

New Jersey Highlands Water Protection and Planning Council  
("Highlands Council")

## **Policy Standards for Warehousing in the New Jersey Highlands Region**

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### **Abstract**

The Highlands Region is a "Special Resource Area" of the State of New Jersey, designated for water and resource protection by the Highlands Water Protection and Planning Act of 2004. The Act assigned management of the Region to the New Jersey Highlands Council, requiring that it adopt and implement a comprehensive master plan designed to achieve a wide-ranging set of resource and community planning goals. The Highlands Regional Master Plan (RMP), adopted in 2008, sets forth those goals along with policies and objectives for accomplishing them as well as a fully formed land management program for implementation. This document provides guidance regarding how existing RMP policies and protocol may apply to siting of warehouse facilities in the Highlands Region. It is intended to supplement statewide policy guidance on this issue ("Distribution Warehousing and Goods Movement Guidelines," NJ State Planning Commission, Sept 2022) with information specific to the Region. The Highlands Council provides this document to assist the counties and municipalities of the Region, as they consider whether to evaluate their planning requirements as related to warehouses.



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# **I. Introduction**

The Highlands Region is uniquely positioned in terms of sought-after locations for new warehouses. Via connections with Interstate Highways I-78, I-80 and I-287, the Region has direct access to the Port Newark-Elizabeth Marine Terminal, currently one of the largest container shipping ports in the country. The demand for warehousing in the Region has increased markedly over the last several years along with the rest of the State, as on-line shopping has become a major source of consumer goods. As warehousing development has proliferated, industry practices have changed along with it. Warehouse facilities are growing larger in area and height, operations are more and more automated, and logistics are better-gearred for faster turn-over of massive quantities of goods and materials. The result is a new and different land use typology that relies on a steady stream of shipping vehicles to continuously move goods between origin and destination. The Highlands Region lies in the middle of the transportation network that connects major east coast ports and terminals with points across New Jersey, throughout Pennsylvania, and beyond.

The purpose of this document is to provide guidance as to how the Highlands Regional Master Plan (RMP) may apply to the siting of warehouse facilities in the Highlands Region. It is intended to supplement statewide policy guidance on this issue (“Distribution Warehousing and Goods Movement Guidelines,” NJ State Planning Commission, Sept 2022) by providing information specific to the Highlands Region. This is a guidance document only. It incorporates standards already established in the RMP, it does not create, nor purport to create, any new standards not established via the RMP Adoption or Amendment processes.

## **A. Application of Highlands Warehouse Policies**

The primary means by which RMP land use policies are implemented in the Region is through municipal adoption and incorporation into regulatory programming. The Highlands Council will provide grant funding to all Highlands municipalities that may seek to incorporate Highlands Warehouse Policy Standards into local land use programs. Grant funding will continue to be available to municipalities for other work to implement the Act and the RMP. Receipt of grant funding for tasks outlined herein shall not restrict or limit other grant funding available to the municipality. In addition, if a municipality does not utilize this guidance document, they shall not be excluded or limited in the amount of grant funding available for other tasks to implement the Act and the RMP.

### **1. Conforming Municipalities**

For Highlands municipalities in conformance with the Highlands RMP or in the process of seeking same, alignment with RMP policies is an integral requirement of such approval. Conformance is required for all lands within the Highlands Preservation Area and voluntary for lands within the Highlands Planning Area. The Highlands Council will provide funding to accomplish alignment with Highlands Warehouse Policies by way of allocations to all existing Plan Conformance Grant contracts.

## **2. Nonconforming Municipalities**

Highlands municipalities that have not chosen to conform with the Highlands RMP are in all cases encouraged to do so. The Highlands Council will provide funding for all aspects of a municipality's participation in that process. Pursuant to the Highlands Act and the protocols of the Highlands Council's Plan Conformance Grant Program, the Council is authorized to provide grant funding for master plan and regulatory updates that align local planning with the goals and policies of the Highlands RMP. As is the case with any Plan Conformance implementation item, the Council will thus fund updates that incorporate and align municipal planning with the Highlands Warehouse Policies provided in this document.

## **3. State Agencies**

The Highlands Act requires a coordination and consistency component which details the ways in which local, State, and federal programs and policies may best be coordinated to promote the goals, purposes, policies, and provisions of the RMP, and which details how land, water, and structures managed by governmental or nongovernmental entities in the public interest within the Highlands Region may be integrated into the RMP. The Act, in Sections 38 through 82, also amends numerous statutes of State agencies to specifically require coordinated action to implement the RMP. In these sections, the Act requires consultation between the Council and State agencies regarding permitting and investment to ensure that the RMP is given great weight and consideration prior to State agency action.

In accordance with RMP Goal 5C, the Highlands Council holds as regionwide policy that public investment in transportation and other infrastructure, where it occurs, must only be in support of development projects (of any nature) that are sited in appropriate RMP-consistent locations, and completed in a fashion protective of Highlands resources and resource areas, all as outlined in the RMP. The Highlands Council supports state and federal funding for transportation maintenance and safety improvements; however, projects involving new through-lanes or increases in vehicular capacity are in most cases inconsistent with the RMP.

## **4. County Planning**

Counties in the Highlands Region are also called upon to align Master Plans and Strategic/Growth Plans with the Highlands RMP. While conformance remains voluntary for Planning Area lands, Highlands counties are working with the Highlands Council and share very similar goals in land use planning. The Highlands Council will provide grant funding to all Highlands counties to incorporate Highlands Warehouse Policies into county planning materials, in particular with respect to transportation planning programs and mapping. Grant funding is available to counties for other work to implement the Act and the RMP. Receipt of grant funding for tasks outlined herein shall not restrict or limit other grant funding available to the county. In addition, if a county does not utilize this guidance document, they shall not be excluded or limited in the amount of grant funding available for other tasks to implement the Act and the RMP.

The Highlands Council regionwide policy regarding public investment in transportation and other infrastructure (see above) applies equally to county resources.

The Highlands Council will also provide grant funding to counties interested in taking lead in providing planning/technical assistance programs to their constituent municipalities to assure coordinated efforts in warehouse planning aligned with both the State and Regional Plans. In conjunction with such efforts, the Highlands Council will also provide funding for feasibility studies and program development needs involved in establishment of Stormwater Utilities, which may provide value in offsetting the impacts of stormwater from both existing and new warehouse and transportation facilities. Such utilities may involve county and/or municipal coordination, as appropriate, in consideration of the watersheds and sub-watersheds in which they are located.

## **B. State Plan Warehouse Policy**

In September 2022, the New Jersey State Planning Commission Office of Planning Advocacy (OPA) released the State Planning Commission’s adopted policy document regarding warehousing in New Jersey. Entitled “[Distribution Warehousing and Goods Movement Guidelines](#)” (“OPA Policy Guidelines”), the material provides helpful background information on the current state of the warehousing industry, discusses the growing demand for warehousing and distribution facilities in New Jersey, and sets forth the policy framework for use across the state in siting and development. Based largely in the tenets of the State Development and Redevelopment Plan, the guidelines include a series of recommendations intended for use by local governments in preparing master plans, zoning ordinances, and associated regulatory provisions for site planning and site plan review. The OPA Policy Guidelines recognize the New Jersey Highlands Region as a “Special Resource Area,” and direct municipalities within the Region to refer to the Highlands Regional Master Plan (RMP) in conjunction with the OPA Policy Guidelines, giving deference to the RMP should any conflicts arise between the two (see pg. 44).

The OPA Policy Guidelines provide a robust foundation for better understanding the logistics, changing needs, and evolving operational methodologies used by the warehousing industry, as well as important core planning considerations for warehouse siting in general. Along with many other state representatives, the Highlands Council was pleased to participate in development of the guidance material and does not believe the final OPA document conflicts in any way with the goals, policies, or objectives of the RMP.

Rather, the Highlands Council Warehouse Policy Standards work hand-in-hand with OPA’s guidance, to protect the water and natural resource base of the Highlands Region.

## **C. Highlands Regional Planning**

The New Jersey Highlands Water Protection and Planning Act (“Highlands Act”) recognizes that the Highlands Region requires special protection as an area rich in natural resources and significantly, the source of drinking water (some or all) for 70% of New Jersey residents. This protection is primarily

achieved through implementation of the Highlands RMP. Endorsed by the State Planning Commission as meeting the requirements of the State Development and Redevelopment Plan, the RMP guides both development and resource protection within the Region. It provides the framework for integrating land use provisions and resource management protections of the Highlands Act at the local level. Management program areas outlined in the RMP include Natural Resources; Water Resources and Utilities; Agricultural Resources; Historic, Cultural, Archaeological and Scenic Resources; Transportation; Sustainable Economic Development; and Air Quality.

Given the intensive nature of current warehousing operations, which typically involve massive structures (e.g., 500,000 to 1+ million square feet, or nearly 23 acres), expansive parking and access drive areas, countless truck trips and vehicular traffic, 24/7 operational modes, and significant impacts on the areas they occupy, it should be noted from the outset, that RMP-consistent opportunities for such warehousing within the Highlands Region are limited.

The development capacity of the Region as a whole is finite, also meaning that warehousing projects will require foregoing other forms of development that may serve important local needs. For comparison purposes, it is helpful to consider that a single warehouse may occupy as much land area as 10 city blocks.

#### **D. Warehouse Policy Updates**

This document provides numbered “**Warehouse Policy Updates**,” which summarize the important points of analysis and outline associated revisions that a municipal or county planning agency may voluntarily incorporate into local land use programs, to address Highlands Warehouse Policy Standards.

#### **E. Disclaimer**

This is a guidance document only that incorporates standards already established in the RMP, it does not create any new standards not established via the RMP Adoption or Amendment processes. This material should not be read to in any way *require* or even suggest that Highlands municipalities must/should permit warehousing or distribution facilities in the locations indicated as potentially viable to support them, or that said municipalities must not/should not ban or limit warehousing or distribution facilities in their municipalities. It is intended to assist and inform municipal planning efforts by providing full and clear information about the Highlands Region, the resources it contains, and the important role each municipality can play in ensuring the future health and vibrancy of the Region. Lastly, it should be noted that Highlands municipalities may always adopt more restrictive standards than those prescribed in this document. In terms of RMP conformance, local standards that meet *or* exceed Highlands requirements are conforming.

## II. Warehouse Classifications

For purposes of this document, the Highlands Council incorporates the classifications provided in the OPA Policy Guidelines for describing warehouse facility types. For greater description and further information on each, please refer to OPA’s guidance material (online at [Distribution Warehousing and Goods Movement Guidelines](#)).

- **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.
- **High Cube Warehousing Distribution Center** – [trending 2022-23] 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).

OPA cautions, “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.” (OPA Distribution Warehousing and Goods Movement Guidelines pg. 8).

As to High Cube Warehouse (HCW) facilities, which are highly automated, OPA notes that: “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.” (OPA Distribution Warehousing and Goods Movement Guidelines pg. 11).

Last, and of great import to Highlands Warehouse siting policies: “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.” (OPA Distribution Warehousing and Goods Movement Guidelines pg. 11).



### **III. Broad Siting Criteria**

The Highlands Regional Master Plan (RMP) guides development within the Region to areas best suited to supporting it. It seeks to protect critical environmental resources while at the same time ensuring availability of the infrastructure that various forms of development rely upon. The RMP aims to protect a multi-faceted resource *system* that sustains a clean, plentiful water supply for 70% of NJ residents for basic needs as well as commercial, industrial, agricultural and ecological uses. Equally important, the RMP seeks to protect the significant agricultural land base of the Region, an important resource and a potentially critical food supply resource in a less stable climate future.

To achieve these goals, the Highlands Council has identified “no-go” areas, meaning that warehouse facilities are without question an unsuitable use, as well as areas having *potential* for siting of warehousing – pending completion of a rigorous screening process. These areas are taken from the RMP standards for Preservation and Planning Areas as established in the Highlands Act, the restrictions on the extension of water and wastewater infrastructure in the Preservation Area as established in the Highlands Act, and the Land Use Capability Zone Map adopted as part of the RMP (Chapter 4, Part 6, Subpart A). The Land Use Capability Zone Map was developed pursuant to N.J.S.A. 13:20-11 and is included in the RMP as a comprehensive statement of policies for planning and managing the development and use of land in the Region.

#### **A. Warehousing Prohibited**

##### **1. Highlands Preservation Area**

The Preservation Area was designated for immediate imposition of stringent water and natural resource standards effective on the date of enactment of the Highlands Act to protect it from “the imminent peril that the ongoing rush of development” posed to the Region. (N.J.S.A. 13:20-2). Preservation Area goals are far-reaching in seeking to protect Highlands water and natural resources, preserve extensive and contiguous areas of land in its natural state, retain its unique scenic resources and natural beauty, and to prohibit construction or development incompatible with preservation. (N.J.S.A. 13:20-10(b)). Because of statutory limitations upon all development within the Preservation Area, warehousing is generally prohibited from the Preservation Area, with the exception of designated Highlands Redevelopment Areas (see B2 below). (See, *i.e.*, N.J.S.A. 13:20-30 (3% Impervious Limitation); N.J.S.A. 58:11A-7.1, Designated sewer service areas, certain, approvals revoked; N.J.S.A. 58:12A-4.1 Limitation on construction of new or extension of public water systems.)

##### **2. Highlands Protection Zone**

The Protection Zone contains the highest quality natural resource value lands of the Highlands Area. Lands in the Protection Zone are essential to maintaining water quality, water quantity, and sensitive ecological resources and processes (RMP pg. 111), and have limited or no capacity to support human development without adversely affecting overall ecological function (RMP Goal 7A). Except as noted in the RMP (Chapter 4, Part 2), the RMP prohibits the extension of



water and wastewater infrastructure into the Protection Zone. Due to these limitations, warehousing should be prohibited from this Zone and its associated sub-zone, the Wildlife Management Sub-Zone. (RMP Goals 2J, 2K, 6B)

### **3. Highlands Conservation Zone**

The Conservation Zone consists of areas with significant agricultural lands interspersed with associated woodlands and environmental features that should be preserved whenever possible. The Conservation Zone is intended primarily for agricultural use and development, including ancillary and supporting uses and activities. (RMP pg. 111). Non-agricultural development activities will be limited in area and intensity due to infrastructure constraints and resource protection goals. (Goal 6D). Except as noted in the RMP (Chapter 4, Part 2), the RMP prohibits the extension of water and wastewater infrastructure into the Conservation Zone. Due to these limitations, warehousing should be prohibited from this Zone and its associated sub-zone, the Conservation Zone-Environmentally Constrained Sub-Zone. (RMP Goal 6D).

## **B. Potential Warehouse Locations**

With many qualifiers discussed in detail in the Sections that follow, the Highlands Council has identified three general RMP land use categories as potential candidates for warehousing in the Region. Qualifying parameters incorporate local planning goals and intents, Highlands-specific resource constraints, OPA Policy Guidelines, and (with emphasis) the need for very proximate access to appropriate transportation infrastructure. The three classifications are listed below.

### **1. Designated Highlands Centers**

A Highlands Center is an area within a municipality where development and redevelopment is encouraged and fostered in accordance with municipal goals. Highlands Centers are intended to support economic balance in the Highlands Region, providing for sustainable economic growth, while protecting critical natural and cultural resources. Highlands Centers may vary in size and character from the smallest hamlet focused on development of a sustainable economy without significant new physical development, to the very largest of Highlands towns proposing significant new, infill, and redevelopment projects. For purposes of warehouse siting, designated Highlands Centers shall include only those in a Planning Area for which the municipality has: a) completed the center planning process; b) identified suitable warehouse locations that meet the criteria of this document; and c) adopted the associated standards, design protocols, and site planning procedures needed to properly consider and address site development applications. (RMP Addendum 2019-2, Appendix B)

### **2. Designated Highlands Redevelopment Areas**

Highlands Redevelopment Areas are adopted pursuant to N.J.S.A. 13:20-9 and identify areas in which redevelopment shall be encouraged in order to promote the economic well-being of the municipality, provided that the redevelopment conforms with the goals of the Act. Designated

Highlands Redevelopment Areas are varied in extent and character but are typically defined with specificity by the approval process for their designation (see RMP Addendum 2019-1).. It is important to note that a Highlands Redevelopment Area has a different purpose from and is not the same as an “Area in Need of Redevelopment” as defined by the Office of Planning Advocacy and the Local Redevelopment and Housing Law (N.J.S.A. 40A:12A-1 et seq), though the latter process may be useful in a Highlands Redevelopment Area. (RMP Addendum 2019-1).

### **3. Planning Area Existing Community Zone (ECZ)**

By far containing the largest land area of the three categories, the Planning Area ECZ consists of areas of concentrated development representing existing communities. These areas tend to have limited environmental constraints due to previous development patterns and may have existing infrastructure that can support additional development or redevelopment. Where served by adequate supporting infrastructure, lands within the ECZ are suited to higher densities and intensities of development than other Zones.. (RMP Goal 6F).

### **Warehouse Policy Update #1:**

The municipality should consider modifying its master plan use classes and implementing zoning ordinance regulations, as needed, concerning permitted, conditional, and prohibited uses to ensure that warehousing is prohibited from all Highlands “no-go” areas listed above, in accordance with the RMP. If municipal zoning permits warehousing (conditionally or as of right) in any listed Potential Warehouse location noted above, or the municipality desires to permit warehousing, continue to the next Section to begin the screening process.

## IV. Proximity and Access to Transportation

To determine whether a municipality's designated Highlands Center, Highlands Redevelopment Area, or Planning Area Existing Community Zone (ECZ) is a viable candidate for consideration of warehousing facilities, the first step in the planning process requires examination of the transportation resources that are proximate, accessible, and suited to supporting the shipping needs associated with the type of facility/facilities proposed.

### A. Transportation System Analysis

The analysis should begin with an examination of the existing transportation network. Warehouse and distribution facilities should be sited in accordance with aspects such as proposed size, intensity of use, and anticipated truck traffic generation. The largest most intensive facilities must be located within a short distance of major state and interstate highways (or if applicable, freight railway access points), including only those suited to handling the heavy truck traffic that carries goods from arrival/departure points across the state and beyond. State highways may serve as such connectors and may provide viable warehouse locations. Less intensive facilities may be suited to locations on county roadways, such as small distribution facilities dependent on van or small truck fleet deliveries. (RMP Goals 5A and 5B).

### B. Proximity Corridor Mapping

[Note: This section provides a recommended methodology which is subject to modification based on transportation network studies currently underway involving OPA and other entities.]

The Highlands Council recommends that municipalities and/or counties map out the existing transportation network and develop "proximity corridors" based upon it for potential placement of warehouse/distribution facilities using OPA facility typology factors, as listed in Section II above. This will narrow down the areas of the municipality in need of significant further evaluation for all other factors (e.g., water/sewer, roadway capacity, environmental resources) necessary to determine viability. (RMP Policies 5C6 and 5C7).

The Highlands Council will provide funding assistance for development of such mapping and recommends coordination with county/state transportation planning departments/agencies to achieve broader-scale, and potentially more effective results. Grant funding is available to municipalities for other work to implement the Act and the RMP. Receipt of grant funding for tasks outlined herein shall not restrict or limit other grant funding available to the municipality. In addition, if a municipality does not utilize this guidance document, they shall not be excluded or limited in the amount of grant funding available for other tasks to implement the Act and the RMP.

- **Interstate Highway Proximity & Access** – Very large facilities, including warehouses of 500,000 square feet or more, and facilities designed for high-intensity interstate truck traffic, potentially 24/7 operation, overnight truck parking, etc., must be located within 3 miles of an Interstate Highway interchange.

- **State Highway Proximity & Access** – State highway locations may be suited to serving very large facilities, where they provide proximate (3 miles or less) access to an Interstate Highway. State highways may also be appropriate for smaller/medium sized facilities, dependent upon conditions and surrounding areas, and again dependent on distances from interstate highway access points. Where centrally located for proximate access to surrounding communities, state routes are also appropriate for small and micro distribution centers that rely on van or smaller truck fleets (ideally electric vehicles) for local deliveries.
- **County Roadways** – County roads may, depending upon conditions and surrounding areas, serve large facilities only where they provide proximate (1 mile or less) access to a State or Interstate Highway. County roads may also be appropriate for micro facilities, dependent upon conditions and proximity to State/Interstate Highways. Where centrally located for proximate access to surrounding communities, these may include micro facilities not exceeding 3,000 square feet in size that rely on van or smaller truck fleets (ideally electric vehicles) for local deliveries.
- **Local Roadways** – Local roads shall serve only the smallest of shipping/delivery facilities, such as those of approximately 1,500 square feet in size, reliant on vans or small trucks (ideally electric) for local deliveries. Local roadways shall not be used in support of other warehouse facilities, whether for direct facility siting or for truck routing associated with facilities located elsewhere.
- **Scenic Byways** – Roadways that have been designated as Scenic Byways, or that are under formal consideration for such designation, shall not be used in support of warehouse facilities, whether for direct facility siting or for truck routing associated with facilities located elsewhere.
- **Freight Railway Proximity & Access** – Siting of warehouse facilities based on proximity and access to freight rail lines requires dedicated use of the subject railway line for movement of goods, unless the site also lies within the proximity corridor of an appropriate highway, as indicated above.

## **Warehouse Policy Update #2:**

The municipality should consider modifying its master plan use classes and implementing zoning ordinance regulations, as needed, concerning permitted, conditional, and prohibited uses to ensure that warehousing is prohibited from any Highlands Center, Highlands Redevelopment Area, or Planning Area ECZ that does not lie within a proximity corridor as determined through completion of the Transportation System Analysis outlined in Section IV.A. above. If municipal zoning permits warehousing (conditionally or as of right) in any Highlands Center, Highlands Redevelopment Area, or Planning Area ECZ that remains, a municipality may modify municipal planning documents as needed to ensure that permitted warehouse locations lie only within the proximity corridor identified and that permitted facility typologies do not exceed those suitable to the corridor. If appropriate warehousing facilities within the corridor remain a permitted use, or if the municipality desires to provide for same, continue to the next Section to proceed through the screening process.

## V. Watershed Impervious Coverage

Impervious coverage is widely recognized as the largest factor in degradation of water quality in most waterways. Higher levels of impervious coverage typically result in increased stormwater runoff, which carries sediment and pollutants by collection systems or overland flow into streams and other surface water bodies. In severe storm situations, runoff volumes can exacerbate flooding and stream bank erosion. In hot weather, runoff from superheated pavements can significantly increase stream/lake temperatures, stressing and even killing aquatic organisms. Impervious surfaces block the natural absorption of rainwater into the ground, thus disrupting natural filtration processes and gradual seepage into streams and aquifers. While use of best practices in stormwater management can address these issues to an extent, the need to manage total watershed impervious coverage has become apparent. The Legislature and the Highlands Council has embodied this within statutes and the RMP. (N.J.S.A. 13:20-30 (3% Impervious Limitation); RMP Ecosystem Technical Report pgs. 27, 30-31, 38; RMP Objectives 1D5b, 1D5e, RMP Policy 2G4, RMP Objective 6N2b).

Various studies show the impacts of impervious coverage on the water quality of streams, lakes, estuaries, and aquifers in a watershed. Recent research indicates that cold-water fisheries are even more highly susceptible to damage from impervious surfaces than other streams, especially regarding thermal impacts, for example. Watersheds with less than 10 percent impervious surface coverage can exhibit damaged trout streams.

The Highlands Council anticipates that climate change will exacerbate all of these impacts as rainfall is expected to increase, storms to become more severe, and temperatures to bring severe heat.

**Rutgers Raritan River Initiatives:** Significant research has been conducted on impervious surface cover as it relates to water quality and researchers have found a high correlation between amounts of impervious surface cover and the degree of water quality impairment. When the impervious surface cover is greater than 10 percent of the total watershed area, the water quality degrades in the watershed; if it is greater than 25 percent the water quality degrades severely (NJWSA, n.d.). When the impervious surface cover is less than 10 percent of total watershed area, the water quality is considered protected (*Arnold, Jr., C.L. and C.J. Gibbons. 1996. Impervious Surface Coverage the Emergence of a Key Environmental Indicator. Journal of the American Planning Association 62(2): 243-258*).

**Rutgers Cooperative Extension, Water Resources Program** (*Schueler, T. 1994. The Importance of Imperviousness. Watershed Protection Techniques 1(3): 100-111. Schueler, T.R. 2004. An integrated framework to restore small urban watersheds. Center for Watershed Protection, Ellicott City, MD.*): Urbanizing streams can be classified into three categories:

- *Sensitive* – Sensitive streams typically have a watershed impervious surface cover from 0-10%.
- *Impacted* – Impacted streams have a watershed impervious cover ranging from 11-25% and typically show clear signs of degradation from urbanization.

- *Non-supporting* – Non-supporting streams have a watershed impervious cover of greater than 25%; at this high level of impervious cover, streams are simply conduits for stormwater flow and no longer support a diverse stream community.

**Rutgers Cooperative Extension, Water Resources Program:** “...new analysis determined that stream degradation was first detected between 2 to 15% impervious cover.....the model recognizes the wide variability of stream degradation at impervious cover below 10%. The updated model moves away from having a fixed line between stream quality classifications.....5-10% impervious cover is included for the transition from sensitive to impacted, 2-25% impervious cover for the transition from impacted to non-supporting, and 60-70% impervious cover for the transition from non-supporting to urban drainage.” (*Rutgers Cooperative Extension, Water Resources Program Regional Stormwater Management Planning for the Highlands Portion of Watershed Management Area 8 - North and South Branch Raritan. July 23, 2021*).

**NJDEP:** Watersheds of “exceptional ecological significance” are characterized by impervious surface coverage of: (1) less than two percent for a hydrologic unit code 14 (HUC 14) of less than five square miles; or (2) less than or equal to 10 percent for a HUC 14 of greater than or equal to five square miles. (N.J.A.C. 7:9B). (*Adopted Amendments: N.J.A.C. 7:9B-1.4 and 1.15 Proposed: March 4, 2019, at 51 N.J.R. 308(a) (see also 51 N.J.R. 531(a)). Adopted: March 4, 2020*).

**EPA EnviroAtlas:** As impervious surfaces increase, stormwater runoff increases in quantity, speed, temperature, and pollutant load. When impervious surfaces reach 10-20% of local watershed area, surface runoff doubles and continues to increase until, at 100% impervious surface coverage, runoff is five times that of a forested watershed. (*U.S. EPA Environmental Atlas. July 2020. <https://enviroatlas.epa.gov/enviroatlas/datafactsheets/pdf/ESN/PercentImperviousArea.pdf>*)

**MD Department of Natural Resources:** “Brook trout are not found in watersheds with more than 4% impervious surface. Some salamanders disappear from watersheds with as little as 0.3% impervious surface.” (*<https://dnr.maryland.gov/streams/Pages/streamhealth/How-Impervious-Surface-Impacts-Stream-Health.aspx>*)

## **A. Highlands Region Impervious Coverage**

A Highlands Council analysis of current watershed conditions in the Highlands Region indicates that roughly half of the Region including most of the Preservation Area, primarily has impervious coverage in the greater than 2% to less than 10%, while the remainder of the Region has impervious coverage in excess of 10% (topping out at 47%). The only watersheds with less than 2% of imperious coverage are located within the Preservation Area. See Exhibit A.

In accordance with RMP policy, the Highlands Council urges municipalities to reduce impervious coverage to the maximum extent feasible, regardless of current levels. The Council will provide funding to assist in development of impervious cover reduction action plans. In all cases,



redevelopment opportunities should be considered first, to take advantage of existing impervious surface areas and avoid expansion.

## **B. Watershed Impervious Coverage Standards**

By any of the measures suggested above, a watershed having more than 10% impervious coverage is a watershed at potential risk. Watersheds with streams supporting trout production or other sensitive ecosystems are at risk at the 2% to 3% level. While one would anticipate higher impervious figures for urban and suburban areas of the Region, it is important to maintain the health of surrounding watersheds, and of remaining Highlands Region watersheds on a broad scale. Failing to do so puts the water resources of the Region at risk. In anticipation of the significant increases in watershed impervious coverage noted above (i.e., those permitted by the Act but not yet exercised), and the potentially severe impacts of climate change, the Highlands Council applies conservative standards for watershed impervious coverage.

### **1. Preservation Area**

Total impervious coverage in Preservation Area watersheds must be maintained or reduced as needed over time, with the goal of achieving 3% by subwatershed or less.

Warehousing shall be permitted only where it will not increase HUC 14 watershed impervious coverage beyond 3%. Removal of impervious coverage from another location in the same watershed in exchange for all newly proposed impervious surface shall be permitted, provided the removal location(s) are restored to natural conditions and placed into protective land status by conservation easement or other appropriate means. (N.J.S.A. 13:20-30 (3% Impervious Limitation)).

### **2. Planning Area**

Total impervious coverage in Planning Area watersheds must be maintained or reduced as needed over time, with the goal of achieving 10% or less. Watersheds with Category 1 waters designated due to exceptional ecological values must be maintained or reduced as needed over time, with the goal of achieving 3% or less. (RMP Ecosystem Technical Report p 27, 30-31, 38; RMP Objectives 1D5b, 1D5e, RMP Policy 2G4, RMP Objective 6N2b).

If the HUC 14 watershed contains greater than 10% existing impervious coverage, all newly proposed impervious surface shall be mitigated for as follows:

- a. Removal of impervious coverage from another location in the same watershed in exchange for all newly proposed impervious surface, provided the removal location(s) are restored to natural conditions and placed into protective land status by conservation easement or other appropriate means. Impervious coverage removed shall be equal to or greater than that proposed by the warehouse development project; or



- b. Existing unmanaged or poorly managed stormwater runoff within the same watershed shall be managed or retrofitted with appropriate green stormwater infrastructure practices. These facilities shall manage stormwater runoff quantities equal to or greater than that generated by the proposed warehouse development project; or
- c. A combination of a. and b. above, sufficient to achieve the listed requirements proportionately for each strategy.

### **Warehouse Policy Update #3**

The municipality should consider modifying its municipal zoning regulations to incorporate the standards above. Require that projects be designed to minimize impervious coverage and incorporate all available stormwater management strategies to maximize groundwater recharge pursuant to NJDEP stormwater regulations at N.J.A.C. 7:8. Include regulatory language as needed, regarding removal of existing impervious coverage in exchange for proposed new coverage and associated requirements for conservation restrictions.

## **VI. Identifying Appropriate Sites**

For all Highlands Centers, Highlands Redevelopment Areas, and Planning Area ECZ's that remain in the screening process, the following parameters are applied to identify appropriate sites for warehousing facilities, and should be considered for all development in these areas. All of these assume that municipal planning goals remain in support of warehouse facility siting as limited by the preceding sections.

### **A. Water and Sewer Infrastructure**

As for all development in the Highlands Region, warehouse facilities shall be permitted only where water and sewer services having sufficient capacity, are existing or available, and can meet the demand associated with the type and size of the facility proposed.

#### **1. Water Infrastructure**

New water usage shall comply with the Net Water Availability provisions of the RMP (RMP Goal 2B and associated Policies and Objectives). Extension of public water services shall be permitted only in accordance with RMP policies which prohibit the extension of utilities within the Preservation Area, Protection Zone and Conservation Zone. Should a proposal require a new or modified Water Allocation Permit (WAP), such permitting is also subject to Highlands Council review and shall require consistency with the Highlands RMP. (N.J.S.A. 58:12A-4.1 Limitation on construction of new or extension of public water systems; RMP Goal 2B, Policy 2j4, Goal 2I, ).

#### **2. Wastewater Infrastructure**

Public Wastewater: Extension of public or community wastewater systems shall be permitted only in accordance with RMP policies, which prohibit the extension of utilities within the Preservation Area, Protection Zone and Conservation Zone. Site-specific amendments to Water Quality Management Plans are subject to Highlands Council review and require consistency with the Highlands RMP. (N.J.S.A. 58:11A-7.1, Designated sewer service areas, certain, approvals revoked; RMP Objective 2K3c).

Septic Systems: In the Planning Area new septic systems shall comply with the septic density provisions of the RMP, based on the RMP Land Use Capability Zones. For warehouse development 18,182 square feet of floor area shall have an equivalent yield for a one-family household generating a maximum flow of 300 gallons of wastewater per day. Alternative flows may be calculated in accordance with NJAC 7:9A-7.4. In the Preservation Area the NJDEP Highlands Rules (N.J.A.C. 7:38) standards shall apply. (RMP Policy 2L2).

### **Warehouse Policy Update #4:**

The municipality should consider modifying its municipal regulations to permit warehouse facilities only where water and sewer services are available and have sufficient capacities to serve the warehouse

typologies permitted. Outside of water and/or sewer service areas, warehouse facilities shall be conditionally permitted only, pending the outcome of soils testing and evaluation of water availability. Within its existing established review authority in the Highlands Act and under EO114 (2008), Highlands Council approval shall also be required in the event of any warehouse proposal for lands within an area the Council identifies as a net water availability deficit sub-watershed.

## **B. Highlands Resources and Resource Areas**

Municipalities may utilize the Highlands Council's [Interactive Environmental Resource Inventory \(ERI\) Map](#) and [Interactive Map](#) to inform the extent of environmental resources at the parcel level, for multiple parcels, or on a municipal-wide basis. Detailed resource requirements may be found in the RMP, which is accessible through the Highlands Council website, along with [Highlands Project Review Standards](#) and [Highlands Model Ordinances](#), which provide regulatory language that can be incorporated into municipal codes.

Resources to be reviewed include:

- Forest Resources (RMP Goals 1A, 1B and 1C):
  - Clear cutting of forested areas is not permitted.
  - Removal of any forested areas shall be avoided and forest and woodlands to remain shall be protected from disturbance during construction.
  - Forest or tree removal in excess of ½ acre shall require mitigation by tree plantings either on-site or off-site in the same subwatershed.
  - Review Highlands Council Forestry Best Management Practices.
- Open Water Protection Areas associated with the following resources must be avoided (RMP Goal 1D):
  - Wetlands
  - Streams
  - Lakes and ponds
  - Vernal Pools and buffers (RMP Goal 1F)
- Prime Groundwater Recharge Areas (RMP Policy 2D4): Areas designated in the RMP as providing enhanced recharge must be avoided. Any encroachment into those designated areas must be minimized and should not exceed 15% of the total area.
- Steep Slopes (RMP Goal 1E):
  - Severe steep slope areas over 20% must be avoided.
  - Disturbance in moderate steep areas must be minimized.
- Critical Habitat and Vernal Pools (RMP Goal 1F):
  - A critical habitat study should be required for any disturbance of areas designated as such. A plan for the minimization of impacts during and after construction should be developed.
  - Where disturbance is unavoidable, a plan for the minimization of impacts and mitigation should be required as part of any site plan review.
- Historical and Scenic Resources (RMP Goals 4A and 4B):

- Where the municipality has conducted a historical sites survey, a review against said survey should be required. Where no sites survey is available, the state list of historic resources should be utilized. The Highlands Council can provide funding for the preparation of a municipal historic sites survey.
- A list of scenic resources is available through the Highlands Council. Impacts to scenic resources should be a required component of review. In addition, a municipality may work with the Highlands Council to identify additional scenic resources in the community that should be so designated.
- A map of archaeological grids is available on the Highlands Council’s interactive map. The grids provide the general location of archaeological resources, exact locations are held by the State Historic Preservation Office.
- Agricultural Resource Areas (RMP Goal 3a, RMP Policies 3A4 and 3A5): Where Agricultural Resource Areas extend into Highlands Centers, Highlands Redevelopment Areas, or Planning Area ECZs that have been otherwise screened based on all factors above (e.g., transportation proximity corridor, Highlands Resources and Resource Areas), warehouses shall be permitted only on condition they are dedicated to agricultural and agriculture-related purposes. Non-agricultural related warehouses shall be permitted only upon evaluation by the Highlands Council, and on the condition that, should their development disturb prime farmland soils, equivalent and/or higher value prime farmland soils of similar acreage are placed into farmland preservation, or Highlands Development Credits (HDCs) of equal or greater value are purchased.
- Stormwater Management Planning (RMP Policy 2G5):
  - Shall incorporate green infrastructure in accordance with NJDEP regulations.
  - Shall plan for aquifer recharge, even in areas where existing soil types do not currently provide for recharge.
  - Shall consider Carbonate Rock topography and potential for development of karst features.
  - Shall incorporate mitigation plans and strategies for potential cases where recharge cannot be met on site.

## **Warehouse Policy Update #5:**

The municipality should consider updating its municipal regulations to ensure that warehouse facilities are not permitted in areas that would disturb or encroach upon Highlands Resources or Resource Areas, in accordance with Highlands RMP requirements as discussed above. Conforming municipalities may already have appropriate ordinances in place – via a Highlands Land Use Ordinance or Highlands Referral Ordinance.

## **C. Zoning Ordinance Update and Amendment Considerations**

Zoning ordinance updates may be based on the standards of the RMP, which can provide additional support for new municipal regulations through the standards and protections of the Highlands Act. (RMP Goals 6K and 6N).

- Review Permitted Uses and Use Types by Zone.
  - Consider updating and clarifying uses as necessary to clearly identify warehousing and distribution centers, apart from general industrial and other commercial uses.
  - As noted above, the State Planning Commission/OPA “[Distribution Warehousing and Goods Movement Guidelines](#)” provide additional details on the various types of warehousing. Municipalities must review zoning and regulatory definitions and master plan use classifications for warehousing to ensure that appropriate types are permitted in appropriate locations, as discussed in preceding Sections.
  - Consider making warehousing and distribution centers conditional uses in appropriate zone districts, conditioned upon compliance with performance standards and other applicable warehousing site design standards.
- Bulk Standards:
  - Setbacks:
    - Review existing setbacks for warehouse and industrial uses. Consider providing increased setbacks from conflicting and sensitive land uses.
    - Consider requiring effective screening and buffering between conflicting and sensitive land uses.
  - Building Lot Coverage: Consider providing building lot coverage restrictions to protect from overdevelopment. These should be in keeping with the provisions of the Watershed Impervious Coverage section of this document.
  - Floor Area Ratios: Floor Area Ratios are of particular importance when considering future development potential of high cube warehousing. In addition, the definition of floor area ratio should consider that warehousing may not contain floors as commonly defined and instead may use multi-story storage racks.
  - Height Restrictions: Height restrictions should consider the visual impacts of warehousing and should also consider potential for high cube warehousing at heights far exceeding that of traditional warehouses.
- Parking Requirements: One of the difficulties with parking regulations for warehousing is that the buildings are open to many uses with differing parking requirements. Banking of required parking is one option to limit the construction of impervious surfaces until such time as a need may warrant. Consider requirements to design banked parking for site plans and stormwater management plans.
- Performance Standards: The zoning ordinance can include performance standards that must be met at the time of application and must be continued to be met during operation. These could include at a minimum, standards for noise, light, air quality, vibration, heat, dust and dirt, hazardous materials best management practices, and odors.
- Green Infrastructure/Green Building Standards: The Zoning Ordinance can require green stormwater-infrastructure standards/building methodology for any proposed industrial or warehouse type development as a way to mitigate impacts. These standards could qualify with various green certifications and other methodologies to reduce environmental impacts.

## Warehouse Policy Update #6

The municipality should consider updating ordinances for warehouse typology definitions and all standards for land use and bulk requirements. Zoning Ordinances should utilize special land use provisions for warehouses in order to mitigate potential impacts on sensitive land uses and incorporate other standards to ensure proper siting and development.

### D. Site-Specific Considerations

Once it is clear where within a municipality warehousing is an acceptable use, Highlands municipalities should consider adopting warehousing-specific site plan standards, which can then be incorporated into the application review process. (RMP Goal 6N).

- Traffic Analysis: A municipality can require a site-specific traffic analysis, including proposed truck routing. Please note that for a use that is permitted, the review of site-specific traffic impacts is limited during the Land Use Board's site plan review process. Any larger scale traffic impacts and concerns about future growth should be addressed through the master planning process and subsequently addressed in the municipalities zoning ordinance.
- Utility Capacity: A municipality can require for:
  - Wastewater Capacity: Submission of proof of the availability of adequate wastewater service.
  - Water Capacity: Submission of proof of the availability of adequate water service.
- Carbonate Rock and Karst Topography:
  - Warehouses that are to be sited in areas of known or potential Karst topography could conduct, at a minimum, a Phase 1 geotechnical investigation.
  - Such an investigation should include the requirement to provide for the effective recharge of all impervious surfaces on the site (or mitigation off site).
- Landscaping and Site Buffers:
  - Planted or constructed buffers can be provided between any new facility and adjacent or proximate sensitive uses.
  - Existing healthy trees, natural areas, and other such features on the site should be maintained and protected from disturbance during construction.
  - Native drought-tolerant landscaping shall be used.
  - Use of expansive lawn areas should be avoided. Open areas should instead be naturalized by planting of native trees/shrubs, use of wildflowers and native grasses, constructed meadows, and/or woodlands.
- Access:
  - Site design should allow for trucks to check-in within the facility area to prevent queuing of trucks outside of facility.
  - Design warehouse/distribution center so that interior vehicular circulation should be located away from residential uses or any other sensitive uses.
  - Design warehouse/distribution center so that interior vehicular circulation is located away from residential uses or any other sensitive uses.

- Separate entrance and exit points to limit the concentration of truck traffic and potential conflicts.
- Lighting
  - Lighting shall be limited to what is necessary for the safe operation of the facility.
  - No building or landscaping up lighting shall be utilized.
  - All lighting must use full cut-off fixtures.
  - Where operational hours are limited, lighting should be reduced to what is minimally necessary.
- Stormwater Management:
  - With the exception of areas requiring heavy-duty pavement, surface treatments shall be pervious in nature to maximize the opportunity for groundwater recharge.
  - Trees shall be interspersed within all automobile parking areas to provide shade and reduce heat island effects. (Solar power arrays may also be used over the parking areas to provide shade and heat island reduction as co-benefits, while allowing room for tree islands.)
  - Management plans shall comply with NJDEP Stormwater Rules at N.J.A.C. 7:8.
  - Installation of a green roof shall be considered on all or portions of the roof area(s).
- Air, Heat and Noise Impacts:
  - Attenuate noise from loading areas through site design, loading locations, sound barriers, operation restrictions, and landscaping.
  - Project design features that generally improve air quality, such as installation of additional trees, landscaping, and air filters for sensitive adjacent land uses
  - Buffer Zones: Create buffer zone of at least 300 meters (roughly 1,000 feet, can be office space, employee parking, greenbelt) between warehouse/distribution center and sensitive uses (housing, schools, daycare centers, playground, hospitals, youth centers, elderly care facilities, etc.).
  - The office portion of a building's rooftop that is not covered with solar panels or other utilities shall be constructed with light colored roofing material with a solar reflective index ("SRI") of not less than 78. This material shall be the minimum solar reflective rating of the roof material for the life of the building.
- Energy:
  - Warehouse building roofs shall be solar-ready, at minimum, in accordance with current state law, which includes designing and constructing buildings in a manner that facilitates and optimizes the installation of a rooftop solar photovoltaic (PV) system at some point after the building has been constructed. Signed into state law in November of 2021, N.J.S.A. 52:27D-123.19 required amendments to the Uniform Construction Code (UCC) regarding solar facilities on warehouses. The UCC now requires that all new warehouses of 100,000 square feet or more reserve up to 40% of their roof area for solar arrays.
  - Electric vehicle charging stations and the facility to provide future charging stations for distribution vehicles. Include the identification in site plans of a location for future electric truck charging stations and installation of a conduit to that location.



- Bicycle racks shall be provided. The racks shall include locks as well as electric plugs to charge electric bikes. The racks shall be located as close as possible to employee entrance(s). This may be satisfied by utilizing bicycle parking amenities considered to be superior such as locating bicycle parking facilities indoors or providing bicycle lockers.
- Loading Requirements: The location and orientation of loading bays should consider the potential visual and noise impacts to adjacent land uses.
- Green Infrastructure and Building Standards
  - Consider requiring Green Roofs.
  - Require installation of solar charging facilities on roof tops of large structures, at minimum, in keeping with requirements pursuant to State law as discussed above.

Operational Conditions: The following are recommended to be included as conditions of any approval for a warehouse facility.

- Truck Routing Plan:
  - Each facility shall implement a truck routing plan to minimize traffic and air quality impacts to neighboring residential areas.
  - Facility operators shall post signs in prominent locations inside and outside of the building indicating that off-site parking for any employee, truck, or other operation related vehicle is strictly prohibited.
  - Signs shall be installed at all truck exit driveways directing truck drivers to the truck route as indicated in the Truck Routing Plan and State Highway System.
  - Compliance with NJ Idling regulations. Posting of no idling signs.
  - No onsite maintenance of trucks.
  - Consider the establishment of overnight parking within the warehouse/distribution center.
  - Any outside PA system must not be audible from the property line.
  - Any facility intended for storage or transfer of potential hazardous materials must be located and operated in accordance with Highlands Council requirements, as provided in the Highlands Council’s [Model Highlands Land Use Ordinance](#).
- Decommissioning Plan: A proposed plan for the end-of-life use of the warehouse should be provided.

## **Warehouse Policy Update #7**

The municipality should consider adopting warehousing-specific site plan standards. The municipality would only adopt updates as needed, to the application review standards and procedures to address items discussed in this Section as well as in the OPA Policy Guidelines.

## VII. Analysis and Gap Identification

An important step in ensuring appropriate development in a municipality is to understand what current zoning, regulations, and infrastructure capacity will allow and how that may or may not differ from the municipal vision. The steps below provide a methodology for conducting that analysis. This analysis may be particularly important to a municipality's land use program following the aforementioned modification considerations regarding warehousing. (RMP Goals 2J, 2K, 6H, 6J, 6K, and Policy 6G4).

### A. Review & Analysis of Existing Industrial/Commercial Zoning

- **Zoning Analysis:** Review all existing Zoning Districts to determine where industrial and commercial activities are permitted either 'by right' or as conditional uses. Analyze zoning and bulk standards to determine the maximum allowable development of each type.
- **Zoning Build Out:** Review the existing zoning for each district to determine the maximum allowable development for each type of use. This zoning analysis should include consideration of existing developed parcels that may be redeveloped at a greater intensity.
- **Map Analysis:** Provide a spatial representation of where these zones occur in the municipality and the amount of development that may ultimately be placed on each lot.

### B. Master Plan Review

- **Master Plan Analysis:** Review existing master plan elements and related documents and determine where the current zoning code is implementing the goals and policies of the master plan with respect to commercial/industrial uses and where there are inconsistencies.
- **Circulation Plan Element:**
  - Does the circulation plan address current road conditions and capacities?
  - Does the circulation plan need to be updated?
- **Environmental Resource Inventory:**
  - Using the Highlands Council Interactive ERI, review the existing environmental resources in the municipality.
  - Review conflicts between identified, non-regulated resources and current zoning.
  - Review existing regulations with respect to long-range planning goals to better understand the impacts of future land use and development on protected resource areas. Any outdated plans regarding protection of resources or stormwater management policies should be updated to reflect current standards.
- **Compatible Land Use Analysis:** Consider existing and planned land uses adjacent to commercial/industrial uses to assess compatibility or potential conflict. This review should consider residential neighborhoods, overburdened communities, schools, public facilities, environmental features, historic sites/districts, etc.

### **C. Analysis of Existing/Available Commercial/Industrial Infrastructure Capacity**

- Identify existing available water capacity (permitted capacity minus committed/used capacity).
- Identify existing available sewer capacity (permitted capacity minus committed/used capacity).
- Identify capacity of the existing road system, including local, county, state and interstate roads.
- Identify freight rail availability.
- Identify critical community facilities (e.g., fire protection) to determine if sufficient capacities exist to support development of large warehousing and distribution facilities.
- Identify existing stormwater management systems and address any capacity, maintenance or design issues.
- Identify existing Watershed Impervious Coverage level(s) to assess for consistency with Section V above and evaluate capacity for expansion.
- Conduct an analysis of available capacities against the buildouts projected in Step 1.

### **D. Address & Resolve Conflicts in Zoning Code**

- Based on the review and analysis above, identify conflicts within current zoning, for example, where permitted commercial/industrial buildout exceeds infrastructure capacity either cumulatively or individually. In cases where development is appropriate but lacks infrastructure capacity, the steps necessary to address the deficiency should be noted (i.e., bridge replacement, sewer upgrades). Identify conflicts relating to permitted uses within and/or between zone districts.
- If appropriate, conduct a Master Plan Reexamination in accordance with N.J.S.A. 40:55D-89 with specific attention given to subsections c. and d.
- Update Master Plan Elements as necessary to support immediate zoning updates based on the above analysis, with particular emphasis on future land use, circulation planning, and infrastructure capacity.
- Adopt changes to the municipal zoning ordinance, as appropriate.
  - Adopt zoning changes to implement master plan recommendations.
  - Adopt site development standards that are reflective of the foregoing analyses and designed to implement the goals and policies of the municipal master plan.

### **E. Comprehensive Master Plan Review**

If at the conclusion of A-C above the municipality determines the objectives and assumptions of the master plan are substantially inadequate such that minor updates or revisions are unable to address the issues identified above, a new or substantially updated Master Plan may be appropriate. If a reexamination report has not already been done during the earlier steps, it would be an appropriate next step to initiate that action. The municipality should review and incorporate as applicable and appropriate, the best practice strategies outlined in the State Planning Guidance for Warehouse Development which outlines steps to developing planning documents related to warehouse development including:

- Traffic Analysis: Level of Service on Roadways (existing & build out capacities).
- Transportation Analysis: Condition of roadways, current capacity for different types of vehicles, expected life span of roadways under current and anticipated future conditions (increased traffic, truck traffic, etc); transportation methods & inadequacies analysis.
- Land Use Analysis: prime agricultural lands, open space/recreation, brownfields/grayfields, environmentally sensitive areas, or polluted lands. Locations, zoning, environmental protections, development potential, etc.
- Community Engagement
- Overburdened Communities
- Transportation Plan: Level of Service Review
- Utilities Plan: Utility Capacity Analysis
- Redevelopment and Center Planning
- Farmland Preservation Plan Element

### **Warehouse Policy Update #8**

The municipality should consider conducting a capacity analysis as described in this Section to identify gaps and consider next steps. Evaluate items as listed herein, and update Master Plan and Land Use Regulations accordingly.

## VIII. Exhibits

### Exhibit A

## IMPERVIOUS SURFACE ACROSS THE HIGHLANDS BY HUC 14

### BACKGROUND

The Highlands Regional Master Plan (RMP) provides policies designed to ensure that public funds and other resources are focused on protection of Highlands resources by limiting impervious cover, particularly in critical resource areas. Impervious Surface is defined in the RMP as any structure, surface, or improvement that reduces or prevents absorption of stormwater into land, and includes porous paving, paver blocks, gravel, crushed stone, decks, patios, elevated structures, and other similar structures, surfaces, or improvements. To be considered an impervious surface, the structure, surface, or improvement must have the effect of reducing or preventing stormwater absorption. Impervious Surface is used as an indicator of water quality, as increased impervious surface typically has a direct correlation to decreased water quality.

The RMP references the Center for Watershed Protection's definition of sensitive streams as typically having impervious surface cover from 0 to 10%, resulting in higher quality water and aquatic habitat; impacted streams have a watershed impervious surface cover of 11 to 25% and show signs of degradation; and non-supporting streams have surrounding land uses with greater than 25% impervious surface cover, with often severe degradation of water quality and limited ability to support an aquatic community.

The watershed boundaries used for the analysis in the RMP were 14-digit Hydrologic Units (i.e., subwatersheds or HUC14s).

### IMPERVIOUS SURFACE COVERAGE

Impervious surface coverage is derived from the 2015 NJDEP Land Use/Land Cover (LULC) dataset by Highlands Region HUC14 subwatershed. IS coverage was broken into four classes (<2%, 2-10%, 10-25%, and >25%) and change represents an increase or decrease of IS such that the subwatershed shifts to a different class. Where subwatersheds are partially within the Highlands Region, the entire subwatershed was analyzed.

### STATUS

As of 2023, using the most recent data available (2015 LULC), approximately 11% of the Highlands Region's subwatersheds are covered in impervious surface. Most (55%) of the Highlands subwatersheds fall in the range of 2 to 10% impervious surface coverage, followed by over one third of the subwatersheds having 10 to 25%, almost 6% having greater than 25% impervious surface coverage, and those with less than 2% making up just over 2% of Highlands Region subwatersheds.

### DATA CONFIDENCE

Data was taken directly from NJDEP Land Use/Land Cover data and was not calculated by the New Jersey Highlands Council. Impervious surface values were assigned in 5% increments based on paved/developed area within each polygon. More information on how this dataset was developed can be found here:

[www.nj.gov/dep/gis/digidownload/metadata/lulc15/update2015.html](http://www.nj.gov/dep/gis/digidownload/metadata/lulc15/update2015.html).



# Impervious Surface Coverage by Watershed



## Legend

- NJ Highlands Boundary
- County Boundaries
- Highlands Preservation Area (Located inside line)

## Impervious Surface by HUC14 subwatershed, 2015

- > 25% Impervious Surface
- 10 - 25% Impervious Surface
- 2% - 10% Impervious Surface
- <2% Impervious Surface

