Executive Summary

In recent years, **industrial-scale warehousing** for goods storage and distribution to businesses and retail customers has undergone rapid change with the growth of e-commerce and rising consumer expectations for same-day delivery services. The continuing evolution of **logistics industries** will have profound implications on the nexus between land use and the intermodal transportation network for years to come.

With its strategic geographic position, skilled workforce, major consumer markets, and robust transportation infrastructure that serve the entire Northeast, **New Jersey is an ideal location for the warehousing and goods movement industries**. These industries contribute significant economic activity, jobs, and ratables to the state.

Available land, particularly important farmland and open space, is under growing pressure in urban, suburban, and rural areas alike. Logistics warehousing can also generate substantial noise, dust, flooding, traffic, and air pollution, especially from medium to heavy-duty diesel trucks. These public health impacts tend to be concentrated in low-income and minority communities that are already overburdened because of New Jersey's long industrial legacy. Thus, proposals for new projects that can worsen public health and safety raise **environmental justice implications**.

Wherever warehouse development happens, **benefits and negative impacts** will follow that must be carefully and equitably considered. There is no shortage of solutions that are good for communities, the environment, and the economy. Guiding such development effectively will require a whole-of-government approach and commitment to long-range planning with a greater focus on the nexus between local and regional land use planning.

As **land-use planning and development review occur predominantly at the local level in New Jersey**, it is important to provide local governments with the technical resources and guidance necessary to assist them in developing land use plans, zoning, and project review procedures based on sound planning, information, and practice. Local development decisions should also be made in the context of a statewide plan and policy that balances competing needs – including protecting important resources and impacted communities, ensuring economic viability, and meeting industry need across labor, workforce safety, infrastructure, employee transit, and market needs.

To that end, the **New Jersey State Planning Commission offers the following considerations and guidance** in accordance with N.J.S.A. 52:18A-196 and 199, to facilitate greater cooperation and coordination among local governments, their counties, and their regions.

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The guidance aims to:

- Facilitate a proactive, rather than a reactive, approach;
- Provide municipal factors to consider when developing or updating a Master Plan and reviewing applications and requirements;
- Encourage a regional approach to planning, siting, and facilitating the logistics facilities.

These guidance documents go into how municipalities can achieve these aims across eleven related areas of focus. Local governing bodies and planners can utilize some or all of these areas, as they choose, to address the challenges they face. The detailed guidance documents consider:

- Types of Uses
- Municipal Considerations
- The Role of Redevelopment and Brownfields
- Public Health and Overburdened Communities
- Traffic and Road Safety
- Sustainable Design
- Mitigation Best Practices
- Community Involvement and Public Engagement
- Taking a Regional Approach
- Special Resource Area Considerations
- The Role of State Agencies

The Commission encourages the use of this guidance to provide a balanced approach to warehouse siting that considers environmental and economic sustainability and public health.

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Types of Warehouses

A **traditional warehouse** is used for storing products/goods for longer periods, while distribution and fulfillment centers store products for relatively lesser periods. The latter see much greater product loading and unloading flow velocity, especially at fulfillment centers, which deliver goods direct to customers.

Following recent updates to its **Trip Generation Manual, 10th Edition Supplement**, the Institute of Traffic Engineers (ITE) now lists six different categories of warehousing designations. For simplicity, these can be aggregated into **three main types of warehouses** that are associated with today's e-commerce landscape and logistical infrastructure. Each is situated in a strategic location and carries out a somewhat distinct activity. They include 1) Distribution or break-bulk facilities, 2) Fulfilment centers, and 3) Last-mile fulfillment facilities or stations. Some of the main differences between these include:

Distribution centers (also known as break-bulk facilities) tend to ship from retail to business, and to fulfillment centers, and typically do not deliver to end-users (i.e., external customers). Distribution centers are typically larger than fulfillment centers, are located away from major consumer markets (population centers), and are a complex transit hub for large quantities of bulk goods that generally do not require finishing or individual packing as they are temporarily stored on palettes before being shipped.

- When items arrive at a port, they go to a break-bulk facility where massive quantities are broken down into smaller clusters for transport to regional locations at fulfillment centers.
- Generally located in or near the largest industrial markets and seaports across the U.S., such as Newark, NJ.
- Often aggregated at massive industrial sites with hundreds of warehouses close to major multi-modal transportation hubs that can include shipping lines, rail lines, and extensive highway networks.
- Can be located an hour to 90 minutes away from the port (e.g., Lehigh Valley along Rt. 78) and still be completely functional for the tenants.
- Access to regional rail and highway networks is key for these larger facilities, since their customers are usually other, smaller fulfillment centers.
- Structures from 500,000 to more than 1.5 million square feet.

Fulfillment centers are a type of distribution center that pick and pack items from shelves **for individual delivery in order to "fulfill" online orders**. They are typically smaller than distribution centers and focus on quickly delivering goods to individual customers and offer an array of services to help with this goal. They typically receive, pick, pack, kit, label, and deliver products to people's doorstep in delivery vans. They are situated closer to consumer markets so individual items can be delivered quickly to people's doorsteps.

- Typically located on the outskirts of major metro areas in regional locations, items can either be stored or sent directly to consumers.
- In major metropolitan areas, items stored in regional warehouses are typically sent to last-mile facilities, which are located close to consumer homes, enabling fast delivery to customers.
- There is a diverse user base for mid-size buildings, ranging from middle-mile support for national users to regional or local businesses serving local customers.
- Structures between 150,000 and 500,000 sq. ft.

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Last-mile fulfillment facilities (or stations) are smaller fulfillment facilities serving the final leg of delivery rather than a literal measurement of distance. They serve consumers, either individual households (for online shopping) or the retail stores they shop at (for traditional retail).

- Typically located in urban and suburban infill areas.
- Locational impetus is to be near those customers, which can result in delivery vans/trucks traveling over local streets.
- Higher sprinter van and truck trips warrant more direct access to the interstates and truck networks.
- High parking requirements may need to accommodate hundreds of delivery vans/trucks.
- Structures between 50,000-to-150,000 square feet.

High Cube and automated warehousing: An emerging trend warranting attention

As available and ideally situated land in strategic locations becomes scarcer and more expensive to meet demand, fulfillment companies are increasingly embracing emerging technologies to move and store goods more efficiently. Warehouse facilities are changing to adapt to automation and reduction in available space by reducing footprints and modifying layouts and designs. High cube and automated warehousing are emerging trends to which decision-makers and planners need to pay close attention.

In contrast with the scale of more traditionally designed warehouses and distribution centers seen in both Pennsylvania and New Jersey over the past decade, high cube and automated warehouse construction is literally taking the industry to new heights, with some built as high as 180 feet tall nationwide. Instead of the standard model of storing goods on one ground floor, nearly all the space within a high cube warehouse (HCW) is dedicated to the rapid storage and removal of goods.

A high-cube warehouse (HCW) is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses.

A typical 1-million-square-foot warehouse has an average daily traffic rate of 1,740 trips, whereas a HCW of the same floor area has 8,180 vehicle trips per day — an estimated 370% increase.
Source: **Institute of Transportation Engineers): HCW Vehicle Trip Generation Analysis.** Whereas a typical large warehouse may have a building footprint between 150,000-to-500,000-square feet with a 40-feet ceiling height (shorter than an average 3-story home), a high cube warehouse can be 10-to-14 stories – potentially four times the height of a typical warehouse. Therefore, square footage may not be the best predictor of traffic generation. Source: **Lehigh Valley Planning Commission: Community Guide: High Cube & Automated Warehousing**

High cube warehousing is highly automated, with sophisticated racking and forklift retrieval systems designed to reduce human labor while dramatically increasing vertical storage capacity (i.e., project density), loading, and unloading speeds. The resultant efficiencies translate to more trucks moving a much greater number of products onto roadways. While HCW building design has the potential to reduce unwanted land consumption (if only at the site-specific level) and provide greater opportunities for a

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reduced carbon footprint and the retention of existing green infrastructure and habitat, the success of any strategy using density to reduce a specific uses' overall footprint, ultimately depends on the broader land-use policies in place. While HCW design offers a compelling opportunity to consume less land, municipal officials and planners must be careful to weigh the project-specific benefits against the potential for significant adverse impacts on community character, viewsheds, air quality, health, safety, and the transportation network.

Changes to existing traffic patterns, especially truck traffic, are a major concern for most residents and municipal reviewing boards. In addition to concerns for heavy truck traffic that higher product volume capacities can generate, height will also present challenges for emergency services personnel who will need special training and expensive equipment—particularly in instances where high cube towers are proposed in suburban and rural areas where police, fire, ambulance, and emergency medical services may be limited, underfunded or volunteer-based agencies not equipped to respond to a multi-story emergency. At the same time, accommodating such facilities in appropriate industrial locations with similarly sized building heights, or where offsetting elevation changes exist in the immediate landscape, in tandem with direct highway access, can mitigate impacts and conflicts, while providing an appropriate fit for a locally desired project or land use that might not otherwise work in other locations.

When reviewing projects that may be 4-to-10 or more stories in height, the consideration for these services becomes especially critical. Larger, taller, and high-powered (potential electrical, hazardous materials risks) automated facilities can pose serious risks to the community and emergency personnel and should not be permitted unless it can be demonstrated that there are adequately trained and equipped personnel and services to respond to emergency situations. Emergency services impact statements should be required in the form of a questionnaire for applicants to submit as part of the site plan review process. Likewise, establishing a municipal public safety or emergency services committee, including review by the local OEM, fire, and police departments, should be considered to facilitate enhanced communication and coordination between emergency response organizations affected by a development proposal. As it can be expected that highly automated facilities will have substantial impacts on the local and regional workforce as robotics technology and trends towards its application in new and retrofitted facilities continue to expand, municipalities should carefully assess potential employment impacts from HCW proposals.

Land Use Considerations for types of warehousing development

Warehouse development comes in many shapes and sizes, and zoning should evolve to keep up with the changing variety of uses and trends as the differences could mean dramatically different impacts and outcomes, and whether a project is compatible for a site and beneficial to a community. Land use regulations should not simply lump "general industrial" or "warehouse" together, as they can be profoundly different, entailing different impacts, which warrant greater specificity as to appropriate siting and design standards where permitted.

As such, it has never been more important that municipalities update and refine their planning and zoning regulations to **differentiate among warehouse use types** to ensure that local reviewing boards are equipped to adequately assess the extent to which a community's transportation network and land uses can handle the proposed traffic and resultant impacts, or whether other infrastructure such as water, sewer, and municipal services, have the capacity to meet demand. Finally, in reviewing existing zoning districts, an appropriate mix of uses should be considered. For example, in rethinking their industrial

zones, municipalities should consider zoning to support manufacturing or a mix of compatible activities, as this type of space may create better-paying jobs than warehousing spaces.

Area and site-specific considerations

Given the serious impacts on health from mobile sources of air pollution associated with the transportation sector, and particularly from diesel truck emissions, largescale warehouse facilities (e.g., above 200,000 sq. ft. of impervious surface), particularly those served by a larger proportion of heavy tractor-trailers, should not be sited where resultant freight movement will have a significant negative impact on residential or downtown areas, retail corridors, scenic byways, or other sensitive receptors, especially locations where people are already overburdened by excessive heavy truck traffic and high air pollution levels.

Local zoning should exclude large-scale warehouse development in areas located outside of State-approved sewer service areas, or other areas lacking the appropriately scaled infrastructure, transportation systems, emergency, or other municipal services necessary to sustain the costs, and maintenance, or improvements that such projects will entail over their lifetime. Unless appropriate highway or freight rail infrastructure and access are in immediate proximity, such uses and supporting zoning districts should generally not be located outside of State Smart Growth Areas, particularly not in Rural (PA-4) or Environmentally Sensitive (PA 5) State Planning Areas. Warehouse-related zoning should likewise exclude areas and/or avoid sites comprising State-regulated areas, including, flood hazard areas, freshwater wetlands, riparian zones, transition areas, steep slopes, and threatened and endangered species habitat as identified under NJDEP's Landscape Project. In addition, areas and sites targeted for preservation under local, county, regional, or state programs and plans (including Agricultural Development Areas), should also be avoided.

In all cases, zoning should only permit major facilities (above 500,000 square feet of impervious surface), where there is direct and immediate access to interstate and major highways (of adequate capacity) and/or freight rail lines, preferably from industrial zoning districts. At the same time, accommodation should be made for customers in more rural and less suburban areas, where smaller last-mile distribution facilities (structures between 50,000-to-100,000 sq. ft.) may be needed to address the final leg of the delivery system, and generally involve less noxious equipment, comprising a greater proportion of delivery vans than tractor-trailers.

It should be noted that last-mile facilities, can, however, still generate high levels of traffic, and should be located in State-designated Centers, Cores, Nodes, Redevelopment Areas, and other formerly developed and underutilized sites, proximate to highway interchanges, appropriately scaled highways, and other transportation infrastructure. In addition, some rural communities may contain abandoned manufacturing, and resource extraction sites (e.g., quarries) where warehouse uses may be a realistic and appropriate choice for local economic development.

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Municipal Considerations

At the local level, where the Municipal Land Use Law (MLUL) grants towns the power to enact a master plan to set land-use priorities and direction, as well as adopt a zoning ordinance to dictate where and in what form various types of development should happen, municipalities are entrusted with the responsibility to ensure that uses like warehousing are developed properly so that they can contribute to the economy and consumer welfare without harming local communities and the environment.

Update Master Plan and Zoning first

Many towns in New Jersey are finding that their communities are particularly vulnerable to poorly sited and scaled warehousing projects because they zoned large areas of their community, particularly farmland in rural areas, for broadly applied "light industrial" uses. As a result, many **land-use plans and zoning ordinances may be inadequate** in their present form, to address the pace and scale of new warehousing proposals and their impacts on neighborhoods, local roads, adjacent communities, and finite resources. Indeed, much of the current outcry from municipalities reviewing and approving warehouse proposals that they are unhappy with comes in cases where the projects largely conform to local zoning standards. Given the scale and intensity of new and emerging warehousing trends and building types, **zoning that simply permits generic warehousing may not be sufficient** to address the different types of warehousing uses, nor to give a municipality the performance standards it needs to adequately review an application or require developers to properly minimize and mitigate impacts.

To systematically address warehouse development, communities should proactively plan for warehouse projects to prevent land-use conflicts that harm residents, other communities, and the environment before they materialize, and guide sustainable development. **Proactive planning** ensures long-term benefits and provides a predictable business environment, with consistent expectations for developers and residents alike. At a minimum, communities should conduct a **Master Plan reexamination and update their zoning ordinances**, relevant redevelopment plans, and land development policies that comply with UCC building codes. In this way, local governing bodies can ensure that they clearly define and distinguish between more traditional industrial-commercial uses and the variety of warehouse types—from the smaller last-mile delivery facilities (50,000 and 150,000 sq. ft.) with limited truck trailer traffic to largescale distribution centers and high cube warehouses that generate much greater levels of heavy of truck traffic that are mobile sources of air pollution.

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Zoning districts should likewise be **appropriately scaled** to match the type and intensity of land use in surrounding areas to minimize and avoid on-and-offsite impacts and offer the best outcome for all communities, including **sensitive receptors** such as schools, daycare centers, recreational parks, places of worship, and overburdened communities. While municipalities are understandably attracted to the tax revenue that comes from warehouses, it is imperative that as part of both the planning and development review process they analyze the potential for wider regional impacts, particularly to adjacent and nearby communities be adequately examined and addressed, **so that impacts and are not unfairly placed** on other municipalities and their residents.

Municipalities seeing greater pressure for larger and/or multiple projects should likewise consider undertaking **comprehensive updates** to their Master Plans and associated land use and circulation elements, with particular emphasis on appropriately accommodating warehousing and goods movement where it makes sense, and implementing a Complete & Green Streets Policy in areas where delivery trucks and vans will interact with passenger vehicles, pedestrians and bicyclists. Planners should examine **opportunities and constraints**, consider infrastructure needs, existing deficiencies, and capacity (e.g., water/sewer, truck parking and services, transportation facilities, levels of service, and access tolerance); ensure that permitted uses are compatible with planning goals (e.g., public health, safety, climate resilience, environmental justice, etc.) of the community, of adjacent communities and of the county, regional and state plans.

These efforts should also be informed by local and regional transportation plans and corridor studies undertaken and coordinated early in the planning process by municipalities, and their county, regional, and metropolitan planning partners. **Proactive transportation planning** will support zoning changes that will avoid and mitigate adverse impacts and restrict warehouse development where necessary. The most important consideration when planning a logistics facility is its location. Warehouses located in residential neighborhoods or near other sensitive receptors expose community residents and visitors to the air pollution, noise, traffic congestion, and other environmental impacts they generate. Once a property is zoned for warehousing, a local land use board has little authority to deny a compliant application based on off-site conditions such as traffic. Likewise, unless a project is accessed by a State roadway, the New Jersey Department of Transportation has little authority to review it under the NJ State Highway Access Management Code.

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Impact Analysis

Subdivision and land development ordinances should include requirements for impact studies so communities can make more informed decisions on warehouse proposals and to help ensure that residents and neighboring communities do not bear the brunt of costs and adverse impacts associated with the proposed development. An analysis of project impacts should consider land use, traffic, the transportation network, supporting infrastructure, wetlands, flood plains, riparian lands, stormwater drainage, habitats, site remediation, cultural and historic resources, proximity/buffers to residential dwellings, as well as economic and employment factors and potential effects on public and emergency services and facilities, local businesses, workforce, residents, and overburdened communities. The analysis must also assess the proposed development for consistency with local and regional master plans.

Cost-Benefit Analysis

In addition to required impact studies, towns should request or conduct their own cost-benefit analysis to weigh projected revenues against costs (e.g., municipal services) and impacts, including wages, benefits, and employment demand. Asking these important questions will help ensure that a community doesn't mistakenly focus on projected job creation, wages, and tax revenue, without fully understanding whether such benefits justify the potential costs in terms of municipal services, facilities, infrastructure, local businesses, and potential loss of value in surrounding real estate, diminished community character, quality of life, public health and safety over the construction and lifetime of the project. Subdivision and land development ordinances should likewise be amended to include standards that consider the equipment and capital needs of emergency service operations, including the participation of such personnel in the application review process. Finally, towns should consult with their land use attorney to ensure that they are not requiring excessive reports.

Special Exceptions and Conditional Uses

Rather than allowing these uses by right as part of the local land-use regulations, municipalities can **exert greater control** over the site plan review process by alternatively permitting them as special exceptions and conditional uses, which may provide better outcomes, particularly for largescale warehouse projects, including high cube warehouse (e.g., above three stories in height). Usually reserved for those land uses that are almost certain to have a significant impact on the zoning district or the community and region as a whole, special exception areas and

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conditional uses are for those uses that warrant additional safeguards, such as landfills, telecommunications towers, asphalt plants, and quarries.

Distribution warehouses are not benign uses and can have substantial health, air quality, noise, traffic, and inequitable impacts based on their intensity and siting. For example, under Conditional Use, an applicant could be required to meet certain criteria regarding the use of electric vehicles (e.g., pollution-free zero-emission trucks) in a manner consistent with meeting DEP's goals under the ACT Rule. Municipalities must take care, however, to ensure the zoning ordinance provision for conditional uses satisfies the State law and requires that the standards be specific and clear enough that applicants for conditional use permits know the "limit and extent" of the conditions, as many local ordinances with vague generalities have been declared invalid.

Overlay Zones

Municipalities can explore enacting an overlay zoning district, which **applies an alternate land development scenario and criteria** to all areas within a defined overlay boundary, regardless of the underlying base zone. Overlay zoning provides the ability to apply a unique set of standards, tailored to a specified area without having to amend all other relevant sections of the code, or to negotiate additional measures on a project-by-project basis that wouldn't otherwise be applicable or needed outside of the overlay zone. Similar to a redevelopment plan, overlay zoning allows existing zoning regulations to be superseded or complemented to solve a known problem, or to meet specific community goals.

Overlay zones are often used to **protect special features** within the defined area, such as cultural and natural resources, wetlands, steep slopes, flood hazard areas, beaches, etc. They can also be used to promote specific or anticipated development, such as warehouse developments while restricting or limiting polluting activities, development density, and intensity. Other potential standards or regulations in an overlay zone may include setbacks (building and vegetation buffers), lot sizes, building height and footprint, impervious surface reduction, enhanced standards or performance measures for landscaping, stormwater and green infrastructure, façade, green building, and resilience measures such as flood-proofing to high water levels, and greater setbacks and management along scenic roads, driveways, or highway access along a commercial corridor. Overlay zones should be used with caution and empirical conditions should be documented in the Master plan as quickly as possible after adoption to justify and support the overlay zone.

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Continue Redeveloping formerly Developed Sites

Utilizing data from the Department of Environmental Protection's **Land Use/Land Cover mapping project**, and a **value-added analysis** by researchers at Rowan and Rutgers Universities, a municipality can significantly reduce land consumption. According to assessments of **2015 land use/land cover data from the Department of Environmental Protection**, since the Great Recession, most of New Jersey's population growth and development has been occurring in State Smart Growth Areas, Centers, Metropolitan and Suburban Planning Areas, easing pressure on New Jersey's remaining undeveloped and unprotected land. This and other information, such as the results from the 2020 census data, indicate very positive vital signs about the resurgence and livability of the State's older cities and state-designated growth areas. Such trends are to be celebrated and further encouraged through continued redevelopment efforts and the use of the tools that make it possible.

The **New Jersey Local Redevelopment and Housing Law** (Redevelopment Statute or LRHL), **NJSA 40A:12A-1 et seq.**, gives municipalities access to powerful tools that are proven agents in making redevelopment projects happen. Designed to revitalize distressed urban areas and avert sprawl by incentivizing the redevelopment of blighted, abandoned, or underutilized sites such as Brownfields that suffer from real or perceived contamination, the Redevelopment Statute provides a variety of **tools that empower municipalities** to be active partners in the redevelopment process. They include the ability to choose and designate redevelopers, negotiate, and execute redevelopment agreements, provide incentives in return for certain public improvements, negotiate payments in lieu of taxes agreements (PILOTs), and issue bonds secured by project revenues to finance project components or other infrastructure improvements (e.g., offsite roadway infrastructure needs/upgrades), as well as negotiate the sale of public property without bidding, and exercise the powers of condemnation to acquire property.

Equally important is that **the Statute removes certain constraints under the MLUL**, allowing greater control over performance standards (such as those to minimize and mitigate public and environmental impacts), including a much higher level of specificity concerning site/architectural design (e.g., rooftop/parking canopy solar, EV charging infrastructure, green infrastructure), physical planning, and necessary transportation infrastructure improvements. If the primary issue concerning warehouses is the impacts of the development, truck traffic, and associated mobile sources of air pollution on the community, then the powers enabled under the LRHL should be focused on addressing those concerns. For example, the tax and land use incentives made available under the LRHL could be applied as financial feasibility offset against such pollution control requirements as mandating the use of electric trucks consistent with meeting DEP's goals under the ACT Rule.

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Design Standards under the Local Redevelopment and Housing Law

The Redevelopment Statute provides for greater specificity in planning and design, giving municipalities greater control of a designated area than under traditional planning and zoning techniques. Redeveloper agreements, abatements, PILOTs, and other developer incentives can be utilized to **achieve enhanced performance standards, Master Plan goals, and objectives** of interest to the community and region. Examples of sustainability standards could include enhanced energy efficiency and greenhouse gas reduction measures, use of 'green' (e.g., LEED-certified) building design and materials used, requiring solar on roofs and parking lots and for powering the building's operation, electric vehicle charging stations for a minimum percentage of required electric trucks, as well as electrical hook-ups for truck parking areas, including for refrigeration trailer units, which will minimize impacts from diesel-run units on neighboring areas and air quality.

Other enhancements could include onsite public amenities such as completing a planned segment of a dedicated bike path, trailhead public access point or linkage, enhanced habitat buffering, and green infrastructure. Consideration should also include the use of rain gardens and the protection of onsite habitat to buffer any waterways, wetlands, and associated flood hazard areas. Such measures also increase asset value and decrease operational costs through energy, water, maintenance, and waste savings, while making better neighbors. PILOT agreements should only be considered for warehousing if they go "above and beyond" existing local performance standards and requirements.

While the trend in redevelopment is to be strongly encouraged, it is, however, not appropriate to designate large tracts of undeveloped, non-blighted, productive farmland and forested sites (particularly outside of State Smart Growth Areas), for redevelopment or rehabilitation. Local officials, land planners, and developers should be mindful that the Redevelopment Statute provides the Commissioner of the NJ Department of Community Affairs (DCA) with the authority to reject a local redevelopment designation in instances where criteria specified in the LRHL are not met.

Develop where infrastructure capacity exists to support it

Encouraging development that utilizes existing infrastructure is a major tenet of smart growth. It makes the most of investments already made in rail, roads, bridges, and underground infrastructure (sewer, water, natural gas) while strengthening local tax bases and protecting open space and resources like farmland that can't be replaced. Before taking on new infrastructure obligations, decision-makers should strive to ensure a better return on existing public and private investments. As prime locations within more developed areas or near highway access continue to be developed, it is increasingly important that various levels of government work to proactively **identify well-suited locations and opportunities to accommodate appropriately-scaled warehouse development**, while continuing to facilitate the trend in redevelopment and

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infill, with consideration given to the condition and adequacy of existing infrastructure and roadway capacity. For example, not all roads are the same, and local and county roads are generally not built to handle heavy truck traffic, especially large volumes.

All levels of government should also continue to promote warehouse development, where appropriate, at former industrial sites, Brownfields, and landfills to help facilitate remediation and clean-up. This not only helps **address existing negative impacts and environmental harm** but provides economic and employment benefits. Many of the known former contaminated sites and abandoned landfills are proximate to both the Delaware River Ports and the NY/NJ Harbor complex, including sites with direct access to freight rail. The use of redevelopment agreements and PILOTs also offer powerful incentives to encourage such uses where they make the most sense while affording opportunities for towns and redevelopers to partner on making infrastructure and other improvements that can minimize and mitigate impacts.

Manner of development

In addition to considering different warehouse development types, their density, and potential impacts on quality of life, public health, and safety, local decision-makers should become familiar with the manner and context in which they emerge and their interplay with zoning, subdivision, building codes, and other regulations. In redevelopment, the **degree of municipal control** depends on the scale and extent to which a structure and/or site is redeveloped, and whether the project is governed by the Redevelopment Statute and undertaken in accordance with a redevelopment plan and redeveloper agreement adopted by a municipality. While zoning and building codes are controlling in all cases, local development and site plan standards may differ for minor projects of varying sizes.

For **building retrofits**, the subdivision and land development ordinance are generally not applicable where there are no proposed changes to the existing use, structure, or site, and any changes are largely internal and without any volume changes. However, if traffic, energy, or the volume of products stored will substantially increase and/or change, then emergency response needs may change, which may justify their being treated differently and more like a new development proposal by local government. Where retrofits only require a building permit or zoning permit for a use change, municipalities should, at a minimum, consider the implementation of assessment forms with required zoning applications to collect such information as changes in employee and product volumes, utility usage, traffic generation, fleet size and fuel types, energy source (for heating/electricity), etc., for future transitional planning, so municipalities can anticipate and plan for shifts in services.

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Use of underutilized land in developed areas

In addition to accommodating warehouse demand through the redevelopment of existing warehouse facilities, Brownfields, and contaminated sites, it is important to **identify the needs of smaller distribution facilities** like the "last mile" delivery stations that have been opening throughout the state. These smaller facilities or stations can range between 75,000 and 150,000 square feet (three stories or less) and serve the unceasing demand for e-commerce as it becomes more decentralized and is located in smaller geographic areas closer to the customer base. They could in some instances, be **ideally suited in developed areas** on land formerly occupied by obsolete office buildings, movie complexes, shuttered malls, brick-and-mortar retail centers, and other stranded assets that are no longer economically viable. Many such sites can be found in both **rural and suburban Commercial-Manufacturing Nodes** and Centers throughout the state, where their reuse through repurposing existing buildings or demolishing them, could accommodate smaller standalone projects, or be part of a larger mixed-use redevelopment, where last-mile facilities would benefit from being in or near population centers.

The built environment contains more buildable land than might be obvious at first glance. Unused surface parking and other underutilized spaces, particularly in many less developed towns and suburban areas, represent a de facto land bank that is worth a second look. Communities should **examine potential opportunities to site smaller projects** than can mimic a traditional flex footprint, ranging in size from 50,000 to 150,000 square feet. However, it is important to keep in mind that the parking needs for last-mile facilities can be very high, because of the need to accommodate hundreds of delivery vans and small trucks. Smaller, formerly developed, or improved sites must still be able to accommodate adequate tractor-trailer access, and towns must still assess impacts on residential and adjacent areas when siting smaller facilities in these locations.

Finally, towns should be careful to not rezone important and strategically located, commercial and retail sites, just because they may not be economically viable in their current configuration. In many cases, towns can revitalize tired commercial strips and struggling big-box shopping centers with creative redevelopment plans and related tools that can reimagine and repurpose such sites into vibrant and walkable mixed-use destinations, where a combination of residential, retail, office, and commercial uses can coexist in a denser vertical format that serves a variety of purposes of interest to communities.

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Air quality and health impact considerations

Emissions of air pollutants and greenhouse gases from diesel-powered delivery vans and tractor-trailers represent the most substantial environmental impact from warehouse facilities. With mounting evidence that diesel exhaust poses major health hazards, reducing diesel pollution has become a public priority, as has the need for careful consideration of where intensive diesel sources of pollution should be located and mitigated. The World Health Organization (WHO) classifies diesel exhaust as carcinogenic to humans, and abundant research has shown that its components, which include nitrogen oxide and particulate matter, are harmful to human health even at low concentrations and through short-term exposures. Among numerous other pollutants, diesel trucks visiting warehouses emit both nitrogen compounds (a primary precursor to smog formation and a significant factor in the development of respiratory problems like asthma, bronchitis, and lung irritation) and diesel particulate matter (a subset of fine particulate matter that is smaller than 2.5 micrometers and a contributor to cancer, heart disease, respiratory illnesses, and premature death).

On December 20, 2021, the New Jersey Department of Environmental Protection (NJDEP) took a major step toward reducing exposure to diesel pollution by adopting the Advanced Clean Trucks (ACT) rule, which provides a regulatory path for electrifying everything from delivery vans to tractor-trailers in the state. The ACT rule requires truck manufacturers to sell and deliver pollution-free zero-emission trucks (instead of diesel and gasoline vehicles) to New Jersey beginning in 2025 and requires 40-75 percent new zero-emission truck sales by 2035. The rule requires that electric truck sales ramp up 5% each year until they comprise 55% of all “Class 2b” vehicles (pickups and vans) sold in 2035. By the same year, 75% of “Class 4-8” trucks (all buses and heavy-duty trucks) sold must be electrics.

New Jersey is one of several states to have adopted California’s ACT rule in recent years, following major industry advances in the availability of zero-emissions trucks, which cause the difference between lifetime costs for electric and diesel trucks to decline every year. Today, over 100 models of electric trucks and buses are on the market, including delivery vehicles, tractor trucks, shuttles, and charter buses, among others. Businesses now have the option to purchase electric trucks and buses that have significantly lower and more predictable fuel and maintenance costs. With New Jersey’s zero-emission phase-in rapidly approaching, and the decreasing technology costs, municipalities should require warehouse developers to construct the necessary infrastructure to prepare for the zero-emission future of goods movement.

Overburdened Communities

In addition to statewide efforts to electrify the truck fleet, under New Jersey's **Environmental Justice Law** (N.J.S.A. 13:1D-157, also see **NJDEP Office of Environmental Justice**), signed into law by Governor Murphy on September 18, 2020, the NJDEP now maintains a list of **overburdened communities** which are located within 331 different municipalities. Pursuant to the Law, "overburdened communities" are defined as Census tracts with low-income, minority, or non-English speaking populations categorized by specified thresholds. As part of the Law, the NJDEP is charged with ensuring that state agency actions do not result in the siting of additional noxious land uses in these neighborhoods and requires it to evaluate the environmental and public health impacts of certain specified facilities on overburdened communities when reviewing specific types of permit applications.

While warehouses are not included in the list of eight types of facilities specified under the Law (a warehouse is not in and of itself a producer of pollution), there is no denying that warehouse operations serve to increase truck traffic volume, which increases mobile sources of air pollution and greenhouse gas emissions when they are located near communities already disproportionately impacted by environmental harms and risks. Recognizing these and other public health stressors, municipalities with overburdened communities should, at a minimum, consider zoning changes as part of a Master Plan reexamination process, to exclude certain types of distribution warehouse facilities (e.g., above 75,000 or 100,000 sq. ft., including those above three stories) particularly those with a preponderance of tractor-trailers, in areas where air quality is already categorized as chronically 'Unhealthy' by **USEPA's Air Quality Index (AQI)**, or as so demonstrated through information and data available at NJDEP or in areas proximate to sensitive receptors.

As the primary public health concern with the siting of warehouse facilities is diesel truck emissions, zoning, among other tools such as overlay zoning, conditional use requirements, redevelopment plans/redeveloper agreements, and enhanced site design/performance standards, could further clarify pollution reduction and mitigation standards, and instances where certain types or intensities of warehouse uses would be permissible. For example, smaller facilities such as last-mile stations (those using a preponderance of smaller delivery vans), facilities required to use a higher percentage of non-diesel-powered vehicles (e.g., 25-40% or more of electric trucks), or facilities required to include mitigation measures such as solar roofs/parking canopies and green infrastructure/buffer/landscaping standards are just a few examples of where local standards could permit a warehouse project that could provide important local benefits in job creation, ratables, economic development, and environmental remediation (e.g., redevelopment of a contaminated site), which are critically needed in overburdened communities.

Traffic and Road Planning

Municipalities are limited in what kind of "off-site" improvements they can require of developers, including improvements to roads or other infrastructure. That is why it is best to study traffic-intensive uses like distribution warehousing as part of a **targeted corridor plan or update the land use and circulation plan** in coordination with NJDOT, county, and regional agency partners. Ideally, this effort should be done as part of a comprehensive review of the municipality's Master Plan and land use ordinance update process. If this effort is completed upon receipt of an application for a new project, it may be too late to mitigate many offsite impacts that could have been avoided through proactive planning.

Requiring traffic and road impact studies both before building and after the warehouse is operational (perhaps requiring a follow-up study as an agreed condition of approval) is a realistic and critical tool to ensure any increased traffic anticipated, and then realized, by a new warehouse can be properly accommodated. The studies should identify all on-and-offsite transportation impacts, including vehicular, truck, pedestrian, multimodal, and transit access.

Traffic studies should extend beyond the site and analyze the anticipated truck routes between the project location and the closest highway access points, including the types of roadway infrastructure to be used and impacted, such as the capacity of bridges, intersections, interchanges, and highways and proposed truck routes. Because different classes of streets and roads are designed for different types and lengths of trip-making, not every road segment will necessarily be appropriate for every mode of travel. **Truck traffic can present substantial safety issues.** Collisions with heavy-duty trucks are especially dangerous for passenger cars, motorcycles, bicycles, and pedestrians. These concerns can be even greater if truck traffic passes through residential areas, school zones, or other places where pedestrians are common and extra caution is warranted. Whatever the level of review, analysis of all such traffic safety aspects should be a requirement of the developer. All such analyses, along with information as to upgrades needed to address impacts should be presented for review/approval.

Given the public health and safety concerns, reviewing boards should ensure that **proposed truck routes** can be identified that are away from downtown centers, residential areas, historic districts, school zones, recreational parks, daycare centers, places of worship, and overburdened communities (especially those that are already subjected to chronically unhealthy air, noise, and other environmental stressors). **Costs and necessary improvements** to identified conflict points, diminished levels of service, and other related transportation capacity concerns along these routes should be identified and quantified. Where road widening and/or expansion is proposed, environmental impacts (e.g., flooding, runoff, degradation of water, and other natural resources) and mitigation measures should likewise be identified.

Studies should involve the developer, municipality, and all other relevant authorities, including counties, bridge/tunnel commissions, NJDEP, and NJDOT as appropriate. It is also important to note that many warehouses are approved and built on speculation, meaning the end-user is not

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known. The end-user can greatly affect the traffic generation and impacts felt across municipal boundaries, which further reinforces the need for more robust planning, zoning, site design standards, and impact analysis.

For larger warehouse proposals that are anticipated or likely to have negative impacts on **adjacent or nearby communities**, the hosting municipality should consider funding its own impact analysis (unless agreed by the applicant and/or funded as part of a redeveloper's agreement) to at a minimum, determine whether truck routes outside of municipal boundaries will negatively impact their neighborhoods, downtowns, historic areas, etc., and to send a copy of this evaluation to the neighboring municipality and county at least thirty days before the project is heard.

If there is a concern that anticipated or planned truck routes will not be followed, the reviewing board and applicant, with assistance and input from the county, and NJDOT, where appropriate, should identify the likely reasons why alternatives routes might be chosen, and develop strategies that would address and mitigate those possibilities.

Specific Traffic Considerations

- Do the configuration of the roads and the geometry of the existing turnarounds, ramps, circles, or exits allow for unimpeded movement of the additional traffic?
- Do the standards and road design of the secondary road network provide the proper turning radii and overpass clearances for the proposed traffic increase?
- Is the road design of the secondary route constructed to handle the proposed increase in traffic loads?
- Will traffic be diverted either regularly or an alternate route basis into neighboring municipalities, e.g., where will truck traffic be routed in instances of nuisance flooding or major storm events where site accessibility issues arise?
- What strategies will be in place to prevent unsuited alternative routes from becoming the "go-to" route?
- What strategies will be in place to prevent highway toll road avoidance resulting in undesirable desirable routes being favored?
- Do the standards and road design allow for compatibility with freight movements and a complete street-friendly design, where appropriate?
- How do proposed changes to weight limits on local, county, and State roads provide for designated truck routes?
- Does the condition and design of the road prevent structural damage to adjacent structures?
- Is there a gate management plan (e.g., staggered shifts as a condition of approval) in place to prevent queuing on affected roads?
- Will patronage to local businesses or commercial areas be impacted if destination access becomes impaired by levels of truck traffic not conducive to visitation?

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Best practices to mitigate negative impacts on traffic and roads:

- Designing, clearly marking and enforcing truck routes that keep trucks out of residential neighborhoods and away from other sensitive receptors.
- Installing signs in residential areas noting that truck and employee parking is prohibited.
- Requiring warehouse facilities to establish specific truck routes and post signage between the warehouse/distribution center and the freeway and/or primary access arterial that achieves the objective. The jurisdiction may not have an established truck route but may take the opportunity to develop one.
- Requiring warehouse facilities to specify on the facility site plan primary entrance and exit points.
- Constructing new or improved transit stops, sidewalks, bicycle lanes, and crosswalks, with special attention to ensuring safe routes to schools.
- Consulting with the local public transit agency and advocating for increased public transit service to the project area.
- Designating areas for employee pickup and drop-off.
- Implementing traffic control and safety measures, such as speed bumps, speed limits, or new traffic signs or signals.
- Placing facility entry and exit points on major streets that do not have adjacent sensitive receptors.
- Restricting the turns trucks can make entering and exiting the facility to route trucks away from sensitive receptors.
- Constructing roadway improvements to improve traffic flow.
- Preparing a construction traffic control plan before starting site work, detailing the locations of equipment staging areas, material stockpiles, proposed road closures, and hours of construction operations, and designing the plan to minimize impacts on roads frequented by passenger cars, pedestrians, bicyclists, and other non-truck traffic.

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Sustainable Design

According to the US Environmental Protection Agency, sustainable building practices include both the structure and use of processes that are environmentally responsible, and energy and resource-efficient throughout a building's life cycle from siting to design, to construction, operation, maintenance, renovation, and demolition. Green building strives to preserve and restore the surrounding habitat, making the most efficient and least disruptive use of water, drainage, energy, and natural resources.

Building construction and operations can have extensive direct and indirect impacts on the environment, society, and the economy, which are commonly referred to as the 3 P's ('People', 'Planet', 'Pocketbook').

Beyond distinguishing between the variety and intensity of uses and regulating where they should and should not go, local decision-makers and planners need to think carefully about design and sustainability standards to ensure that warehousing development and the many disparate impacts it generates are both minimized and **compatible with the surrounding community**. Design must not undermine valued community characteristics or the carrying capacity of physical and natural infrastructure, from the transportation network to local streams and watersheds that may already experience nuisance or severe riverine flooding.

When incorporating architectural **design standards** into local ordinances, municipalities should include a variety of amenities and features addressing project location, scale, intensity, local context, aesthetics, and adjacent roadway typology. They should ensure adequate **buffers** to neighboring uses and provide generous landscaping requirements, including the use of adequately-sized berms and larger plant/tree materials to soften and screen dominating structural features, while reducing noise, dust, odors, and visual impacts.

Green infrastructure standards and stormwater ordinances should address water conservation, low impact "green" stormwater management via options such as pervious parking and drive lane surfacing, green roofs, and bioretention systems. Planting plans should use native species that will prove more durable and resilient to local conditions while maximizing carbon sequestration potential. Rain gardens and other green infrastructure and non-structural enhancements for the treatment of stormwater (particularly for communities with chronic combined sewer overflow and nuisance flooding problems) provide both water quality and wildlife benefits, as well aesthetic values that complement landscaping, public spaces, and associated amenities such as sidewalks and bike paths.

Design standards should also address a building's shape, scale, color, pattern, texture, and space, using a variety of **architectural elements**, styles, and materials to articulate and break up a structure's monotony and line of site in a manner that reduces both visual and environmental impacts. Defined entry features, columns, awnings, adequate windows, lighting, and a variety of

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durable materials, all provide relief from flat facades, fragmenting large, and otherwise featureless spaces, masses, or volumes.

Municipalities should require developers of new warehouse construction to meet enhanced green infrastructure standards that go above and beyond the state's minimum requirements in the Stormwater Management Rules. For example, enhanced green infrastructure improvements can make a tremendous quality of life improvement to overburdened communities—many of which experience chronic and disproportionate flooding.

Projects should be designed with their **long-term viability in mind**. Constructing the necessary infrastructure to prepare for the zero-emission future of goods movement not only reduces a facility's emissions and local impact now but can also save money as regulations tighten and demand for zero-emission infrastructure grows. Buildings should be designed to support solar installation (per P.L.2021, c.290), but preferably should include solar arrays and solar panel or green rooftop installations; and operational standards should restrict truck idling time, and encourage off-peak goods movement and staggered shifts, to minimize traffic impacts. In addition, towns must meet the **minimum requirements for electrical infrastructure** to support future EV charging (i.e., Electric Vehicle Supply/Service Equipment (EVSE) and Make-Ready parking spaces), pursuant to PL 2021, c 171, which includes the adoption of Model Statewide Municipal EV Ordinance, the statewide municipal ordinance.

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Municipal Mitigation Best Practices

Examples of best practices for siting, design, and operation of warehouse facilities include:

- Siting largescale warehouse facilities as close as possible to rail, national highway networks, and major arterial roads, which are designed (along wide lanes, gentle curves, long forward sightlines, and infrequent access points) to move large volumes of traffic at high speeds that accommodates vehicles and volumes of all sizes.
- Siting largescale warehouse facilities so that their property lines are between 500 and 1,000 feet from the property lines of the nearest sensitive receptors, (e.g., homes, schools, daycare centers, places of worship, hospitals, community centers, and parks).
- Creating physical, structural, and/or vegetative buffers that adequately prevent or substantially reduce noise and pollutant dispersal between warehouses and any areas where sensitive receptors are likely to be present.
- Providing adequate areas for on-site parking, on-site queuing, and truck check-in that prevent trucks and other vehicles from parking or idling on public streets.
- Placing facility entry and exit points from the public street away from sensitive receptors.
- Locating warehouse dock doors and other onsite areas with significant truck traffic and noise away from sensitive receptors.
- Screening dock doors and onsite areas with significant truck traffic with physical, structural, and/or vegetative barriers that adequately prevent or substantially reduce noise and other pollutant dispersals from the facility towards sensitive receptors.
- Posting signs clearly showing the designated entry and exit points from the public street for trucks and service vehicles.
- Posting signs indicating that all parking and maintenance of trucks must be conducted within designated on-site areas and not within the surrounding community or public streets.
- Ensuring the site plan provides safe truck rest, amenity, and service areas, so drivers do not instead find other offsite areas to park that create sanitary and public health and safety nuisances for drivers, property owners, and the general public.
- Requiring warehouse distribution centers to provide signage or flyers identifying where food, lodging, and entertainment can be found, when it is not available on-site.
- Providing for overnight parking within the warehouse distribution center.
- Providing transportation/shuttle service and/or links to transit if a large number of workers are anticipated to commute from outside areas and/or comprise low-wage workers.
- Site design shall allow for trucks to check-in within the facility area to prevent queuing of trucks outside of the facility.
- Establishing performance standards at or above state requirements for airborne emissions, noise, glare, vibrations, traffic, and Complete and Green Streets.
- Installing climate control in the warehouse facility to promote worker well-being.
- Installing air filtration in the warehouse facility to promote worker well-being.

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- Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near the entry and exit points.
- Design warehouse/distribution center so that interior vehicular circulation shall be located away from residential uses or any other sensitive receptors.
- Creating a fund that can be used to mitigate impacts on affected residents, schools, places of worship, and other community institutions by retrofitting their property. For example, retaining a contractor to retrofit/install HVAC and/or air filtration systems, doors, dual-paned windows, and sound- and vibration-deadening insulation and curtains.
- Sweeping surrounding streets daily during construction to remove any construction-related debris and dirt.
- Directing all lighting at the facility into the interior of the site.
- Using full cut-off light shields and/or anti-glare lighting.
- Using cool pavement to reduce heat island effects.
- Providing meal options onsite or shuttles between the facility and nearby meal destinations.
- Posting signs at every truck exit driveway providing directional information to the truck route.

Noise Impacts Analysis and Mitigation

The noise associated with logistics facilities can be among their most intrusive impacts on nearby sensitive receptors such as residential areas, schools, parks, and other places where pedestrians, groups, and people are found. Various sources, such as unloading activity, diesel truck movement, and rooftop air conditioning units, **can contribute to substantial noise pollution** that can cause hearing damage after prolonged exposure. These impacts are exacerbated by logistics facilities' sometimes 24-hour, seven-days-per-week operation. Construction noise is often even greater than operational noise, so if a project site is near sensitive receptors, developers and lead agencies should adopt measures to reduce the noise generated by both construction and operation activities.

Examples of best practices when studying noise impacts include:

- Preparing a noise impact analysis that considers all reasonably foreseeable project noise impacts, including to nearby sensitive receptors. All reasonably foreseeable project noise impacts encompass noise from both construction and operations, including stationary, on-site, and off-site noise sources.
- Adopting a lower significance threshold for incremental noise increases when baseline noise already exceeds total noise significance thresholds, to account for the cumulative impact of additional noise and the fact that, as noise moves up the decibel scale, each decibel increase is a progressively greater increase in sound pressure than the last. For example, 70 decibels is ten times more sound pressure than 60 decibels, and 100 times more pressure than 50 decibels.

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Examples of measures to mitigate noise impacts include:

- Constructing physical, structural, or vegetative noise barriers on and/or off the project site.
- Locating or parking all stationary construction equipment as far from sensitive receptors as possible and directing emitted noise away from sensitive receptors.
- Verifying that construction equipment has properly operating and maintained mufflers.
- Requiring all combustion-powered construction equipment to be surrounded by a noise protection barrier.
- Limiting operations to daytime hours on weekdays.
- Paving roads where truck traffic is anticipated with low noise asphalt.
- Orienting any public address systems onsite away from sensitive receptors and setting system volume at a level not readily audible past the property line.

Best practices when studying air quality and greenhouse gas impacts

- Fully analyze all reasonably foreseeable project impacts, including a project's local, statewide, and cumulative emissions impacts.
- When analyzing cumulative impacts, thoroughly consider the project's incremental impact in combination with past, present, and reasonably foreseeable future projects, even if the project's individual impacts alone do not exceed the applicable significance thresholds.
- Prepare a quantitative air quality study in accordance with local air district guidelines.
- Prepare a quantitative health risk assessment in accordance with NJDEP Division of Air Quality Technical Manual 1003, Guidance on Preparing a Risk Assessment for Air Contaminant Emissions.
- Refrain from labeling compliance with NJDEP or air district regulations as a mitigation measure; compliance with applicable regulations is a baseline expectation.
- Fully analyze impacts from truck trips. Municipalities should require full public disclosure of a project's anticipated truck trips, which entails calculating truck trip length based on likely truck trip destinations.
- Any contributions to air pollution in adjacent communities should be quantified, and their significance should be considered.
- Account for all reasonably foreseeable greenhouse gas emissions from the project, without discounting projected emissions based on participation in New Jersey's **Regional Greenhouse Gas Initiative (RGGI)**.

Best practices to mitigate air quality and greenhouse gas impacts from construction are below. To ensure mitigation measures are enforceable and effective, municipalities should consider

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imposing certain conditions on a project where appropriate and if needed, requiring the availability of the expertise needed to address compliance (via developer funding).

- Requiring off-road construction equipment to be zero-emission, where available.
- Restricting all off-road diesel-powered equipment from being in the "on" position for more than 10 hours per day.
- Requiring that all on-road heavy-duty haul trucks be the model year 2010 or newer if diesel-fueled.
- Requiring electrical hookups to the power grid, rather than the use of diesel-fueled generators, for electric construction tools, such as saws, drills, and compressors, and using electric tools whenever feasible.
- Limiting the amount of daily grading disturbance area.
- Prohibiting grading on days with an Air Quality Index forecast of greater than 100 for particulates or ozone for the project area.
- Prohibiting the idling of heavy equipment for more than ten minutes.
- Keeping onsite and furnishing to the lead agency or other regulators upon request, all equipment maintenance records and data sheets, including design specifications and emission control tier classifications.
- Conducting an on-site inspection to verify compliance with construction mitigation and to identify other opportunities to further reduce construction impacts.
- Using paints, architectural coatings, and industrial maintenance coatings that have volatile organic compound levels of less than 10 g/L.
- Providing information on transit and ridesharing programs and services to construction employees.
- Providing meal options onsite or shuttles between the facility and nearby meal destinations for construction employees.

Examples of measures to mitigate air quality and greenhouse gas impacts from operation include:

- Requiring early compliance with NJ's Act Rule, e.g., ensuring that all heavy-duty vehicles entering or operating on the project site are zero-emission beginning in 2030.
- Installing/using on-site equipment, such as forklifts and yard trucks, that is electric with the necessary electrical charging stations provided.
- Using zero-emission light- and medium-duty vehicles.
- Prohibiting trucks from idling for more than ten minutes and requiring operators to turn off engines when not in use.
- Requiring the installation of electric hook-ups to eliminate idling of main and auxiliary engines during loading and unloading, and when trucks are not in use.

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- Constructing electric truck charging stations proportional to the number of dock doors and parking spaces at the project.
- Constructing electric plugs for electric transport refrigeration units at every dock door if the warehouse use could include refrigeration.
- Training warehouse managers and employees on efficient scheduling and load management to eliminate unnecessary queuing and idling of trucks within the facility.
- Appointing a compliance officer who is responsible for implementing all mitigation measures and providing contact information for the compliance officer to the lead agency, to be updated annually.
- Posting both interior-and exterior-facing signs, including signs directed at all dock and delivery areas, identifying idling restrictions and contact information to report violations to NJDEP's Environmental Hotline at 1-877 WARN DEP (1-877-927-6337), and the building manager.
- Installing and maintaining, at the manufacturer's recommended maintenance intervals, air filtration systems at sensitive receptors within a certain radius of the facility for the life of the project.
- Installing and maintaining, at the manufacturer's recommended maintenance intervals, an air monitoring station proximate to sensitive receptors and the facility for the life of the project and making the resulting data publicly available in real-time. While air monitoring does not mitigate the air quality or greenhouse gas impacts of a facility, it nonetheless benefits the affected community by providing information that can be used to improve air quality or avoid exposure to unhealthy air.
- Installing solar photovoltaic systems on the project site of a specified electrical generation capacity, such as equal to the building's projected energy needs.
- Installing all stand-by emergency generators to be powered by a non-diesel fuel.
- Requiring operators to establish and promote a rideshare program that discourages single-occupancy vehicle trips and provides financial incentives for alternate modes of transportation, including carpooling, public transit, and biking.
- Achieving certification of compliance with LEED green building standards, including all provisions related to designated parking for clean air vehicles, electric vehicle charging, and bicycle parking.
- Requiring compliance with the Federal Energy Management Program's Fleet Management Framework: https://www.energy.gov/eere/femp/femp-best-practices-fleet-management-framework.
- Requiring tenants to enroll in the United States Environmental Protection Agency's SmartWay program and requiring tenants to use carriers that are SmartWay carriers.

(Source: State of CA, Dept. of Justice. Warehouse Projects: Best Practices)

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Adopt a Good Neighbor Policy

In addition to the Public Notice requirements pursuant to P.L. 1975, c. 291 (C. 40:55D-12), municipalities considering a warehouse siting are encouraged to adopt a "good neighbor policy" **to notify and seek non-binding informal comments** from adjacent and affected nearby municipalities, overburdened communities, county, and other relevant stakeholders both at the Master Planning and at the pre-application stages. For pre-applications, this is especially important for large projects that meet certain pre-established criteria (e.g., proposed impervious footprint above 200,000 square feet, or more than three stories in height). The policy could be incorporated into the subdivision and land development ordinance, a resolution, or as a memorandum of understanding between two or more municipalities and counties.

In any case, when a municipality receives either a concept plan or preliminary and/or major site plan meeting certain established criteria, representatives from adjacent or nearby municipalities, affected counties, and relevant state agencies should be noticed and invited to provide comments through the duration of the application approval process. In addition, and as part of any good neighbor policy, municipalities are strongly encouraged to establish expanded public notice requirements to adjacent and nearby municipalities, particularly those sharing a proposed freight route, to increase transparency and provide meaningful opportunities for inter-municipal dialogue and public comments.

Concept Plan Review

Incorporating a **conceptual plan submittal and review requirement** into the subdivision and land development ordinance (perhaps for projects that meet certain size requirements) can help facilitate public and private collaboration between the community, the applicant, and appropriate county and state agencies. County and State agencies should be encouraged to participate in the concept plan review to ensure that large warehouse projects will comply with state regulations earlier in the approval process to avoid unnecessary design costs. This enables interested parties the opportunity to discuss and understand local and neighboring needs as well as industrial sector needs and county and state regulations, affording the chance to identify and potentially resolve certain issues of concern early in the process, and to refine and adjust plans before extensive design costs.

By requiring a concept plan submittal and review for major developments, municipalities can establish a process for facilitating preliminary discussion among affected residents, stakeholders, appointed officials, elected representatives, developers, and end-users in a manner that is both transparent and inclusive, with potential for better outcomes for all involved before a formal process. Even if not required, an optional **pre-application meeting should be strongly encouraged** as an important opportunity for the applicant, the site designer, the Planning Board,

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and the municipal planner, to introduce the applicant to the municipality's zoning and subdivision regulations and procedures, to discuss the applicant's conceptual plans, existing resources, project merits, and concerns, scheduling, plan submissions, and any variances or design waivers that may be required. In addition, counties, regional planning agencies, and state agencies should be part of these meetings as appropriate.

Technical Advisory Committee

Towns facing increased warehouse pressure or impacts are encouraged to work with their respective county or regional planning agency if one exists, to establish a Technical Advisory Committee (TAC), comprised of representatives from municipal and county government, their appointed staff, and professionals, and relevant State agency representatives tasked with providing technical assistance specific to **warehouse planning and review**. The TAC would be **advisory**. This is particularly important as a municipality is considering changes to its Master Plan and zoning ordinances. Depending on how the TAC is organized and assigned roles and tasks, it could also assist in the evaluation of conceptual and/or preliminary and major site plans; recommend and review impact studies, and proposed design measures; and **provide recommendation report**s for local consideration of proposed projects against review criteria as appropriate.

A TAC would be especially useful to communities and counties where warehousing and goods movement is already an issue, including:

- In municipalities with overburdened communities, particularly where air quality, flooding, noise, traffic, and other environmental stressors are already a major issue.
- Where important resources like farmland, forested areas, and threatened and endangered species habitat are threatened.
- Where anticipated freight routes and associated infrastructure is undersized and lacks capacity.
- Where routes would bisect or negatively impact sensitive receptors (e.g., schools, daycares, churches, places where pedestrians or people congregate, etc.), neighborhoods, downtowns, historic districts, rural areas, and scenic byways.

Community Engagement

Early and consistent community engagement is central to establishing good relationships between communities, lead agencies, warehouse developers, and tenants. Robust community engagement can give lead agencies access to community residents' on-the-ground knowledge and information about their concerns, build community support for projects, and develop

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creative solutions to ensure new logistics facilities are mutually beneficial. Examples of best practices for community engagement include:

- Holding a series of community meetings at times and locations convenient to members of the affected community and incorporating suggestions into the project design.
- Posting information in hard copy in public gathering spaces and on a website about the Project. The information should include a complete, accurate project description, maps and drawings of the project design, and information about how the public can provide input and be involved in the project approval process. The information should be in a format that is easy to navigate and understand for members of the affected community.
- Providing notice by mail to residents and schools within a certain radius of the project and along transportation corridors to be used by vehicles visiting the project, and by posting a prominent sign on the project site. The notice should include a brief project description and directions for accessing complete information about the project and for providing input on the project.
- Providing translation or interpretation in residents' native language, where appropriate.
- For public meetings broadcast online or otherwise held remotely, providing access and public comment by telephone and supplying instructions for access and public comment with ample lead time before the meeting.
- Partnering with local community-based organizations to solicit feedback, leverage local networks, co-host meetings, and build support.
- Considering the adoption of a community benefits agreement, negotiated with input from affected residents and businesses, by which the developer provides benefits to the community.
- Creating a community advisory board made up of local residents to review and provide feedback on project proposals in the early planning stages.
- Identifying a person to act as a community liaison concerning on-site construction activity and operations and providing contact information for the community relations officer to the surrounding community.

(Source: State of CA, Dept. of Justice. Warehouse Projects: Best Practices)

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A Regional Approach

If impacts are regional, planning should be as well. Given the undeniable importance of the warehousing and goods movement industries to the economy of New Jersey, its unique land use and transportation needs, significant growth projections, and potential for serious adverse impacts across municipal and state boundaries, transportation networks, and resources of statewide importance, a regional approach can help municipalities more comprehensively address and plan for the locating, review, and accommodation of larger projects (including finding solutions to problems at existing sites that pose regional impacts) in a manner that adequately assesses, avoids and mitigates negative impacts while increasing benefits for affected communities, and the region in which a project is proposed.

County subdivision and site plan review

As part of any regional approach, it is important to recognize that **counties have an extremely important, albeit limited, role to play** in the review of proposed warehouses and other development projects within their jurisdiction. The New Jersey County Planning Act N.J.S.A. 40: 27-1 et seq, provides County Planning Boards, or their county planning director and designated development review committee, with **authority to review all local development proposals** (i.e. subdivision and site plan applications), to determine whether any county roads/property and/or drainage facilities for which it is responsible would be adversely affected. This includes any proposed land development along county roads or development which will cause stormwater to drain either directly or indirectly to a County road or through any drainage way, structure, pipe, culvert, or facility for which the County is responsible (i.e, for the construction, maintenance or proper functioning).

The purpose of county land development review is to provide rules, regulations, and standards to guide land development that affects or involves County facilities. Land development review regulations ensure that land development within a county is in accordance with the goals and objectives of the County Master Plan and other adopted County plans, regulations, and standards. In addition, the Official County Map serves as a master plan for **county highway systems** and establishes rights-of-way, roadway widths, and specific functional classifications for all county highways.

The statute further empowers County Planning Boards to adopt subdivision and site plan standards and procedures, including the **authority to assess land development projects** for their proportionate share (i.e. developer contributions, including performance guarantees and maintenance bonds for improvements) if necessary, related infrastructure improvements to county roads and drainage facilities which are the direct result of, or bear, a rational nexus to the development, to reduce hazards to the general public caused by unsafe traffic conditions and/or flooding. Where a proposed project fails to meet County regulations and standards concerning providing adequate physical road and drainage improvements to increase traffic safety and

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convenience of the traveling public to mitigate impacts as necessitated, the County Planning Board or authorized review committee **may deny the application (where negative impacts would result to the level of service).**

Counties can **require developers to improve shoulders, add turn lanes, and improve driveways for properties that front on county roads**. In instances where a proposed project does not impact a county roadway or drainage facility, the County Planning Board or its designated development review committee has the discretion to provide non-binding reviews and comments. The statute further allows "aggrieved persons" to appeal a planning decision made at the county level. Finally, counties can assist municipalities with warehouse siting/traffic issues and may be well-suited to addressing the issue on a wider scale. The Highlands Council funded a study completed by Warren County, for example, that examines the potential impacts of warehouse development in the county and identifies possible traffic mitigation measures: https://www.nj.gov/njhighlands/warren_county/county/wc_lightindustrial_2020.pdf

Establish Regional Technical Advisory Committees

Under a regional approach, a **county, or regional planning agencies** could, with the assistance and support of their constituent municipalities, **establish and administer** Technical Advisory Committees (TACs). Appropriate State agencies are encouraged to participate. The TAC could be most advantageous during the master planning process and for large-scale projects that have the potential for significant regional impacts. The role of a county or regional TAC would be **advisory**. Its purpose would be to provide interested and affected municipalities with the means and technical staff support, necessary to meaningfully participate in the **wider review and analysis of warehouse projects** that meet certain established threshold criteria and to provide reports and comments for consideration by local reviewing boards when evaluating their Master Plan updates and hearing proposed projects.

Ideally, a county or regional TAC would be comprised of pre-selected representatives from relevant State agencies, the respective Metropolitan Planning Organization (MPO), the county (and adjoining county, if appropriate), the hosting municipality (perhaps serving as TAC chair), and a representative from each adjacent, as well as nearby municipalities within a certain distance where there exists the potential for significant impacts, particularly to overburdened communities, and/or transportation networks.

Depending on how the TAC is organized and assigned membership, roles and tasks, it could evaluate proposed Master Plan and ordinance changes, concept plans, and/or preliminary and final site plans; recommend and review impact studies, provide reviewing boards with comments; propose design modifications and measures to address environmental justice, greenhouse gas emissions reduction, energy efficiency, improvements both on and off-site to the road network; as well as provide recommendations for planning and zoning changes, among other **assigned roles and tasks**.

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The county, or regional planning agency, and appropriate state agency representatives and staff, could also support the TAC and constituent municipalities, by undertaking long-range **regional planning** studies and providing technical assistance in the development of local plans and ordinances. For example, the regional entity could, with the input and support of its constituent municipalities and TAC, develop and maintain an inventory of regionally pre-screened sites/locations determined to be appropriate for warehouse development, supporting infrastructure and transportation improvements (e.g., widening or construction of new highway interchange access), thereby reducing the need for a myriad of local assessments, saving time and money for municipalities and developers.

In addition to State agency partners, the field of potential regional partners can include County Planning Boards, State Special Resource Area Agencies such as the New Jersey Highlands Water Protection and Planning Council, the New Jersey Pinelands Commission, and the New Jersey Sports and Exposition Authority. Important to the conversation are New Jersey's three Metropolitan Planning Organizations, which include the North Jersey Transportation Planning Authority (NJTPA), the Delaware Valley Regional Planning Commission (DVRPC), and the South Jersey Transportation Planning Organization (SJTPO).

Three Authorities include the Port Authority of New York and New Jersey (PANYNJ), the Delaware River Port Authority, and the New Jersey Turnpike Authority. All are mentioned here because each represents an important planning partner and regional planning resource, with their own plans and guidance that may provide further insight and information about the growing logistics industry (e.g., forecasts on future growth and identifying plans within their jurisdictions to address them) that would be very helpful to municipalities in understanding what is likely going to happen in the future, and what these entities are doing to positively work with their partners and constituents to more smartly accommodate the movements of goods while enhancing levels of service and a more healthy environment.

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Special Resource Areas

There are three Special Resource Areas that maintain their own regional Master Plans and that are outside of the jurisdiction of the State Planning Commission. Municipalities in these regions are encouraged to utilize this guidance; however, if any guidance in these documents conflicts with the Master Plans for the Special Resource Areas below, those Master Plans will prevail.

NJ Highlands

The Highlands Region is at a critical crossroads for the location of warehousing, as it is crossed by three major interstate highways: I-80, I-287, and I-78. There likely are appropriate locations for warehousing in the Region, but the Highlands Council's authority to affect locations or address regional traffic implications is limited as most land use planning authority rests with municipalities. Where municipalities are in conformance with the Highlands Regional Master Plan (RMP), local land-use decisions have significantly improved alignment with Highland's goals and objectives. For conforming municipalities and counties, the Council is authorized **to provide grant funding that could assist in the traffic and feasibility analyses needed to identify the most suited locations in the Region** for warehouse and distribution facilities. In general terms, the RMP would steer such projects away from lands in the Highlands Preservation Area, favoring sites in the Highlands Planning Area that: have no (or minimal) Highlands Resources, are in designated sewer service areas, have proximate access to highways and highway entry points (to avoid/minimize impacts to local roads and scenic byways), and do not significantly affect or eliminate the Region's prime farmland or prime farmland soils.

Large areas of **prime farmland in the Region are at risk** in the face of the demand for warehousing. They are often the least encumbered areas in terms of Highlands Resources, meaning they have little or no forest cover, steep slope area, wetland area, stream/riparian habitat area, etc., and are thus targeted for development. Prime farmland and prime farm soils must be protected in the Region, however, along with the agricultural communities built around them. These are the goals of the Highlands RMP. It should be noted that the Highlands Council is also working to strengthen farmers and farming communities since a thriving agricultural economy may be its own best defense.

NJ Pinelands

The Pinelands Area is comprised of 938,000 acres, spread across seven counties and 53 municipalities. Development in the Pinelands Area is subject to the land use and environmental standards set forth in the Pinelands Commission's Comprehensive Management Plan (CMP). All development in the Pinelands Area must comply with the minimum environmental standards of the CMP, including standards for the protection of wetlands, water quality, and threatened and

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endangered species. All master plans, land use ordinances, and redevelopment plans adopted by Pinelands municipalities are required to be in **conformance with the CMP** and must be approved by the Commission before they may take effect. The Commission's approval process includes consideration of potential inter-municipal conflicts that could arise as the result of a municipal ordinance amendment.

The Commission has experienced increased interest in the siting and development of large warehouses in the Pinelands Area, although perhaps not to the degree seen in the rest of the State. In 2021, the Commission received **numerous inquiries and new applications** for warehouses ranging in size from 50,000 square feet to over 1,000,000 square feet. The CMP does not permit the development of large nonresidential uses, such as warehouses, in approximately 75% of the Pinelands Area. This includes the most environmentally-sensitive areas (the Preservation Area District and Forest Area) and the Agricultural Production Area, where most of the prime farmland and prime farm soils in the Pinelands Area are located. However, in other portions of the Pinelands Area, such as Regional Growth Areas, Rural Development Areas, and Pinelands Towns, municipalities can establish nonresidential zoning districts and permit a wide variety of nonresidential uses, including warehouses. An overall **regional framework** is thus in place to provide opportunities for the siting and development of warehouses in appropriate portions of the Pinelands Area.

Hackensack Meadowlands District

The New Jersey Sports and Exposition Authority (NJSEA) is the Authority of the State of New Jersey responsible for the regional planning and zoning of the Hackensack Meadowlands District (District), a 30.3-square-mile area encompassing portions of fourteen municipalities in two counties, Bergen and Hudson. The District, located approximately five miles west of New York City in northern New Jersey, is a unique landscape, composed of an amalgam of natural and developed areas bisected by the Hackensack River and crisscrossed by major transportation corridors. The network of transportation routes through the District, as well as its proximity to New York City, the Port of New York and New Jersey, Newark Liberty International Airport, and various freight rail facilities, have **established the District as a key location for the siting of warehouse and distribution facilities.** Transportation-related and industrial land uses cover more than one-third of the District's land area, second only in prevalence to natural areas, such as waterways and wetlands, in the District.

The NJSEA maintains a professional staff of engineers, planners, and construction code officials to administer land use and construction code regulations within the District. In accordance with the planning goals of the **Hackensack Meadowlands District Master Plan Update 2020**, new warehouse development in the District is directed toward brownfield and redevelopment sites, and away from natural areas. The NJSEA's review process includes the evaluation of traffic impacts of proposed warehouse uses.

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A word on State agency requirements

Once a development proposal is approved by the local reviewing board, a project must still comply with all County and state agency requirements. In many cases, final site plan approvals are conditioned on an applicant meeting all outside agency requirements and obtaining all necessary permit approvals.

Many rules implemented by the New Jersey Department of Environmental Protection, Division of Land Resource Protection (DLRP), and its more-recently created Watershed and Land Management Program (WLM), will have a direct and measurable impact on the layout, design, and feasibility of a project, depending on environmental site constraints (e.g., Freshwater Wetlands, Flood Hazard Areas, etc.), location (e.g., within the Coastal Zone Management Area, etc.), and whether any encroachments into regulated areas are proposed.

In addition, several environmental land use, regulatory programs, and rules within DEP have been or are in the process of being modernized to **respond to environmental justice and climate change concerns** by considering risks such as sea-level rise and chronic flooding. These updates also aim to facilitate climate resilience by supporting green infrastructure and strengthening air pollution rules to help reduce future greenhouse gas emissions, particularly in overburdened communities.

With these changes in mind, warehouse development applicants should be encouraged to **request a Pre-Application conference** with the DLRP at the conceptual stage of a project's site plan process to understand what permit approvals may be necessary, clarify design conflicts, determine regulatory compliance, and determine if any unforeseen regulatory issues might be discovered. The DLRP may also provide recommendations for design changes that would help to minimize disturbance in environmentally sensitive areas and help the project achieve compliance with the regulations.

The New Jersey Department of Transportation (NJDOT) is responsible for freight planning activities encompassing all modes of freight distribution, including highway, rail, water, and aviation. This includes the gathering of data on all modes, especially trucks, to inform NJDOT on the best use of resources for the maintenance of the state's road and bridge infrastructure.

NJDOT manages and oversees numerous freight planning studies and research projects, such as the 2017 New Jersey Statewide Freight Plan, released and approved by FHWA under the current guidelines of the Fixing America's Surface Transportation Act (FAST) of 2016. NJDOT also collaborates with other transportation agencies on studies, projects, and other public and private initiatives, such as the State Rail Plan with NJ TRANSIT.

Applicants seeking traffic **access to state roadways/highways** and transportation infrastructure must submit applications for access to NJDOT. Access applications with fewer than 500 daily trips

are considered minor, while those with more than 500 are considered major. For further guidance and rules governing access to state roadways, see the **New Jersey State Highway Access Management Code**. Roadway designers should also consult the code to determine access requirements for design plans. Anyone who needs to do business with NJDOT can do so from the **Doing Business website**.

Municipalities can also seek guidance and technical assistance by **pursuing or renewing petitions for Plan Endorsement by the State Planning Commission (SPC)**. Plan Endorsement is a voluntary review process with specific requirements designed to ensure consistency in achieving the goals and policies of the State Development and Redevelopment Plan. The endorsement process expands upon the minimum requirements of the MLUL by incorporating several planning priorities of increased State emphasis, including enhanced measures to address climate resilience, greenhouse gas emissions reduction, smart growth, Complete and Green Streets, sustainability, environmental justice, and social equity.

Upon endorsement, the municipality may be entitled to financial and other incentives such as enhanced scoring for grant funding, low-interest loans, technical assistance, and coordinated regulatory review among the State agencies that will assist in making its endorsed plan a reality.

Other State agencies can assist with planning services such as Local Planning Services in the **Department of Community Affairs,** and the Department of Agriculture.

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Other plans and reports

NJDOT 2017 Statewide Freight Plan

New Jersey's Global Warming Response Act 80x50 Report

Articles

NJ Future: Warehouse Sprawl: Plan Now or Suffer the Consequences

NJ Future: Environmental Justice and Warehouse Sprawl

NJ Future: "Complete Streets" and Goods Delivery: What Is a Street For?

State of California: Warehouse Projects: Best Practices and Mitigation Measures

Zoning

Lower Macungie Township Zoning Example: Specific Criteria for Warehouse, Wholesale, Storage, or Distribution uses: https://ecode360.com/34785641

Traffic Impacts

https://www.ite.org/pub/?id=a3e6679a%2De3a8%2Dbf38%2D7f29%2D2961becdd498

Programs

NJ ZIP: New Jersey Zero Emission Incentive Program