



# Green Infrastructure Barriers and Opportunities in Camden, New Jersey

An Evaluation of Local Codes and Ordinances

## About the Green Infrastructure Technical Assistance Program

Stormwater runoff is a major cause of water pollution in urban areas. When rain falls in undeveloped areas, the water is absorbed and filtered by soil and plants. When rain falls on our roofs, streets, and parking lots, however, the water cannot soak into the ground. In most urban areas, stormwater is drained through engineered collection systems and discharged into nearby waterbodies. The stormwater carries trash, bacteria, heavy metals, and other pollutants from the urban landscape, polluting the receiving waters. Higher flows also can cause erosion and flooding in urban streams, damaging habitat, property, and infrastructure.

Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city or county, green infrastructure refers to the patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the scale of a neighborhood or site, green infrastructure refers to stormwater management systems that mimic nature by soaking up and storing water. These neighborhood or site-scale green infrastructure approaches are often referred to as *low impact development*.

EPA encourages the use of green infrastructure to help manage stormwater runoff. In April 2011, EPA renewed its commitment to green infrastructure with the release of the *Strategic Agenda to Protect Waters and Build More Livable Communities through Green Infrastructure*. The agenda identifies technical assistance as a key activity that EPA will pursue to accelerate the implementation of green infrastructure.

In February 2012, EPA announced the availability of \$950,000 in technical assistance to communities working to overcome common barriers to green infrastructure. EPA received letters of interest from over 150 communities across the country, and selected 17 of these communities to receive technical assistance. Selected communities received assistance with a range of projects aimed at addressing common barriers to green infrastructure, including code review, green infrastructure design, and cost-benefit assessments. Cooper's Ferry Partnership was selected to receive assistance to evaluate green infrastructure barriers and opportunities in Camden, New Jersey.

For more information, visit [http://water.epa.gov/infrastructure/greeninfrastructure/gi\\_support.cfm](http://water.epa.gov/infrastructure/greeninfrastructure/gi_support.cfm).

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**Contents**

1 Introduction ..... 1

2 Key Opportunities ..... 2

3 Next Steps ..... 4

Attachment 1 Development Code Review Summary ..... A-1

# 1 Introduction

*Green infrastructure* uses vegetation and soil to manage rainwater where it falls. This broad term can include minimizing impervious area on a development site; preserving a site's natural features, vegetation, and water; planting new trees; or installing "engineered" best management practices (BMPs) that mimic natural functions such as rainwater storage, infiltration, and cleansing. These practices not only treat and retain stormwater on-site, but also provide multiple environmental benefits and support sustainable communities. The City of Camden provides a unique opportunity to examine the compatibility of green infrastructure practices with zoning and development codes in an urban community seeking revitalization.

Camden, New Jersey, is an urban community situated along the scenic Delaware River, with its waterfront just one mile from Philadelphia's historic district. While areas surrounding Camden have grown, Camden's population has been in decline for the last several decades, falling from a peak of about 125,000 residents in 1950 to 77,334 in 2010. This decline is due largely to the closure of major manufacturing industries, coupled with worsening socio-economic conditions. Like other older U.S. cities, its sewer system is primarily a combined system, conveying both stormwater and sanitary sewage. Camden's twenty-eight combined sewer outfalls frequently discharge combined sewage directly to nearby rivers and creeks.

Despite its hardships, Camden has multiple assets that it is using to attract investment and encourage the city's revitalization. These include its extensive waterfronts, seven higher educational and health care facilities, proximity to Philadelphia, significant transportation infrastructure, and the presence of economic generators like Campbell's Soup Company and L3 Communications.

Camden and the Camden Stormwater Management and Resource Training (CamdenSMART) Initiative are seeking to improve local water quality by develop a comprehensive network of green infrastructure programs and projects within the city. Not only can such techniques restore degraded urban waters, but they can be leveraged to revitalize communities and spur new private-public partnerships. Often, however, development codes and standards can work against these goals. Local codes and ordinances can include inflexible standards or incorporate outdated requirements that result in excess impervious cover and reduce the functionality of landscapes. This report presents findings from EPA's review of the regulations and standards relevant to the implementation of stormwater best management practices within the City of Camden. The purpose of the review was to identify opportunities to minimize impervious cover and promote environmentally sensitive site design during development and redevelopment activities and to identify potential barriers to the implementation of structural green infrastructure practices.

EPA reviewed the following city codes and documents:

- *FutureCamden* Comprehensive Master Plan
- Chapter 418 – Property Maintenance:
  - New Jersey Uniform Fire Code
  - Building Code of the City of Camden
  - Article V. Plumbing Facilities and Fixtures Requirements
- Chapter 491 – Streets and Sidewalks
- Chapter 542 – Trees and Shrubs
- Chapter 577 – Zoning and Land Use (as codified)

- Land Development Ordinance of the City of Camden (Approved by City Council 2011, and replaces Chapter 577 – Zoning and Land Use)

Several guidance documents that identify key land development and green stormwater infrastructure codes and principles were also utilized. These included the New Jersey Department of Environmental Protection's *Stormwater Best Management Practices Manual* (April 2004, Revised September 2009); New Jersey Department of Agriculture's *Revised Erosion Control Standards* (2012); USEPA's *Green Parking Lot Resource Guide* (February 2008); the Center for Watershed Protection's *Codes and Ordinance Worksheet* (1998); and the USEPA *Water Quality Scorecard* (EPA, 2009). Emphasis was placed on site design techniques and stormwater management practices considered appropriate for Camden.

The findings presented in this memo are intended to highlight code areas for CamdenSMART to consider as they continue to integrate green stormwater infrastructure throughout the city. Potential solutions to the identified issues were included and prioritized to help initiate a conversation when the group considers this report. However, it is fully expected and presented in a way that CamdenSMART partners, through discussions with staff and external stakeholders, can manipulate and revise recommendations and priorities as necessary. EPA's review did not include an evaluation of administrative, inspection, or enforcement procedures; cost/benefit analyses; interviews with agency staff; or work sessions engaging the local regulatory, development, and environmental communities, which would likely precede any formal code update process. Where practical, EPA provided alternatives for addressing some of the issues, but ultimately it is up to the city to determine the most appropriate recommendations for local implementation.

## 2 Key Opportunities

Recommendations to address the most significant code barriers to green infrastructure in Camden are listed below, without assignment of priority. These findings are a subset of the more detailed recommendations provided in the development code review table in Attachment 1.

### *Evaluate the ¼-acre (10,890-square-foot) impervious surface threshold for water quality control*

The 2010 Land Development Ordinance (LDO) significantly updated Camden's existing Zoning and Land Use code. In the LDO, provisions were added to require the post-construction load of total suspended solids to be reduced by 80 percent of the anticipated load whenever an additional ¼ acre of impervious surface is proposed on a development site. Given Camden's urban makeup, the city may want to consider a lower threshold for regulatory applicability. For example, Washington, D.C., has implemented a threshold of 5,000 square feet to trigger stormwater management requirements which applies to renovations as well as new construction.

### *Prevent soil compaction on development sites*

While the Land Development Ordinance includes many important updates to the city's stormwater requirements, one area which was minimally addressed was soil compaction as it relates to a development site in its entirety, and not just around trees. Consider adding provisions to Article XXIX to prevent the compaction of soils with the highest infiltration potential, and ensure highly erodible soils and areas suitable for infiltration practices are both mapped and designated to be left undisturbed, where possible. Also consider revising the as-built inspection process to ensure that soil compaction is addressed and mediated prior to an issuance of a Certificate of Occupancy. In addition, consider adding provisions to Article XXIX of the 2010 LDO Soil Erosion and Sediment

Control requirements to restore overall soil conditions at construction sites after construction is complete. These suggested changes are compatible to those identified in New Jersey's recently released 2012 Revised Erosion Control Standards.

*Certify that projects are completed in accordance with an approved stormwater management plan prior to Certificate of Occupancy*

Consider requiring a Stormwater Observation Report (SOR) or similar document be submitted by the engineer of record prior to the issuance of a Certificate of Occupancy, esp. for complex projects, in order to ensure that the BMP was constructed and installed in accordance with an approved plan. Similar requirements already exist for landscaping (see §577-246, Landscape Maintenance and Inspections).

*Incentivize the use of green infrastructure practices*

Investigate ways to incentivize the use of bioretention and other green infrastructure practices to meet landscaping/tree planting requirements. Consider encouraging the use of pervious parking lot surfaces by allowing a percentage to be excluded when calculating allowable lot coverage.

*Allow landscaped areas to function as stormwater management features*

Update ordinance language in Articles XVIII and XXIX of the 2010 Land Development Ordinance to expressly allow the use of landscaped edges and islands in parking areas to function as stormwater management features and to allow the use of bioretention and other green stormwater infrastructure practices within landscaped areas, setbacks, or in the areas between curbs and sidewalks. Also give preference to utilizing vegetation designed in keeping with green infrastructure principals over the use of walls and berms.

*Evaluate open space requirements for planned developments*

Evaluate open space requirements for planned development to ensure that a minimum percentage of open space is retained for vegetative purposes. While the prior version of the Zoning and Land Use Code (see original §577-207) established specific percentages, these were not included in the updated Land Development Ordinance. Model ordinance language for open space developments from the US EPA suggests a minimum percent open space requirement of between 35–50%, depending on base density.

*Reduce/eliminate minimum parking requirements*

Review parking demand in order to determine if minimum parking standards can either be reduced/eliminated or maximum parking requirements can be established, particularly in areas where transportation alternatives exist. Other cities have used such parking management techniques effectively to reduce vehicular traffic and encourage the use of transit facilities that provide a mobility alternative to the automobile, or where existing parking already greatly exceeds demand.

*Allow curb cuts or flush curbs with curb stops to direct runoff to vegetated areas*

Revise curbing standards to allow curb cuts or flush curbs with curb stops to be utilized as an alternative to raised curbs in order to allow for the disconnection of impervious areas. This

technique can be used to direct runoff from streets or parking areas into vegetated swales or other green infrastructure practices.

*Allow reduced street pavement/travel lane widths to create space for bioretention*

Consider allowing smaller street pavement/travel lane widths, as well as consolidated travel lanes and on-street parking to create space for bioretention.

In addition, two state-level activities were identified:

*Develop guidelines and standards for green roofs*

Pursue the development of guidelines and standards for green roofs that can be integrated into local building codes. Camden follows New Jersey's Uniform Construction Codes. For building codes, New Jersey cites the 2009 International Building Code® New Jersey Edition (IBC 2009). While the IBC 2009 appears to limit the use of green roof systems, it is still possible to utilize them, with approval. CamdenSMART should consider pursuing the development of standards at the state level that can be integrated into local building codes. Without a clear review process and building code standards in place, developers are less likely to utilize green roof technology as it may require additional review time and engineering expense.

*Include BMP design specifications for additional green infrastructure practices in the New Jersey Stormwater BMP Manual*

Encourage stormwater BMP specifications to include design specifications for green roofs, rain barrels, and cisterns, and for locating BMP's in an urban environment. For example, while the New Jersey Stormwater BMP Manual includes a placeholder for rooftop vegetated covers, there is no standard as of yet. For urban environments, guidance on the use of BMPs near building foundations and guidance and specifications for urban bioretention (e.g., stormwater planters, stormwater curb extensions, and/or extended tree pits), for example, would provide urbanized areas with more practical information on the use of stormwater BMPs on smaller sites.

### **3 Next Steps**

In addition to the key findings presented above, a tabulated code review accompanies this memorandum which provides a more detailed review of Camden's codes. The attached table provides some example code language and other resources for crafting code text amendments. While potential solutions were provided, they are presented as a means to help initiate conversation.

Delivered along with this memo is a green infrastructure handbook that focuses more specifically on the types of green infrastructure and LID techniques applicable to Camden. Such practices better mimic pre-construction runoff conditions on new development projects and more effectively utilize water quality strategies and technologies on redevelopment projects to the maximum extent practicable.

## Attachment 1 Development Code Review Summary

NJ List	Key Question	Findings	Code/ Ordinance <sup>1</sup>	Section Reference	Comments	Recommendation	Priority
<b>Impervious Area Management</b>							
<b>Buildings</b>							
No	Requirements for rooftop structures and materials allow/encourage green roofs	Partly	2010 LDO	Article I	Camden follows New Jersey's Uniform Construction Codes. For building codes, NJ cites the 2009 International Building Code® New Jersey Edition. While the IBC 2009 appears to limit the use of green roof systems, it is still possible to utilize them, with approval. See <a href="http://www.ecodes.biz/ecodes_support/Free_Resources/NewJersey/06_09NewJersey_main.html">www.ecodes.biz/ecodes_support/Free_Resources/NewJersey/06_09NewJersey_main.html</a> for a copy of the building code. In addition, there is no standard as of yet (only a placeholder) for rooftop vegetated covers in the NJ Stormwater BMP Manual. The 2010 LDO, §577-229, Section 5, Part B, does state that: "Other stormwater management measures may be utilized provided the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by this subchapter."	Pursue the development of detailed design guidelines and standards at the state level that can be integrated into local building codes	Med
No	Allow bioretention areas, swales, rain barrels and cisterns near building foundations, if properly designed	No	2010 LDO	Article XXIX	The Stormwater Control Ordinance included as part of the 2010 LDO "establishes minimum stormwater management requirements and controls for major development," and is intended to be "applicable to any site plan or subdivision that requires preliminary or final site plan review" (starts on p. 379). It also states that "Guidance for nonstructural stormwater management measures is available in the New Jersey Stormwater Best Management Practices Manual." However, the New Jersey Stormwater BMP Manual does not address the use of such BMP near building foundations.	Pursue revisions to Stormwater BMP specifications to include information on/requirements for locating BMPs near buildings. Ensure specifications for rain barrels and cisterns exist, if not yet available.	High
<b>Parking Areas and Sidewalks</b>							
Yes	Ability to reduce parking ratios	Yes	2010 LDO	Article XXIX	See §577-230 Parking and Loading Requirements. While each use has minimum parking requirements, part J (p. 412) states: "The required number of parking spaces may... be reduced where the Planning Board finds that application of the above standards is not required in the interest of the residents, owners, tenants, and occupants of a development and their employees and that modification of the above standard is consistent with the interests of the entire City."	Consider re-examining parking demand in urban areas where land and parking costs are higher and transportation alternatives exist in order to determine whether minimum parking standards can either be reduced or eliminated completely. Reducing minimum parking requirements will help to create more livable communities by reducing the abundant supply of free parking and encouraging transit use.	High
Yes	Establish maximum parking requirements	No	2010 LDO	Article XXIX	See §577-230 Parking and Loading Requirements. Cities typically set minimum parking requirements which mandate ample off-street parking for any new development. However, the provision of parking can be a major barrier to creating more livable communities that adhere to smart growth principles.	In areas of Camden that are well served by transit, consider the use of maximum parking requirements to limit the amount of off-street parking built. These requirements prevent auto-oriented uses from occupying land near rail and bus stations, and encourage the creation of transit-oriented districts, or transit villages.	High
Yes	Allow for the use of shared parking arrangements	Yes	2010 LDO	Article XXIX	See §577-230 Parking and Loading Requirements. In addition to allowing parking requirements to be reduced, Part J (p. 412) also states: "Shared parking is encouraged between different land uses on a given lot, parcel, or within a development. The Board may require the applicant to utilize the Urban Land Institute's "Shared Parking Analysis" and/or another comparable approach if deemed appropriate for a given application or situation."	None	--
Yes	Provide a model shared parking agreement	No	2010 LDO	Article XXIX	While the City of Camden does allow shared parking, no model agreement currently exists within its ordinance. One challenge with shared parking is working out an agreement between land owners or developers if the uses are not all on the same property.	Consider providing a model shared parking agreement to facilitate agreements between land owners/ developers. Some examples can be found at the following link: <a href="http://www.mapc.org/resources/parking-toolkit/strategies-topic/shared-parking">www.mapc.org/resources/parking-toolkit/strategies-topic/shared-parking</a>	Med
Yes	Allow for reduced parking ratios where mass transit exists	Yes	2010 LDO	Article XXIX	See §577-230 pp. 413-414. Parking and Loading Requirements. N. The Planning Board or Zoning Board of Adjustment shall be authorized, in accordance to permit the incorporation of transit stops as a means of satisfying the otherwise applicable off-street parking standards, provided the following conditions are met. And "4. The maximum reduction in the number of parking spaces shall be no more than twenty percent (20%) of the total required spaces."	None	--

<sup>1</sup> 2010 LDO = Land Development Ordinance; Ch. 418 PM = Chapter 418, Property Maintenance

<input checked="" type="checkbox"/> NJ list	Key Question	Findings	Code/ Ordinance <sup>1</sup>	Section Reference	Comments	Recommendation	Priority
Yes	Allow min. stall width of 9 ft.	Yes	2010 LDO	Article XXIX	See §577-231 Parking and Loading Design Standards, Part B, p. 420. Minimum standard car spaces dimensional requirements. A minimum stall width of 9 ft. is allowed for regular cars. A minimum of 7.5 ft. is allowed for compact cars. Also: "Compact car spaces may be permitted by the Planning Board only where the total number of spaces proposed to be provided exceeds fifty (50) and shall not exceed thirty percent (30%) of the total number required."	None	--
Yes	Allow min. stall length of 18 ft.	Yes	2010 LDO	Article XXIX	See §577-231 Parking and Loading Design Standards, p. 420. Minimum standard car spaces dimensional requirements. A minimum stall length of 18 ft. is allowed for regular cars. A minimum length of 15 ft. is allowed for compact cars.	None	--
Yes	Allow reduction in stall lengths for vehicle overhang in vegetated areas	Yes	2010 LDO	Article XXIX	See §577-231 Parking and Loading Design Standards, pp. 421-2. 8. Parking spaces may be reduced to sixteen (16) feet in length where vehicles overhang landscaped or expanded pedestrian walkways by a minimum of two (2) feet, subject to Board approval."	None	--
Yes	Allow permeable materials for overflow parking	Yes	2010 LDO	Article XXIX	See §577-230 pp. 413-414. Parking and Loading Requirements. While not specific to overflow parking areas, p. 417 states: "...Turfblock may be used for off-street parking and loading areas if approved by the City Engineer." However, also on same page: "X. Parking areas, including all access ways and driveways, shall be smoothly paved with materials which do not produce dust or debris; are durable and all-weather; uniform in application and appearance; and does not permit the growth of vegetation. The choice of surfacing material is left to the property owner's discretion and Planning Board's approval, provided the above performance standards are met. Choices can include but are not limited to: bituminous asphalt, concrete, crushed stone, etc." Does not mention permeable material, but is also not restricted.	Consider encouraging the use of pervious parking lot surfaces by allowing the majority of the pervious parking surfaces provided to be excluded when calculating allowable lot coverage. This allows a developer to increase a proposed building footprint because when less of the parking area is counted towards allowable lot coverage, more of that coverage becomes available for building space. See p. 20 of <a href="http://www.fhiplan.com/PDF/NW%20Parking%20Study/NW%20Connecticut%20Parking%20Study%20Phase%202.pdf">http://www.fhiplan.com/PDF/NW%20Parking%20Study/NW%20Connecticut%20Parking%20Study%20Phase%202.pdf</a> for some possible ideas.	Med
Yes	Allow for multi-level parking	Yes	2010 LDO	Article XXIX	See §577-230 pp. 413-414. Parking and Loading Requirements.	None	--
Yes	Provide incentives to reduce impervious cover in parking	No	2010 LDO	Article XXIX	Each zone has impervious cover limits which apply to the lot in its entirety. While this impacts parking, there are no additional incentives to reduce impervious cover in parking lots exist in §577-231 Parking and Loading Design Standards	Consider encouraging the use of pervious parking lot surfaces by allowing the majority of the pervious parking surfaces provided to be excluded when calculating allowable lot coverage. This allows a developer to increase a proposed building footprint because when less of the parking area is counted towards allowable lot coverage, more of that coverage becomes available for building space. See p. 20 of <a href="http://www.fhiplan.com/PDF/NW%20Parking%20Study/NW%20Connecticut%20Parking%20Study%20Phase%202.pdf">http://www.fhiplan.com/PDF/NW%20Parking%20Study/NW%20Connecticut%20Parking%20Study%20Phase%202.pdf</a> for some possible ideas.	High
Yes	Allow for pervious sidewalks	Yes	2010 LDO	Article XXIX	See §577-241 Sidewalks and Pathways. On p. 439 it states: "C. Where required, sidewalks shall be at least five (5) feet wide and located as approved by the Board. Sidewalks shall be at least four thousand (4000) per square inch air-entrained, six (6) inches thick at driveways. Sidewalks shall be provided with expansion joints of one-half (½) inch thick preformed bituminous joint fill spaced at intervals of not more than twenty-four (24) feet. Sidewalks such as brick pavers may be considered by the Planning Board upon submission of complete design details. All sidewalks shall be 5 inches 4000 PSI concrete on firm non-yielding sub-base compacted to 95% proctor. Though pervious materials are not specifically named, these PSI requirements do not preclude the use of pervious materials.). Also, on pp. 372-373 of the new stormwater section, part O deals with pervious paving: "1. Previous paving systems may be used to reduce the imperviousness of firm surfaces such as patios, walkways, driveways, fire lanes, and parking areas, for the purpose of reducing surface runoff and increasing infiltration. The pervious paving systems may also be used as inlets and covers for infiltration trenches. Pervious paving can be effective in helping to reduce peak surface runoff rates or in improving the groundwater recharge characteristics of developed sites."	The city may want to consider requiring sidewalks to be permeable, or, could take a less prescriptive approach and just require a certain percentage of surfaces in front yards be permeable (for example, 50%) by using porous asphalt, porous concrete, interlocking pavers, bricks, or landscaping. Areas counted towards the landscaping requirement (e.g., 20% of the required setback area) could also be credited towards the permeability requirement. The City of San Francisco has some good ordinance language for the latter here: <a href="http://www.sf-planning.org/ftp/files/publications_reports/Guide_to_SF_Green_Landscaping_Ordinance.pdf">http://www.sf-planning.org/ftp/files/publications_reports/Guide_to_SF_Green_Landscaping_Ordinance.pdf</a>	Med

<b>NJ</b> <b>✔list</b>	<b>Key Question</b>	<b>Findings</b>	<b>Code/ Ordinance<sup>1</sup></b>	<b>Section Reference</b>	<b>Comments</b>	<b>Recommendation</b>	<b>Priority</b>
Yes	Allow alternate pedestrian networks to be substituted for sidewalks	Yes	2010 LDO	Article XXIX	See §577-241 Sidewalks and Pathways, pp. 439-440: "G. At the discretion of the Planning Board, pathways may be substituted for or provided in addition to sidewalks. Bike pathways shall be designed to separate bike and motor vehicle traffic. Pathways shall generally not exceed a grade of three percent (3%), except for short distances, and shall be a minimum of eight (8) feet wide. Pathways shall have a minimum four (4) inch base of crushed stone and a two (2) inch FABC-2 surface course. Where pathways intersect a street, the curbing (where applicable) shall be ramped for access to the street grade."	None	--
No	Allow parking lot drive aisles to be 22 ft.	No	2010 LDO	Article XXIX	Under §577-231, Parking and Loading Design Standards, Part B, Parking Design Principals, 1.a and 1.b, Two-way aisle widths for standard cars must be a minimum of 24 ft., and two-way aisle widths for compact cars must be a minimum of 20 ft.	Places such as the City of Minneapolis have successfully utilized drive aisle width for a two-way drive aisle of 22 ft. By utilizing 45- and 60-degree parking, drive aisle minimums can be even smaller.	Med
No	Reduced parking ratio of 3.0 spaces per 1,000 sq. ft. gross floor area	No	2010 LDO	Article XXIX	See §577-230, Parking and Loading Requirements, Part F., the minimum standard for offices is 1 space for each 300 square feet of gross floor area (p. 407).	Reevaluate minimum parking standards, where utilized, to ensure that standards are not higher than necessary.	Med
No	Reduced parking ratio of 2 to 4.5 spaces for 1,000 sq. ft. gross floor area for commercial centers	No	2010 LDO	Article XXIX	See §577-230, Parking and Loading Requirements, Part F., the minimum standard for shopping and neighborhood centers is 5.5 spaces for each 1,000 square feet of gross leasable floor area, excluding theaters.	Reevaluate minimum parking standards, where utilized, to ensure that standards are not higher than necessary.	Med
<b>Streets and Driveways</b>							
Yes	Evaluate minimum widths of streets to ensure narrowest possible	No	2010 LDO	Article XXIX	See §577-236, Streets, p. 433. It states: "E. The right-of-way width for internal roads and alleys in residential, multifamily, commercial and industrial development shall be determined on an individual basis and shall, in all cases, be of sufficient width and design to safely accommodate the maximum traffic, parking and loading needs and maximum access for fire-fighting equipment." Also see §577-237 Street Design Standards. G. G. Minimum roadway construction.	Consider allowing street pavement widths between 18 to 22 feet, with curb pullouts for passing of large vehicles.	High
Yes	Allow/require street features to receive runoff	No	2010 LDO	Article XXIX	See §577-237 Street Design Standards.	Revise street design standards to allow circles, rotaries, or landscaped islands to receive runoff. Allow for consolidated travel lanes and consolidated on-street parking to create space for bioretention.	High
Yes	Allow the use of curb cuts or flush curbs	No	2010 LDO	Article XXIX	See §577-242 Curbing. No alternatives to raised curbs (in form of curb cuts or flush curbs with curb stops) are currently allowed. Curb cuts are openings created in the curb to allow stormwater from the street (or any adjacent impervious surface, like a parking lot) to flow into a depressed infiltration and planting area.	Revise curbing standards to allow curb cuts or flush curbs with curb stops to be utilized as an alternative to raised curbs, as well as grass swales or bioretention swales instead of curb or gutter.	High
Yes	Reduce minimum cul-de-sac radius or require center island landscaped	No	2010 LDO	Article XXIX	See §577-237 Street Design Standards. "D. Each cul-de-sac shall provide a turnaround at the end with a minimum radius of fifty (50) feet to the outside edge of the cartway or curb line and sixty (60) feet to the outside edge of the right-of way."	Allow for smaller minimum cul-de-sac radii (such as 35 feet or less) or include landscaped islands that can receive stormwater runoff in the center.	Low
Yes	Allow alternative turnarounds for low-density residential streets	No	2010 LDO	Article XXIX	See §577-237 Street Design Standards. Alternative turn-arounds such as "hammerheads" are not currently allowed on short streets in low density residential areas.	Revise street design standards to allow for alternative turn-arounds such as "hammerheads" on short streets in low density residential developments.	Low
Yes	Allow minimum driveway widths to be reduced	Yes	2010 LDO	Article XXIX	Not specifically address, but under §577-224, "Parking and Circulation" on p. 336, it states: "Each development site must provide adequate off-street automobile parking and loading facilities and no parking or loading facilities shall be permitted on any street, entrance drive, or any place other than in an approved location. Off-street parking and loading design shall conform to those standards identified in this Ordinance although actual design may be based on site experiences at other locations. It may not be necessary to pave the entire parking area established by ratios found in this Ordinance where it can be demonstrated by the applicant that the minimum Ordinance requirements are in excess of need." Reducing requirements is also addressed on p. 412 under §577-230 Parking and Loading Requirements.	Consider revising ordinance to include minimum driveway widths. Single car driveways can be as narrow as 9 feet, or as wide as 12 feet. Double car driveways can be between 20 and 24 feet wide. To allow for door swing and area for passengers to step onto hard surfaces, consider encouraging decorative, permeable bands of 2 ft. in width where absolute minimum driveway widths are utilized (e.g., 9 feet may mean that guests are stepping in grass or dirt as they exit their vehicles).	Med

<b>NJ</b> <b>list</b>	<b>Key Question</b>	<b>Findings</b>	<b>Code/ Ordinance<sup>1</sup></b>	<b>Section Reference</b>	<b>Comments</b>	<b>Recommendation</b>	<b>Priority</b>
Yes	Permit shared driveways in residential developments	No	2010 LDO	Article XXIX	For commercial development, shared parking is encouraged between different land uses on a given lot, parcel, or within a development (see site design criteria for non-residential properties, §577-224). However, shared driveways in residential developments are not. Given the low level of applicability for Camden, this is a low priority.	None	--
No	Allow travel lanes to be from 12 to 10 ft. (or less) with curb pullouts for passing	No	2010 LDO	Article XXIX	See §577-236, Streets, p. 433. It states: "E. The right-of-way width for internal roads and alleys in residential, multifamily, commercial and industrial development shall be determined on an individual basis and shall, in all cases, be of sufficient width and design to safely accommodate the maximum traffic, parking and loading needs and maximum access for fire-fighting equipment." Also see §577-237 Street Design Standards. G. G. Minimum roadway construction. Individual travel lane widths are not specified.	Consider allowing smaller travel lane widths	High
No	Allow the use of curb bumpouts for traffic calming and bioretention	No	2010 LDO	Article XXIX	Curb bumpouts/extensions are not addressed in §577-236, Streets.	Consider allowing curb bumpouts/extensions near intersections and mid-block for traffic calming and bioretention opportunities.	Med
No	Allow pervious parking for alleyways and on-street parking	No	2010 LDO	Article XXIX	G.3., Minimum roadway construction requirements, found in §577-237, Street Design Standards, on p. 435 of the 2010 Land Development Ordinance state: "3. All of the above construction shall be in accordance with the current New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction and supplements thereto on file in the City Engineer's office." Currently, pervious surfaces such as paver stones, porous pavement, or grass pavers are not considered for on-street parking or alleyways.	Consider amending to add: Bikeways, sidewalks, trails and walkways shall be constructed in accordance with the current NJDOT Standard Specification for Road and Bridge Construction unless otherwise required herein," and place where pervious paving would be allowed.	Med
No	Require site designs to reduce overall street length	No	2010 LDO	Article XXIX	§577-236, Streets, states: "Proposed streets and extensions of existing streets shall conform to the Master Plan or Official Map, and shall be designed and located to facilitate orderly circulation patterns, assure emergency access and provide for future connections to adjoining properties in accordance with the following standards." "E. The right-of-way width for internal roads and alleys in residential, multifamily, commercial and industrial development shall be determined on an individual basis and shall, in all cases, be of sufficient width and design to safely accommodate the maximum traffic, parking and loading needs and maximum access for fire-fighting equipment."	Encourage site designers to analyze different layouts to see if they can reduce street length.	Low
<b>Unconnected Impervious Area</b>							
Yes	Require developers to disconnect impervious surfaces	Yes	2010 LDO	Article XXIX	See §577-229 Stormwater Collection and Management, pp. 381-382: "To the maximum extent practicable, the standards in 3.F and 3.G shall be met by incorporating nonstructural stormwater management strategies at 3.E into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in 3.E.2 below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention." The second nonstructural stormwater management measure listed is "b. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.")	None	--
Yes	Allow runoff volumes to be reduced when infiltrated into vegetated areas	Yes	2010 LDO	Article XXIX	See §577-229 Stormwater Collection and Management, pp. 356-7, part A, Runoff Standards: "1. For runoff computation purposes, in the post development condition all nonresidential lawn areas, including open space areas, commercial developments, etc., are to be assumed to have grass cover in fair condition (grass cover 50% to 75%), unless otherwise approved."	None	--
Yes	Allow flush curbs and/or curb cuts to allow for sheet flow discharge	No	2010 LDO	Article XXIX	In the definitions section on p. 97 of the 2010 land development ordinance, stormwater management is defined as "methods to reduce the volume and pollutant load of stormwater runoff from proposed land developments which can include, but may not be limited to, detention/retention basins, grass-lined swales, porous pavements, and sheet flow into vegetation. However, §577-242, Curbing, on p. 440+, provides curbing specifications. There is no allowance for flush curbs and/or curb cuts in this section.	Revise curbing standards to allow curb cuts or flush curbs with curb stops to be utilized as an alternative to raised curbs	High

NJ List	Key Question	Findings	Code/ Ordinance <sup>1</sup>	Section Reference	Comments	Recommendation	Priority
No	Distinguish between connected and disconnected impervious	Yes	2010 LDO	Article XXIX	§577-16, defines impervious surface as: "The square footage or other area measurement by which all buildings and impervious surfaces cover a lot as measured in a horizontal plane to the limits of the impervious area(s), such as surface areas, walkways, patios and plazas. All parking spaces and lots, buildings, roads, driveways, walkways, tennis courts, patios, decks and any other structure or on-site material or ground condition that does not permit the natural absorption of water shall be included in the computation of improvement coverage. All surfaced parking areas and driveways, all required parking areas which are permitted to remain un-surfaced and all gravel and packed stone areas and landscape areas lined with weed-inhibiting plastic sheeting shall be included in the computation of impervious coverage. In addition, other areas determined by the City Engineer to be impervious within the meaning of this definition shall also be considered as an "impervious surface." "Reducing and disconnecting impervious cover," however, is identified as a nonstructural best management practice in the definitions section. This refers to "b. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces" as a BMP identified in Section 3, Part E.2.b., of the stormwater control ordinance which is found on p. 382.No emphasis is given to impervious connected to the storm drain.	None	Low
<b>Manage Stormwater to Sustain Stream Function</b>							
<b>Inspections and Maintenance</b>							
No	Require inspectors during and routinely after construction	Partly	2010 LDO	Article XXIX	In §577-229, the stormwater control ordinance provided as part of the 2010 LDO, general requirements include: "9. A maintenance schedule shall be provided for all systems," and Section 9 focuses on Maintenance and Repair. In addition, see §577-246 for Landscape Maintenance and Inspections: "A. Landscape maintenance shall be provided on all approved developments as to street trees, common open space, and areas to be dedicated to the public and all approved development plans. All maintenance shall be performed in order to assure a safe and attractive landscape environment and to promote healthy growth of all plant materials. They may take the form of a monthly schedule or a categorized guideline. All maintenance shall be on a site-specific basis and shall comply with the following standards: 1. All lands, developed or undeveloped, shall receive periodic inspection to evaluate the performance of landscape areas and need for maintenance. Such inspections shall be conducted by the applicant or its successor in interest at a minimum interval of once every month. During the growing season, recreation, streetscape, parking, and buffer areas shall be inspected. <i>Stormwater areas also shall be inspected after every storm or storm episode. During site inspections, the need to perform maintenance tasks for the specific area being inspected shall be evaluated. All areas shall be inspected in relation to the maintenance specifications contained in this Section.</i> "	Stormwater inspection requirements during installation are unclear and hard to pull out of the existing ordinance. Consider revising to require a Stormwater Observation Report (SOR) be submitted prior to the issuance of the Certificate of Occupancy, esp. for complex projects (similar requirements already exist for Landscaping - see p. 470 of the LDO). It is suggested that the SOR be prepared, signed, and stamped by the engineer of record (e.g., a licensed civil engineer or qualified professional), certifying that: (S)he is the engineer or architect responsible for the approved LID technique and; (s)he or the designated staff under his/her responsible charge has performed the required site visits at each significant construction stage and at completion to verify that the BMPs shown on the approved plan have been constructed and installed in accordance with the approved plan. Also consider reviewing landscape maintenance and inspection requirements, and revising debris and weed control maintenance requirements (see p. 467+) to allow for maintenance of vegetated stormwater BMPs. As it currently reads, turf, weeding and mowing requirements may conflict with maintenance requirements of stormwater BMPs.	High
No	Require maintenance agreements	Yes	2010 LDO	Article XXIX	Stormwater Ordinance in the 2010 LDO, Section 9: Maintenance and Repair, Part B, General Maintenance: 2. The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). Maintenance guidelines for stormwater management measures are available in the New Jersey Stormwater Best Management Practices Manual. <i>If the maintenance plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.</i> 3. Responsibility for maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project, unless such owner or tenant owns or leases the entire residential development or project. 4. <i>If the person responsible for maintenance identified under Section 9.B.2 above is not a public agency, the maintenance plan and any future revisions based on Section 9.B.7 below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.</i>	Review landscaping maintenance requirements to ensure that no conflicts exist with those of the stormwater section.	High

<b>NJ</b> <b>☑list</b>	<b>Key Question</b>	<b>Findings</b>	<b>Code/ Ordinance<sup>1</sup></b>	<b>Section Reference</b>	<b>Comments</b>	<b>Recommendation</b>	<b>Priority</b>
No	Require inspectors to be trained and certified	No	2010 LDO	Article XXIX	Information is conflicting as to the training/certification requirements. No requirements were listed under Article XXIX, Design standards for subdivision and site plans, §577-246 Landscape Maintenance and Inspections. However, under §577-229 Stormwater Collection and Management-Sanitary/Combined Sewer, it states "P. Stormwater reports. 1. All reports are to be signed and sealed by a professional engineer." These reports appear to be part of the plan submission process (although not included on the Checklist for the Site Development Stormwater Plan (p. 393+)), and not the inspection process.	Clarify the training and certification requirements for inspectors. Revise the ordinance to more clearly define the inspection requirements.	High
No	Require maintenance to be performed by a certified professional	No	2010 LDO	Article XXIX	Maintenance is not required to be performed by a certified professional. However, the maintenance plan shall be prepared by a design engineer. Section 9: Maintenance and Repair, Part A. Applicability, 1. Projects subject to review as in Section 1.C of this ordinance shall comply with the requirements of Section 9.B and 9.C. Under B. General Maintenance, it states that: "1. The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development." And: "4. If the person responsible for maintenance identified under Section 9.B.2 above is not a public agency, the maintenance plan and any future revisions based on Section 9.B.7 below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.	Consider including certification requirements for BMP maintenance in the stormwater ordinance	High
<b>Performance Standards</b>							
No	Require stormwater to be retained/ infiltrated onsite (bioretention, natural areas, and swale infiltration) where possible	Yes	2010 LDO	Article XXIX	§577-229 Stormwater Collection and Management-Sanitary/Combined Sewer, states "Except as supplemented below, stormwater collection and management shall be designed in accordance with the standards set forth in the City Stormwater Ordinance, Stormwater Management Plan, and the New Jersey Residential Site Improvements Standards (RSIS) N.J.A.C 5:12-7 et. Seq. for both residential and non-residential development." See the Stormwater Control Ordinance provided on p. 379 of the 2010 LDO. Under Section 2: General Standards, Part A. Design and Performance Standards, of the Stormwater Control Ordinance (starts on p. 379 of the 2010 LDO), it states: 1. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in this section. To the maximum extent feasible, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.	None	--
No	Provide sufficient storage volume via stormwater management practice standards and sizing requirements	Yes	2010 LDO	Article XXIX	The SCO restricts post-construction runoff hydrographs for the 2, 10, and 100 year storm events from exceeding, at any point in time, the pre-construction runoff hydrographs for the same storm events. Part 1.c., minimum design standards, states that, in order to control stormwater runoff quantity impacts the design engineer shall complete one of the following: 1. Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the 2, 10, and 100 year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events; 2. Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the 2, 10, and 100 year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area; 3. Design stormwater management measures so that the post-construction peak runoff rates for the 2, 10 and 100 year storm events are 50, 75 and 80 % respectively, of the preconstruction peak runoff rates. The %ages apply only to post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed. The %ages shall not be applied to post-construction stormwater runoff into tidal flood hazard areas if the increased volume of stormwater runoff will not increase flood damages below the point of discharge; or 4. In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with 1, 2 and 3 above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.	None	--

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No	Ensure adequate water quality, channel protection, and flood control performance	Yes	2010 LDO	Article XXIX	Water quality: Stormwater management measures are designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80 percent of the anticipated load from the developed site, expressed as an annual average. Requirements kick in if an additional ¼ acre of impervious surface is being proposed on a development site. The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollution Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in Table 1. The calculation of the volume of runoff may take into account the implementation of non-structural and structural stormwater management measures.	None	--
No	Ensure adequate applicability thresholds for performance standards	Partly	2010 LDO	Article XXIX	• Under Sec. 1, Part C., Applicability, the Stormwater Control Ordinance states: the minimum stormwater management requirements and controls "...shall be applicable to any site plan or subdivision that requires preliminary or final site plan review." • Under Sec. 2, General standards, Part A.2., states: the Design and Performance Standards for Stormwater Management Measures "... apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or Water quality Management Plan adopted in accordance with Department rules. Such alternative standards shall provide at least as much protection from stormwater-related loss of groundwater recharge, stormwater quantity and water quality impacts of major development projects as would be provided under the standards in this subchapter." • Sec. 2, General Standards, Part G.1., regarding stormwater runoff quality standards, states: "Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80 percent of the anticipated load from the developed site, expressed as an annual average. Stormwater management measures shall only be required for water quality control if an additional ¼ acre of impervious surface is being proposed on a development site. The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollution Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. The water quality design storm is 1.25 inches of rainfall in two hours..."	Evaluate the 1/4 acre impervious surface requirement which triggers water quality control requirements to be put into place in Camden in comparison to average lot sizes. For an urban area, where lots are typically smaller than 1/4 acre, the majority of sites would fall under this lot size. Consider reducing the requirement to 5,000 sq. ft.	High
No	Require outfalls to be stabilized to reduce erosion	Yes	2010 LDO	Article XXIX	See state code, NJAC §7:13-11.10 Requirements for a stormwater outfall structure	None	--
Yes	Identify environmentally critical/constrained areas as part of existing conditions	Yes	2010 LDO	Article XXIX	Existing conditions identified include steep slopes (§577-264), trees (§577-248), wetlands and stream encroachments (§577-260); threatened and endangered plants and animals (§577-263). Note: It is not clear to the reader if a limit of disturbance that depicts environmentally critical and environmentally constrained areas (e.g., an approved stream buffer) is required to be shown on a grading plan, regardless of whether a site plan is to be submitted. Minimum details required to be shown on a grading plan are provided on pp. 353-354 of the 2010 land development ordinance, but do not mention a limit of disturbance. However, on p.465, under §577-245 Landscape Plan Notes: "G. Additional landscaping approved by the City Engineer shall be provided by the applicant to replace any vegetation inadvertently removed from outside the limit of disturbance line as shown on the approved grading plan during construction." In either case, a soil and erosion plan is required if >500 sq. ft. is disturbed.	Clarify whether environmentally critical or constrained areas and limits of disturbance are identified on grading plans, regardless of whether a site plan is submitted. Consider requiring a natural resources and hydrologic soils inventory plan be required to be approved by the department prior to any grading plan or Minor Subdivision and Minor Site Plan submissions	Med

NJ List	Key Question	Findings	Code/ Ordinance <sup>1</sup>	Section Reference	Comments	Recommendation	Priority
<b>Minimize Land Disturbances</b>							
<b>Limits of Disturbance</b>							
Yes	Ability to reduce setbacks	No	2010 LDO	Various (Article IV - Article XXIV)	While there's not the ability to reduce setbacks, each zone (except for planned developments) has impervious cover limits. The reduction of setbacks and frontages are sometimes used as an LID tool to further reduce the total amount of impervious area associated with land development projects. Reduced setbacks allow structures to be located closer to the street, reducing the length of driveway needed to access the site. Similarly, reduced frontage widths can result in structures located closer together, ultimately requiring less public infrastructure (e.g., roadway and utilities).	Consider allowing for reduced setbacks in residential developments where it allows increased access and proximity to communal open space and a strong sense of neighborhood community	Low
Yes	Include maximum turf grass or impervious cover limits in setbacks	No	2010 LDO	Various (Article IV - Article XXIV)	While each zone has an impervious cover limit, there are no additional maximum turf grass or impervious cover limits imposed on the setbacks themselves.	Consider putting restrictions on the amount of turf or impervious areas for setback areas specifically	Low
Yes	Prohibit clear-cutting of construction project site	Yes	2010 LDO	Article XXIX	Measures currently exist to protect trees or a percentage of trees of site. See §577-247 and §577-248. Sets limits on the % of existing tree canopy that can be removed, both in total and based on DBH, replacement requirements, tree protection measures during construction, and the use of a conservation easement to protect remaining stands.	None	--
Yes	Limit traffic of heavy construction vehicles to specific areas	No	2010 LDO	Article XXIX	Measures are included for preventing soil compaction around trees (see §577-248 Standards for Tree Protection During Construction), but not the site in general (see §577-250 Soil Erosion and Sediment Control). It is best (and cost-effective) to avoid soil compaction whenever possible.	Consider adding provisions to §577-250 to include measures to identify and prevent soil compaction of soils with the highest infiltration capacity, and to require the identification and use of specified travel paths for heavy construction equipment to limit overall site compaction, in addition to preventing and controlling soil erosion and sedimentation. Also require the placement of temporary construction trailers to be shown on plans to ensure they are placed outside of environmentally sensitive areas and off soils with the highest infiltration capacity.	High
Yes	Require identification of specific areas that provide significant hydrologic functions.	Yes	2010 LDO	Article XXIX	The ordinance requires the identification of forested areas, riparian corridors, wetlands, and areas with high groundwater recharge capabilities.	Include on checklist of areas that should be identified on plans	Med
Yes	Require as-built inspections before issuance of occupancy that includes id of compacted areas	No	2010 LDO	Article XXX	See §577-290 Signing and Distribution of Approved Plans.	Consider revise as-built inspection process to ensure that soil compaction is addressed and mediated prior to the issuance of occupancy.	High
Yes	Require restoration of compacted areas in accordance with soil erosion and sediment plan	No	2010 LDO	Article XXIX	Measures are included for preventing soil compaction around trees (see §577-248 Standards for Tree Protection During Construction), but not the site in general. It is best (and cost-effective) to avoid soil compaction whenever possible. Prior to construction, assess the site to identify the soils with the highest infiltration capacity.	Add provisions to the §577-250 Soil Erosion and Sediment Control to restore overall soil conditions at construction sites after construction is completed. Note that New Jersey has just recently (this year) published modifications and standards to address post-construction soil compaction across the state. These will be included in the Technical Standards for Soil Erosion and Sediment Control in New Jersey when they are readopted. The most recent version is available here: <a href="http://www.state.nj.us/dep/barnegatbay/plan-soilrestoration.htm">www.state.nj.us/dep/barnegatbay/plan-soilrestoration.htm</a>	High

<b>NJ</b> <b>☑list</b>	<b>Key Question</b>	<b>Findings</b>	<b>Code/ Ordinance<sup>1</sup></b>	<b>Section Reference</b>	<b>Comments</b>	<b>Recommendation</b>	<b>Priority</b>
No	Require disturbance of vegetated areas to be phased	Yes	2010 LDO	Article XXIX	Under Part D, Design standards for the preparation and implementation of a soil erosion and sediment control plan (§577-250), it states that: "3. The smallest practicable area of land shall be exposed at any one time during development, and stripping of vegetation, grading or other soil disturbance shall be done in a manner which will minimize soil erosion and the duration of the disturbance;" and "4. Work shall be performed in stages where necessary."	None	--
No	Minimize hydrologic alterations to existing wetlands.	Yes	2010 LDO	Article XXIX	Under §577-260 Wetlands, Stream Encroachment, Environmental Constraints and Considerations:• C. All applications for development and uses of land in wetlands shall be subject to and permitted only in compliance with the provisions of the New Jersey Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.) and the regulations adopted thereunder (N.J.A.C. 7:7A-1 et seq.). Any provisions in this article referring to wetlands regulations shall be construed to mean the provisions of the New Jersey Freshwater Wetlands Protection Act and the regulations adopted pursuant thereto. • D. All applications for development shall show the limits of wetlands, wetland buffer area, stream encroachment limits and other environmental constraints. In the case of subdivisions, this shall be included on the plan of lots, recorded in the deeds, and a point-of-sale disclosure provided to all prospective buyers of individual lots	None	--
No	Require/encourage building footprints to avoid highly erodible soils and soils with high permeability (Soil Groups A and B).	No	2010 LDO	Article XXIX	§577-250, Soil Erosion and Sediment Control, requires a soil erosion and sediment control plan to be approved prior to preliminary major site plan approval, minor subdivision approval or preliminary major subdivision approval. The plan must show the location and description of existing natural and manmade features on and surrounding the site, and including the soil characteristics of the site. However, the design standards do not specify that highly erodible soil areas and areas suitable for infiltration practices should be designated to be left undisturbed (see p. 487+). Similarly, the checklist for a Site Development Stormwater Plan Approval (§577-229) includes a topographic base map which include, among other things, the location of highly erodible soils (p. 393). However, the current language in the ordinance doesn't necessarily preclude development in such areas.	Consider revising ordinance language to make it clear that highly erodible soils and areas suitable for infiltration practices (soil groups A and B) are both mapped and designated to be left undisturbed, where possible.	Med
<b>Open Space and Cluster Development</b>							
Yes	Allow open space or cluster developments	Yes	2010 LDO	Article XXVIII	See §577-215 Planned Developments	None	--
Yes	Allow for flexible site design incentives for open space or cluster design	Yes	2010 LDO	Article XXVIII	See §577-215 Planned Developments. States that "Common open space shall be provided as part of any planned development. Open space shall be classified as developed (recreational) or undeveloped (natural) space. Undeveloped open space shall have as a prime objective the preservation of a site's natural amenities." However, no requirements are placed in the ordinances as to the percentage or type of open space required to allow to be considered as a planned development. Note that the previous version of the Zoning and Land Use had open space ratios defined (see prior §577-207)	Add minimum percentage requirement of the development that must remain open space. Set priorities for what open space should preserve.	Med
Yes	Set limits on allowable disturbance of existing vegetation	No	2010 LDO	Article XXVIII	See §577-215 Planned Developments. No limits are currently set on the allowable disturbance of existing vegetated areas in open space.	Establish limits on the allowable disturbance of existing vegetated areas in open space	Med
Yes	Reestablish vegetated areas in disturbed open space	No	2010 LDO	Article XXVIII	See §577-215 Planned Developments. No requirements exist for re-establishing vegetation in disturbed areas dedicated to open space. Only states that: "F. F. Common open space facilities shall be constructed, improved and dedicated in accordance with a comprehensive phasing plan set forth in the approving resolution, the developer's agreement or both."	Set requirements for re-establishing vegetation in disturbed areas dedicated to open space.	Med
Yes	Set limits on allowable impervious cover in open space	No	2010 LDO	Article XXVIII	See §577-215 Planned Developments. No maximum allowable impervious cover limits are established for open space areas in planned developments.	Establish maximum allowable impervious cover limits for open space areas in planned developments.	Med

<input checked="" type="checkbox"/> NJ list	Key Question	Findings	Code/ Ordinance <sup>1</sup>	Section Reference	Comments	Recommendation	Priority
<b>Transit Oriented Development</b>							
No	Encourage higher density development to be centered around transportation corridors	Yes	2010 LDO	Article XVII	Transit Oriented Development (TOD) Zones are covered under Article XVIII, and allows for a considerably higher total % impervious for townhouse (80%), multi-family (90%), and nonresidential (90%) than other zones. ALSO: Under the Purpose section (§577-3), the 2010 LDO lists as part of its objectives: • D. To promote the Smart Growth planning goals of the State of New Jersey with the establishment of appropriate population densities and concentrations that will contribute to the well-being of persons, neighborhoods, communities and regions and preservation of the natural and historic environment; and • G. To encourage intense and varied development where land, utilities and access to mass transportation exists. In its Definitions section, Transit Nodes are defined as “stops along a public transportation route where people board and disembark, often where one or more routes intersect with each other. These sites can provide ideal locations for mixed-use developments as well as transit-oriented developments.”	None	--
<b>Rainwater Harvesting</b>							
<b>Building and Zoning Code</b>							
No	Allow downspouts to be disconnected into a rain barrel or yard	Yes	2010 LDO	Article XXIX	While not specifically listed in the stormwater control ordinance section of the 2010 LDO, and also not present in the NJ Stormwater Best Management Practices Manual, the 2010 LDO, §577-229, does identify "reducing and disconnecting impervious cover" as a BMP, and Section 5, Part B, states: "Other stormwater management measures may be utilized provided the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by this subchapter." The Rutgers Cooperative Extension Water Resources Program is listed as one source, and provides significant outreach on downspout disconnections into a rain barrel or yard.	Consider providing design specifications or a link on Camden's website that identifies common practices for homeowners and developers. Consider revising the New Jersey Uniform Construction Codes to allow for rainwater harvesting. As an example, see Virginia's amendments (search for "rain water") to its 2009 codes, also derived from the International Building Codes, and available here: <a href="http://www.dhcd.virginia.gov/StateBuildingCodesandRegulations/PDFs/2009/Code%20-%20VCC.pdf">http://www.dhcd.virginia.gov/StateBuildingCodesandRegulations/PDFs/2009/Code%20-%20VCC.pdf</a>	Med
No	Allow interior or exterior cisterns	No	2010 LDO	Article XXIX	Camden follows New Jersey's Uniform Construction Codes. For building codes, NJ cites the 2009 International Building Code® New Jersey Edition, and may need to be modified to allow for rainwater harvesting. See <a href="http://www.ecodes.biz/ecodes_support/Free_Resources/NewJersey/06_09NewJersey_main.html">www.ecodes.biz/ecodes_support/Free_Resources/NewJersey/06_09NewJersey_main.html</a> for a copy of the building code. In addition, there is no standard for cisterns in the NJ Stormwater BMP Manual.	Consider revising the New Jersey Uniform Construction Codes to allow for rainwater harvesting. As an example, see Virginia's amendments (search for "rain water") to its 2009 codes, also derived from the International Building Codes, and available here: <a href="http://www.dhcd.virginia.gov/StateBuildingCodesandRegulations/PDFs/2009/Code%20-%20VCC.pdf">http://www.dhcd.virginia.gov/StateBuildingCodesandRegulations/PDFs/2009/Code%20-%20VCC.pdf</a>	Med
No	Allow rain barrels to be placed within standard zoning setback areas	No	2010 LDO	Various (Article IV - Article XXIV)	In the 2010 LDO, a setback is defined as “An area extending the full width of the lot between the street right-of-way and the required yard within which no buildings or parts of buildings may be erected.”	Revise the zoning and development code to expressly allow rain barrels to encroach into required zoning setbacks	Med
No	Allow cisterns to be placed on rooftops for rainwater harvesting	No	2010 LDO	Article I, Article III	§577-18 defines Accessory Buildings, Structures, or Uses as “a building, structure or use which is customarily associated with and is incidental and subordinate to the principal building, structure or use, and which is located on the same lot therewith, including but not limited to garages, carports, decks, sheds, non-portable swimming pools and all roofed structures. Any accessory building or structure attached to the principal building shall be considered part of the principal building...” Building Height is defined as “The vertical distance measured from the mean elevation of the finished grade along the front of the building to the highest point of the roof for flat roofs, to the mean height level (between the eaves and ridge) for gable and hip roofs and to the deck line of mansard roofs. In all cases the building height shall not include chimneys, spires, towers, elevator penthouses, tanks, antennas, air-conditioning equipment, and similar projections, provided however that such projections shall be attractively and appropriately designed and/or shielded.” §577-23 Principal and Accessory Buildings, states “Unless otherwise specifically permitted within this Ordinance, no more than one (1) principal dwelling or building shall be permitted on one (1) lot. Any accessory building attached to a principal building by a common wall, an abutting wall or a roof shall be considered part of the principal building and shall adhere to the yard requirements for the principal building.”	Review/revise the zoning code to allow cisterns to exceed building height requirements (building height definition). Review/revise the building code for allowing cisterns to be placed on rooftops, with identified maintenance requirements.	Med

<input checked="" type="checkbox"/> NJ List	Key Question	Findings	Code/ Ordinance <sup>1</sup>	Section Reference	Comments	Recommendation	Priority
<b>Plumbing</b>							
No	Allow interior or exterior cisterns	Partly	Ch. 418 PM	Article V	<ul style="list-style-type: none"> <li>• §418-96 Sanitary drainage system, part A, states that, "All plumbing fixtures shall be properly connected to either a public sewer system or to an approved private sewage disposal system."</li> <li>• §418-97, Storm drainage, states that "Drainage of roofs and paved areas, yards and courts and other open areas on the premises shall not be discharged in a manner that creates a public nuisance."</li> <li>• In addition, Camden follows the National Standard Plumbing Code, 2009. Chapter 13, Storm Water Drainage, 13.1.1, Where Required, states that "Roofs, paved areas, yards, courts, and courtyards shall be drained to either a storm sewer where available, a combined sewer where necessary, or to a place of disposal satisfactory to the Authority Having Jurisdiction. EXCEPTION: Storm water from one- and two-family dwellings may be discharged on lawns or streets provided that the storm water flows away from the dwelling and does not otherwise create a nuisance."</li> <li>• National Standard Plumbing Code, 2009, includes Appendix G: Graywater Recycling Systems. States: "G.3 APPROVED MATERIALS. a. All materials, fixtures or equipment used in the installation, repair or alteration of graywater systems, shall conform to the standards listed in Chapter 3 of this Code. b. Materials not listed in Chapter 3 of this Code may be used with the approval of the Authority Having Jurisdiction as permitted in Section 3.12.2." (Note: these rules are for graywater, and not rainwater)</li> </ul>	Consider revising Article 5 to allow for rainwater collection. As an example of where amendments have been made to a state plumbing code to allow for rainwater collection, see North Carolina's Appendix C-1, Rainwater Recycling Systems, which added requirements for rain water connections, collection reservoir, filtration, overflow and makeup water related to the use of cistern-collected rainwater for flushing toilets and irrigation. In addition, rainwater harvesting guidelines outlining when a permit or site plan approval is required, design specifications, etc., would benefit developers and homeowners alike. An example guideline (Berkeley, CA) can be found here: <a href="http://www.ci.berkeley.ca.us/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/rainwater.pdf">www.ci.berkeley.ca.us/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/rainwater.pdf</a> . In addition, a list of and information on states with rainwater harvesting statutes, programs and legislation is available here: <a href="http://www.ncsl.org/issues-research/env-res/rainwater-harvesting.aspx">www.ncsl.org/issues-research/env-res/rainwater-harvesting.aspx</a> .	Med
No	Require BMP maintenance plan for cisterns	Partly	Ch. 418 PM	Article V	Camden follows the National Standard Plumbing Code, 2009, which includes Appendix G: Graywater Recycling Systems. In reference to graywater systems, appendix G states: "G.11 MAINTENANCE The graywater system shall be maintained in accordance with the manufacturers recommended maintenance instructions." (Note: these rules are for graywater, and not rainwater). In Article XXIX of the 2010 LDO, Any stormwater management measures incorporated into the design of a major development shall incorporate a maintenance plan, according to Section 3:Stormwater Management Requirements for Major Development of the Stormwater Control Ordinance (p. 380). However, it is not clear what size or use would trigger a maintenance plan.	Consider adding specifications for the use of rainwater harvesting systems, in addition to graywater systems.	Med
No	Allow harvested rainwater to be used for nonpotable interior uses (e.g., toilet flushing)	No	Ch. 418 PM	Article V	Camden follows the National Standard Plumbing Code, 2009, which includes Appendix G: Graywater Recycling Systems. States: "G.3 APPROVED MATERIALS. a. All materials, fixtures or equipment used in the installation, repair or alteration of graywater systems, shall conform to the standards listed in Chapter 3 of this Code. b. Materials not listed in Chapter 3 of this Code may be used with the approval of the Authority Having Jurisdiction as permitted in Section 3.12.2." (Note: these rules are for graywater, and not rainwater)	Consider working with the state to identify how rainwater can be used for nonpotable interior uses.	Med
No	Allow personal treatment systems to be used for potable water supplies	No	Ch. 418 PM	Article V	Camden follows the National Standard Plumbing Code, 2009, which includes Appendix G: Graywater Recycling Systems. Graywater applications are limited to non-potable uses such as toilet and urinal flushing, landscape irrigation, supply water for ornamental ponds and make-up water for cooling towers.	If the use of rainwater for non-potable uses is a high priority for the city, consider working with public officials at the city and state level to determine the personal treatment measures necessary for allowing rainwater to be used for potable uses.	Low
<b>Vegetated Open Channels</b>							
<b>Vegetated Channels</b>							
Yes	Allow/require vegetated open channel conveyance	Yes	2010 LDO	Article XXIX	See §577-229 Stormwater Collection and Management, pp. 381. Vegetated open channels are listed under part 2.h. as a nonstructural stormwater management measure which should be incorporated into the design to the maximum extent practicable. However, Camden Smart may want to check the New Jersey State Department of Transportation Specifications for Curbs and Gutters to ensure that gutters are not limited to concrete only.	Check to ensure compatibility with the New Jersey State Department of Transportation Specifications for Curbs and Gutters	High
Yes	Establish design criteria for vegetated channels	Yes	2010 LDO	Article XXIX	See §577-229 Stormwater Collection and Management, pp. 382: "Guidance for nonstructural stormwater management measures is available in the New Jersey Stormwater Best Management Practices Manual. The manual is available on the Department of Environmental Protection's stormwater web page at <a href="http://www.njstormwater.org">http://www.njstormwater.org</a> ."	None	--

NJ List	Key Question	Findings	Code/ Ordinance <sup>1</sup>	Section Reference	Comments	Recommendation	Priority
<b>Vegetation and Landscaping</b>							
<b>Landscaping Island and Screening Ordinance</b>							
Yes	Require landscaping in parking lots	Yes	2010 LDO	Article XXIX	See §577-244, Site Design Principles, Part B, Non-residential developments, Part 5, Parking and Circulation, it states that "All parking areas shall be screened from streets and adjacent parcels by fencing and/or walls plus landscaping to assure that the visual effect of large paved areas and standing automobiles is minimized and that the effect of the natural landscape and the architecture dominates. Parking areas shall also be subdivided by planting islands containing trees and other landscape materials. Planting islands shall be located at selected intervals where they will aid in reducing the visual expanse of pavement areas."	The language of the ordinance could easily be adjusted to require vegetation that is more beneficial for stormwater quality. However, as it currently reads, the ordinance's primary concern is reducing the visual expanse of pavement areas. Consider changing to: <u>"Landscaped edges and islands for all parking areas shall be provided which function as stormwater management features and incorporate well screened by berms, plantings and/or other screening methods to minimize their visual impact of the parking area."</u>	High
Yes	Allow the use of bioretention islands and other stormwater practices within landscaped areas or setbacks	No	2010 LDO	Article XXVIII and Article XXIX	Article XXIX §577-244, Site Design Principles, Part B, Non-residential developments, Part 7, Landscaping: "Landscaping shall be required in those areas that are designated as required setback areas, areas within parking lots, and areas not used for ingress, egress, parking, or storage, and areas subject to grading and re-contouring. ... an overall landscape theme dealing with major design elements shall be established." The landscape themes do not explicitly encourage or discourage the placement of bioretention or other stormwater practices within landscaped areas or setbacks. Similarly, Article XXVIII §577-192 Landscaping in All Zones, states that, "... the entire lot, except for areas covered by buildings or surfaced as parking, recreation or service areas, shall be seeded, sodded or planted with ground cover and suitably landscaped to include trees, shrubs, edging materials, stones, rocks or gravel; in accordance with an overall landscape plan consistent with the natural surroundings and neighborhood. All landscaping shall be properly maintained throughout the life of any use on said lot." Design Standards for Subdivision and Site Plans, §577-218 General Interest: • Part D, "Buffering shall be located around the perimeter... to minimize the impact of vehicle headlights, noise, light from structures, the movement of people and vehicles, and to shield activities from adjacent properties when necessary. Buffering shall consist of fencing, landscaped berms, evergreen trees and shrubs, and deciduous trees or combinations thereof to achieve the stated objectives." • Part E, "Landscaping shall be provided as part of the overall development design and integrated into building arrangements, topography, parking and buffering requirements. Landscaping shall include the preservation of existing vegetation to the extent possible as well as trees, shrubs, ground cover, perennials, annuals, plants, sculpture, art and the use of building and paving materials in an imaginative manner." • Part F, "Common open space shall be provided as part of any planned development. Open space shall be classified as developed (recreational) or undeveloped (natural) space. Undeveloped open space shall have as a prime objective the preservation of a site's natural amenities."	Consider changing §577-244, Site Design Principles, Part B, Non-residential developments, Part 7, Landscaping, to read something like: "Landscaping shall be required in those areas that... Although each site could have a different building configuration and use, and in some cases individual owners, an overall landscape theme <u>shall be designed in keeping with low impact stormwater management principles, and dealing with the major design elements shall be established that complement the general appearance of neighboring developed areas.</u> Similarly, consider changing §577-192, Landscaping in All Zones, to include concepts such as: "Other provisions of this Ordinance notwithstanding, in any district, the entire lot, except for areas... shall be <u>designed in keeping with low impact stormwater management principles seeded, sodded planted with ground cover</u> and suitably landscaped to include trees, shrubs, edging materials, stones, rocks or gravel; in accordance with an overall landscape plan consistent with the natural surroundings and neighborhood. All landscaping shall be properly maintained throughout the life of any use on said lot." Similar revisions should be considered for the sections identified under §577-218.	High
Yes	Require screening from adjoining properties to encourage using vegetation in lieu of walls and berms	No	2010 LDO	Article XXIX	Screening is required. It is identified in various parts of the 2010 land development ordinance, and in particular in §577-244 Landscaping and Buffering. The screening requirement does not currently place preference on the use of vegetation to the maximum extent practicable	Revise the language in §577-244 A, General principals, to place the use of vegetation which is designed in keeping with low impact stormwater management principles over the use of walls and berms.	High
No	Give bioretention areas "credit" as landscape areas to count as a percent of required landscaping	No	2010 LDO	Various (Article IV - Article XXIV)	While no % landscaping requirements exist, there are maximum % impervious cover limits for each zoning type.	Ensure that bioretention areas, rain gardens, and other vegetated LID BMPs receive partial or full credit towards meeting % pervious cover requirements.	High

<b>NJ</b> <b>list</b>	<b>Key Question</b>	<b>Findings</b>	<b>Code/ Ordinance<sup>1</sup></b>	<b>Section Reference</b>	<b>Comments</b>	<b>Recommendation</b>	<b>Priority</b>
No	Require landscaping plans to include less water-intensive, native vegetation	Yes	2010 LDO	Article XXIX	Under §577-244 Landscaping and Buffering, Part B, Landscaping Plan: • “A landscape plan prepared by a certified landscape architect, planner, architect or engineer shall be submitted with each site plan and major subdivision application... All plants listed in Appendix I —Nonindigenous Plant Species shall not be used (unless otherwise approved by the Planning Board) by applicants, developers and others that seek to develop land in the City and all plants listed in Appendix II —Native Plants of New Jersey shall be used (unless otherwise approved by the Planning Board).” And under the 2010 LDO §577-313 Violations and Penalties, Part B.2.c.: • “Where a shoreline lot owner violates the buffer corridor cutting restrictions, the Zoning Officer/Administrative Officer shall require native trees/vegetation of reasonable diameter in size to be planted so as to create a buffer strip area which is in compliance with that Section....” In addition, under §577-244 Landscaping and Buffering, Part C, general landscaping requirements states that "Landscaping shall be planned in such a way that the site requires as little use of potable water as possible to ensure the survival of the plants. Water conservation is a critical purpose of this section."	None	--
No	Allow the use of rain gardens, tree boxes, and other LID BMPs for tree planting requirements	No	2010 LDO	Article XXIX	The street tree selection and design guidelines found in §577-244 Landscaping and Buffering, Part D.8. do not particularly encourage or require the use of rain gardens, tree boxes, and other LID BMPs with street tree plantings.	Revise tree selection and design guidelines to allow the use of bioretention areas, tree boxes, and other GSI practices for tree planting requirements. Consider allowing for certain practices to receive partial or full credit for tree planting requirements as an incentive.	High
No	Require weather-based irrigation controls	Partly	2010 LDO	Article XXIX	Irrigation systems are not always required. In the 2010 LDO, §577-224 Site Design Principles., Part B.7.c., Landscaping for nonresidential development: • “Landscaping shall be designed and installed in accordance with professional standards and all landscape plans shall be subject to Planning Board review and approval. All such landscaping, including lawn areas, trees and shrubbery shall be maintained in excellent condition by cutting, trimming, feeding, watering and weeding. Plants shall be replaced as may be required by Ordinance. Landscaping shall be installed upon the substantial completion of the building, weather permitting, and an underground irrigation system may be required by the Planning Board in some or all landscaped areas.”  Also, the Green Design Guidelines encourage limiting the use of potable water for irrigation, but does not restrict it.	None	--
No	Allow green infrastructure techniques to replace grass strips between sidewalk and curb	No	2010 LDO	Article XXIX	In the definitions section of the 2010 Land Development Ordinance, “Landscape Screen/Strip” is defined as “a completely planted visual barrier (or having equivalent natural growth) composed of evergreen plants and trees and/or shrubs arranged to form both a low-level and a high-level screen.” Curb cuts plus bioretention areas/swales/and other green infrastructure practices within the area between the sidewalk and curb are a useful tool for retrofitting existing neighborhoods with green infrastructure practices without major reconstruction. It is significantly cheaper than working to collect stormwater via in-street practices.	In addition to modifying the ordinance to allow for curb cuts, also consider placing emphasis on the use of bioretention, swales, and other green infrastructure practices between the curb and sidewalk, and to incorporate specific design specs for doing so (see <a href="http://watershedmg.org/sites/default/files/greenstreets/WMG_GIS_WNH_1.0.pdf">http://watershedmg.org/sites/default/files/greenstreets/WMG_GIS_WNH_1.0.pdf</a> as an example).	High
<b>Preservation of Natural Areas</b>							
Yes	Site plan applicants required to provide layout of existing vegetated areas	Yes	2010 LDO	Article XXIX	See Design Standards for Subdivisions and Site Plans. Existing and proposed conditions of a lot "including but not limited to topography, vegetation, drainage, flood plains, marshes and waterways," must be shown for development plans of one or more lots. Also, proposals for protection of existing vegetation during and after construction must be provided on a landscape plan (See §577-244 Landscaping and Buffering, Part B, p. 454)	None	Low
Yes	Presence of maximum as well as minimum yard sizing ordinance	Yes	2010 LDO	Article I	§577-11 lists the minimum and uniform regulations that shall apply in the respective districts, including B... maximum allowable lot coverage. Lot Coverage is defined as that part or percentage of the lot covered by building area and impervious surfaces.	None	Low
Yes	Residential restrictions for enlarging existing turf lawn areas	No	2010 LDO	Article XXIX	Not addressed under §577-244 Landscaping and Buffering.	Consider placing limits on (or incentivizing reductions of) the percentage of landscapable area that can be in turf grass. EPA's Watersense program recommends 40%. See <a href="http://epa.gov/watersense/docs/home_turfgrass-report508.pdf">http://epa.gov/watersense/docs/home_turfgrass-report508.pdf</a> .	Low

NJ List	Key Question	Findings	Code/ Ordinance <sup>1</sup>	Section Reference	Comments	Recommendation	Priority
Yes	Provides incentives for using vegetation to filter stormwater runoff	No	2010 LDO	Appendix XVIII	While using vegetation to filter stormwater runoff is o incentives for filtering stormwater runoff.	Explore options for including incentives to encourage BMPs on residential properties.	Med
Yes	Require a specific percentage of permanently protected open space for cluster development	No	2010 LDO	Article XXVIII	Original §577-207 established specific percentages. However, the 2010 LDO takes out specific percentages (see new §577-215, Planned development.). The development does have to follow more stringent requirements and must submit a general development plan for approval. Also, §577-252 Open Space and Recreation Facilities states that "F. Residential subdivisions of eight or more lots shall provide at least ten percent (10%) dedicated open space, of which fifty percent (50%) must be usable land to provide for active and/or passive recreation as found to be appropriate by the Planning Board based on existing and/or anticipated resident need and demand."	Open space is defined as including conservation and recreational uses; however, these two uses can be conflicting. Clarify the purpose and percentage of open space required for conservation purposes for planned developments. Model ordinance language provided by the US EPA suggests a minimum percent open space requirement of between 35 – 50%, depending on base density. For more information, see: <a href="http://water.epa.gov/polwaste/nps/mol3.cfm">http://water.epa.gov/polwaste/nps/mol3.cfm</a>	Med
No	Limit site designs to areas of lesser slope and farther from watercourse	Yes	2010 LDO	Article XXIX	§577-264 Steep Slopes, Requires a Steep Slope Conservation Overlay (SSCO) to be identified in any area where slopes exceed fifteen percent (15%) and be shown on site plans. In those areas, grading shall be minimized, and no grading shall be undertaken within any area of the SSCO except where approved in conjunction with a permitted use. In addition, within any lot, the maximum extent of areas classified as precautionary slopes (15-25% slope) that may be permanently disturbed for the installation of site improvements shall be limited to forty percent (40%) of the precautionary slope areas, or twenty percent (20%) of the lot area, whichever is the lesser. The total amount of impervious surface that may be installed within areas of precautionary slope shall not exceed forty percent (40%) of the total impervious area permitted.	None	--
<b>Riparian Buffers</b>							
Yes	Presence of a stream buffer or floodplain ordinance	Yes	2010 LDO	Article XXIX	These elements are included, although there is some confusion on the reader's part. The previous <i>Article XXVII, Stream and river corridor protection and management overlay zone</i> , has been stricken from the 2010 Land Development Ordinance, but some parts of the 2010 LDO still refer to a "stream and river corridor protection management overlay zone" (pp. 619-620). It appears that this has been replaced with a 'special water resource protection area' (see Section 3, Stormwater Management Requirements for Major Development, of the stormwater control ordinance under §577-229, includes a 300 ft. buffer on either side of "all waters designated Category One at N.J.A.C. 7:9B and perennial or intermittent streams that drain into or upstream of the Category One waters... within the associated HUC14 drainage." The buffer can be reduced to 150 ft. per side if there is an existing encroachment (e.g., parking lot, agricultural area, maintained lawn).	Revise the stormwater control ordinance included as part of the 2010 LDO to ensure nomenclature throughout (and on checklists) is consistent.	High
Yes	Consistency of stream/riparian requirements with state regulatory requirements	Yes	2010 LDO	Article XXIX; N.J.A.C. 7:8, 7:13, and 7:15	See <a href="http://www.nj.gov/dep/wqmp/docs/riparian_model_ordinance.pdf">www.nj.gov/dep/wqmp/docs/riparian_model_ordinance.pdf</a> , for State's model ordinance (dated July .2008). Appears consistent. Section 3, Stormwater Management Requirements for Major Development, of the Stormwater Control Ordinance, requires a 300 ft. buffer on either side of "all waters designated Category One at N.J.A.C. 7:9B and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC14 drainage." This buffer can be reduced to a minimum of 150 ft. on a side if an existing encroachment (such as a parking lot, agricultural area, or maintained lawn area, already exists).	Review the state model ordinance for consistency.	Low
Yes	Buffer areas protected by conservation easement or other permanent restrictions	Yes	2010 LDO	Article XXIX	See §577-256, Public Uses and Service Areas; Utility Placement, requires the placement of a stream corridor conservation easement. "B. Drainage and conservation easement. 1. Where a subdivision is traversed by a watercourse, drainage way, channel or stream as shown on the United States Geological Survey (USGS) Quadrangle Maps or includes an open water body, a stream corridor conservation easement shall be provided on each side of the stream or around the open water body, where there is no defined stream bank, from the water's edge. Such easements shall be deeded to the City prior to final subdivision approval and shall carry the following limitations..." §577-249 Natural Features, states: "natural features and critical areas, such as treed areas, scenic views; natural terrain including steep slopes, open waters and stream corridors; wetlands and associated buffers; natural drainage lines; open space of high ecological value; and other community assets shall be preserved to the maximum extent possible in designing any development containing such features..." and restricts the removal of topsoil from areas intended for lawn or open space.	None	--

<input checked="" type="checkbox"/> NJ list	Key Question	Findings	Code/ Ordinance <sup>1</sup>	Section Reference	Comments	Recommendation	Priority
Yes	Ordinance identifies or limits when stormwater outfall structures can cross the buffer	Yes	2010 LDO	Article XXIX	§577-229 Stormwater Collection and Management, p. 386. b. All stormwater shall be discharged outside of and flow through the special water resource protection area and shall comply with the Standard For Off-Site Stability in the Standards for Soil Erosion and Sediment Control in New Jersey, established under... N.J.S.A. 4:24-39 et seq. c. If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the Standard For Off-Site Stability in the Standards for Soil Erosion and Sediment Control in New Jersey... then the stabilization measures in accordance with the requirements of the above standards may be placed, provided that: (1) Stabilization measures shall not be placed within 150 feet of the Category One waterway; (2) Stormwater associated with discharges allowed by this section shall achieve a 95% TSS post construction removal rate; (3) Temperature shall be addressed to ensure no impact on receiving waterway; (4) The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable; (5) A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and (6) All encroachments proposed under this section shall be subject to review and approval...	None	--
Yes	Specify what maintenance /activities are allowed within the buffer	Yes	2010 LDO	Article XXIX	See §577-229, p. 388: "(2) Encroachment within the designated special water resource protection area under Subsection (1) above shall only be allowed where previous development or disturbance has occurred (for example, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or centerline of the waterway where the bank is undefined. All encroachments proposed under this subparagraph shall be subject to review and approval by the Department."	None	--
No	Require/ encourage a 50 ft. min wetland buffer	Yes	2010 LDO	Article XXIX	Under §577-260 Wetlands, Stream Encroachment, Environmental Constraints and Considerations: • C. All applications for development and uses of land in wetlands shall be subject to and permitted only in compliance with the provisions of the New Jersey Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.) and the regulations adopted thereunder (N.J.A.C. 7:7A-1 et seq.). Any provisions in this article referring to wetlands regulations shall be construed to mean the provisions of the New Jersey Freshwater Wetlands Protection Act and the regulations adopted pursuant thereto. In reading the Act, it requires regulation of transition areas of 150 feet around exceptional resource value wetlands and 50 feet around intermediate resource value wetlands.	None	--
<b>Tree Protection Ordinance</b>							
Yes	Existence of a tree protection ordinance	Yes	2010 LDO	Article XXIX	See §577-247 Tree Preservation and Removal.	None	Low
Yes	Existence of a forest protection ordinance	Yes	2010 LDO	Article XXIX	See §577-248. Sets limits on the % of existing tree canopy that can be removed, both in total and based on DBH, replacement requirements, tree protection measures during construction, and the use of a conservation easement to protect remaining stands	None	--
Yes	Requirements for protecting % of existing forest	Yes	2010 LDO	Article XXIX	See §577-248. Sets limits on the % of existing tree canopy that can be removed, both in total and based on DBH, replacement requirements, tree protection measures during construction, and the use of a conservation easement to protect remaining stands	None	--