Home/FileId/3650

[72] *2017 Dougherty County-City of Albany, GA Long-Term Recovery & Resiliency Plan.*

This is currently being updated and lessons from there could be useful for SFCSA for overall and freight resiliency. Figure 7-1 shows the disaster recovery support system they used in the plan.

Figure 7-1: Community Programs to Support Disaster Recovery.[73]



7.3 Equity

Equity considerations are of importance at local, state, regional, and national levels. Many new federal funding programs have equity requirements that are still being understood by grant applicants. The discussions regarding equity are taking place individually and collectively by public, private, and advocacy groups/agencies.

7.3.1 Description

Equity is the promotion of justice, impartiality, and fairness within the procedures, processes, and distribution of resources. Tackling equity issues requires an understanding of the underlying or root causes of disparities within our society. Diversity is the demographic mix of a specific collection of people, considering elements of human difference. For example: racial and ethnic groups, income, spectrum of built environment settings (rural to urban), faith communities, LGBTQ+ populations, people with disabilities, gender, relationship to the natural environment. Inclusion refers to the degree to which diverse individuals can participate fully in the decision-making processes within an organization or

[73] *Ibid*

group. While a truly "inclusive" group is necessarily diverse, a "diverse" group may or may not be "inclusive." Accessibility is giving equitable access to everyone along the continuum of human ability and experience Justice – the quality of being just, impartial, or fair. All are important to consider in policies, programs, plans, and projects.

7.3.2 Prospects and Problems

The need to take equity into consideration in freight-related projects is highlighted by the rejection of the bid for Metro Green Recycling plant and Duke Realty's large distribution center near existing neighborhoods in the City of Stonecrest. These projects ran into heavy opposition from nearby residents and claims of environmental racism was raised because most neighborhoods near the industrial lands were majority Black.[74]

7.3.3 Efforts/Practices

***Going beyond environmental justice*:** According to US Environmental Protection Agency (USEPA), Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations and policies , and refers to "decisions [that] support sustainable communities where people can interact with confidence that their environment is safe, nurturing, and productive..." The Chesapeake Bay Program (CBP)[75] identifies the differences among It differentiates among Diversity (D), Equity (E), Inclusion (I), Accessibility (A), Justice (J), underrepresented groups/communities, and under resourced or overburdened. It also provides a compilation of Signatory and Partner DEI activities, programs, and practices. Across the United States over the past few years, communities have begun to acknowledge and embrace the need to better understand issues of equity and incorporate them into planning practices. Whereas equity considerations have long been discussed or addresses as part of required plan sections on environmental justice, cities and counties across the country are making more concerted efforts to do better – to acknowledge the impact of past practices and policies, to mitigate ongoing issues, and identify ways to improve conditions for all community members going forward.

Hiring Programs: Cities are also successfully implementing hiring programs that require and/or incentivize businesses receiving any public assistance to hire locally. Local hiring requirements have helped companies to grow reliable and local workforces while lowering the barriers of employment for job seekers who have experienced racial discrimination. Cities are also supporting workforce development by providing public financial assistance to reduce the costs of training. As industries continue to evolve, it is important to nurture the local business community to facilitate inclusive growth across sectors. One pathway for entrepreneurs of color to build wealth is through manufacturing.

---

[74] *Hansen, Z. (2021). Stonecrest grapples with industrial facilities near neighborhoods. The Atlanta Journal Constitution. 10/04/2021.*

[75] *(CBP) Chesapeake Bay Program (2022). What's DEI and EJ.* https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/CBPDEI-and-EJ.pdf

SFCSA has elaborate and successful stakeholder engagement practice and is utilized in all their plan and project development. Many of the efforts and achievements in incorporating equity within ARC are relevant and applicable to SFCSA.

American Trucking Research Institute-has several best practices for implementing DEI initiatives.[76] It also provides a compilation of best practices from public and private sectors.

The ***Urban Manufacturing Alliance's*** State of Urban Manufacturing report[77] identified a lack of available business support for manufacturing small and medium-sized enterprises (SMEs) as a hinderance to their ability to grow their businesses. For these businesses to be successful, they need to be able to access the ecosystem of suppliers, distributors, contractors, and other service providers that cater to small-batch manufacturers. The Chicago Neighborhood Business Development Centers (NBDCs) program provides funding to nearly 70 local non-profit chambers of commerce and business support organizations, who use the financial assistance to improve the small business ecosystem. The NBDCs offer a range of services, including supporting emerging business models and industry-specific needs, providing general business technical assistance, facilitating access to capital and assisting entrepreneurs with specific language needs.

Workforce development initiatives aimed at freight, logistics, and industrial jobs, along with local hiring programs, can increase quality jobs for Black and low-income underrepresented communities.

Procurement and project evaluation processes must include equity considerations to improve business opportunities and ensure infrastructure and development projects prioritize historically disadvantaged communities and benefit everyone.

Intentional action and commitment - Working toward equity requires intentional action and commitment. Specific, targeted initiatives such as direct neighborhood outreach, use of equity factors in data analysis, truly prioritizing vulnerable or disadvantaged community members and direct involvement of affected community members are effective strategies.

The State of Washington's Office of Minority & Women's Business Enterprises Toolkit for Equity in Public Spending suggests strategies to increase disadvantaged business participation in public contracting and procurement to increase diversity.

The City of Atlanta is taking numerous steps to tackle issues of equity head-on in its transportation planning processes. The One Atlanta Strategic Transportation Plan is a roadmap for a safer, more equitable and more sustainable network in which everyone can travel where they need to go and trust that the transportation system will get them there safely, reliably, and efficiently. It is built around four key pillars:

- A safe, welcoming, and inclusive city
- Thriving neighborhoods, communities, and businesses

---

[76] *(ATRI) American Trucking Research Institute (2023). Best Practices for Implementing DEI Initiatives.*
https://www.trucking.org/sites/default/files/2022-07/ATA%20DEI%20Best%20Practices_0.pdf

[77] *Foggin, M. (2019). The State of Urban Manufacturing. National Report. Urban Manufacturing Alliance.*
https://www.urbanmfg.org/wp-content/uploads/2017/11/SUM-National-Report-Final.pdf

- World class employees, infrastructure, and services, and
- Ethical, transparent, and fiscally responsible government

7.4 Relevance and Implication for Stonecrest

The City of Stonecrest has faced several natural hazards and face disruptions due to incidents and work zones daily. Equity has been considered in plans and programs. SFCSA has elaborate and successful stakeholder engagement practice and is utilized in all their plan and project development. While exploring application of best practices, SFCSA should:

Enhance their stakeholder engagement with additional stakeholders, new communication technologies, and interactive formats;

- Apply equity, particularly considerations of vulnerable populations, in hiring, planning, design, operations, policies, and programming;
- Encourage industries, freight operators, zoning to address equity; and
- Identify vulnerabilities, hazards, critical infrastructure, and risks, and develop a resiliency plan.

8 Key Takeaways from Relevant Best Practices for SFCSA

Freight access and mobility in, around, and through SFCSA are essential to its economic competitiveness, as well as to the daily activities of businesses and residents. With limited land and a high degree of mixing of people, land uses, and modes of travel, finding or carving out space for industrial businesses and freight vehicles alongside commercial districts, residential areas, parks, open spaces, and the rest of the transportation network can be challenging. New approaches to managing development and access to industrial areas are essential to sustain a thriving economy.

The freight shippers and carriers in and around the SFCSA depend on transportation infrastructure to provide crucial first and last-mile access to their businesses. Over the last decade, freight best practices have been increasingly incorporated into planning activities of sub-areas and freight clusters, State DOTs, and MPOs, while freight has also received significant focus from the U.S. Congress, federal transportation agencies, national trade and transportation groups, and business and industry leaders. Because of this, incorporating freight best practices into existing planning, policy, and programming responsibilities of the SFCSA is critical. SFCSA should apply the best current practices noted in this report to improve transportation in areas with high freight and industrial activity and improve efficiency among businesses operating in those spaces.

Previous sections reviewed trends, challenges, and opportunities in industrial and land development, e-commerce, technologies, and freight and logistics planning. Also included in the review were best practices in sustainable industrial development, accommodating freight mobility and facilities, and multimodal access and mobility. Technological trends such as autonomous vehicles, e-commerce, non-traditional delivery methods, alternative fuels, and curbside management will each have vast implications in small sub-areas with significant freight activities like SFCSA. Cargo-oriented development and infrastructure friendly to both people and freight could make the SFCSA more of a livable population center, especially for its strategic location as manufacturing and distribution hub. The opening of inland ports throughout Georgia and the growing need for fulfillment centers and other warehouses to facilitate deliveries in and around SFCSA make efficient land use even more critical. Development that includes intelligent growth policies and principles consistent with freight villages are potential options. Also, vertical developments that utilize scarce land efficiently are an essential future consideration for jurisdictions regulating industrial developments and the companies and developers looking to locate or expand existing operations in the SFCSA. Zoning practices and codes that are innovative, comprehensive, and relatively straightforward are vital to efficient land use in the SFCSA. From a land use and planning perspective, it is essential to make freight and the transport of goods sustainable to ensure this competitiveness in the future. Communication and collaboration should occur within the SFCSA, the Atlanta region, across Georgia, and the Piedmont Atlantic megaregion.

Logistics and business models that are sustainable and prevent redundancy can positively affect freight and transportation networks by taking trucks off highways and maximizing utility for each load. Business practices like outsourcing to delivery service partners are gaining popularity with platforms like Amazon and UPS. They will have vast implications for supply and demand concerning delivery capabilities. Emerging practices like omnichannel commerce, transportation network companies, and green supply chains will also affect freight movements. Vital land use decisions affecting freight, transportation, and livability in the SFCSA should consider the needs and demands of these logistical frameworks.

The cases and practices reviewed provide some insights into approaches that the SFCSA may consider as part of SFCP and future related studies. Below is a summary of lessons learned and best practices from the previous sections.

- Preserve industrial land using LDR and overlays is necessary;
- Mixed use zoning will be used increasingly in future and use of buffers would be critical;
- Redevelopment and warehouse designs should be responsive to changes in demographics, deliveries, new freight vehicles;
- Recognize increased demand for daily deliveries using a mix of traditional and new freight vehicles;
- Enhance infrastructure for fueling stations, cleaning stations, and truck parking;
- Support development of light industrial and flex spaces with limited noise and flexible operating hours;
- encourage commercial uses such as eateries, convenience stores, etc.; and
- modify and utilize zoning and building codes to prevent illegal and incompatible uses.
- recognize corridors and segments in poor or unsafe condition make appropriate investments and apply best design, management, and materials for infrastructure improvements;
- enhance its multimodal and intermodal access and connectivity;
- state of good repair and safety remains foundational considerations to have efficient freight mobility and increasing economic competitiveness;
- promote and encourage freight operators to use truck designated routes and comply with truck restrictions;
- resolve issues with gravel truck parking and explore providing public truck parking; and
- explore opportunities related to transportation operations, safety, and alternate fuel technologies.
- Apply complete streets principles and guidelines;
- Encourage micromobility as well as shared mobility opportunities and provide needed infrastructure;
- Explore additional travel options and access for commuting workers going to employment hubs;
- Use buffers between land uses and between trail and freight corridors; and
- Better balance freight mobility with active transportation and trail users.
- New federal funding and other grant programs may present opportunities to infuse funds directly into applying best practices for developing infrastructure projects that support efficient and responsible goods movement.
- Working with local, regional, and state-level partners from the public and private sectors from the early stages of the planning process is critical to leverage resources and for long-term success.
- Enhance their stakeholder engagement with additional stakeholders, new communication technologies, and interactive formats;
- Apply equity, particularly considerations of vulnerable populations, in hiring, planning, design, operations, policies, and programming;
- Encourage industries, freight operators, zoning to address equity; and
- Identify vulnerabilities, hazards, critical infrastructure, and risks, and develop a resiliency plan.
- Nonetheless, it's important to highlight that exemptions to these restrictions apply for trips related to business activities or maintenance, where the shortest practicable routes are pursued. However, this has resulted in traffic flow movement across the SFCSA on streets that

are not particularly designed for truck traffic to access some of the businesses and truck parking locations, resulting in poor pavement condition affecting all traffic flows.

- The SFCSA should coordinate with cities within and adjacent regularly to ensure a zoning district compatible with changing industrial demands and increase the SFCSA's potential to attract new businesses.
- Multiple types of vehicles use truck routes for different purposes; it may be helpful to consider a system that differentiates routes based on vehicle size, the types of facilities to which they provide access, and their connectivity to other parts of the roadway system.
- Direct financial assistance supporting and preserving industrial uses may be an essential tool alongside supporting non-profit/developer models such as non-profit industrial development corporations to facilitate industrial development (or redevelopment).
- With limited land areas, cities, and developers should embrace new designs for last-mile fulfillment centers that allow for multi-story and more vertical warehousing, localized neighborhood lockers and pick-up sites, and microhubs that bundle goods closer to delivery points in urban areas.
- As commercial and residential development and redevelopment continue in SFCSA alongside increased home delivery, competition for curbside space will become stiffer. Strategies to design, track, and otherwise manage curb usage will become increasingly important.
- Workforce development initiatives aimed at freight, logistics, and industrial jobs, along with local hiring programs, can increase quality jobs for underrepresented communities.
- Procurement and project evaluation processes must include equity considerations to improve business opportunities and ensure infrastructure and development projects prioritize historically disadvantaged communities and benefit everyone.
- Working toward equity requires intentional action and commitment. Specific, targeted initiatives such as direct neighborhood outreach, use of equity factors in data analysis, truly prioritizing vulnerable or disadvantaged community members and direct involvement of affected community members are effective strategies.
- The best way to understand community needs and priorities is through direct communication with community members. A combination of in-person and online engagement that uses plainly stated information highlights common goals or desires and asks simple questions that will help quickly drill into critical issues and foster the development of potential solutions.
- Given the relatively small size of the SFCSA, potential actions to improve resiliency by the cities alone may be limited. However, SFCSA should work with the DeKalb County, ARC and GDOT to consider transportation (in particular) freight resiliency more in its policy guidelines and project prioritization, especially related to the I20 corridor.
- Staff from the cities of Stonecrest and Lithonia should coordinate with its partners - ARC, DeKalb County, and GDOT - to investigate potential ITS improvements along the I20 and other significant corridors, including tracking the advancement of autonomous and connected vehicle technologies to ensure proper infrastructure as needed to keep the SFCSA area a competitive industrial area.
- Trail use in the Arabia Mountain area and shared mobility on city streets require transition to complete street designs and implementations.