



August 2, 2023

Board Chair Sandy Hart  
Members of the County Board  
County of Lake  
18 N County Street, 10th Floor  
Waukegan, IL 60085

Re: Rethinking Warehouse/Logistics Centers

Dear Board Chair Hart and Members of the County Board:

As you may know, the Village of Riverwoods opposes approval of the large, speculative, high-volume warehouses as currently proposed for the Baxter Campus. There is a mismatch between the potential impact of these industrial-use facilities on our safety, health, and ecosystem and the current zoning tools available to regulate how they are designed, used, and operated. The world has changed, so our zoning definitions and land use concepts must also change to protect the integrity of our communities.

With this in mind, we ask that the County Board take a step back and engage with local municipalities prior to granting a zoning approval that fails to recognize distinctions among warehouses. During this period, we also ask the County Board to engage with the Chicago Metropolitan Agency for Planning (CMAP) to recommend best practices for our region and to develop guidance to prevent and minimize the most harmful aspects of these industrial uses, notably air quality.

The logistics industry should not be exempt from strenuous site evaluation and regulatory oversight. The building of warehouse facilities without proper study has led to the overloading of local streets, driver and pedestrian hazards, and dangerously diminished air quality.

The Brushwood Center At Ryerson Woods, drawing on assistance from many local agencies, including the Lake County Department of Planning, has just published *Health, Equity, and Nature, A Changing Climate in Lake County, Illinois*. The GIS maps in this volume are stunning and convey much useful information. Note the plume of particulate matter exposure in Figure 23: Diesel Particulate Matter Exposure in Lake County, IL below.

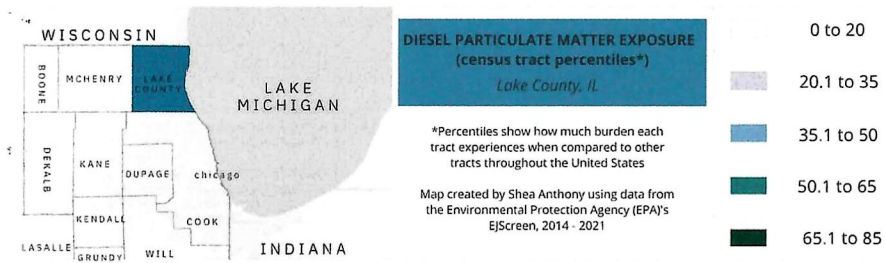
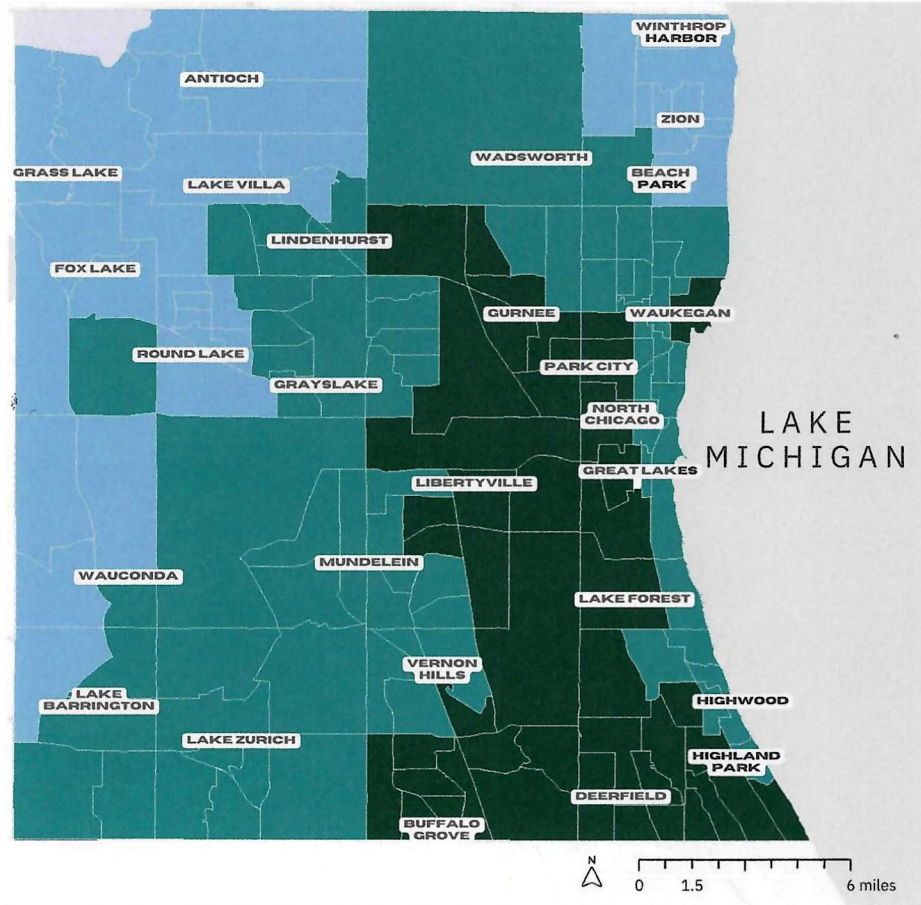


FIGURE 23. DIESEL PARTICULATE MATTER EXPOSURE IN LAKE COUNTY, IL

The concern over the harmful effects of particulates exposure for those in closer proximity is growing. California and New Jersey, among other states, have provided guidance to local units of government on how to incorporate best management practices to mitigate damage and prevent future harm. To help governing bodies protect communities through better decisions, the Institute of Traffic Engineers has expanded its classification of warehouses to include six (6) different models.

The intended use of the Baxter Campus does not align with the long-established vision for Riverwoods and neighboring communities, which Lake County has preserved and fostered. Nevertheless, the County Board is being asked to transform a massive site for an unknown, speculative end-user whose industrial operations and associated truck traffic could severely impact our ecosystem, safety, and health. This is why we request that additional community engagement and a deeper review of best practices take place.

We are confident in the Board's desire to engage intensely on this subject. Indeed, your careful planning may serve as a catalyst for statewide efforts.

As an introduction to the issues raised by large scale distribution warehouses, we are enclosing a memorandum dated June 1, 2023, provided to the Riverwoods Board of Trustees, with underlying source materials from California and New Jersey, as well as the introduction to the recent proposed rule from the US EPA, *Reconsideration of the National Ambient Air Quality Standards for Particulate Matter*.

It is incumbent on all units of government in Lake County to begin addressing these serious challenges. One important step would be preparing an overhaul of the regulations that govern logistics warehouses.

Thank you for your consideration.

Sincerely,



Kristine L. Ford

Village President

Village of Riverwoods

cc: Gary Gibson, County Administrator

Eric Waggoner, Director of Planning, Building & Development Department

## ATTACHMENTS

1. MEMORANDUM to Riverwoods Board of Trustees dated June 1, 2023
2. ENVIRONMENTAL PROTECTION AGENCY, Reconsideration of the National Ambient Air Quality Standards for Particulate Matter, Federal Register / Vol. 88, No. 18 / Friday, January 27, 2023 / Proposed Rules, pages 5558-5563.

3. XAVIER BECERRA, Attorney General, Department of Justice, State of California

Warehouse Projects: Best Practices and Mitigation Measures to Comply with the California Environmental Quality Act

4. NJ State Planning Commission, Office of Planning Advocacy

Distribution Warehousing and Goods Movement Guidelines, Policy adopted September 7, 2022



## MEMORANDUM

**To:** Riverwoods Board of Trustees  
**From:** Bruce Huvard, Village Attorney  
**Date:** June 1, 2023  
**Re:** First Review of Bridge Industrial's proposal for Baxter Campus

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At the regular May 2, 2023, meeting of the Riverwoods Board of Trustees, the Board stated its opposition to the proposed industrial warehouse development on the Baxter Campus in the Village of Deerfield. Residents of the Thorngate Subdivision have retained independent counsel and will be presenting objections to the zoning application at the reconvened meeting of the Deerfield Plan Commission on June 8, 2023. At the request of the Board, I have been discussing the deficiencies in the proposal with Thorngate's independent counsel. This memo is not intended as a confidential analysis of legal issues.

Our analysis is aided by the fact that the Village of Riverwoods did receive a proposal for a distribution center for a Milwaukee Avenue parcel in late 2021. We investigated best practices and researched zoning issues. The developer submitted a traffic report from the same firm that prepared the report for Bridge Industrial. In the end, that proposal was eventually abandoned for reasons having to do with lack of signalized access to Milwaukee Avenue.

Through that process, we became better informed of the newest research on the hazards of particulate pollution and best practices for locating and managing a large, modern warehouse.

We considered the experience of jurisdictions where substantial waves of e-commerce warehouse development have occurred.

### California Attorney General

In 2019, the California Attorney General, Bureau of Environmental Justice, reacting to the profusion of these new forms of e-commerce warehouses, issued a guidance memorandum entitled "Warehouse Projects: Best Practices and Mitigation Measures to Comply with the

California Environmental Quality Act”. Summarizing the potential harms of new forms of warehouse development, the memorandum states:

When done properly, these activities can contribute to the economy and consumer welfare. However, imprudent warehouse development can harm local communities and the environment. Among other pollutants, diesel trucks visiting warehouses emit nitrogen oxide (NO<sub>x</sub>)—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 particular matter that is smaller than 2.5 micrometers)—a contributor to cancer, heart disease, respiratory illnesses, and premature death. Trucks and on-site loading activities can also be loud, bringing disruptive noise levels during 24/7 operation that can cause hearing damage after prolonged exposure. The hundreds, and sometimes thousands, of daily truck and passenger car trips that warehouses generate contribute to traffic jams, deterioration of road surfaces, and traffic accidents. These environmental impacts also tend to be concentrated in neighborhoods already suffering from disproportionate health impacts. [footnotes omitted]

The memorandum then lists a number of best practices, some of which can be summarized as:

1. Engage in proactive planning with early and consistent community engagement.
2. Locate warehouses at least 1,000 feet from the property lines of the nearest sensitive receptors (such as residential neighborhoods).
3. Provide 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.
4. Place facility entry and exit points from the public street away from sensitive receptors, e.g., placing these points on the north side of the facility if sensitive receptors are adjacent to the south side of the facility.

The memorandum continues: “Emissions of air pollutants and greenhouse gases are often among the most substantial environmental impacts from new warehouse facilities.” Accordingly, local agencies should:

...consider designing projects 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 it can also save money as regulations tighten and demand for zero-emission infrastructure grows. In planning new logistics facilities, the Bureau strongly encourages developers to consider the local, statewide, and global impacts of their projects’ emissions.

5. When studying air quality and greenhouse gas impacts, the project should include a health risk assessment.
6. Numerous best practices for mitigating air quality and greenhouse gas impacts during construction and during operations are listed. Among these steps are:
  - Requiring all heavy-duty vehicles entering or operated on the project site to be zero-emission beginning in 2030.
  - Requiring tenants to use zero-emission light- and medium-duty vehicles as part of business operations.

Note: California first passed the Advanced Clean Trucks (ACT) rule in 2020. The rule was issued under a Clean Air Act preemption waiver allowing states to impose more stringent standards (though the waiver is currently being challenged in court). The ACT rule has been adopted in California and by seven other states. It imposes a requirement for medium- and heavy-duty fleets to purchase an increasing percentage of zero-emission trucks. Illinois has not passed this rule.

- Forbidding trucks from idling for more than two minutes and requiring operators to turn off engines when not in use.
- 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.
- Constructing electric truck charging stations proportional to the number of dock doors at the project.
- Constructing electric plugs for electric transport refrigeration units at every dock door, if the warehouse use could include refrigeration.
- Constructing electric light-duty vehicle charging stations proportional to the number of parking spaces at the project.
- 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.

7. Numerous best practices for mitigating noise impacts are listed. Among these steps are:

- Limiting operation hours to daytime hours on weekdays.
- Paving roads where truck traffic is anticipated with low noise asphalt.

8. Numerous best practices for mitigating traffic impacts are listed. Among these steps are:

- Restricting the turns trucks can make entering and exiting the facility to route trucks away from sensitive receptors.

#### New Jersey State Planning Commission

The New Jersey State Planning Commission approved a policy on “Distribution Warehousing and Goods Movement Guidelines”, dated September 7, 2022. The New Jersey Guidelines explain that a traditional warehouse is used for storing goods for extended periods of time.

The main difference between traditional and distribution warehouse functions relates to the time the inventory spends within a facility. The latter see much greater product loading and unloading flow velocity (usually less than a few days), especially at fulfillment centers, which deliver goods direct to customers within less than 48 hours in high throughput facilities.

The Institute of Traffic Engineers (ITE) publishes a Trip Generation Manual to estimate the number of trips to and from a facility. In recent 11<sup>th</sup> Edition of the ITE manual, there are six different categories of warehouses. The New Jersey Guidelines then state:

For simplicity, these can be aggregated into three main types of distribution and fulfillment warehouses that are associated with today’s e-commerce landscape and logistics (i.e., freight) infrastructure. Each is situated in a strategic location and carries out a somewhat distinct activity. They include

- Distribution facilities
- Fulfillment centers, and
- Last-mile fulfillment facilities or stations.

Keep in mind that this and other guidance is highly variable for specific types of warehousing uses as industry definitions, warehouse uses, and technology are constantly evolving and changing. There can be substantive variability within a single warehousing development based on type, intensity, and the potential for misclassification.



The New Jersey Guidelines state that municipalities should conduct comprehensive reviews of their land use plans and adopt zoning that distinguishes among types of warehouse use.

Warehouse development comes in many shapes and sizes, and zoning should evolve to keep up with the changing variety of uses and trends. These differences could mean dramatically different impacts and outcomes, and whether a project is compatible with 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, zoning, and development regulations to differentiate among warehouse use types.

The New Jersey Guidelines incorporate many best practices similar to the suggestions from the California Attorney General. New Jersey is one of the states that has adopted the ACT rule requiring a phase-in of zero emissions vehicles.

An aspect of the New Jersey Guidelines referring to a Good Neighbor Policy is worth quoting:

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.

The use of zoning and special use approvals is recommended as a driver of specific performance standards for noise, glare, vibrations, traffic, and Complete and Green Streets:

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.

#### Application to Bridge Industrial Proposal

Contemplating the available guidelines, in view of the current process for approving Bridge Industrial, we note several broad deficiencies:

1. There has been no community planning between adjoining communities when one community is disproportionately affected. The compatibility of an e-commerce warehouse with existing zoning of nearby properties has not been discussed when the spillover effects are considerable.

2. The nearest buildings do not observe the minimum 1,000 foot buffer provided in exemplary Good Neighbor Policies. The suggested buffer is a minimum.

3. The proposal does not identify the users – and the range of impacts from different tenants is not explored. The traffic report assumes only the base case of simple warehouse – different users generate significantly more traffic. The planned development approval for speculative end users is akin to approving an apartment development in the abstract that can house 500 or 5,000 occupants.

4. The facility would share the single intersection (Baxter/Thorngate) used by a sensitive receptor (Thorngate community). The turning movements in this intersection have not been considered to avoid interference. The number and composition of trucks queuing to exit the facility (due to the timing of the signal at Baxter/Thorngate) suggests idling trucks will be much closer to a sensitive receptor than is suggested by guidelines.

5. The air quality report is based on a traffic generation assumption of a general warehouse. The EPA air quality model for measuring emissions would not actually measure localized air quality variations due to queuing vehicles (e.g., at the Baxter/Thorngate intersection). The measurement of particulates at the neighborhood level is a complex topic and should be further provided as an ongoing tool with advice of appropriate experts.<sup>1</sup> No health risk assessment has been provided.

6. There are no proposed performance standards, such as requiring zero emission vehicles, requiring curtailment of operations when particulate concentrations are excessive, or limiting hours of operation, vibrations and noise.

The granting of a special use for Bridge Industrial, absent a specific end user, amounts to a blanket approval for a warehouse. But, as multiple guidelines suggest, zoning of a traditional warehouse is inadequate for the regulation of a modern e-commerce center.

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<sup>1</sup> Mukherjee, Anondo, Steven G. Brown, Michael C. McCarthy, Nathan R. Pavlovic, Levi G. Stanton, Janice Lam Snyder, Stephen D’Andrea, and Hilary R. Hafner. 2019. "Measuring Spatial and Temporal PM<sub>2.5</sub> Variations in Sacramento, California, Communities Using a Network of Low-Cost Sensors" *Sensors* 19, no. 21: 4701. <https://doi.org/10.3390/s19214701>; also see Zimmerman, N., Li, H.Z., Ellis, A., Hauryliuk, A., Robinson, E.S., Gu, P., Shah, R.U., Ye, Q., Snell, L., Subramanian, R., Robinson, A.L., Apte, J.S. and Presto, A.A. (2020). Improving Correlations between Land Use and Air Pollutant Concentrations Using Wavelet Analysis: Insights from a Low-cost Sensor Network. *Aerosol Air Qual. Res.* 20: 314-328. <https://doi.org/10.4209/aaqr.2019.03.0124>

**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Parts 50, 53, and 58**

[EPA-HQ-OAR-2015-0072; FRL-8635-01-OAR]

RIN 2060-AV52

**Reconsideration of the National Ambient Air Quality Standards for Particulate Matter**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Proposed rule.

**SUMMARY:** Based on the Environmental Protection Agency's (EPA's) reconsideration of the air quality criteria and the national ambient air quality standards (NAAQS) for particulate matter (PM), the EPA proposes to revise the primary annual PM<sub>2.5</sub> standard by lowering the level. The Agency proposes to retain the current primary 24-hour PM<sub>2.5</sub> standard and the primary 24-hour PM<sub>10</sub> standard. The Agency also proposes not to change the secondary 24-hour PM<sub>2.5</sub> standard, secondary annual PM<sub>2.5</sub> standard, and secondary 24-hour PM<sub>10</sub> standard at this time. The EPA also proposes revisions to other key aspects related to the PM NAAQS, including revisions to the Air Quality Index (AQI) and monitoring requirements for the PM NAAQS.

**DATES:** Comments must be received on or before March 28, 2023.

**Public Hearings:** The EPA will hold a virtual public hearing on this proposed rule. This hearing will be announced in a separate **Federal Register** document that provides details, including specific dates, times, and contact information for these hearings.

**ADDRESSES:** You may submit comments, identified by Docket ID No. EPA-HQ-OAR-2015-0072, by any of the following means:

- **Federal eRulemaking Portal:** <https://www.regulations.gov/> (our preferred method). Follow the online instructions for submitting comments.

- **Email:** [a-and-r-Docket@epa.gov](mailto:a-and-r-Docket@epa.gov). Include the Docket ID No. EPA-HQ-OAR-2015-0072 in the subject line of the message.

- **Mail:** U.S. Environmental Protection Agency, EPA Docket Center, Air and Radiation Docket, Mail Code 28221T, 1200 Pennsylvania Avenue NW, Washington, DC 20460.

- **Hand Delivery or Courier (by scheduled appointment only):** EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue NW, Washington, DC 20004. The Docket Center's hours of operations are 8:30

a.m.–4:30 p.m., Monday–Friday (except Federal Holidays).

**Instructions:** All submissions received must include the Docket ID No. for this document. Comments received may be posted without change to <https://www.regulations.gov>, including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the **SUPPLEMENTARY INFORMATION** section of this document.

**FOR FURTHER INFORMATION CONTACT:** Dr. Lars Perlmutter, Health and Environmental Impacts Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Mail Code C539-04, Research Triangle Park, NC 27711; telephone: (919) 541-3037; fax: (919) 541-5315; email: [perlmutter.lars@epa.gov](mailto:perlmutter.lars@epa.gov).

**SUPPLEMENTARY INFORMATION:**

**General Information**

*Preparing Comments for the EPA*

Follow the online instructions for submitting comments. Once submitted to the Federal eRulemaking Portal, comments cannot be edited or withdrawn. The EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written submission. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.*, on the web, the cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit <https://www.epa.gov/dockets/commenting-epa-dockets>.

When submitting comments, remember to:

- Identify the action by docket number and other identifying information (subject heading, **Federal Register** date and page number).
- Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.

- Provide specific examples to illustrate your concerns and suggest alternatives.

- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.

- Make sure to submit your comments by the comment period deadline identified.

*Availability of Information Related to This Action*

All documents in the dockets pertaining to this action are listed on the [www.regulations.gov](http://www.regulations.gov) website. This includes documents in the docket for the proposed decision (Docket ID No. EPA-HQ-OAR-2015-0072) and a separate docket, established for the Integrated Science Assessment (ISA) (Docket ID No. EPA-HQ-ORD-2014-0859) that has been adopted by reference into the docket for this proposed decision. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and may be viewed with prior arrangement with the EPA Docket Center. Additionally, a number of the documents that are relevant to this proposed decision are available through the EPA's website at <https://www.epa.gov/naaqs/particulate-matter-pm-air-quality-standards>. These documents include the Integrated Science Assessment for Particulate Matter (U.S. EPA, 2019a), available at [https://cfpub.epa.gov/ncea/isa/recor\\_display.cfm?deid=347534](https://cfpub.epa.gov/ncea/isa/recor_display.cfm?deid=347534), the Supplement to the 2019 Integrated Science Assessment for Particulate Matter (U.S. EPA, 2022a), available at [https://cfpub.epa.gov/ncea/isa/recor\\_display.cfm?deid=354490](https://cfpub.epa.gov/ncea/isa/recor_display.cfm?deid=354490), and the Policy Assessment for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter (U.S. EPA, 2022b), available at <https://www.epa.gov/naaqs/particulate-matter-pm-standards-integrated-science-assessments-current-review>.

**Table of Contents**

The following topics are discussed in this preamble:

- Executive Summary
- I. Background
  - A. Legislative Requirements
  - B. Related PM Control Programs
  - C. Review of the Air Quality Criteria and Standards for Particulate Matter
    - 1. Reviews Completed in 1971 and 1987
    - 2. Review Completed in 1997
    - 3. Review Completed in 2006
    - 4. Review Completed in 2012

5. Review Completed in 2020
6. Reconsideration of the 2020 PM NAAQS Final Action
  - a. Decision To Initiate a Reconsideration
  - b. Process for Reconsideration of the 2020 PM NAAQS Decision
- D. Air Quality Information
  1. Distribution of Particle Size in Ambient Air
  2. Sources and Emissions Contributing to PM in the Ambient Air
  3. Monitoring of Ambient PM
  4. Ambient Concentrations and Trends
    - a. PM<sub>2.5</sub> Mass
    - b. PM<sub>2.5</sub> Components
    - c. PM<sub>10</sub>
    - d. PM<sub>10-2.5</sub>
    - e. UFP
  5. Characterizing Ambient PM<sub>2.5</sub> Concentrations for Exposure
    - a. Predicted Ambient PM<sub>2.5</sub> and Exposure Based on Monitored Data
    - b. Comparison of PM<sub>2.5</sub> Fields in Estimating Exposure and Relative to Design Values
  6. Background PM
- II. Rationale for Proposed Decisions on the Primary PM<sub>2.5</sub> Standards
  - A. General Approach
    1. Background on the Current Standards
      - a. Considerations Regarding the Adequacy of the Existing Standards in the 2020 Review
      2. General Approach and Key Issues in This Reconsideration of the 2020 Final Decision
    - B. Overview of the Health Effects Evidence
      1. Nature of Effects
        - a. Mortality
        - b. Cardiovascular Effects
        - c. Respiratory Effects
        - d. Cancer
        - e. Nervous System Effects
        - f. Other Effects
      2. Public Health Implications and At-Risk Populations
      3. PM<sub>2.5</sub> Concentrations in Key Studies Reporting Health Effects
        - a. PM<sub>2.5</sub> Exposure Concentrations Evaluated in Experimental Studies
        - b. Ambient PM<sub>2.5</sub> Concentrations in Locations of Epidemiologic Studies
      4. Uncertainties in the Health Effects Evidence
    - C. Summary of Exposure and Risk Estimates
      1. Key Design Aspects
      2. Key Limitations and Uncertainties
      3. Summary of Risk Estimates
    - D. Proposed Conclusions on the Primary PM<sub>2.5</sub> Standards
      1. CASAC Advice in This Reconsideration
      2. Evidence- and Risk-Based Considerations in the Policy Assessment
        - a. Evidence-Based Considerations
        - b. Risk-Based Considerations
      3. Administrator's Proposed Conclusions on the Primary PM<sub>2.5</sub> Standards
        - a. Adequacy of the Current Primary PM<sub>2.5</sub> Standards
        - b. Consideration of Alternative Primary Annual PM<sub>2.5</sub> Standard Levels
    - E. Proposed Decisions on the Primary PM<sub>2.5</sub> Standards
- III. Rationale for Proposed Decisions on the Primary PM<sub>10</sub> Standard
  - A. General Approach
    1. Background on the Current Standard
      - i. Considerations Regarding the Adequacy of the Existing Standard in the 2020 Review
      2. General Approach and Key Issues in This Reconsideration of the 2020 Final Decision
    - B. Overview of Health Effects Evidence
      1. Nature of Effects
        - a. Mortality
          - i. Long-Term Exposures
          - ii. Short-Term Exposures
        - b. Cardiovascular Effects
          - i. Long-Term Exposures
          - ii. Short-Term Exposures
        - c. Respiratory Effects—Short-Term Exposures
        - d. Cancer—Long-Term Exposures
        - e. Metabolic Effects—Long-Term Exposures
        - f. Nervous System Effects—Long-Term Exposures
    - C. Proposed Conclusions on the Primary PM<sub>10</sub> Standard
      1. CASAC Advice in This Reconsideration
      2. Evidence-Based Considerations in the Policy Assessment
      3. Administrator's Proposed Decision on the Current Primary PM<sub>10</sub> Standard
  - IV. Communication of Public Health
    - A. Air Quality Index Overview
    - B. Air Quality Index Category Breakpoints for PM<sub>2.5</sub>
      1. Air Quality Index Values of 50, 100 and 150
      2. Air Quality Index Values of 200 and 300
      3. Air Quality Index Value of 500
    - C. Air Quality Index Category Breakpoints for PM<sub>10</sub>
    - D. Air Quality Index Reporting
  - V. Rationale for Proposed Decisions on the Secondary PM Standards
    - A. General Approach
      1. Background on the Current Standards
        - a. Non-Visibility Effects
          - i. Considerations Regarding Adequacy of the Existing Standards for Non-Visibility Effects in the 2020 Review
          - b. Visibility Effects
            - i. Considerations Regarding Adequacy of the Existing Standards for Visibility Effects in the 2020 Review
            2. General Approach and Key Issues in This Reconsideration of the 2020 Final Decision
        - B. Overview of Welfare Effects Evidence
          1. Nature of Effects
            - a. Visibility
            - b. Climate
            - c. Materials
          - C. Summary of Air Quality and Quantitative Information
            1. Visibility Effects
              - a. Target Level of Protection in Terms of a PM<sub>2.5</sub> Visibility Index
              - b. Relationship Between the PM<sub>2.5</sub> Visibility Index and the Current Secondary 24-Hour PM<sub>2.5</sub> Standard
            2. Non-Visibility Effects
          - D. Proposed Conclusions on the Secondary PM Standards
            1. CASAC Advice in This Reconsideration
            2. Evidence- and Quantitative Information-Based Considerations in the Policy Assessment
            3. Administrator's Proposed Decision on the Current Secondary PM Standards
        - VI. Interpretation of the NAAQS for PM
          - A. Proposed Amendments to Appendix K: Interpretation of the NAAQS for Particulate Matter
            1. Updating Design Value Calculations To Be on a Site-Level Basis
            2. Codifying Site Combinations To Maintain a Continuous Data Record
            3. Clarifying Daily Validity Requirements for Continuous Monitors
          - B. Proposed Amendments to Appendix N: Interpretation of the NAAQS for PM<sub>2.5</sub>
            1. Updating References to the Proposed Revision(s) of the Standards
            2. Codifying Site Combinations To Maintain a Continuous Data Record
        - VII. Proposed Amendments to Ambient Monitoring and Quality Assurance Requirements
          - A. Proposed Amendment in 40 CFR Part 50 (Appendix L): Reference Method for the Determination of Fine Particulate Matter as PM<sub>2.5</sub> in the Atmosphere—Addition of the Tisch Cyclone as an Approved Second Stage Separator
          - B. Issues Related to 40 CFR Part 53 (Reference and Equivalent Methods)
            1. Update to Program Title and Delivery Address for FRM and FEM Application and Modification Requests
            2. Requests for Delivery of a Candidate FRM or FEM Instrument
            3. Amendments to Requirements for Submission of Materials in § 53.4(b)(7) for Language and Format
            4. Amendment to Designation of Reference and Equivalent Methods
            5. Amendment to One Test Field Campaign Requirement for Class III PM<sub>2.5</sub> FEMs
            6. Amendment to Use of Monodisperse Aerosol Generator
            7. Corrections to 40 CFR Part 53 (Reference and Equivalent Methods)
          - C. Proposed Changes to 40 CFR Part 58 (Ambient Air Quality Surveillance)
            1. Quality Assurance Requirements for Monitors Used in Evaluations for National Ambient Air Quality Standards
              - a. Quality System Requirements
              - b. Measurement Quality Check Requirements
              - c. Calculations for Data Quality Assessments
              - d. References
            2. Quality Assurance Requirements for Prevention of Significant Deterioration (PSD) Air Monitoring
              - a. Quality System Requirements
              - b. Measurement Quality Check Requirements
              - c. Calculations for Data Quality Assessments
              - d. References
            3. Proposed Amendments to PM Ambient Air Quality Methodology
              - a. Proposal To Revoke Approved Regional Methods (ARMS)
              - b. Proposal for Calibration of PM Federal Equivalent Methods (FEMs)
            4. Proposed Amendment to the PM<sub>2.5</sub> Monitoring Network Design Criteria To Address At-Risk Communities
            5. Proposed Revisions To Probe and Monitoring Path Siting Criteria
              - a. Providing Separate Section for Open Path Monitoring Requirements

- b. Amending Distance Precision for Spacing Offsets
- c. Clarifying Summary Table of Probe Siting Criteria
- d. Adding Flexibility for the Spacing From Minor Sources
- e. Amendments and Clarification for the Spacing From Obstructions and Trees
- f. Reinstating Minimum 270-Degree Arc and Clarifying 180-Degree Arc in Regulatory Text
- g. Clarification on Obstacles That Act as an Obstruction
- h. Amending and Clarifying the 10-Meter Tree Dripline Requirement
- i. Amending Spacing Requirement for Microscale Monitoring
- j. Amending Waiver Provisions
- k. Broadening of Acceptable Probe Materials
- D. Taking Comment on Incorporating Data From Next Generation Technologies
- 1. Background on Use of FRM and FEM Monitors
- 2. Next Generation Technologies: Data Considerations
- 3. PM<sub>2.5</sub> Continuous FEMs
- 4. PM<sub>2.5</sub> Satellite Products
- 5. Use of Air Sensors
- 6. Summary
- VIII. Clean Air Act Implementation Requirements for the PM NAAQS
  - A. Designation of Areas
  - B. Section 110(a)(1) and (2) Infrastructure SIP Requirements
  - C. Implementing Any Revised PM<sub>2.5</sub> NAAQS in Nonattainment Areas
  - D. Implementing the Primary and Secondary PM<sub>10</sub> NAAQS
  - E. Prevention of Significant Deterioration and Nonattainment New Source Review Programs for the Proposed Revised Primary Annual PM<sub>2.5</sub> NAAQS
  - F. Transportation Conformity Program
  - G. General Conformity Program
- IX. Statutory and Executive Order Reviews
  - A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review
  - B. Paperwork Reduction Act (PRA)
  - C. Regulatory Flexibility Act (RFA)
  - D. Unfunded Mandates Reform Act (UMRA)
  - E. Executive Order 13132: Federalism
  - F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments
  - G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks
  - H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use
  - I. National Technology Transfer and Advancement Act (NTTAA)
  - J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

#### References

#### Executive Summary

This document presents the Administrator's proposed decisions for

the reconsideration of the 2020 final decision on the primary (health-based) and secondary (welfare-based) National Ambient Air Quality Standards (NAAQS) for Particulate Matter (PM). More specifically this document summarizes the background and rationale for the Administrator's proposed decisions to revise the primary annual PM<sub>2.5</sub> standard by lowering the level from 12.0 µg/m<sup>3</sup> to within the range of 9.0 to 10.0 µg/m<sup>3</sup> while taking comment on alternative annual standard levels down to 8.0 µg/m<sup>3</sup> and up to 11.0 µg/m<sup>3</sup>; to retain the current primary 24-hour PM<sub>2.5</sub> standard (at a level of 35 µg/m<sup>3</sup>) while taking comment on revising the level as low as 25 µg/m<sup>3</sup>; to retain the primary 24-hour PM<sub>10</sub> standard, without revision; and, not to change the secondary PM standards at this time, while taking comment on revising the level of the secondary 24-hour PM<sub>2.5</sub> standard as low as 25 µg/m<sup>3</sup>. In reaching his proposed decisions, the Administrator has considered the currently available scientific evidence in the 2019 Integrated Science Assessment (2019 ISA) and the Supplement to the 2019 ISA (ISA Supplement), quantitative and policy analyses presented in the Policy Assessment (PA), and advice from the Clean Air Scientific Advisory Committee (CASAC). The EPA solicits comment on the proposed decisions described here and on the array of issues associated with the reconsideration of these standards, including the judgments of public health, public welfare and science policy inherent in the proposed decisions, and requests commenters also provide the rationales upon which views articulated in submitted comments are based.

The EPA has established primary and secondary standards for PM<sub>2.5</sub>, which includes particles with diameters generally less than or equal to 2.5 µm, and PM<sub>10</sub>, which includes particles with diameters generally less than or equal to 10 µm. The standards include two primary PM<sub>2.5</sub> standards, an annual average standard, averaged over three years, with a level of 12.0 µg/m<sup>3</sup> and a 24-hour standard with a 98th percentile form, averaged over three years, and a level of 35 µg/m<sup>3</sup>. It also includes a primary PM<sub>10</sub> standard with a 24-hour averaging time, and a level of 150 µg/m<sup>3</sup>, not to be exceeded more than once per year on average over three years. Secondary PM standards are set equal to the primary standards, except that the level of the secondary annual PM<sub>2.5</sub> standard is 15.0 µg/m<sup>3</sup>.

The last review of the PM NAAQS was completed in December 2020. In

that review, the EPA retained the primary and secondary NAAQS, without revision (85 FR 82684, December 18, 2020). Following publication of the 2020 final action, several parties filed petitions for review and petitions for reconsideration of the EPA's final decision.

In June 2021, the Agency announced its decision to reconsider the 2020 PM NAAQS final action.<sup>1</sup> The EPA is reconsidering the December 2020 decision because the available scientific evidence and technical information indicate that the current standards may not be adequate to protect public health and welfare, as required by the Clean Air Act. The EPA noted that the 2020 PA concluded that the scientific evidence and information called into question the adequacy of the primary PM<sub>2.5</sub> standards and supported consideration of revising the level of the primary annual PM<sub>2.5</sub> standard to below the current level of 12.0 µg/m<sup>3</sup> while retaining the primary 24-hour PM<sub>2.5</sub> standard (U.S. EPA, 2020a). The EPA also noted that the 2020 PA concluded that the available scientific evidence and information did not call into question the adequacy of the primary PM<sub>10</sub> or secondary PM standards and supported consideration of retaining the primary PM<sub>10</sub> standard and secondary PM standards without revision (U.S. EPA, 2020a).

The proposed decisions presented in this document on the primary PM<sub>2.5</sub> standards have been informed by key aspects of the available health effects evidence and conclusions contained in the 2019 ISA and ISA Supplement, quantitative exposure/risk analyses and policy evaluations presented in the PA, advice from the CASAC<sup>2</sup> and public comment received as part of this reconsideration.<sup>3</sup> The health effects evidence available in this reconsideration, in conjunction with the full body of evidence critically evaluated in the 2019 ISA, supports a causal relationship between long- and

<sup>1</sup> The press release for this announcement is available at: <https://www.epa.gov/newsreleases/epa-reexamine-health-standards-harmful-soot-previous-administration-left-unchanged>.

<sup>2</sup> In 2021, the Administrator announced his decision to reestablish the membership of the CASAC. The Administrator selected seven members to serve on the chartered CASAC, and appointed a PM CASAC panel to support the chartered CASAC's review of the draft ISA Supplement and the draft PA as a part of this reconsideration (see section I.C.6.b below for more information).

<sup>3</sup> More information regarding the CASAC review of the draft ISA Supplement and the draft PA, including opportunities for public comment, can be found in the following **Federal Register** notices: 86 FR 54186, September 30, 2021; 86 FR 52673, September 22, 2021; 86 FR 56263, October 8, 2021; 87 FR 958, January 7, 2022.

short-term exposures and mortality and cardiovascular effects, and the evidence supports a likely to be a causal relationship between long-term exposures and respiratory effects, nervous system effects, and cancer. The longstanding evidence base, including animal toxicological studies, controlled human exposure studies, and epidemiologic studies, reaffirms, and in some cases strengthens, the conclusions from past reviews regarding the health effects of PM<sub>2.5</sub> exposures. Epidemiologic studies available in this reconsideration demonstrate generally positive, and often statistically significant, PM<sub>2.5</sub> health effect associations. Such studies report associations between estimated PM<sub>2.5</sub> exposures and non-accidental, cardiovascular, or respiratory mortality; cardiovascular or respiratory hospitalizations or emergency room visits; and other mortality/morbidity outcomes (e.g., lung cancer mortality or incidence, asthma development). The scientific evidence available in this reconsideration, as evaluated in the 2019 ISA and ISA Supplement, includes a number of epidemiologic studies that use various methods to characterize exposure to PM<sub>2.5</sub> (e.g., ground-based monitors and hybrid modeling approaches) and to evaluate associations between health effects and lower ambient PM<sub>2.5</sub> concentrations. There are a number of recent epidemiologic studies that use varying study designs that reduce uncertainties related to confounding and exposure measurement error. The results of these analyses provide further support for the robustness of associations between PM<sub>2.5</sub> exposures and mortality and morbidity. Moreover, the Administrator notes that recent epidemiologic studies strengthen support for health effect associations at lower PM<sub>2.5</sub> concentrations, with these new studies finding positive and significant associations when assessing exposure in locations and time periods with lower mean and 25th percentile concentrations than those evaluated in epidemiologic studies available at the time of previous reviews. Additionally, the experimental evidence (*i.e.*, animal toxicological and controlled human exposure studies) strengthens the coherence of effects across scientific disciplines and provides additional support for potential biological pathways through which PM<sub>2.5</sub> exposures could lead to the overt population-level outcomes reported in epidemiologic studies for the health effect categories for which a causal relationship (*i.e.*, short- and long-term

PM<sub>2.5</sub> exposure and mortality and cardiovascular effects) or likely to be causal relationship (*i.e.*, short- and long-term PM<sub>2.5</sub> exposure and respiratory effects; and long-term PM<sub>2.5</sub> exposure and nervous system effects and cancer) was concluded.

The available evidence in the 2019 ISA continues to provide support for factors that may contribute to increased risk of PM<sub>2.5</sub>-related health effects including lifestage (children and older adults), pre-existing diseases (cardiovascular disease and respiratory disease), race/ethnicity, and socioeconomic status. For example, the 2019 ISA and ISA Supplement conclude that there is strong evidence that Black and Hispanic populations, on average, experience higher PM<sub>2.5</sub> exposures and PM<sub>2.5</sub>-related health risk than non-Hispanic White populations. In addition, studies evaluated in the 2019 ISA and ISA Supplement also provide evidence indicating that communities with lower socioeconomic status (SES), as assessed in epidemiologic studies using indicators of SES including income and educational attainment are, on average, exposed to higher concentrations of PM<sub>2.5</sub> compared to higher SES communities.

The quantitative risk assessment, as well as policy considerations in the PA, also inform the proposed decisions on the primary PM<sub>2.5</sub> standards. The risk assessment in this consideration focuses on all-cause or nonaccidental mortality associated with long- and short-term PM<sub>2.5</sub> exposures. The primary analyses focus on exposure and risk associated with air quality that might occur in an area under air quality conditions that just meet the current and potential alternative standards. The risk assessment estimates that the current primary PM<sub>2.5</sub> standards could allow a substantial number of PM<sub>2.5</sub>-associated premature deaths in the United States, and that public health improvements would be associated with just meeting all of the alternative (more stringent) annual and 24-hour standard levels modeled. Additionally, the results of the risk assessment suggest that for most of the U.S., the annual standard is the controlling standard and that revision to that standard has the most potential to reduce PM<sub>2.5</sub> exposure related risk. Further analyses comparing the reductions in average national PM<sub>2.5</sub> concentrations and risk rates within each demographic population estimate that the average percent PM<sub>2.5</sub> concentrations and risk reductions are slightly greater in the Black population than in the White population when meeting a revised annual standard with a lower level. The analyses are

summarized in this document and described in detail in the PA.

In its advice to the Administrator, the CASAC concurred with the draft PA that the currently available health effects evidence calls into question the adequacy of the primary annual PM<sub>2.5</sub> standard. With regard to the primary annual PM<sub>2.5</sub> standard, the majority of the CASAC concluded that the level of the standard should be revised within the range of 8.0 to 10.0 µg/m<sup>3</sup>, while the minority of the CASAC concluded that the primary annual PM<sub>2.5</sub> standard should be revised to a level of 10.0 to 11.0 µg/m<sup>3</sup>. With regard to the primary 24-hour PM<sub>2.5</sub> standard, the majority of the CASAC concluded that the primary 24-hour PM<sub>2.5</sub> was not adequate and that the level of the standard should be revised to within the range of 25 to 30 µg/m<sup>3</sup>, while the minority of the CASAC concluded that the primary 24-hour PM<sub>2.5</sub> standard was adequate and should be retained, without revision.

In considering how to revise the suite of standards to provide the requisite degree of protection, the Administrator recognizes that the current annual standard and 24-hour standard, together, are intended to provide public health protection against the full distribution of short- and long-term PM<sub>2.5</sub> exposures. Further, he recognizes that changes in PM<sub>2.5</sub> air quality designed to meet either the annual or the 24-hour standard would likely result in changes to both long-term average and short-term peak PM<sub>2.5</sub> concentrations. Based on the current evidence and quantitative information, as well as consideration of CASAC advice and public comment thus far in this reconsideration, the Administrator proposes to conclude that the current primary PM<sub>2.5</sub> standards are not adequate to protect public health with an adequate margin of safety.

The Administrator also notes that the CASAC was unanimous in its advice regarding the need to revise the annual standard. In considering the appropriate level for a revised annual standard, the Administrator provisionally concludes that a standard set within the range of 9.0 to 10.0 µg/m<sup>3</sup> would reflect his placing the most weight on the strongest available evidence while appropriately weighing the uncertainties. In addition, the Administrator recognizes that some members of CASAC advised, and the PA concluded, that the available scientific information provides support for considering a range that extends up to 11.0 µg/m<sup>3</sup> and down to 8.0 µg/m<sup>3</sup>.

With regard to the primary 24-hour PM<sub>2.5</sub> standard, the Administrator finds it is less clear whether the available scientific evidence and quantitative

information calls into question the adequacy of the public health protection afforded by the current 24-hour standard. He notes that a more stringent annual standard is expected to reduce both average (annual) concentrations and peak (daily) concentrations. Furthermore, he notes that the CASAC did not reach consensus on whether revisions to the primary 24-hour PM<sub>2.5</sub> standard were warranted at this time. The majority of the CASAC recommended that the level of the current primary 24-hour PM<sub>2.5</sub> should be revised to within the range of 25 to 30 µg/m<sup>3</sup>, while the minority of the CASAC recommended retaining the current standard. The Administrator proposes to conclude that the 24-hour standard should be retained, particularly when considered in conjunction with the protection provided by the suite of standards and the proposed decision to revise the annual standard to a level of 9.0 to 10.0 µg/m<sup>3</sup>.

The EPA solicits comment on the Administrator's proposed conclusions, and on the proposed decision to revise the primary annual PM<sub>2.5</sub> standard and retain the primary 24-hour PM<sub>2.5</sub> standard, without revision. The Administrator is conscious of his obligation to set primary standards with an adequate margin of safety and preliminarily determines that the proposed decision balances the need to provide protection against uncertain risks with the obligation to not set standards that are more stringent than necessary. The requirement to provide an adequate margin of safety was intended to address uncertainties associated with inconclusive scientific and technical information and to provide a reasonable degree of protection against hazards that research has not yet identified. Reaching decisions on what standards are appropriate necessarily requires judgments of the Administrator about how to consider the information available from the epidemiologic studies and other relevant evidence. In the Administrator's judgment, the proposed suite of primary PM<sub>2.5</sub> standards reflects the appropriate consideration of the strength of the available evidence and other information and their associated uncertainties and the advice of the CASAC. The final rulemaking will reflect the Administrator's ultimate judgments as to the suite of primary PM<sub>2.5</sub> standards that are requisite to protect the public health with an adequate margin of safety. Consistent with these principles, the EPA also solicits public comment on alternative

annual standard levels down to 8.0 µg/m<sup>3</sup> and up to 11.0 µg/m<sup>3</sup>, on an alternative 24-hour standard level as low as 25 µg/m<sup>3</sup> and on the combination of annual and 24-hour standards that commenters may believe is appropriate, along with the approaches and scientific rationales used to support such levels. For example, the EPA solicits comments on the uncertainties in the reported associations between daily or annual average PM<sub>2.5</sub> exposures and mortality or morbidity in the epidemiologic studies, the significance of the 25th percentile of ambient concentrations reported in studies, the relevance and limitations of international studies, and other topics discussed in section II.D.3.b.

The primary PM<sub>10</sub> standard is intended to provide public health protection against health effects related to exposures to PM<sub>10-2.5</sub>, which are particles with a diameter between 10 µm and 2.5 µm. The proposed decision to retain the current 24-hour PM<sub>10</sub> standard has been informed by key aspects of the available health effects evidence and conclusions contained in the 2019 ISA, the policy evaluations presented in the PA, advice from the CASAC and public comment received as part of this reconsideration. Specifically, the health effects evidence for PM<sub>10-2.5</sub> exposures is somewhat strengthened since past reviews, although the strongest evidence still only provides support for a suggestive of, but not sufficient to infer, causal relationship with long- and short-term exposures and mortality and cardiovascular effects, short-term exposures and respiratory effects, and long-term exposures and cancer, nervous system effects, and metabolic effects. In reaching his proposed decision, the Administrator recognizes that, while the available health effects evidence has expanded, recent studies are subjected to the same types of uncertainties that were judged to be important in previous reviews. He also recognizes that the CASAC generally agreed with the draft PA that it was reasonable to retain the primary 24-hour PM<sub>10</sub> standard given the available scientific evidence, including PM<sub>10</sub> as an appropriate indicator. He proposes to conclude that the newly available evidence does not call into question the adequacy of the current primary PM<sub>10</sub> standard, and he proposes to retain that standard, without revision.

This reconsideration of the secondary PM standards focuses on visibility, climate, and materials effects.<sup>4</sup> The

<sup>4</sup> Consistent with the 2016 Integrated Review Plan (U.S. EPA, 2016), other welfare effects of PM, such

Administrator's proposed decision to not change the current secondary standards at this time has been informed by key aspects of the currently available welfare effects evidence as well as the conclusions contained in the 2019 ISA and ISA Supplement; quantitative analyses of visibility impairment; policy evaluations presented in the PA; advice from the CASAC; and public comment received as part of this reconsideration. Specifically, the welfare effects evidence available in this reconsideration is consistent with the evidence available in previous reviews and supports a causal relationship between PM and visibility, climate, and materials effects. With regard to climate and materials effects, while the evidence has expanded since previous reviews, uncertainties remain in the evidence and there are still significant limitations in quantifying potential adverse effects from PM on climate and materials for purposes of setting a standard. With regard to visibility effects, the results of quantitative analyses of visibility impairment are similar to those in previous reviews, and suggest that in areas that meet the current secondary 24-hour PM<sub>2.5</sub> standard that estimated light extinction in terms of a 3-year visibility metric would be at or well below the upper end of the range for the target level of protection (*i.e.*, 30 deciviews (dv)). The CASAC generally agreed with the draft PA that substantial uncertainties remain in the scientific evidence for climate and materials effects. In considering the available scientific evidence for climate and materials effects, along with CASAC advice, the Administrator proposes to conclude that it is appropriate to retain the existing secondary standards and that it is not appropriate to establish any distinct secondary PM standards to address non-visibility PM-related welfare effects. With regard to visibility effects, while the Administrator notes that the CASAC did not recommend revising either the target level of protection for the visibility index or the level of the current secondary 24-hour PM<sub>2.5</sub> standard, the Administrator

as ecological effects, are being considered in the separate, on-going review of the secondary NAAQS for oxides of nitrogen, oxides of sulfur and PM. Accordingly, the public welfare protection provided by the secondary PM standards against ecological effects such as those related to deposition of nitrogen- and sulfur-containing compounds in vulnerable ecosystems is being considered in that separate review. Thus, the Administrator's conclusion in this reconsideration of the 2020 final decision will be focused only and specifically on the adequacy of public welfare protection provided by the secondary PM standards from effects related to visibility, climate, and materials and hereafter "welfare effects" refers to those welfare effects.

recognizes that, should an alternative level be considered for the visibility index, that the CASAC recommends also considering revisions to the secondary 24-hour PM<sub>2.5</sub> standard. In considering the available evidence and quantitative information, with its inherent uncertainties and limitations, the Administrator proposes not to change the secondary PM standards at this time, and solicits comment on this proposed decision. In addition, the Administrator additionally solicits comment on the appropriateness of a target level of protection for visibility below 30 dv and down as low as 25 dv, and of revising the level of the current secondary 24-hour PM<sub>2.5</sub> standard to a level as low as 25 µg/m<sup>3</sup>.

Any proposed revisions to the PM NAAQS, if finalized, would trigger a process under which states (and tribes, if they choose) make recommendations to the Administrator regarding designations, identifying areas of the country that either meet or do not meet the new or revised PM NAAQS. Those areas that do not meet the PM NAAQS will need to develop plans that demonstrate how they will meet the standards. As part of these plans, states have the opportunity to use tools to advance environmental justice, in this case for overburdened communities in areas with high PM concentrations above the NAAQS, as provided in current PM NAAQS implementation guidance to meet requirements (80 FR 58010, 58136, August 25, 2016). The EPA is not proposing changes to any of the current PM NAAQS implementation programs in this proposed rulemaking, and therefore is not requesting comment on any specific proposals related to implementation or designations.

On other topics, the EPA proposes to make two sets of changes to the PM<sub>2.5</sub> sub-index of the AQI. First, the EPA proposes to continue to use the approach used in the revisions to the AQI in 2012 (77 FR 38890, June 29, 2012) of setting the lower breakpoints (50, 100 and 150) to be consistent with the levels of the primary PM<sub>2.5</sub> annual and 24-hour standards and proposes to revise the lower breakpoints to be consistent with any changes to the primary PM<sub>2.5</sub> standards that are part of this reconsideration. In so doing, the EPA proposes to revise the AQI value of 50 within the range of 9.0 and 10.0 µg/m<sup>3</sup> and proposes to retain the AQI values of 100 and 150 at 35.4 µg/m<sup>3</sup> and 55.4 µg/m<sup>3</sup>, respectively. Second, the EPA proposes to revise the upper AQI breakpoints (200 and above) and to replace the linear-relationship approach used in 1999 (64 FR 42530, August 4, 1999) to set these breakpoints, with an

approach that more fully considers the PM<sub>2.5</sub> health effects evidence from controlled human exposure and epidemiologic studies that has become available in the last 20 years. The EPA also proposes to revise the AQI values of 200, 300 and 500 to 125.4 µg/m<sup>3</sup>, 225.4 µg/m<sup>3</sup>, and 325.4 µg/m<sup>3</sup>, respectively. The EPA proposes to finalize these changes to the PM<sub>2.5</sub> AQI in conjunction with the Agency's final decisions on the primary annual and 24-hour PM<sub>2.5</sub> standards, if proposed revisions to such standards are promulgated. The EPA is soliciting comment on the proposed revisions to the AQI. In addition, the EPA also proposes to revise the daily reporting requirement from 5 days per week to 7 days per week, while also reformatting appendix G and providing clarifications.

With regard to monitoring-related activities, the EPA proposes revisions to data calculations and ambient air monitoring requirements for PM to improve the usefulness of and appropriateness of data used in regulatory decision making and to better characterize air quality in communities that are at increased risk of PM<sub>2.5</sub> exposure and health risk. These proposed changes are found in 40 CFR part 50 (appendices K, L, and N), part 53, and part 58 with associated appendices (A, B, C, D, and E). These proposed changes include addressing updates in data calculations, approval of reference and equivalent methods, updates in quality assurance statistical calculations to account for lower concentration measurements, updates to support improvements in PM methods, a revision to the PM<sub>2.5</sub> network design to account for at-risk populations, and updates to the Probe and Monitoring Path Siting Criteria for NAAQS pollutants.

In setting the NAAQS, the EPA may not consider the costs of implementing the standards. This was confirmed by the Supreme Court in *Whitman v. American Trucking Associations*, 531 U.S. 457, 465–472, 475–76 (2001), as discussed in section II.A of this document. As has traditionally been done in NAAQS rulemaking, the EPA prepared a Regulatory Impact Analysis (RIA) to provide the public with information on the potential costs and benefits of attaining several alternative PM<sub>2.5</sub> standard levels. In NAAQS rulemaking, the RIA is done for informational purposes only, and the proposed decisions on the NAAQS in this rulemaking are not based on consideration of the information or analyses in the RIA. The RIA fulfills the requirements of Executive Orders 13563 and 12866. The RIA estimates the costs

and monetized human health benefits of attaining three alternative annual PM<sub>2.5</sub> standard levels and one alternative 24-hour PM<sub>2.5</sub> standard level. Specifically, the RIA examines the proposed annual and 24-hour alternative standard levels of 10/35 µg/m<sup>3</sup> and 9/35 µg/m<sup>3</sup>, as well as the following two more stringent alternative standard levels: (1) An alternative annual standard level of 8 µg/m<sup>3</sup> in combination with the current 24-hour standard (*i.e.*, 8/35 µg/m<sup>3</sup>), and (2) an alternative 24-hour standard level of 30 µg/m<sup>3</sup> in combination with the proposed annual standard level of 10 µg/m<sup>3</sup> (*i.e.*, 10/30 µg/m<sup>3</sup>). The RIA presents estimates of the costs and benefits of applying illustrative national control strategies in 2032 after implementing existing and expected regulations and assessing emissions reductions to meet the current annual and 24-hour particulate matter NAAQS (12/35 µg/m<sup>3</sup>).

## I. Background

### A. Legislative Requirements

Two sections of the Clean Air Act (CAA) govern the establishment and revision of the NAAQS. Section 108 (42 U.S.C. 7408) directs the Administrator to identify and list certain air pollutants and then to issue air quality criteria for those pollutants. The Administrator is to list those pollutants “emissions of which, in his judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare”; “the presence of which in the ambient air results from numerous or diverse mobile or stationary sources”; and for which he “plans to issue air quality criteria. . . .” (42 U.S.C. 7408(a)(1)). Air quality criteria are intended to “accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of [a] pollutant in the ambient air. . . .” (42 U.S.C. 7408(a)(2)).

Section 109 [42 U.S.C. 7409] directs the Administrator to propose and promulgate “primary” and “secondary” NAAQS for pollutants for which air quality criteria are issued [42 U.S.C. 7409(a)]. Section 109(b)(1) defines primary standards as ones “the attainment and maintenance of which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health.”<sup>5</sup> Under

<sup>5</sup> The legislative history of section 109 indicates that a primary standard is to be set at “the maximum permissible ambient air level . . . which  
Continued





## Warehouse Projects: Best Practices and Mitigation Measures to Comply with the California Environmental Quality Act

In carrying out its duty to enforce laws across California, the California Attorney General's Bureau of Environmental Justice (Bureau)<sup>1</sup> regularly reviews proposed warehouse projects for compliance with the California Environmental Quality Act (CEQA) and other laws. When necessary, the Bureau submits comment letters to lead agencies, and in rare cases the Bureau has filed litigation to enforce CEQA.<sup>2</sup> This document builds upon the Bureau's comment letters, collecting knowledge gained from the Bureau's review of hundreds of warehouse projects across the state. It is meant to help lead agencies pursue CEQA compliance and promote environmentally-just development as they confront warehouse project proposals.<sup>3</sup> While CEQA analysis is necessarily project-specific, this document provides information on feasible best practices and mitigation measures, the overwhelming majority of which have been adapted from actual warehouse projects in California.

### I. Background

In recent years, the proliferation of e-commerce and rising consumer expectations of rapid shipping have contributed to a boom in warehouse development.<sup>4</sup> California, with its ports, population centers, and transportation network, has found itself at the center of this trend. For example, in 2014, 40 percent of national container cargo flowed through Southern California, which was home to nearly 1.2 billion square feet of warehouse facilities.<sup>5</sup> In the Inland Empire alone, 150 million square feet of new industrial space was built over the last decade,<sup>6</sup> and 21 of the largest 100 logistics leases signed in 2019 nationwide were in the Inland

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<sup>1</sup> <https://oag.ca.gov/environment/justice>.

<sup>2</sup> <https://oag.ca.gov/environment/ceqa/letters>; *South Central Neighbors United et al. v. City of Fresno et al.* (Super. Ct. Fresno County, No. 18CECG00690).

<sup>3</sup> Anyone reviewing this document to determine CEQA compliance responsibilities should consult their own attorney for legal advice.

<sup>4</sup> As used in this document, "warehouse" or "logistics facility" is defined as a facility consisting of one or more buildings that stores cargo, goods, or products on a short or long term basis for later distribution to businesses and/or retail customers.

<sup>5</sup> Industrial Warehousing in the SCAG Region, Task 2. Inventory of Warehousing Facilities (April 2018), [http://www.scag.ca.gov/Documents/Task2\\_FacilityInventory.pdf](http://www.scag.ca.gov/Documents/Task2_FacilityInventory.pdf) at 1-1, 2-11.

<sup>6</sup> Los Angeles Times, *When your house is surrounded by massive warehouses*, October 27, 2019, <https://www.latimes.com/california/story/2019-10-27/fontana-california-warehouses-inland-empire-pollution>.

Empire, comprising 17.5 million square feet.<sup>7</sup> This trend has not slowed, even with the economic downturn caused by COVID-19, as e-commerce has continued to grow.<sup>8</sup> Forecasts predict that the Central Valley is where a new wave of warehouse development will go.<sup>9</sup>

When done properly, these activities can contribute to the economy and consumer welfare. However, imprudent warehouse development can harm local communities and the environment. Among other pollutants, diesel trucks visiting warehouses emit nitrogen oxide (NO<sub>x</sub>)—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 particular matter that is smaller than 2.5 micrometers)—a contributor to cancer, heart disease, respiratory illnesses, and premature death.<sup>10</sup> Trucks and on-site loading activities can also be loud, bringing disruptive noise levels during 24/7 operation that can cause hearing damage after prolonged exposure.<sup>11</sup> The hundreds, and sometimes thousands, of daily truck and passenger car trips that warehouses generate contribute to traffic jams, deterioration of road surfaces, and traffic accidents. These environmental impacts also tend to be concentrated in neighborhoods already suffering from disproportionate health impacts.

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<sup>7</sup> CBRE, *Dealmakers: E-Commerce & Logistics Firms Drive Demand for Large Warehouses in 2019* (January 23, 2020), <https://www.cbre.us/research-and-reports/US-MarketFlash-Dealmakers-E-Commerce-Logistics-Firms-Drive-Demand-for-Large-Warehouses-in-2019>; see also CBRE, *E-Commerce and Logistics Companies Expand Share Of Largest US Warehouse Leases, CBRE Analysis Finds* (Feb. 25, 2019), <https://www.cbre.us/about/media-center/inland-empire-largest-us-warehouse-leases> (20 of the largest 100 warehousing leases in 2018 were in the Inland Empire, comprising nearly 20 million square feet).

<sup>8</sup> CBRE, 2021 U.S. Real Estate Market Outlook, Industrial & Logistics, <https://www.cbre.us/research-and-reports/2021-US-Real-Estate-Market-Outlook-Industrial-Logistics>; Kaleigh Moore, *As Online Sales Grow During COVID-19, Retailers Like Montce Swim Adapt And Find Success*, FORBES (June 24, 2020), available at <https://www.forbes.com/sites/kaleighmoore/2020/06/24/as-online-sales-grow-during-covid-19-retailers-like-montce-swim-adapt-and-find-success/>.

<sup>9</sup> New York Times, *Warehouses Are Headed to the Central Valley, Too* (Jul. 22, 2020), available at <https://www.nytimes.com/2020/07/22/us/coronavirus-ca-warehouse-workers.html>.

<sup>10</sup> California Air Resources Board, Nitrogen Dioxide & Health, <https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health> (NO<sub>x</sub>); California Air Resources Board, Summary: Diesel Particulate Matter Health Impacts, <https://ww2.arb.ca.gov/resources/summary-diesel-particulate-matter-health-impacts>; Office of Environmental Health Hazard Assessment and American Lung Association of California, Health Effects of Diesel Exhaust, <https://oehha.ca.gov/media/downloads/calenviroscreen/indicators/diesel4-02.pdf> (DPM).

<sup>11</sup> Noise Sources and Their Effects, <https://www.chem.purdue.edu/chemsafety/Training/PPETrain/dblevels.htm> (a diesel truck moving 40 miles per hour, 50 feet away, produces 84 decibels of sound).

## II. Proactive Planning: General Plans, Local Ordinances, and Good Neighbor Policies

To systematically address warehouse development, we encourage governing bodies to proactively plan for logistics projects in their jurisdictions. Proactive planning allows jurisdictions to prevent land use conflicts before they materialize and guide sustainable development. Benefits also include providing a predictable business environment, protecting residents from environmental harm, and setting consistent expectations jurisdiction-wide.

Proactive planning can take any number of forms. Land use designation and zoning decisions should channel development into appropriate areas. For example, establishing industrial districts near major highway and rail corridors but away from sensitive receptors can help avoid conflicts between warehouse facilities and residential communities.

In addition, general plan policies, local ordinances, and good neighbor policies should set minimum standards for logistics projects. General plan policies can be incorporated into existing economic development, land use, circulation, or other related elements. Many jurisdictions alternatively choose to consolidate policies in a separate environmental justice element. Adopting general plan policies to guide warehouse development may also help jurisdictions comply with their obligations under SB 1000, which requires local government general plans to identify objectives and policies to reduce health risks in disadvantaged communities, promote civil engagement in the public decision making process, and prioritize improvements and programs that address the needs of disadvantaged communities.<sup>12</sup>

The Bureau is aware of four good neighbor policies in California: Riverside County, the City of Riverside, the City of Moreno Valley, and the Western Riverside Council of Governments.<sup>13</sup> These policies provide minimum standards that all warehouses in the jurisdiction must meet. For example, the Western Riverside Council of Governments policy sets a minimum buffer zone of 300 meters between warehouses and sensitive receptors, and it requires a number of design features to reduce truck impacts on nearby sensitive receptors. The Riverside County policy requires vehicles entering sites during both construction and operation to meet certain California Air Resources Board (CARB) guidelines, and it requires community benefits agreements and supplemental funding contributions toward additional pollution offsets.

The Bureau encourages jurisdictions to adopt their own local ordinances and/or good neighbor policies that combine the most robust policies from those models with measures discussed in the remainder of this document.

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<sup>12</sup> For more information about SB 1000, see <https://oag.ca.gov/environment/sb1000>.

<sup>13</sup> <https://www.rivcocob.org/wp-content/uploads/2020/01/Good-Neighbor-Policy-F-3-Final-Adopted.pdf> (Riverside County); <https://riversideca.gov/planning/pdf/good-neighbor-guidelines.pdf> (City of Riverside); [http://qcode.us/codes/morenovalley/view.php?topic=9-9\\_05-9\\_05\\_050&frames=on](http://qcode.us/codes/morenovalley/view.php?topic=9-9_05-9_05_050&frames=on) (City of Moreno Valley); <http://www.wrcog.cog.ca.us/DocumentCenter/View/318/Good-Neighbor-Guidelines-for-Siting-Warehouse-Distribution-Facilities-PDF?bidId=> (Western Riverside Council of Governments).

### **III. Community Engagement**

Early and consistent community engagement is central to establishing good relationships between communities, lead agencies, and 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 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 for access and public comment by telephone and supplying instructions for access and public comment with ample lead time prior to the meeting.
- Partnering with local community-based organizations to solicit feedback, leverage local networks, co-host meetings, and build support.
- Considering 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 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.

### **IV. Warehouse Siting and Design Considerations**

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 those using or visiting sensitive receptor sites to the air pollution, noise, traffic, and other environmental impacts they generate. Therefore, placing facilities away from sensitive receptors significantly reduces their environmental and quality of life harms on local

communities. The suggested best practices for siting and design of warehouse facilities does not relieve lead agencies' responsibility under CEQA to conduct a project-specific analysis of the project's impacts and evaluation of feasible mitigation measures and alternatives; lead agencies' incorporation of the best practices must be part of the impact, mitigation and alternatives analyses to meet the requirements of CEQA. Examples of best practices when siting and designing warehouse facilities include:

- Per CARB guidance, siting warehouse facilities so that their property lines are at least 1,000 feet from the property lines of the nearest sensitive receptors.<sup>14</sup>
- Creating physical, structural, and/or vegetative buffers that adequately prevent or substantially reduce pollutant dispersal between warehouses and any areas where sensitive receptors are likely to be present, such as homes, schools, daycare centers, hospitals, community centers, and parks.
- 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, e.g., placing these points on the north side of the facility if sensitive receptors are adjacent to the south side of the facility.
- Locating warehouse dock doors and other onsite areas with significant truck traffic and noise away from sensitive receptors, e.g., placing these dock doors on the north side of the facility if sensitive receptors are adjacent to the south side of the facility.
- Screening dock doors and onsite areas with significant truck traffic with physical, structural, and/or vegetative barriers that adequately prevent or substantially reduce pollutant dispersal 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.

## **V. Air Quality and Greenhouse Gas Emissions Analysis and Mitigation**

Emissions of air pollutants and greenhouse gases are often among the most substantial environmental impacts from new warehouse facilities. CEQA compliance demands a proper accounting of the full air quality and greenhouse gas impacts of logistics facilities and adoption of all feasible mitigation of significant impacts. Although efforts by CARB and other authorities to regulate the heavy-duty truck and off-road diesel fleets have made excellent progress in reducing the air quality impacts of logistics facilities, the opportunity remains for local jurisdictions to further mitigate these impacts at the project level. Lead agencies and developers

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<sup>14</sup> California Air Resources Board (CARB), Air Quality and Land Use Handbook: A Community Health Perspective (April 2005), at ES-1. CARB staff has released draft updates to this siting and design guidance which suggests a greater distance may be warranted under varying scenarios; this document may be found on CARB's website and is entitled: "California Sustainable Freight Initiative: Concept Paper for the Freight Handbook" (December 2019).

should also consider designing projects 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 it can also save money as regulations tighten and demand for zero-emission infrastructure grows. In planning new logistics facilities, the Bureau strongly encourages developers to consider the local, statewide, and global impacts of their projects' emissions.

Examples of best practices when studying air quality and greenhouse gas impacts include:

- Fully analyzing all reasonably foreseeable project impacts, including cumulative impacts. In general, new warehouse developments are not ministerial under CEQA because they involve public officials' personal judgment as to the wisdom or manner of carrying out the project, even when warehouses are permitted by a site's applicable zoning and/or general plan land use designation. CEQA Guidelines § 15369.
- When analyzing cumulative impacts, thoroughly considering 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.
- Preparing a quantitative air quality study in accordance with local air district guidelines.
- Preparing a quantitative health risk assessment in accordance with California Office of Environmental Health Hazard Assessment and local air district guidelines.
- Refraining from labeling compliance with CARB or air district regulations as a mitigation measure—compliance with applicable regulations is a baseline expectation.
- Fully analyzing impacts from truck trips. CEQA requires full public disclosure of a project's anticipated truck trips, which entails calculating truck trip length based on likely truck trip destinations, rather than the distance from the facility to the edge of the air basin. Emissions beyond the air basin are not speculative, and, because air pollution is not static, may contribute to air basin pollution. Moreover, any contributions to air pollution outside the local air basin should be quantified and their significance should be considered.
- Accounting for all reasonably foreseeable greenhouse gas emissions from the project, without discounting projected emissions based on participation in California's Cap-and-Trade Program.

Examples of measures to mitigate air quality and greenhouse gas impacts from construction are below. To ensure mitigation measures are enforceable and effective, they should be imposed as permit conditions on the project where applicable.

- Requiring off-road construction equipment to be zero-emission, where available, and all diesel-fueled off-road construction equipment, to be equipped with CARB Tier IV-compliant engines or better, and including this requirement in applicable

bid documents, purchase orders, and contracts, with successful contractors demonstrating the ability to supply the compliant construction equipment for use prior to any ground-disturbing and construction activities.

- Prohibiting off-road diesel-powered equipment from being in the “on” position for more than 10 hours per day.
- Requiring on-road heavy-duty haul trucks to be model year 2010 or newer if diesel-fueled.
- Providing electrical hook ups to the power grid, rather than 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.
- Forbidding idling of heavy equipment for more than two 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 that all facility-owned and operated fleet equipment with a gross vehicle weight rating greater than 14,000 pounds accessing the site meet or exceed 2010 model-year emissions equivalent engine standards as currently defined in California Code of Regulations Title 13, Division 3, Chapter 1, Article 4.5, Section 2025. Facility operators shall maintain records on-site demonstrating compliance with this requirement and shall make records available for inspection by the local jurisdiction, air district, and state upon request.
- Requiring all heavy-duty vehicles entering or operated on the project site to be zero-emission beginning in 2030.
- Requiring on-site equipment, such as forklifts and yard trucks, to be electric with the necessary electrical charging stations provided.
- Requiring tenants to use zero-emission light- and medium-duty vehicles as part of business operations.
- Forbidding trucks from idling for more than two minutes and requiring operators to turn off engines when not in use.
- 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 CARB, the air district, 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 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.
- Constructing electric truck charging stations proportional to the number of dock doors at the project.
- Constructing electric plugs for electric transport refrigeration units at every dock door, if the warehouse use could include refrigeration.
- Constructing electric light-duty vehicle charging stations proportional to the number of parking spaces at the project.
- Installing solar photovoltaic systems on the project site of a specified electrical generation capacity, such as equal to the building's projected energy needs.
- Requiring all stand-by emergency generators to be powered by a non-diesel fuel.
- Requiring facility operators to train managers and employees on efficient scheduling and load management to eliminate unnecessary queuing and idling of trucks.
- 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.
- Meeting CalGreen Tier 2 green building standards, including all provisions related to designated parking for clean air vehicles, electric vehicle charging, and bicycle parking.
- Achieving certification of compliance with LEED green building standards.
- 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.
- Improving and maintaining vegetation and tree canopy for residents in and around the project area.
- Requiring that every tenant train its staff in charge of keeping vehicle records in diesel technologies and compliance with CARB regulations, by attending CARB-approved courses. Also require facility operators to maintain records on-site demonstrating compliance and make records available for inspection by the local jurisdiction, air district, and state upon request.
- Requiring tenants to enroll in the United States Environmental Protection Agency's SmartWay program, and requiring tenants to use carriers that are SmartWay carriers.



- Providing tenants with information on incentive programs, such as the Carl Moyer Program and Voucher Incentive Program, to upgrade their fleets.

## **VI. Noise Impacts Analysis and Mitigation**

The noise associated with logistics facilities can be among their most intrusive impacts to nearby sensitive receptors. Various sources, such as unloading activity, diesel truck movement, and rooftop air conditioning units, can contribute substantial noise pollution. These impacts are exacerbated by logistics facilities' typical 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 encompasses 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 dBA is ten times more sound pressure than 60 dBA.

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 operation hours 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.

## **VII. Traffic Impacts Analysis and Mitigation**

Warehouse facilities inevitably bring truck and passenger car traffic. 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.

Examples of measures to mitigate traffic impacts include:

- 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.
- 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 securing 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 prior to grading, detailing the locations of equipment staging areas, material stockpiles, proposed road closures, and hours of construction operations, and designing the plan to minimize impacts to roads frequented by passenger cars, pedestrians, bicyclists, and other non-truck traffic.

## **VIII. Other Significant Environmental Impacts Analysis and Mitigation**

Warehouse projects may result in significant environmental impacts to other resources, such as to aesthetics, cultural resources, energy, geology, or hazardous materials. All significant adverse environmental impacts must be evaluated, disclosed and mitigated to the extent feasible under CEQA. Examples of best practices and mitigation measures to reduce environmental impacts that do not fall under any of the above categories include:

- 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.
- Creating a fund 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 on a daily basis 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.
- Installing climate control in the warehouse facility to promote worker well-being.
- Installing air filtration in the warehouse facility to promote worker well-being.

## **IX. Conclusion**

California's world-class economy, ports, and transportation network position it at the center of the e-commerce and logistics industry boom. At the same time, California is a global leader in environmental protection and environmentally just development. The guidance in this document furthers these dual strengths, ensuring that all can access the benefits of economic development. The Bureau will continue to monitor proposed projects for compliance with CEQA and other laws. Lead agencies, developers, community advocates, and other interested parties should feel free to reach out to us as they consider how to guide warehouse development in their area.

Please do not hesitate to contact the Environmental Justice Bureau at [ej@doj.ca.gov](mailto:ej@doj.ca.gov) if you have any questions.

## NJ State Planning Commission

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### Office of Planning Advocacy

## Distribution Warehousing and Goods Movement Guidelines

Policy adopted September 7, 2022

### Acknowledgments:

#### State Planning Commission

##### Public Members

Thomas Wright, *Chair*, President & CEO of Regional Plan Association

Edward J. McKenna, Jr., *Vice Chair, Principal*, McKenna, Dupont, Stone & Washburne

Elizabeth Terenik, PP, AICP, Atlantic City Development Corporation

Stephen Santola, *Executive Vice President/General Counsel*, Woodmont Properties Properties

##### County/Local Government Representatives

Bruce Harris, Chatham Borough

Shanel Y. Robinson, County Commissioner Director, Somerset County

##### State Agencies

Joseph Fiordaliso, President, Board of Public Utilities

Diane Gutierrez-Scaccetti, Commissioner, NJ Department of Transportation

Shawn M. LaTourette, Commissioner, NJ Department of Environmental Protection

Sheila Oliver, Lieutenant Governor, Commissioner, NJ Department of Community Affairs

Tahesha Way, Secretary of State, NJ Department of State

##### Executive Branch Representatives

Danielle Esser, Director of Governance and Strategic Initiatives, Economic Development Authority

Douglas H. Fisher, Secretary of Agriculture, NJ Department of Agriculture

Donna Rendeiro, Executive Director, NJ Office of Planning Advocacy

Executive Director/Secretary State Planning Commission

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Matthew Blake, P.P., AICP

Senior Planner, NJ Office of Planning Advocacy

N.J. Planner License No. 33LI00643000

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY.....</b>	<b>4</b>
<b>TYPES OF WAREHOUSES.....</b>	<b>7</b>
Major Distribution Centers.....	8
Large Fulfillment Centers.....	9
Last Miles Fulfillment Centers.....	10
High Cube and automated warehousing.....	11
<b>MUNICIPAL CONSIDERATIONS.....</b>	<b>12</b>
Update Zoning First.....	12
Areawide Siting Considerations.....	14
Other Planning and zoning tools.....	16
<b>REDEVELOPMENT AND BROWNFIELDS.....</b>	<b>18</b>
Continue to redevelop formerly developed sites.....	18
Design standards under the Local Redevelopment and Housing Law.....	19
Develop where infrastructure capacity exists to support it.....	20
Manner of development.....	21
Use of underutilized land in developed areas.....	21
<b>OVERBURDENED COMMUNITIES.....</b>	<b>22</b>
Air quality and health impact considerations.....	22
Overburdened Communities.....	23
<b>TRANSPORTATION, TRAFFIC AND ROAD SAFE.....</b>	<b>24</b>
Traffic and Road planning.....	24
Specific Traffic Considerations.....	27
Best practices to mitigate possible negative impacts on traffic and roads.....	28
<b>SUSTAINABLE DESIGN.....</b>	<b>28</b>
<b>MITIGATION BEST PRACTICES.....</b>	<b>31</b>
Best practices for siting, design, and operation of warehouse facilities.....	31
Noise Impacts Analysis and Mitigation.....	31
Measures to study and mitigate noise impacts.....	32

Best practices when studying air quality and GHG impacts at the regional level.....34

Best practices to mitigate air quality and greenhouse gas impacts from construction.....34

Local and regional measures to mitigate air quality and GHG impacts from operation.....35

Labor Practices and Protection.....36

**COMMUNITY INVOLVEMENT AND ENGAGEMENT.....37**

    Adopt a Good Neighbor Policy.....37

    Concept Plan Review.....37

    Technical Advisory Committee.....38

    Community Engagement.....39

**A REGIONAL APPROACH.....39**

    County subdivision and site plan review.....40

    Establish Technical Advisory Committees.....41

**SPECIAL RESOURCE AREAS.....43**

    NJ Highlands.....43

    NJ Pinelands.....43

    Hackensack Meadowlands District.....44

**A WORD ON STATE AGENCY REQUIREMENTS.....44**

**ADDITIONAL RESOURCES.....47**

## 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. In the past, travel associated with logistics was apportioned to freight, local delivery, and retail traffic, with the “last mile” of fulfillment delivery being a shopper. The age of online shopping (e-commerce) and direct-to-home shipping service has dramatically changed these relationships, particularly with the advent of online retailers and the decline of brick-and-mortar retail. 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. What was once a less conspicuous land use limited to industrial parks in peripheral areas, distribution warehouses have become a much more recognizable feature on the landscape in towns across New Jersey, as logistics companies pursue more and increasingly larger projects.

With its strategic geographic position, skilled workforce, major consumer markets, and robust transportation infrastructure, including freight rail lines, interstate highways, and the Port of New York and New Jersey that serves 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.

Until recently, most (but not all) of the large warehouse development in New Jersey occurred in places both specifically envisioned and encouraged in the State Development and Redevelopment Plan—in State Smart Growth Areas and associated Centers, Suburban and Metropolitan State Planning Areas. It occurred in urban cores and nodes near major ports and highway interchanges, in designated redevelopment areas, contaminated sites, and Brownfields. It occurred in places where the reuse of previously developed, underutilized, blighted, or otherwise appropriately located land continues to be repurposed, providing many benefits to the hosting community and state, through job creation and returning unused land and stranded assets to the tax rolls in a sustainable manner.

It is also true that logistics industries have particular growth, location, and transportation needs that, unlike residential or other land uses, make them ill-suited to certain locations. Nor can they simply be located anywhere, particularly when options exist to locate them closer to major ports, highway interchanges, and State Smart Growth Areas, where industry-preference and land use compatibility remains the greatest.

According to a 2021 report by Costar, more than 100 warehouses totaling 26.5 million square feet of rentable space are due to be built in New Jersey over the next three years alone. Growth and traffic at New Jersey’s ports (including South Jersey ports in Camden, Paulsboro, and Salem) is growing. For example, at the Port of New York and New Jersey, container volume has increased by 19% since 2016.

It is the intent of the State Development and Redevelopment Plan (the “State Plan”) that the full amount of growth projected for the state, including logistics and warehousing, should be accommodated.

However, with the current vacancy rate for warehouse/industrial space across all of New Jersey at less than 2%, with several key markets under 1% ([Cushman & Wakefield data](#)), and increasing by 30% in each of the last two years, it is clear the market is screaming for more supply in available space. Finding creative ways to accommodate this demand appropriately and cooperatively is of statewide economic importance and something which every municipality, county, State, and regional agency should keep in mind when balancing the following guidelines while also supporting New Jersey's reputation as a logistics state.

According to the [2019 County Business Patterns \(CBP\) report](#), transportation and Warehousing led all business sectors with the largest rate of employment growth with an increase of 7.5% in the United States from 2018 to 2019, according to [U.S. Census Bureau economic statistics](#) released in 2021. Overall, employment in this sector grew from 5.0 million in 2018 to 5.4 million in 2019. In addition, annual payroll in Transportation and Warehousing ([NAICS 48-49](#)) grew 7.9% from \$262.5 billion in 2018 to \$283.2 billion in 2019, and the number of establishments grew 2.2% from 244,800 in 2018 to 250,080 in 2019. Indeed, nearly 12.2% of all jobs located in New Jersey, are in the wholesale trade or transportation and warehousing sectors of the economy, those that are devoted primarily to the storage and distribution of goods. This is the highest share among the 50 states. These sectors together are responsible for 15.7% of New Jersey's total payroll and are the highest in the country.

At the same time, large-scale regional warehousing, can if not properly sited and scaled, result in significant negative impacts, from the intensive consumption of undeveloped land to the degradation of habitat, air and water resources, quality of life, public health, safety, infrastructure, and transportation networks. Traffic tends to be the most obvious impact that affected communities and the public raise concerns about. The hundreds, and sometimes thousands, of daily truck and passenger car trips that logistics warehousing generates, contribute to traffic jams and accidents, and the deterioration of road surfaces, in addition to harmful emissions of air pollutants. Put a large-scale project in the wrong place, and the negative impacts from a single intensive facility can have a significant regional impact.

The public health impacts of warehousing also tend to be concentrated in low-income and minority communities and neighborhoods that already suffer from disproportionate health impacts because of New Jersey's long industrial legacy. For these communities, where residents are already disparately impacted by current and past environmental harms, proposals for new projects that will only worsen public health and safety raise environmental justice implications that clearly warrant a different approach and more immediate attention.

In New Jersey's more rural and less developed areas where open space and farmland preservation efforts have been focused, large warehouse projects are encroaching deeper into remaining unprotected agricultural and forested areas. With only a finite amount of available land near major ports, highway interchanges, and accessible freight rail lines, warehouse development is occurring in outlying locations that have limited infrastructure and capacity to support them, particularly along local roads and related infrastructure that was not designed to handle heavy truck traffic. As large tracts of forested habitat and productive farmland are replaced with intensive warehouse uses, communities may be changed forever. Should such trends in accelerating greenfield development continue unabated, and without adequate



land use parameters to appropriately locate, scale, and design projects, the negative impacts to New Jersey's agricultural and natural land base, and associated communities, have the potential to be dramatic.

Wherever warehouse development happens, benefits and negative impacts will follow that must be carefully balanced 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 and transportation 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 growth and viability, and meeting industry needs 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. The State Plan's Statewide Policies provide the principal source of this guidance and are reflected in each of the following sections.

The State Plan, including its State Plan Policy Map, is used to guide municipal, county, and regional planning, state agency functional planning, and public and private infrastructure investment decisions in a fair and equitable manner. While the State Planning Commission ("the Commission") does not possess regulatory authority over land use and zoning, when municipal, county and regional plans are updated, they should be modified to reflect compatibility or consistency with of the State Plan.

The guidance aims to:

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

These guidance documents and policy statements therein, describe how municipalities can achieve these aims across eleven related areas of focus. Each area of focus identifies a related State Plan Policy that provides a basis for inclusion. Local governing bodies and planners can utilize some or all of these areas holistically to address the challenges they face. The detailed guidance documents consider:

- Types of Warehouses
- Municipal Considerations
- The Role of Redevelopment and Brownfields

- Public Health and Overburdened Communities
- Transportation, 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 holistically to provide a balanced approach to warehouse siting that considers environmental and economic sustainability and benefits and public health. As technology advances, the recommendations included herein may become outdated or even obsolete. Warehouse developers are encouraged to take every opportunity to implement newer, cleaner technologies and methodologies as they become available, even if not specified in these guidance documents. Municipalities are likewise encouraged to plan and zone for the future, not just their current situation or the proposal before them. In all cases, municipal and county authorities should consult with their land use attorneys before enacting or amending land use, planning, and zoning regulations.

## Types of Warehouses

Warehouse development comes in many shapes and sizes, each serving a specific role depending on the nature of the operations, and constraints of the supply chains they are supporting. Zoning should evolve to keep up with the changing variety of uses and trends (including definitions) as the differences could mean dramatically different impacts and outcomes, and whether a project is compatible with a site and beneficial to a community. Land use regulations should not simply lump “general industrial” or “warehouse” together, as different types 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. This will 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 level of intensity, traffic, and resultant impacts. Other impacts that can be assessed include infrastructure such as water, sewer, and municipal services (e.g., emergency services), which have the sustained capacity to meet demand over the lifetime of the project. For our purposes, the guidance largely focuses on various types of warehouse distribution facilities, their scale and intensity, and municipal, county, and regional considerations therein.

According to the [Geography of Transport Systems, 5<sup>th</sup> Edition](#), warehouse distribution centers are a type of freight movement (e.g., logistics) facility that includes manufacturing, container and bulk terminals, and traditional warehouse storage facilities. A traditional warehouse is used for storing goods and materials in inventory for extended periods of time and releasing them on demand. They include multitenant facilities that are usually rented through short to medium-term leases.

The main difference between traditional and distribution warehouse functions relates to the time the inventory spends within a facility. The latter see much greater product loading and unloading flow velocity (usually less than a few days), especially at fulfillment centers, which deliver goods direct to customers within less than 48 hours in high throughput facilities. Warehouses may also include office, employee welfare, maintenance areas, as well as light manufacturing in the form of packaging, labeling, assembly, and returns, more typical of distribution functions. However, the space provided for these uses can be highly variable but is typically an insignificant portion of the overall building square footage.

Following recent updates to its [Trip Generation Manual, 11th 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 distribution and fulfillment warehouses that are associated with today's e-commerce landscape and logistics (i.e., freight) infrastructure. Each is situated in a strategic location and carries out a somewhat distinct activity. They include

- Distribution facilities
- Fulfillment centers, and
- Last-mile fulfillment facilities or stations.

Keep in mind that this and other guidance is highly variable for specific types of warehousing uses as industry definitions, warehouse uses, and technology are constantly evolving and changing. There can be substantive variability within a single warehousing development based on type, intensity, and the potential for misclassification. In addition, some warehouse developments may have multiple warehousing use types within a single building or site. From the standpoint of a warehouse distribution center/facility's size, the following may be used:

- **Major Distribution center** – large-scale regional and/or interstate distribution facility having a minimum gross floor area from 500,000 to more than 1.5 million square feet.
- **Large Fulfillment center** – a large format regional fulfillment facility having a minimum gross floor area from 150,000 to more than 500,000 square feet. In this category, a medium-sized fulfillment center would average between 250,000 to 350,000 square feet.
- **Last-mile Fulfillment center** – a smaller local or area fulfillment center/facility or station that primarily serves local markets (roughly the same function as retail shopping centers) having a minimum gross floor area from 50,000 to more than 150,000 square feet. This category could include micro/small fulfillment centers of 3,000 to more than 25,000 square feet.

**Warehouse distribution centers/facilities may be further characterized by the following attributes:**

**Major Distribution Centers** tend to ship from wholesale or manufacturer, to businesses, or to fulfillment centers, and typically do not deliver to end-users (i.e., retailers and 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 pallets 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 hubs that can include shipping lines, rail lines, and extensive highway networks.
- Can be located an hour to 90 minutes away (i.e., within a 75-mile radius) 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.
- Performs transloading functions (aka. cross docking), whereby the consolidation, transferring and distribution of pallets, equipment, and other shipments are made between locations using more than one mode of transportation for manufacturers, wholesalers, or retailers.
- Includes cross-docking functions, whereby palletized freight (goods and materials) is moved across the distribution center to another truck to complete the rest of its journey. Characterized as having little or no storage function due to the perishable nature of many goods being shipped, such as food (including refrigeration and heated)
- Includes fabrication functions (e.g., sorting and packaging before final delivery).
- Includes break-bulk functions, whereby items that are shipped in bulk (e.g., unpackaged state) are divided into units for further shipment (i.e., palletized or completely broken down) so that a retailer, business, or fulfillment center can receive a smaller quantity to their exact specifications. Structures typically from 500,000 to more than 1.5 million square feet.
- Average clear building height is between 32 and 35 feet. According to the Commercial Real Estate Development Association (NAIOP), in newly constructed structures larger than 300,000 square feet, 32 feet clear is typical. In mega-sized distribution buildings, 36 feet is common, with clear heights rising past 40 feet in some cases.

**Large Fulfillment Centers** are a type of distribution center often solely dedicated to e-commerce supply chains that pick and pack incoming orders (i.e., items/parcels) from shelves for individual delivery in order to “fulfill” individual online orders. They are short-term storage-based (holding a very high range of goods) but also rely on a high level of throughput. Typically, smaller than distribution centers and focus on quickly delivering goods to individual customers. 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.
- Includes cross-docking functions, whereby palletized freight is moved across the distribution center to another truck to complete the rest of its journey. Characterized as having little or no storage function due to the perishable nature of many goods being shipped, such as food (including refrigeration and heated)

- Includes fabrication functions (e.g., sorting and packaging before final delivery).
- Includes cold storage and refrigeration functions, including [large scale grocery cold chain distribution](#), whereby outbound loads are customized shipments bound to specific grocery stores. These deliveries are usually regional in scope, which corresponds to the market area of the distribution center.
- Includes break-bulk functions, whereby palletized freight or boxed goods are completely broken down so that a customer can receive a smaller quantity to their exact specifications.
- Includes high-cube automated fulfillment centers and associated facilities as described below.
- Structures typically from 150,000 to 500,000 sq. ft., with an average clear building height between 32 and 35 feet.

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

- Typically located in urban and suburban infill areas.
- Primarily serve local markets with roughly the same function as retail shopping centers
- Locational impetus is to be near those customers, which can result in delivery vans/trucks traveling over local streets.
- Last mile delivery hubs may be smaller compared to distribution centers, but truck and van trips are high, as are the parking requirements necessary to accommodate hundreds of employees, delivery vans, and trucks, and require a larger parking lot (impervious surface) footprint than other warehouse operations.
- Higher sprinter van and truck trips warrant more direct access to the interstates and truck networks.
- Structures typically from 50,000 to more than 150,000 square feet.
- Includes micro-fulfillment centers (i.e., small fulfillment centers) with a footprint between 3,000 and 25,000 sq. ft., that are typically highly automated, run on a very small staff, and cater to the area they are in. Sometimes occupy sections of retail stores that handle last-mile fulfillment and delivery of products to customers.

### **High Cube and automated warehousing – an emerging trend in distribution**

As available and ideally situated land in strategic locations becomes scarcer and more expensive to meet demand, distribution companies are increasingly embracing emerging technologies to move and store goods more efficiently. As a result, warehouse distribution facilities are changing to adapt to automation and reduction in available space by reducing footprints and modifying layouts and designs. These changes have taken the form of high cube and automated warehousing (HCW), which are differentiated from traditional warehouses because of their height.

In contrast with the scale of more traditionally designed warehouses and distribution centers seen in both Pennsylvania and New Jersey over the past decade, HCW 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 HCW is dedicated to the rapid storage

and removal of goods. HCW's are 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.

- A HCW Distribution Center is typically a very large shell building commonly constructed using steel framed and/or other concrete tilt-up techniques with a minimum gross floor area of 200,000 square feet, a ceiling height of 32 feet or more (can be as high as 10-to-14 stories in height), a minimum dock-door ratio of 1 door per 10,000 square feet.
- Primarily used 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. It has a high level of on-site automation and logistics management, which enable highly efficient processing of goods.
- Characterized by a small employment count due to a high level of automation, and truck activities frequently outside of the peak hour of the adjacent street system.
- Related types of HCW's include high-cube transload and short-term storage warehouses, high-cube parcel hub warehouses, and high-cube cold storage warehouses.
- A short-term HCW is a distribution facility often with custom/special features built into the structure for the movement of large volumes of freight with only short-term storage of products.
- High-cube parcel (i.e., fulfillment) hub warehouses typically serve as a regional and local freight-forwarder facility for time sensitive shipments via airfreight and ground carriers, while high-cube cold storage warehouses entail substantial temperature-controlled environments for frozen food and other perishable products such as bulk raw produce. 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 — nearly 5 times as much.
- Whereas a typical large warehouse may have a building footprint between 150,000-to-500,000-square feet with a 40-foot ceiling height (shorter than an average 3-story home), a high cube warehouse can be 10-to-14 stories (a story generally being 14 feet) – 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

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 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 should weigh the project-specific benefits against the potential for significant adverse impacts on community character, viewsheds, air quality, health, safety, and the transportation network.

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. This is particularly concerning 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. The height of the structure, the construction materials used, and what is stored in the warehouse are

critical to ensuring that workers are safe and that emergency services can adequately respond safely. 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 above three 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.

Highly automated facilities can be expected to 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 (e.g., more high-tech jobs) from HCW proposals. Given these special needs and concerns, HCW uses above 150,000 gross square feet may be more appropriate where permitted a conditional use in tandem with permitted uses that otherwise limit building height and size among other standards utilized to limit the scale and intensity of uses.

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*Conduct Master Plan Reexaminations and update relevant land use, zoning, land development and redevelopment plans, policies, and programs to ensure that they clearly define and reflect various warehouse typologies, including new sub-categories of industrial development. Zoning should ensure that projects are appropriately located, scaled, and designed to mitigate and avoid conflicts with surrounding uses, infrastructure, resources, sensitive receptors and adjacent municipalities, particularly overburdened communities.*

*State Planning Commission Policy*

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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 and size 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

Warehouse development comes in many shapes and sizes, and zoning should evolve to keep up with the changing variety of uses and trends. These differences could mean dramatically different impacts and outcomes, and whether a project is compatible with 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, zoning, and development regulations to differentiate among warehouse use types. This will 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, can meet demand.

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 without consideration or limitation on the size and intensity of today’s distribution warehouses. 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 residents in municipalities reviewing and approving warehouse proposals that they are unhappy with are 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.

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*Mitigate and avoid conflicts with other uses, sensitive populations and receptors by locating large warehouses away from residential areas/neighborhoods, downtown commercial/retail areas and main streets, schools, daycare centers, places of worship, hospitals, overburdened communities, scenic corridors and historic districts, important public and civic outdoor spaces, and recreational facilities.*

*State Planning Commission Policy*

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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. In this way, local governing bodies can ensure that they clearly define and distinguish between more traditional industrial-commercial uses and a variety of warehouse types. These uses can range 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 truck traffic that are mobile sources of air pollution.

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, and places of worship, hospitals, 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 are not unfairly placed on other municipalities and their residents.

Municipalities seeing greater pressure for larger (above 150,000 sq. ft. of gross floor area) and/or multiple projects should 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. Additionally, implementing a Complete & Green Streets Policy in areas where delivery trucks and vans will interact with passenger vehicles, pedestrians and bicyclists should be considered. 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). This will 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 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 and intensity (e.g., impervious surface, height, building footprint, and amount of semi-truck parking) 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. Even a warehouse located in an otherwise ideal location can result in substantial detriment to the transportation network if its intensity is completely out of scale and incompatible with roadway capacity and associated infrastructure. 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. Finally, in reviewing existing zoning districts, municipalities should consider zoning to support manufacturing or a mix of compatible activities, as this type of space might create better-paying jobs than warehousing spaces.

## Areawide Siting Considerations

Local zoning should exclude large 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 regional highway or freight rail infrastructure and access are in immediate proximity, larger warehouse development should be excluded outside of State-designated Smart Growth Areas, Centers, and Nodes, and sewer service areas, particularly in Rural Planning Area (PA-4) and Environmentally Sensitive Planning Areas (PA-4B, 5 and 5B).

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 habitats 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 largescale facilities (above 500,000 square feet of impervious surface), where there is direct access to interstate and major highways (of adequate capacity) and/or freight rail lines, preferably from industrial zoning districts. Large regional distribution facilities should not be mixed with other land uses due to the vast scale and intensive nature of their activities. Warehouse development, especially larger projects, should not occur outside 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.

Smaller facilities, such as last mile stations (e.g., those using a preponderance of smaller delivery vans) under 150,000 sq. ft. in gross floor area that primarily serve local markets, may be appropriate in Fringe Planning Areas (PA-3), and Centers and Nodes located within Rural and Environmentally Sensitive (PA 4B and 5) Planning Areas, and overburdened communities, Urban Cores and Clusters where adequate infrastructure and transportation, including proximity to a regional/major highway network, ports, rail yards, and other key intermodal transportation facilities and more immediate access exists.

In addition, accommodation should be made for customers in more rural and less suburban areas, where smaller last-mile facilities may be needed to address the final leg of the delivery system or for purposes of cold storage, 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 appropriately scaled interchanges, highways (including along 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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*Should be organized in a compact form and located in State-designated Smart Growth Areas, Centers, Nodes, State-approved sewer service areas, and other appropriate areas proximate to regional highway network and rail lines/yards access in Metropolitan, Suburban or Fringe Planning Areas.*

*Exclude, adequately buffer, and protect areas and/or avoid sites comprising a prevalence of State-regulated areas and natural resources of local, regional, and state significance, including aquatic resources, flood hazard areas, freshwater wetlands, riparian zones, transition areas, steep slopes, and threatened and endangered species habitats as identified under NJDEP's Landscape Project.*

*Areas and sites identified for preservation and/or protection under local, county, regional, or state programs and plans, including any portion of land or site within a designated Agricultural Development Area, should be excluded from warehouse development. Larger properties (e.g., 10 or more acres) comprising a prevalence of Primary Soils should likewise be avoided.*

*State Planning Commission Policy*

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## **Other planning and zoning tools**

### **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, truck and employee routes, the transportation network, supporting infrastructure (e.g., water supply and sewer capacity), 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 providing and maintaining 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**

Large-scale distribution warehouses are not benign uses and can have substantial health, air quality, noise, traffic, and inequitable impacts based on their intensity and siting. Rather than allowing uses that are more intensive by right as part of the local land-use regulations, municipalities can exert greater control over the site plan review process by permitting them as special exceptions and conditional uses. This may provide better outcomes, particularly for large warehouse projects (e.g., above 150,000 sq. ft. of gross floor area and/or above 32 feet in height), particularly major structures (e.g., above 250,000 sq. ft., including high cube buildings). 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 conditional uses are for those uses that warrant additional safeguards, such as landfills, telecommunications towers, asphalt plants, and quarries.

For example, under Conditional Use, an applicant could be required to meet certain criteria regarding design, bulk, or circulation standards. 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 some 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 would not 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.

## Redevelopment & Brownfields

### Continue to redevelop 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 (e.g., to remediate contaminated sites, incorporate environmental protection, climate, energy, and stormwater mitigation measures, guarantee specific infrastructure and capital improvements, public amenities, etc.). Redevelopment Agreements can 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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*Promote warehouse development through the redevelopment of former industrial sites, Brownfields, and landfills to help facilitate remediation and clean-up of abandoned, blighted, or underutilized properties, and to revitalize distressed urban areas. In all cases, redevelopment activities should seek to mitigate and avoid creating additional burden, while working to correct past harm and provide lasting and meaningful benefits, particularly in overburdened communities.*

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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. Other examples include requiring solar on roofs and parking lots and for powering the building’s operation, electric vehicle charging stations to encourage electrical hookups 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

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*Proactively work to identify well-suited locations and opportunities to accommodate appropriately-scaled warehouse development, while continuing to facilitate the trend in redevelopment and infill, with consideration given to the condition and adequacy of existing infrastructure and roadway capacity. While 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.*

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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. At the same time, there may be instances where it may be appropriate to create industrial parks (e.g., regional industrial nodes) on non-blighted open lands within State-designated sewer service areas, Centers, and other recognized and approved growth areas with ready access to major highways and other important infrastructure, but without the use of Redevelopment Statute.

### **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 infill. Consideration should be 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 cleanup of abandoned or underutilized properties. This not only helps address existing negative impacts and environmental harm but also provides economic and employment benefits, particularly in communities of high unemployment. 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 collaborate on making infrastructure and other improvements that can minimize and mitigate impacts. At the same time, not all Brownfield sites are suitable for excavation and warehouse operations due to the type of contamination present (e.g., VOC seepage through the flooring), the impact that dust and site disturbance might have on the neighborhood, and more.

## **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 use, 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 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. This information will give the municipality the ability to anticipate and plan for shifts in services.

## **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 that can mimic a traditional commercial or retail space, 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 at 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. In these cases, 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.

## **OVERBURDENED COMMUNITIES**

### **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, and needs 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 oxides and particulate matter, are harmful to human health even at low concentrations and through short-term exposures. 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 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.

In support of the ACT rule, [P.L. 2021, c. 171](#), requires applicants to meet minimum requirements for electrical infrastructure to support future EV charging (i.e., Electric Vehicle Supply/Service Equipment (EVSE) and Make-Ready parking spaces). The law, signed by Governor Murphy in July 2021, requires Electric Vehicle Supply/Service Equipment (EVSE) and Make-Ready parking spaces to be designated as a permitted accessory use in all zoning or use districts in New Jersey. The law also establishes installation and parking requirements for EVSE and Make-Ready parking spaces in local communities.

### **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 348 different municipalities. Pursuant to the Law, "overburdened communities" are defined as Census block groups with low-income, minority, or limited 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.

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*Avoid the disproportionate location of large warehouse distribution facilities in Overburdened Communities, Urban Cores and Clusters that serve a regional market and are characterized by a preponderance of diesel-powered tractor-trailers, particularly where air quality is categorized as chronically 'Unhealthy' by USEPA's Air Quality Index (AQI), or as so demonstrated through use of NJ Environmental Justice Mapping, Assessment and Protection Tool, which provides air pollution data. In all cases, environmental justice, equity, and fair labor practices should be guiding principles and actionable, enforceable elements in warehouse policymaking and siting decisions.*

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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. This increased traffic volume 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).

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*Warehouse facilities may be appropriate in Overburdened Communities, Urban Cores and Clusters where a project advances significant remediation of a contaminated and blighted site, and provides important local benefits in job creation, ratables, economic development, performance standards and amenities (e.g., utilizes a high percentage of electric semi-trucks and/or providing congestion bypasses for local through movement of trucks). Acceptable redevelopment activities are those that substantially mitigate and avoid creating additional burden, while meaningfully correcting current and past harm on environmental justice communities.*

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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, getting a warehouse user to utilize a certain percentage of electric vehicles ahead of ACT Rule’s phased implementation could significantly advance local efforts to reduce GHG emissions and air pollution. Such mitigation, among other locally desired measures, could help build support and acceptance of 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.

## **Transportation, Traffic and Road Safety**

### **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 regional transportation plan, targeted corridor study, or update the land use and circulation plan in coordination with NJDOT, county, and regional agency partners, as part of an inclusive public planning process. 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 not completed prior to 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.

In all cases, municipal reviewing boards should emphasize the importance for applicants to perform due diligence before submission of a subdivision and/or site plan application. This includes involving county planning, engineering, and the NJDOT early on (before local permits are issued) if there is a desire to access a road within their jurisdiction. Local approvals do not guarantee that county and state permits will be granted. Many developers make significant investments only to find out that a county and/or Minor or Major NJDOT Access Permit either cannot be granted quickly or accommodated at all.

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 be required by ordinance and identify all on-and-offsite transportation impacts, including vehicular (including autonomous), truck, pedestrian, multimodal, air (e.g., drone), 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.

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*Improve the coordination and integration of land use and transportation planning among the relevant public, quasi-public and private transportation interests in New Jersey, including the metropolitan planning organizations, bi-state authorities, toll road authorities and commissions, to strengthen the linkages between land use and transportation planning for all modes of transportation.*

*Ensure that distribution warehouses are sufficiently linked with and served by appropriately scale port facilities, regional highway networks, and/or freight rail access, and other strategic intermodal transportation facilities throughout the region and state with special efforts to improve linkages between employees and job opportunities, and last mile fulfillment centers and consumers.*

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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 known. In addition, the user of the warehouse may be a tenant with a lease subject to change at each lease term. 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. It is also important to recognize the relationship between transportation project justifications that often precede speculative development proposals, local zoning modifications, etc., to identify any assumptions for inducing/incentivizing industrial development and redevelopment.

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 impact analysis (unless agreed by the applicant and/or funded as part of a redeveloper's agreement). At a minimum, the study should determine whether truck routes outside of municipal boundaries will negatively affect their neighborhoods, downtowns, historic areas, etc., and send a copy of this evaluation to the potentially affected municipalities and counties 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 alternative routes might be chosen, and develop enforceable strategies for trucks that go off route.

### **Specific Traffic Considerations**

- Traffic Impact Studies should include a truck and automobile trip analysis to project and break out different vehicle trips throughout the entire day (i.e., not just peak hours) to capture the full (potential) magnitude generated from a proposed warehouse.
- 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 on 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 an entrance (i.e., gate) management plan (e.g., staggered shifts as a condition of approval) in place to prevent queuing on affected roads?
- Is there adequate truck parking to ensure that trucks delivering or awaiting loads do not end up waiting outside of the facility until their appointed time?
- Will patronage to local businesses or commercial areas be impacted if destination access becomes impaired by levels of truck traffic not conducive to visitation?

**Best practices to mitigate possible 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.
- Imposing delivery schedule time restrictions on specific local road networks where necessary to protect public safety and avoid negative impacts and major disruption to other users such as same-route school drop-off/pick-up hours.
- 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 turn's trucks can make entering and exiting the facility to route trucks away from sensitive receptors (e.g., neighborhoods, overburdened communities, schools, daycare centers, etc.)
- 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.

## Sustainable Design

According to the US Environmental Protection Agency, sustainable building practices include both the structure and use of environmentally responsible processes, and energy and resource-efficient materials 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.

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 sufficient landscaping requirements, including the use of adequately sized berms, solid walls, 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. Climate mitigation measures should also be employed to anticipate more extreme heat, weather, and rain, including flood control, permeable surfaces, and natural absorption systems.

Design standards should also address a building's shape, scale, color, pattern, texture, and space, using a variety of architectural elements, accent features, 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 durable materials, all provide relief from flat facades, fragmenting large, and otherwise spaces, masses, or volumes.

Municipalities should require developers of new warehouse construction to meet enhanced green infrastructure standards that go 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 also can save money as regulations tighten and demand for zero-emission infrastructure grows. For example:

- All warehouse buildings should strive to be LEED Silver or higher or comply with a comparable "green building" program at the same standard or higher.
- For existing warehouses, rooftop (and other suitable) surface areas that are not already covered by solar panels should be retrofitted to be solar-ready. 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. If concrete is used in parking lots and drive aisles, it should have a solar reflective index of no less than 30, and trees planted on the premises, especially in parking lots, should be capable of providing significant shade as they mature.
- Cool pavement should be used throughout the facility to reduce heat island effects. Any rooftop equipment should have screens if visible from residential homes within a certain radius of the warehouse.
- Warehouses should also keep up external appearances, remove unsanctioned graffiti, and dead trees, and address any unsightly issues promptly.
- 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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*Encourage sustainability in siting, design, construction, operations, maintenance, redevelopment, renovation and demolition, including energy and resource-efficiency (e.g., solar roofs, EV ready and zero emission semi-trailers), and the preservation and restoration of the surrounding habitat, making the most efficient and least disruptive use of water, drainage, energy, and natural resources. Design projects with their long-term viability in mind and scaled to be compatible with the surrounding area and transportation network and utilize enhanced Green Building and green infrastructure to extent feasible.*

*Recognize the deleterious impacts of emissions (i.e., air pollutants and greenhouse gases) from diesel-powered delivery vans and tractor trailers; undertake remedies that mitigate or eliminate these impacts through public and private sector actions addressing transportation mobility choices, use of clean, renewable, alternative forms of energy. Encourage the promotion and implementation of medium and heavy-duty truck electrification programs in overburdened communities, among other efforts to implement the Advanced Clean truck Rule.*

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## **Mitigation Best Practices**

The Municipal Land Use Law (“MLUL”) requires certain processes, allows certain considerations, is silent on others, and prohibits some. Municipalities are also required to address certain other mandates identified through legislation or executive orders that are not addressed in the MLUL (e.g., EO 89, EO 23, Advanced Clean Trucks (ACT) rule, and P.L. 2021, c. 171 statewide EVSE ordinance). The following best practices identify ways that municipalities can address the requirements set forth in the MLUL as well as other mandates and initiatives.

Factors below may also be addressed in master plans, ordinances, redeveloper’s agreements, redevelopment plans, negotiated or as conditions of approval, in consultation with a municipal land use attorney. Keep in mind that any requirement should be, defensible, reasonable, and enforceable to the extent of the municipality’s capacity. It is strongly recommended that when considering these factors, a holistic review be considered for inclusion where practicable and appropriate so that land use policies set forth a strong legal basis for desired performance standards.

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

- Siting largescale warehouse facilities as close as possible to rail, regional and 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 large warehouse facilities so that their property lines are between 500 and 1,000 feet from the nearest sensitive receptors, (e.g., residential areas, schools, daycare centers, places

- of worship, hospitals, community centers, and active recreational parks). Mitigating features such as a large forest patch protected by a conservation easement, may warrant special consideration, justifying a reduced buffer.
- Screening dock doors and onsite areas with significant truck traffic with physical, structural, and/or vegetative buffers that adequately prevent or substantially reduce noise to meet local sound level standards in compliance with N.J.A.C. 7:29.
  - Site entry gates into the loading dock and truck court areas at least 100 feet inside the property line.
  - Reducing light pollution and glare to the maximum extent possible. Warehouses should try to implement a site-wide lighting program in compliance with International Dark Sky Association standards when possible.
  - Equipping interior and exterior lighting with motion sensors that either turn lights off, or for exterior lighting, dim lights to 50-25% output after sundown when no motion has been detected for 10 minutes.
  - Installing outdoor freestanding and wall-mounted lights that do not exceed 20 feet when within a certain radius of residential areas.
  - Only locate truck entry points on commercial class streets.
  - Shielding and directing construction lighting away from the project's property lines and residential areas.
  - Site design shall provide adequate areas for on-site parking, on-site queuing, and truck check-in that prevent trucks and other vehicles from queuing, circling, parking, or idling on public streets, as may be defined in the local ordinance.
  - 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.
  - 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.<sup>2</sup>
  - Establishing performance standards at or above state requirements for noise, glare, vibrations, traffic, and Complete and Green Streets.
  - Consider 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.
  - 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.
  - Posting clear, durable, weatherproof signage and maps available on the property, especially

- at truck entrances and exits, depicting truck routes and truck turning prohibitions, along with physical preventive measures such as bumps, curbs that force one-way turns, etc. to prevent trucks from taking the wrong routes through sensitive receptors.
- Signs and pavement markings should clearly identify traffic circulation patterns to minimize unnecessary on-site vehicular travel.

### **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, and diesel truck movement, 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. In all cases, sound level requirements should be established by local ordinance in compliance with N.J.A.C. 7:29. Finally, keep in mind that some freight businesses need to operate up to 24-hours per day to meet demand and be successful. In such cases, careful siting, particularly along anticipated truck routes, will be necessary to avoid negative impacts to residential areas and other sensitive receptors.

#### **Examples of measures to study and mitigate noise impacts include:**

- Preparing a noise impact analysis that considers all reasonably foreseeable project noise impacts 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 are ten times more sound pressure than 60 decibels, and 100 times more pressure than 50 decibels.
- Constructing physical, structural, or vegetative noise barriers on and/or off the project site, particularly around combustion-powered construction equipment, and properly functioning mufflers should be fitted on construction equipment.
- 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.
- Using a noise protection barrier around combustion-powered construction equipment.

- 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.
- Preparing a noise impact analysis that considers all reasonably foreseeable project noise (both on and off-site).
- Prohibiting outdoor loading activities conducted between 9 pm-6 am that exceed 50 dB A CNEL noise levels, nor shall anyone operate speakers that exceed 45 dB A Leg (i.e., equivalent continuous sound level) within 1,500 feet of residential property between 7 pm-7 am.
- Prohibiting warehouses from conducting any nighttime construction on areas abutting residential neighborhoods, and if nighttime construction is necessary, one week's notice shall be given to the residents within hearing distance.
- Paving truck roads should be paved with low-noise asphalt.

#### **Best practices when studying air quality and greenhouse gas impacts at the regional level**

- 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.
- Fully analyze impacts from truck trips. Municipalities and regional authorities should require full public disclosure of a project's anticipated truck trips, which entails calculating truck trip length based on likely truck trip destinations.
- Quantify any contributions to air pollution in adjacent communities and their significance
- 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. Municipalities should consider encouraging or imposing certain conditions on a project where appropriate, including:**

- Utilizing off-road construction equipment to be zero-emission, where available.
- Ensuring all off-road diesel-powered equipment from being in the “on” position for more than 10 hours per day.
- Using only all on-road heavy-duty haul trucks be the model year 2010 or newer if diesel-fueled.
- Using 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.
- Only grading on days when the Air Quality Index forecast is less 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.
- Encouraging operators to consider providing meal options onsite or shuttles between the facility and nearby meal destinations for construction employees.

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

- Requiring compliance with NJ’s Act Rule as a condition of approval.
- Encouraging installing/using on-site equipment, such as forklifts and yard trucks, that is electric with the necessary electrical charging stations provided.
- Encouraging installing/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.
- Encouraging installing/using electric hook-ups to eliminate idling of main and auxiliary

engines during loading and unloading, and when trucks are not in use.

- 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.
- Encouraging operators to install and maintain, 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.
- Encouraging operators to install and maintain, 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.
- Encouraging 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.
- Encouraging compliance with the Federal Energy Management Program's Fleet Management Framework: <https://www.energy.gov/eere/femp/femp-best-practices-fleet-management-framework>.

### **Labor Practices and Protection**

- Installing climate control in the warehouse facility to promote worker well-being.
- Installing air filtration in the warehouse facility to promote worker well-being where appropriate.

- 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 public.
- Providing air-conditioned and heated on-site lounges with vending machines, seating areas, restrooms, showers, TV, and workspaces that are kept clean and stocked for warehouse workers and truckers, with signage in both English and Spanish.
- Encouraging operators to provide meal options onsite or shuttles between the facility and nearby food centers.
- Requiring operators 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.
- Encouraging operators to provide 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.
- Encouraging operators to establish subsidy programs to encourage workers to either bike to work, use public transit, or carpool.
- Encouraging operators to provide a zero emissions shuttle to take workers to and from the nearest bus and/or train stop(s).
- Bike racks and preferential parking for personal ZEVs and E-bikes should be provided.
- Truckers should also be provided with maps of designated trucking routes, as well as charging ports for medium to heavy-duty ZE trucks.
- Operators should implement ongoing programs, in both English & Spanish, to educate truckers, tenants, and construction workers on all of the rules and requirements” they are expected to follow.
- Encouraging operators to consider providing (non-required) on-site meal vendors during construction for construction workers.
- Encouraging operators to consider providing workers with paid release from their shifts in the case of natural disasters or other emergencies.
- Providing escape plans in the case of natural disasters or other emergencies.
- Encouraging operators to provide better wages, working conditions, and safety protections across the board.

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

## **COMMUNITY INVOLVEMENT & PUBLIC ENGAGEMENT**

### **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 large-scale warehouse or other intensive use 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. Appropriate County and State agencies (e.g., DEP, DOT, etc.) 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.

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*Early and consistent community engagement and involvement is central to establishing good relationships between communities, lead agencies, 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 creative solutions to ensure new logistics facilities are mutually beneficial.*

*State Planning Commission Policy*

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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, and the municipal planner, to



introduce the applicant to the municipality's zoning and subdivision regulations and procedures. In this way, the parties can 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). The TAC can be comprised of representatives from municipal and county government, their appointed staff, professionals, one or more representatives from an Environmental Commission or Green Team, an overburdened community representative, and relevant State agency representative. 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 reports 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 affect sensitive receptors (e.g., schools, daycares, churches, places where pedestrians or people congregate, etc.), neighborhoods, downtowns, historic districts, rural areas, and scenic byways.

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*Develop and review plans and application in collaboration with appropriate communities, groups, organizations and agencies, including engaging those not traditionally involved in planning processes, make a special effort to seek out and include participation and involvement of those who are affected, particularly overburdened communities*

*State Planning Commission Policy*

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## 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 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.
- Collaborating 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 residents to review and provide feedback on project proposals in the early planning stages.
- Designating several seats on a TAC or community advisory board set aside for community members from the affected communities, particularly overburdened communities, that is proportional to the overall group.
- Creating binding enforceable Community Benefits Agreements (CBAs) with impacted communities and residents involved, not just the host community or just local officials.
- Warehousing facilities and municipalities should look to the NJ Environmental Justice Law for guidance and heavily consider EJ concerns when proposing expansion or siting.
- Warehouses should determine whether their proposed facilities would cause or contribute to disproportionate adverse impacts on the surrounding communities relative to other New Jersey communities.

- Warehouses that already exist in these communities should work with the municipality and the local community in adopting measures to avoid contributing to adverse environmental and public health stressors that would further worsen public health within the community.
- Notices, signage, and any public engagement meetings must provide translation and interpretation when a significant percentage of residents require such services.
- 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)

## 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. This includes 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 Planning Boards can play a vital role in these regional planning efforts and provide technical expertise and assistance to municipalities during the planning process. They can assist municipalities with warehouse siting/traffic issues and may be well suited to addressing the issue on a wider scale. [Somerset County's County Investment Framework](#) and the [Supporting Priority Investment in Somerset County Initiative](#), are examples of how a County can support inclusive, comprehensive, and consensus-based planning efforts by working with multiple planning partners. In addition, the Highlands Council funded a [Light Industrial Site Assessment Study](#) completed by Warren County, for example, that examines the potential impacts of warehouse development in the county and identifies possible traffic mitigation measures.

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*As part of both the planning and development review process, municipalities, counties, regional and state agencies (including metropolitan planning agencies) should, to the extent feasible, coordinate and collaborate on local and regional planning. By doing so, these planning entities can avoid and mitigate the potential for negative impacts of a regional nature, particularly to adjacent and nearby communities, especially overburdened communities, so that impacts are not unfairly placed on other municipalities, and their residents, and associated transportation networks and facilities.*

*State Planning Commission Policy*

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### **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 and approval 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), affecting any county roads/property and/or drainage facilities for which it is responsible that 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.

#### **40:27-6.2. Review and approval of all subdivisions of land; procedures; engineering and planning standards:**

- Section a. of the statute provides the requirement of adequate drainage facilities and easements when, as determined by the county engineer in accordance with county-wide standards, the proposed subdivision 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 for the construction, maintenance, or proper functioning; and
- Section b. provides the requirement of dedicating rights-of-way for any roads or drainage ways shown on a duly adopted county master plan or official county map; and
- Section c. addresses where a proposed subdivision abuts a county road, or where additional rights-of-way and physical improvements are required by the county planning board, such improvements shall be subject to recommendations of the county engineer relating to the safety and convenience of the traveling public and may include additional pavement widths, marginal access streets, reverse frontage and other county highway and traffic design features necessitated by an increase in traffic volumes, potential safety hazards or impediments to traffic flows caused by the subdivision.

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. While a county planning board has the power to approve or disapprove applications for subdivisions of land that “affect county roads and drainage facilities,” it has jurisdiction only over site plans that “are along county roads or affect county drainage facilities.”

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, in all cases, interpretation of the County Planning Act should be made in consultation with the County land use attorney.

### **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.

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*Proactively promote, coordinate, and collaborate on local and regional planning efforts, programs, and policies to identify and accommodate large warehouse development and redevelopment in appropriate locations, including regional logistics facility nodes, proximate to ports, rail lines/yards, regional highway networks and other key intermodal transportation facilities.*

*State Planning Commission Policy*

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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.

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.

## **Special Resource Areas**

Three Special Resource Areas maintain their own regional Master Plans 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 three major interstate highways cross it (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. These areas 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 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.

### **A word on State agency requirements**

Once the local reviewing board approves a development proposal, 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.



Environmental site constraints (e.g., Freshwater Wetlands, Flood Hazard Areas, etc.), location (e.g., within the Coastal Zone Management Area, etc.), and any encroachments into regulated areas may affect the final design of the project. 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 the 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. Roadway designers should also consult the code to determine access requirements for design plans. Applicants should, likewise, be encouraged to conduct a Lot Conformance Analysis as this study can determine the extent to which development will be limited by the NJDOT. This analysis is a study of the amount of traffic that will be permitted to access a state road from a site and which traffic movements will be allowed. It considers a number of factors including roadway speeds, amount of frontage along the roadway, size of the site, etc. Applicants can then schedule an informal Pre-Application Meeting with NJDOT to confirm the results of the Lot Conformance Analysis and the allowable movements out of a site driveway and onto a state highway. There is no fee charged by the NJDOT for these meetings, all that is required is a conceptual layout plan and initial calculations from a traffic engineer.

In all cases, applicants should perform due diligence prior to submission of a subdivision and/or site plan application. This includes involving county planning, engineering, and the NJDOT early on, and before local permits are issued. Local approvals do not guarantee that county and state permits will be granted. Many developers make significant investments only to find out that a county and/or Minor or Major NJDOT Access Permit either cannot be granted quickly or accommodated. For further guidance and rules governing access to state roadways, see the [New Jersey State Highway Access Management Code](#). 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](#).

## Additional Resources

### Articles

- [Warehouse sprawl shows need for regional approach to planning, advocates say](#)
- [NJ State Planning Commission Adopts Warehouse Siting Guidance](#)
- [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?](#)

### Plans/Guides

- [NJDOT 2017 Statewide Freight Plan](#)
- [NJTPA’s Plan 2050](#)
- [High Cube & Automated Warehousing Guide](#)
- [Warehouse Projects: Best Practices and Mitigation Measures](#)
- [Delivering Green: A vision for a sustainable freight network serving New York City](#)
- [State of California: Warehouse Projects: Best Practices and Mitigation Measures](#)

### Studies/Reports

- [2020 Report on the Economic Value of the New York-New Jersey Port Industry](#)
- [Clean Freight Corridors Study](#) (NYMTC planning area (including portions of NJ))
- [Regional Freight Land Use Study](#) (NYMTC planning area (including portions of NJ))
- [2050 Freight Industry Level Forecasts Study](#)
- [Freight Movement Around NJ Turnpike Interchange 6A Study](#)
- [Developing a Sustainable Urban Freight Plan – a review of good practices](#)
- [Warren County Light Industrial Site Assessment](#)
- [LVPC High-Cube Warehouse Vehicle Trip Generation Analysis](#)
- [New Jersey’s Global Warming Response Act 80x50 Report](#)
- [Moving Mindfully: Monmouth Mercer Study](#)

- [Southern Middlesex County Freight Movement Study](#)
- [Hudson County Truck Routes Assessment](#)

#### Programs

- [NJ ZIP: New Jersey Zero Emission Incentive Program](#)
- [Clean Truck Replacement Program](#)
- [Goods Movement Action Program \(G-MAP\)](#)

#### Tools

- [NJTPA's Goods Movement Strategies for Communities \(GMSC\) Tool](#)
- [Freight Activity Locator](#)

#### Zoning

- [Lower Macungie, PA Model Ordinance: Criteria for Warehouse, Wholesale, Storage, or Distribution uses](#)
- [Moore, PA Model Ordinance: Changing Warehouse use from Permitted to Conditional Use](#)