

Appendix A

APPLICATION TRANSMITTAL FORM
Hudson County Planning Board

The following items shall be submitted to the Hudson County Planning Board before an application can be deemed complete:

1. ____ Subdivision & Site Plan Review Application
2. ____ Application Fees & Escrow Payments
3. ____ Checklist- Development Review
4. ____ Checklist- Low Impact Development
5. ____ Plans (3 full size sets)
6. ____ Plans (1 set at 11" x 17")
7. ____ Stormwater Management Report (if impacting County facility)
8. ____ Urban Stormwater Mitigation Plan (if impacting County facility)
9. ____ Traffic Impact Report (if required by Regulations)
10. ____ Digital submission of Plans and Application materials (on CD-ROM or DVD-ROM)

Name of Person preparing Application:

Signature:

Date:

Appendix B

Owner Information:

7.	Owner(s): _____ (If other than applicant)	Firm: _____
	Address: _____	City, State, zip: _____
	Telephone: _____	Fax: _____

Attorney Information:

8.	Attorney: _____ (If applicable)	Firm: _____
	Address: _____	City, State, zip: _____
	Telephone: _____	Fax: _____

Architect/Engineer:

9.	Person preparing plans: _____ (If applicable)	License No. _____
	Firm: _____	
	Address: _____	City, State, zip: _____
	Telephone: _____	Fax: _____

Site Characteristics:

10. Municipal Zoning: _____

Existing Use: _____ Proposed Use: _____

Is the property located on, or adjacent to a county road? If yes, which? _____

Does the property impact county drainage facilities? If yes, where? _____

Is the property within 200 feet of an adjacent municipality? If yes, which? _____

Does any portion of the property fall within a floodplain? Yes or No: _____

Does the property contain freshwater wetlands? If yes, approximate size in square feet: _____

Does the property abut a Bay, River, Stream or Creek? If yes, linear feet of waterfront: _____

Does the property contain or abut a steep slope? Yes or No: _____

Is the property within walking distance of a transit stop? If yes, which line? _____

Project Information:

11.	Existing	Proposed	Total
Parcels/Lots:			
Vacant lots to be sold:			
Linear feet of new roadway:			
Tract Area (in Square Feet):			
Impervious Area (in Square Feet):			
Building Coverage (in Square Feet):			
Gross Floor Area (in Square Feet):			
Number of Dwelling Units (DUs):			
Number of Affordable Dwelling Units (Recognized by COAH)			
Number of Bedrooms:			
Number of Parking Spaces:			
Bicycle rack storage capacity:			
Number of trees on site:			
Number of Employees:			
Hours of Operation:			

Status of Applications and Approvals

12.	Please list date of Submission to other Agencies and Status	
	<u>Date</u>	<u>Status</u>
	Municipal Planning Board:	_____
	Zoning Board of Adjustment:	_____
	Construction Official:	_____
	NJ DEP:	_____
	NJ Meadowlands Comm.:	_____
	Army Corps of Engineers:	_____
	Soil Conservation District:	_____

Other Information:

Please provide any other relevant information about this Project: _____

Fee Schedule

Established:
August 10, 2006

Performance Guarantee
& Escrow

Review
Escrow Deposit

Application Fee

I. Subdivisions

A. A Subdivision which affects a county road and/or county drainage facilities.	\$250 plus \$25 per new parcel	\$1,000 plus \$25 per new parcel	\$500 plus \$25 per new parcel
B. A Subdivision which <u>does not</u> affect a county road or county drainage facilities.	\$250 plus \$25 per new parcel	\$0 not applicable	\$0 not applicable

II. Site Plans

A. A Site Plan which is along a county road and/or affects county drainage facilities.	\$250 plus \$10 per parking space, or \$10 per 100 SF of total impervious lot coverage (<i>whichever is greater</i>)	\$1,000 plus \$20 per parking space, or \$20 per 100 SF of total impervious lot coverage (<i>whichever is greater</i>)	\$500 plus \$5 per parking space, or \$5 per 100 SF of total impervious lot coverage (<i>whichever is greater</i>)
B. A Site Plan which is <u>not</u> along a county road and <u>does not</u> affect county drainage facilities.	\$250 plus \$10 per parking space, or \$10 per 100 SF of total impervious lot coverage (<i>whichever is greater</i>)	\$0 not applicable	\$0 not applicable

1. US Green Building Council LEED® (Leadership in Energy & Environmental Design) certified projects receive a discounted rate on their application fee. Silver certified projects shall submit 50% of the total application fee, Gold certified projects shall submit 25% of the total application fee, and Platinum certified projects pay no application fee.

2. Federal, state, county and municipal governments, churches, hospitals and 501(c)3 non-profit organizations are not required to submit an application fee.

3. Certified Checks, Cashier Checks or Money Orders shall be made payable to the "County of Hudson." Cash or personal checks will not be accepted. Separate checks must be submitted for the application fee and the escrow deposit.

Appendix C

DEVELOPMENT REVIEW CHECKLIST
for Subdivisions and Site Plans

	Required Item (* = subdivision only)	Submitted	Waiver Request	Applicant Comments (i.e., explain waiver request)
A PLAT / PLAN INFORMATION				
1	Three (3) sets of plans; minimum scale 1" = 100'			
2	Sheet sizes consistent with NJ Map Filing Act (30"x42", 24" x 36", 15" x 21")			
3	One (1) set of plans on a sheet size of 11" x 17"			
4	Name and address of Owner and Applicant.			
5	Signature block containing the name, address, phone/fax numbers, signature, license number, and embossed seal of the licensed professional(s) (Engineer, Architect or Planner) involved in preparation of the plan.			
6	Title block containing the name of the application, type of application, municipality, county, block/ lot numbers, tax map sheet and street address.			
7	Date of original plan. Dates of all revisions. All revisions should be graphically indicated on plans with a numerical legend that associates the revision with the revision date. Example:  4/11/08			
8	Key Map at a scale not less than 1" = 500 ft, showing tract with reference to surrounding properties, streets, zone districts, municipal boundaries within 1,000 feet and lots numbers within 200 feet. Key Map shall be Official County Road Map (http://www.hudsoncountynj.org/planning/docs/hcmap.pdf)			
9	The names and addresses of all adjacent property owners within 200 feet with block/lot numbers and zone districts.			
10	A zoning table containing required and provided zone district requirements including setbacks, area, density, lot coverage, height, bulk, FAR, parking, and all other local zoning requirements			
11	A listing or indication of the required Variances requested			
12	Percent impervious surface			
13	Scale (written and graphic) and North arrow with datum (horizontal & vertical)			
14	Signature blocks for County Engineer and County Planner.			
15	Survey, signed and sealed by a licensed NJ surveyor of subject property, prepared to scale with date, showing all easements and encumbrances.			
16	Location of all existing and proposed property lines with dimensions in feet and bearings (degree, minutes, seconds).			
17	Municipal setback requirements clearly demarcated.			
18	Plan showing entire tract and contiguous lots even if only a portion of the property is involved in the application; where an entire tract or contiguous lots cannot be shown on one map, submit a key map scaled down to use as an index.			
19	Number of proposed lots in the subdivision, as well as the acreage of the entire lot and of each proposed lot to the nearest hundredth of an acre.*			
B ENVIRONMENTAL FEATURES				
20	Existing and proposed contour intervals (slopes less than 10% at 2 foot intervals; Slopes 10% or greater at 5 foot intervals) for the subject property and 100' beyond, based on New Jersey Geopdetic Control Survey Datum, NVD 87.			
21	Delineation and location of all floodway and flood hazard areas as delineated in the current "Flood Insurance Rate Map" issued by FEMA or NJDEP Stream Study Maps, on and within 200 feet of the subject site. Also indicate all flood elevations			

**DEVELOPMENT REVIEW CHECKLIST
for Subdivisions and Site Plans**

	Required Item (* = subdivision only)	Submitted	Waiver Request	Applicant Comments (i.e., explain waiver request)
22	Location, size and direction of flow of all existing natural and artificial watercourses, streams, shorelines, lakes, ponds, swales, wetlands and water boundaries on site and within 200 feet of the subject property; also NJDEP Stream Encroachment & Wetlands delineation, buffers and permit data.			
23	Aquifer recharge areas, including safe sustained ground water yield.			
24	Location and size of wooded areas (in acres or square feet) and a written description indicating predominant species.			
25	Location of trees 6 inches or more in diameter, as measured 18 inches above ground level, with size and species of each.			
26	All wellhead protection areas.			
27	Location and description of cliffs and rock outcroppings, with geologic type.			
28	A plan showing All areas to be disturbed by grading or construction.			
C IMPROVEMENTS & CONSTRUCTION INFORMATION				
29	Location, names and dimensions of all existing and proposed streets on the property and within 200 feet of the tract.			
30	Location, size and use of all existing and proposed buildings and structures and their setbacks from existing and proposed property lines.			
31	All existing buildings and structures to be removed shall be labeled as such, and indicated by dashed lines.			
32	The location, size, type of all existing and proposed utility layouts, including plans for sanitary sewers, storm drains, water, gas, communications, cable and fiber optic, and electric utilities and the easements to accommodate them.			
33	Location of existing wells and septic systems. When Applicant intends to use a conventional septic disposal system: location of test holes, test results and approximate location of the intended disposal field.			
34	Proof of utility service, including telephone, electric, gas, cable TV, sewer, water.			
35	The location, size and type of all existing railroads, bridges, culverts, drain-pipes, curbs, sidewalks, driveways, retaining walls, water and sewer mains and other man-made installations affecting the tract, including jurisdiction.			
36	Spot and finish elevations at the corners of all existing and proposed buildings, structures, pavements, walks, other physical features and at changes in grade. Finished first floor and garage floor elevations shall be shown at all corners of buildings.			
37	Location, type and size of all lighting and utility poles within 25 feet of the County right-of-way, as well as information on the power and direction of illumination of proposed lighting, and nearest Lead Center.			
38	Location and description of monuments, set or to be set.			
D ROADWAY & ACCESS				
39	Profiles and cross-sections of all existing and proposed streets and driveways abutting and within the development, indicating: the type, width and depth of pavement, grading and the location of curb, bike lanes, sidewalks and shade tree planting strips.			
40	Plans of proposed street intersections with County roads at a minimum scale of 1"=30' including existing or proposed sight-triangles, radii of curb lines, traffic control signs, pavement markings, traffic islands, curb elevations, bikeway or bike lanes, sidewalks, drainage inlets and drainage flow direction.			
41	The location and design of any off-street parking and loading areas, showing location and dimensions of bays, aisles and barriers.			
42	Location and dimensions of mandatory ADA parking spaces and signage.			

**DEVELOPMENT REVIEW CHECKLIST
for Subdivisions and Site Plans**

	Required item (* = subdivision only)	Submitted	Waiver Request	Applicant Comments (i.e., explain waiver request)
43	All proposed means of vehicular access (ingress/egress) from the site onto public streets, showing the size and location of driveways and curb cuts, acceleration and deceleration lanes and any other device necessary to permit the safe and efficient movement of traffic.			
44	Construction details (i.e., color, material, width, dimensions, etc.) for existing and proposed curbing, pavement markers, line striping, depressed curb and ramps, aprons, etc.			
45	The location and construction details for all walkways and rights-of-way for pedestrian traffic.			
46	Location, type and size of all existing and proposed signs, and traffic control devices using the Manual on Uniform Traffic Control Devices (MUTCD), within 25 feet of the County right-of-way.			
47	Existing and proposed utility poles and equipment with pole references along frontage within 300 feet of site and on opposite side of road.			
48	Traffic Control and Detor Plan and Details in accordance with NJDOT Standards for Maintenance and Protection of Traffic (MPT) plans			
49	Letter from utility company(ies) approving the location of relocated poles and equipment.			
50	Emergency access detail			
51	An indication of existing and proposed sight distance, sight triangles and sight line profiles.			
52	Encroachments in the proposed right-of-way or sight triangle to be removed.			
53	Pavement repair detail with saw cut.			
54	A traffic signage and striping plan (1" = 20')			
55	Traffic Impact Report			
E DRAINAGE & STORMWATER				
56	Stream profiles 500 feet upstream and downstream of county drainage system or structure.			
57	Pre and post development drainage area maps.			
58	Drainage calculations as outlined in Ordinance			
59	Profiles and construction details (size, material, class and percent slope) of existing and proposed storm sewers, pipes, inlets, manholes and other drainage structures.			
60	Perc Tests as required by the County Engineer			
61	Location and details for at least 2 Low Impact Development Best Management Practices			
62	Locations where vegetation serve as filters for runoff			
63	A Stormwater Management Report			
64	Urban Stormwater Mitigation Plan			
65	A Maintenance and Operations Manual which specifies agreement and notarized signature(s) from responsible parties.			
66	A Soil Erosion and Sediment Control Plan consistent with the requirements of the local soil conservation district and in compliance with the "Soil Erosion and Sediment Control Act," (N.J.S.A. 4:24-39 et seq.), or a certification that the disturbed area is less than 5,000 square feet.			
F LANDSCAPING				
67	A Landscaping plan that graphically depicts the type and location of existing and proposed landscaping.			
68	A table which indicates the type, quantity, and size, genus, species and common name of all proposed vegetation (trees, shrubs and ground cover).			
69	The method of protecting trees to be saved and planted.			

**DEVELOPMENT REVIEW CHECKLIST
for Subdivisions and Site Plans**

	Required Item (* = subdivision only)	Submitted	Waiver Request	Applicant Comments (i.e., explain waiver request)
70	A 2 Year Guarantee for any shade trees to be installed along a County Road or within 25 feet of a County ROW.			
G DEEDS AND EASEMENTS				
71	Copy and description of any existing or proposed deed restrictions or covenants			
72	Any existing or proposed easement or land reserved for or dedicated to public use.			
73	The location and extent of existing and proposed sight easements if sight lines encroach other properties.			
74	A sight triangle easement for a commercial driveways or road intersection with a County road.			
75	The location and extent of existing and proposed drainage and conservation easements where required.			
76	Additional right-of-way or access easement or encumbrance.			
77	Bridge maintenance easement			
H OTHER				
78	Signed and sealed architectural plans			
79	Plans submitted on digital media, in accordance with the County's Digital Submission Standards			
80	List of all required regulatory approvals or permits			
81	Photographs of the premises in question taken from within and from the opposite side of the street.			
82	Statement explaining how the project is consistent with the County Master Plan and other applicable County Plans.			

Name of Person Preparing the Plan
(Must be a licensed professional Engineer, Architect, Landscape Architect, etc.)

Signature and Seal of Person Preparing the Plan

Date

By signing the above, I certify as a Licensed Professional that the information provided in this checklist is accurate and complete to the best of my professional knowledge. I understand that any requested "waivers" for the above items will be evaluated by the Hudson County Subdivision and Site Plan committee and may be approved or denied based on their evaluation. I certify that the plans are designed according to municipal zoning and land use regulations, and that all requirements are accurately listed in a zoning table. All variances (use, bulk, height, etc...) required per the project are also listed.

(Initials here)

Appendix D

LOW IMPACT DEVELOPMENT CHECKLIST
Hudson County Planning Department

Please fill out this checklist for identifying Low Impact Development Activities incorporated into the proposed land development.

Part 1 - Vegetation and landscaping

1. Has an inventory of existing site vegetation been performed? _____
If yes, was the inventory a factor in the site's layout and design? _____
2. Does the site utilize any of these non-structural LID-BMPs:
 - a. Preservation of natural areas: _____ If yes, specify location _____ and % of site _____
 - b. Use of native ground cover: _____ If yes, specify location _____ and % of site _____
 - c. Use of vegetated buffers: _____ If yes, specify location _____ and % of site _____
3. Specify percentage of total building roof area that will be vegetated: _____.
4. How many trees will be planted on site? _____ How many deciduous _____ Coniferous _____
How many trees will be removed? _____
How many *street* trees will be planted? _____ What types: _____

Part 2 – Minimizing site disturbance

5. Have inventories of existing site soils and slopes been performed? _____ If yes, were the inventories a factor in the site's layout and design? _____. Please explain _____.
6. Explain how site disturbance will be minimized during construction phases
_____.
7. Specify the percent of site to be cleared: _____. For buildings: _____. For driveways _____.
Specify % of site to be re-graded: _____.
8. Specify the site's hydrologic soil group (HSG) percentages:
HSG A: _____ HSG B: _____ HSG C: _____ HSG D: _____
9. Specify percentage of each HSG that will be permanently disturbed:
HSG A: _____ HSG B: _____ HSG C: _____ HSG D: _____
10. Explain how site disturbance will be minimized within areas with greater permeable soils (HSG A and B) to maintain groundwater recharge rates and reduce stormwater volume increases.
_____.

Part 3 – Impervious area management

11. Specify the following with regards to impervious coverage:
 - a. Maximum site impervious coverage (%) permitted by local regulations _____
 - b. Existing (%) (pre-project) impervious coverage at the site: _____
 - c. Proposed (%) impervious coverage for the site: _____
 - d. Is the site designed to achieve minimum impervious coverage? _____

LOW IMPACT DEVELOPMENT CHECKLIST
Hudson County Planning Department

12. Specify percentage of impervious coverage that will be porous: _____. Please explain which site areas will be porous: _____

13. Specify the following with regards to the number of parking spaces:

- a. The number of parking spaces required by local regulations for the development _____
- b. The number of parking spaces being provided _____
- c. Is the site designed to minimize the number of parking spaces to reduce impervious surface? _____

14. Specify the following with regard to the size of parking stalls:

- a. The size of parking spaces required by local regulations _____
- b. The size of parking stalls being provided _____

15. Specify percentage of total parking area that will be:

- a. Located beneath buildings _____
- b. Within a multi-level parking deck _____
- c. Only for compact cars _____

16. Specify the number of parking spaces provided for bicycle parking _____

Part 4 - Circulation Improvements

17. Explain how the project will impair or improve vehicular traffic flow? _____

18. Provide the pre-project Level of Service (LOS) _____ Post-project LOS _____

19. Explain how roadway safety and the pedestrian environment will be improved for each of the following:

- a. Placement and type of intersection signals _____
- b. Pedestrian features _____
- c. Sidewalk replacement _____
- d. Access control _____
- e. Aesthetic treatments _____
- f. Improved sight distance _____
- g. Street and sidewalk lighting _____
- h. Pedestrian- and bicyclist-activated signals _____
- i. Landscaped planters _____
- j. Bus pullout lanes and transit shelters _____

20. Explain how bicycle use will be promoted for the development. Will bicycle accessories (bike racks, secure storage, showers, etc.) be provided? _____

21. Explain how public transit will be promoted for the development _____

22. Will Transportation Demand Management techniques be provided? Please explain: _____

LOW IMPACT DEVELOPMENT CHECKLIST
Hudson County Planning Department

Part 5 – Source Control and Pollution Prevention

- 23. Specify number of outdoor trash receptacles provided _____. Number of recycling receptacles provided _____.
- 24. Is a recycling plan being submitted _____?
- 25. Identify stormwater management measures on the site that prevent discharge of large trash and debris.

Part 6 – Energy and Environmental Control

- 26. Indicate what is being done to reduce the site’s contribution to the urban heat island effect (i.e., light-colored/high albedo pavement surface with a minimum albedo of 0.3; use of porous pavement; substantial increase of tree canopy) _____
- 27. Will outdoor lighting fixtures be installed with energy-efficient fixtures in conformance with the Hudson County Site Plan and Subdivision Ordinance and as outlined by the International Dark Sky Association (ADA) www.darksy.org to preserve and protect the nighttime environment? Please explain.

- 28. What percentage of the total electricity for the site will be from renewable sources? _____. Please explain _____

Part 7 – Construction Materials

- 29. Is there a plan for the processing, transportation and disposal of waste? Provide a description of all material being disposed and location of disposal.

- 30. What percentage of non-hazardous construction and demolition debris from the project will be recycled? _____ Salvaged back into the site? _____

Part 8 – Community

- 31. Explain how meaningful public input was incorporated into the project. Provide evidence of how community values (historic preservation, cultural, neighborhood preservation, environmental) were integrated into the design process.

- 32. Explain how the project is consistent with the Hudson County Master Plan

LOW IMPACT DEVELOPMENT CHECKLIST
Hudson County Planning Department

Part 9 – Narrative

33. In narrative form, provide an overall description of the LID-BMP approach to stormwater management and strategies incorporated into the proposed site design. Attach additional pages as necessary.

Part 10 – Compliance with Non-structural Requirements of NJDEP Stormwater Management Rules

N.J.A.C. 7:8-5.3(b)

No	Nonstructural Strategy	Yes	No
1	Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss. <i>Please explain:</i>		
2	Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces. <i>Please explain:</i>		
3	Maximize the protection of natural drainage features and vegetation. <i>Please explain:</i>		
4	Minimize the decrease in pre-construction time of concentration. <i>Please explain:</i>		
5	Minimize land disturbance including clearing and grading. <i>Please explain:</i>		
6	Minimize soil compaction. <i>Please explain:</i>		
7	Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides. <i>Please explain:</i>		
8	Provide vegetated open-channel conveyance systems that discharge into and through stable vegetated areas. <i>Please explain:</i>		
9	Provide preventative source controls. <i>Please explain:</i>		

Appendix E

DIGITAL SUBMISSION REQUIREMENTS

Hudson County Planning Board

A. Objective

The Hudson County Digital Submission Standards is being implemented to assist the County in receiving, processing, utilizing, maintaining, and making available relevant digital map data contained in subdivision and site plan submissions. Digital submissions aid the County in many ways, including:

1. Maintaining an accurate parcel dataset.
2. Improving public access to current geographic information.
3. Allowing for electronic transfer of plans with consultants and municipalities, thereby reducing communication times and increasing productivity and the speed of review.
4. Development of digital tax maps.
5. Reducing storage of paper submissions.
6. Saving paper and ink and reducing waste and costs.

B. Applicability

The Hudson County Digital Submission Standards shall apply to all final plats for major and minor subdivisions submitted to the Hudson County Planning board pursuant to N.J.S.A 40:27-1 et. seq or N.J.S.A 40:55D et. seq.

C. Technical Standards

Digital submissions should include only such relevant information as: existing survey tract lines, proposed property lines, easement lines, and setback linnets, as well as ground features that have been field surveyed or obtained by photogrammetry- such as streams, railroads, topography, and similar features. Digital submissions shall NOT contain title bocks, plan sheet borders, zoning tables, key map, and other information that would have to be removed by the County, prior to utilizing for GIS. The submission should NOT simply be an electronic copy of the final plat. The following sections present the minimum standards required for submission of digital maps and final plats.

D. Data Scope

Each applicant shall provide on separate layers, the following data:

1. Right-of-way with descriptors
2. Property Lines (Existing and Proposed) with descriptors
3. Lot and Block descriptors
4. Easements
5. Utilities, (existing and proposed) each type on an individual layer
6. Monumentation with State Plane Coordinates
7. Roadway pavement markings with descriptors
8. Traffic control devices with descriptors

DIGITAL SUBMISSION REQUIREMENTS
Hudson County Planning Board

- 9. Topographic data including contours at appropriate elevations
- 10. Wetlands and Flood Plain delineation limits

E. Data requirements

A primary goal of the County as a data steward is to maintain current, accurate GIS data. Much of the CAD data created through the planning process will be brought into the Hudson County GIS data system. The following are minimum standards related to CADD and GIS data submission:

1. AutoCADD

- a. Blocks shall not be exploded.
- b. Drawings shall be purged.
- c. Drawings shall be zoomed to the project extents.
- d. All layers shall be turned on.
- e. All lines shall intersect
- f. Proposed lots, easements and rights-of-way shall be comprised of closed polygons
- g. All drawings shall be created at 1 to 1 "full scale."

2. GIS

- a. GIS data shall store point, line, polygon and annotation features using New Jersey State Plane Coordinate System (NAD83 horizontal and NAVD88 vertical) or the most current State Plane Coordinate System and datums.
- b. GIS data shall be created using spatial tolerances for dangle length 0.0 and fuzzy tolerance 0.005.
- c. GIS data shall consist of topologically correct, error-free and complete digital data sets, including:
 - i. No gaps
 - ii. No overlaps
 - iii. Right-of-way must overlap parcel boundary
 - iv. Block boundary must overlap parcel boundary
 - v. Municipal boundary must overlap stream centerline
 - vi. Municipal boundary must overlap road centerline

F. Coordinate Reference

Digital data shall be positioned in New Jersey State Plane Coordinate System (NAD83 horizontal) and North American Vertical Datum 1988 (NAVD88 vertical) or the most current State Plane Coordinate Systems and datums.

DIGITAL SUBMISSION REQUIREMENTS

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If the source information to the final digital data is/was not native to the coordinates system required for submittal, a brief explanation of the method by which the final data was created shall be included in the documentation that accompanies the digital submittal. The AutoCAD compatible file shall not contain any foreign rotation factors.

G. Platform and File Formats

Hudson County's prefers submission of digital data in a file format native to the following preferred platform, as follows:

File format	Software Program*
Computer Aided Drafting & Design (CADD)	AutoCAD
Geographic Information Systems (GIS)	ArcGIS
Text Document	Microsoft Word
Spreadsheet	Microsoft Excel
Database	Microsoft Access
Images (TIFF, JPG, BMP, GIF or MrSID)	Most Image/Photo Software

* Submission of files in the latest software version/release is always preferred. If submission in these digital formats is not feasible, contact the County Engineer to determine if your file format will be compatible with existing County software/hardware.

H. Delivery Media and Documentation

All information submitted to the County shall be described in both a digital file and hard copy. The County will accept CD-ROM and DVD ROM media to facilitate delivery of the required digital data.

Appendix F

TRAFFIC IMPACT REPORT
Hudson County Planning Board

A. Purpose

Hudson County requires applicants to submit a Traffic Impact Report in order to evaluate how a project may adversely impact local traffic conditions, where "traffic" shall encompass all modes, including vehicular, pedestrian, bicycle and public transportation. The County utilizes a Traffic Impact Report especially in instances when:

1. Traffic that is generated by a single project or when considered cumulatively with other projects, will add to existing traffic volumes, exceed desired capacity thresholds at an intersection or roadway, contribute to an unacceptable level of service (LOS), or exacerbate an existing congested condition.
2. Project-generated traffic may interfere with the existing traffic flow.
3. Proposed access locations may not provide for adequate safety.
4. Nonresidential uses may generate commuter or truck traffic through a residential area.
5. Projected-generated traffic may alter the existing character of a street.

B. Applicability

A comprehensive Traffic Impact Report shall be prepared by a licensed Civil or Traffic Engineer and submitted to the County Planning Board for any land development located along or affecting a County road, which meet one or more of the following conditions:

1. Any proposed development which will generate in excess of 10 vehicle trips during the weekday, morning, evening or Saturday peak hour using the latest "Institute of Transportation (ITE) Engineering Trip Generation Rates."
2. Any proposed development, where because of its location in relation to land use, traffic volumes and traffic patterns, the County Engineer determines the development warrants a comprehensive Traffic Impact Report.

C. Report Contents

The following items must be included in traffic impact reports:

1. Project Description

- a. Those factors which quantify vehicular traffic generators (dwelling units, commercial square feet, persons to be employed, restaurant seats, etc.) Residential developments should be specific as to the type of residence proposed.
- b. A plot plan showing proposed driveways, streets, internal circulation and any new parking facilities on the site.
- c. A vicinity map showing the site location and study area relative to other transportation systems

2. Existing Conditions.

- a. A description of existing streets and roadways within and surrounding the project site. Include roadway classification, the number of lanes and roadway widths, signalized intersections, separate turn lanes, pedestrian crossing areas, traffic control devices, and the signal phases for turning movements.

TRAFFIC IMPACT REPORT
Hudson County Planning Board

- b. Existing daily directional and peak-hour (through and turning) traffic volumes for the abutting and surrounding roadways and intersections. Local streets affected by the project should also be shown. Each report shall include appendices providing count data used in the preparation of the report, as well as the source and date of the traffic volume information. Count data should not be over one (1) year old.
- c. The scope of the analysis shall be determined in consultation with the County Engineer and may include off-tract intersections and highway links that may be affected by the development.
- d. Existing levels of service (LOS) calculations using the latest edition of the *Highway Capacity Manual*, published by the Transportation Research Board. LOS Descriptions are provided in Table 1 below. Different analytical methods require advanced approval from the County Engineer.

Table 1: Level of Service (LOS) Descriptions

LOS	General Characteristics
A	Nearly free-flow conditions; full freedom to maneuver within traffic stream
B	Nearly free-flow conditions; with some restrictions on maneuverability
C	Nearly free-flow conditions; with noticeable restrictions on maneuverability
D	Declining speeds; increasing densities; restricted maneuverability
E	At capacity; unstable flow; reasonable speeds; very little, if any, freedom to maneuver
F	Unstable flow conditions; low speeds; significant queuing at constricted points

LOS is defined by the average travel speed along a roadway segment.

3. Proposed Conditions.

a. Trip Generation Analysis.

Tabulate the estimated number of daily AM and PM peak hour trips generated by the proposed development (entering and exiting the site) and any other significant peak anticipated (e.g., Saturday). Supporting information must be provided for any generation rates which deviate from the "ITE Trip Generation Manual".

b. Trip Distribution.

Diagrams showing the percentages and volumes of the project (and nearby project's) AM and PM peak-hour trips logically distributed on the surrounding roadway system. Full documentation of the distribution rationale must be provided.

c. Related Projects.

A list of related projects that are approximately within a one-and-a-half mile radius of the project site and would reasonably be expected to be in place by the project's build out year must be included in the report. Related projects shall include all pending, approved, recorded, or constructed projects that are not occupied at the time of the existing traffic counts. A table and a map showing the status, project/zone change/conditional use permit/parcel map/tract number, and the location of each project must be provided.

d. Future Year Volumes.

Future year traffic volumes with level of service calculations for a target year. Target year volumes must include volumes from adjacent developments and background traffic rates.

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e. LOS Analysis.

If it appears that the project's generated traffic alone or together with other projects in the area could worsen the LOS of an intersection or roadway, a "before" and "after" LOS analysis is necessary. Intersection LOS analysis and calculation work sheets, as well as diagrams showing turning volumes shall be included in the report for the following traffic conditions:

- i. Existing traffic
- ii. Existing traffic + Ambient growth (to the year the project would be completed.)
- iii. Existing traffic + Ambient traffic + Project traffic
- iv. Existing traffic + Ambient traffic + Project traffic + Mitigation measures
- v. Existing traffic + Ambient traffic + Project traffic + Mitigation measures + Cumulative traffic of other known developments
- vi. Existing traffic + Ambient traffic + Project traffic + Mitigation measures + Cumulative traffic of other known developments + Proposed mitigation measures

f. Analysis Discussion.

- i. Discuss conclusions regarding the adverse impacts caused by the proposed project on the roadway system and those areas that require mitigation measures.
- ii. Discuss other possible adverse impacts on traffic such as: (1) the limited visibility of access points on curved roadways; (2) the need for pavement widening to provide left-turn and right-turn lanes at access points into the proposed project; (3) the impact of increased traffic volumes on local residential streets; and (4) the need for road realignment to improve sight distance.
- iii. Discuss whether or not the project is consistent with the Circulation Element of the County's Master Plan.

4. Traffic improvement and mitigation strategies.

Identify feasible traffic improvement strategies which would mitigate the project and/or related projects' significant impacts to a level of insignificance. Also identify any mitigation measures that are assumed to be implemented by others. Mitigation strategies shall be designed for a minimum Level of Service "D" in the peak hour, and should include, but are not limited to, the following:

a. Traffic Engineering Techniques.

- i. Locate access points to optimize visibility and reduce potential conflict.
- ii. Design parking facilities to avoid queuing into public streets during peak arrival periods.
- iii. Provide additional off-street parking.
- iv. Dedicate visibility easements to assure adequate sight distance at intersections and driveways.
- v. Signalize or modify traffic signals at intersections.

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- vi. Install left-turn phasing and/or multiple turning lanes to accommodate particularly heavy turning movements.
 - vii. Widen the pavement to provide left- or right-turn lanes to lessen the interference with the traffic flow.
 - viii. Widen intersection approaches to provide additional capacity.
 - ix. Prohibit left turns.
- b. **Transportation Control Measures** (Per US Clean Air Act 1990 Amendments, 42 USC 7401)
- i. Improved public transit
 - ii. Restrictions of certain roads to lanes to, or construction of such roads or lanes for use by, passenger buses or high occupancy vehicles
 - iii. Fringe and transportation corridor parking facilities serving multiple occupancy vehicle programs or transit service.
 - iv. The provision of all forms of high-occupancy, shared-ride services
 - v. Employer-based transportation management plans, including incentives
 - vi. Employer-sponsored programs for flexible work schedules
 - vii. Secure bicycle storage facilities and other facilities including bike lanes, for the convenience and protection of bicyclists.
 - viii. Construction of paths, tracks or areas solely for the use by pedestrian or other non-motorized means of transportation.

5. Traffic Demand Management.

Provide a discussion of specific Traffic Demand Management (TDM) measures that will be implemented to reduce peak-hour trips and the expected effect of such TDM measures. TDM measures should maximize the movement of people, not vehicles, and should reduce the dependence on and use of single-occupant vehicles or alter the timing of travel to other, less congested time periods, using the above transportation control measures, and including, but not limited to, the following strategies:

- (a) Improve/increase alternatives to driving alone, including transit service, carpooling, vanpooling and provisions for walking and bicycling, where appropriate.
- (b) Use of incentives and disincentives such as preferential parking, direct subsidies to high occupancy vehicle users and inverted parking areas.
- (c) Better management of work hours, including the use of flexible hours (flex-time), staggered work hours, and modified work schedules (work from home, telecommuting, 4-day week).
- (d) Restrict truck deliveries to secondary routes and encourage deliveries during off-peak hours.

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- (e) Establish a monitoring program to ensure that project traffic volumes do not exceed project traffic demand.

D. Waivers

The applicant's engineer may request a waiver from strict compliance with this requirement if it can be demonstrated, in writing, that the land development will not have a significant impact on County roads. The County Engineer may grant said waiver, based on the documentation submitted.

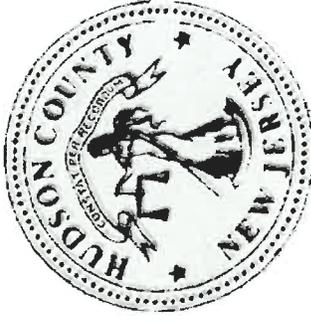
Appendix G

LOW IMPACT DEVELOPMENT / GREEN INFRASTRUCTURE / BEST MANAGEMENT PRACTICES
For Sustainable Stormwater Management
Hudson County Planning Board

The following list of Low Impact Development (LID) and Green Infrastructure techniques are examples of strategies that can be employed to control stormwater runoff in Hudson County. In practice, these techniques utilize engineered or natural systems to mimic natural processes and pre-development conditions. Many strategies (such as green roofs, permeable paving, rain gardens, infiltration trenches, etc...) use soils and vegetation to infiltrate, evapo-transpirate and/or recycle runoff. Other strategies focus on site design (i.e., reducing connected impervious surfaces, reducing the number of parking spaces, adding bike lanes or green roofs atop parking decks, etc.) to produce a variety of environmental benefits.



Green Infrastructure



The suitability of a strategy or combination of strategies for each project will depend on the physical opportunities and constraints of a site, as well as the intended environmental benefits of the strategy. Physical factors to consider include the amount of space available, soil permeability, slopes, distance to water table/bedrock, proximity to building foundations, depth requirements and maintenance needs. The environmental benefits of a strategy vary with respect to runoff rate control, volume reduction, water quality benefits, heat island effect reduction, resource protection, air quality improvement, etc.

In all new development and redevelopment projects, the use of green Infrastructure/LID strategies should be considered a priority tool for stormwater management, before resorting to conventional end-of-pipe approaches.

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The table below provides general descriptions for some LID/Green BMP strategies. For each method selected, the developer shall provide detailed construction specifications, and shall comply with all requirements for stormwater management, in accordance with the provisions of the Hudson County Subdivision and Site Plan Ordinance.

Strategy	Type	Description	Implementation	Maintenance
Conservation sements	Site Design	Conservation easements are voluntary agreements that allow individuals or groups to limit the type of amount of development on all or just a portion of their property. By agreeing to give up or restrict the development rights for a parcel of land, landowners can guarantee that their property will remain in a prescribed state for property which receiving its benefits.	Easements should include (1) a description of the resource they are designed to protect (e.g. agricultural, forest, historic, water quality or open space easement), (2) restrictions on the uses and development (3) who is responsible (land, trust, governmental agency, etc.) for maintenance (4) language that is clear and enforceable (5) maps, descriptions and baseline documentation of the property characteristics, and (6) explanation of how the use of the land will be monitored on a regular basis.	The responsibility for maintenance of property in a conservation easement depends on the individual agreement with a land trust or agency. While many organizations assume the responsibility for managing and monitoring a property, some land trusts leave maintenance responsibilities to the landowner and act only to monitor that the terms of the easement are met.
Compatible Design	Site Design	Natural drainage patterns, native vegetation, and stabilization of soil during construction are important factors in the prevention of flooding and degradation of water quality. Priority shall be placed on the design that maintains natural drainage patterns and watercourses. Alternatives to natural drainage patterns shall not create flooding or degradation of water quality for adjacent governmental property. Site design shall minimize the disturbance and loss of vegetation.	Site development should be fitted to the topography and soil so as to create the least potential for vegetation loss and site disturbance. Vegetation removal should be limited to that amount necessary for the development of the site. Vegetation native to the site or plant community should be restored in areas affected by construction activities.	New planting shall be given sufficient water, fertilizer if necessary, and protein to ensure reestablishment.
ing	Site Design	Natural landscaping vegetation (particularly grass, shrubs and woody species) on a development or redevelopment project. The preservation and restoration of natural plant communities is important for the protection of natural resources and habitat, prevention of flooding and erosion, and the enhancement of the quality and quantity of water resources, and therefore encourages their protection and enhancement.	Development should be designed to preserve and enhance natural vegetation through factors in topography, soil drainage patterns and the culture and shade of the landscape for use by green roofs, permeable paving and drainage features, edges of streets, parking areas, pedestrian areas, and gardens, courtyards, arboreal and traditional development corridors, and other uses.	Native vegetation typically requires less routine maintenance than conventional landscaping.
Redevelopment	Site Design	Redevelopment is development that occurs on previously developed land. Redevelopment already developed areas is a key strategy for reducing the disturbance to natural resources and associated degradation to ecosystems.	Redevelopment includes adding, removing, substituting, restoring, or otherwise using government, institutional, private, or public structures, which comprising the visual and architectural quality and structural quality.	NA

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Strategy	Type	Description	Implementation	Maintenance
5. Green Parking	Site Design	Green parking techniques that minimize the amount of parking space required for a facility, such as compact parking, shared parking, and other techniques that reduce the amount of parking space required. Green parking techniques include compact parking, shared parking, and other techniques that reduce the amount of parking space required. Green parking techniques include compact parking, shared parking, and other techniques that reduce the amount of parking space required.	New parking lots and structures should include a percentage of designated spaces for compact cars, motorcycles, and bicycles. Compact car spaces should be smaller than typical spaces. Motorcycle spaces should be smaller still, and bicycle parking facilities should be adjacent to building entrances. Shared parking is encouraged for adjacent businesses or users who typically share parking spaces, such as when businesses have staggered needs according to peak times. Compact parking materials are encouraged for areas where parking and other low volume parking needs exist. Stormwater will not be impacted by such structures. Shared parking, when used, should be located in areas that are not impacted by other parking facilities. Other parking facilities for use by those vehicles. Intensive landscaping of parking lots should be encouraged.	Shared parking techniques include compact parking, shared parking, and other techniques that reduce the amount of parking space required. Shared parking techniques include compact parking, shared parking, and other techniques that reduce the amount of parking space required.
6. Riparian or Forested Buffers	Site Design	A riparian or forested buffer is an area along a shoreline, wetland, or stream where development is restricted or prohibited to prevent erosion and separate a stream, lake, or wetland from other disturbance or encroachment. A properly designed buffer can provide stormwater management and act as a right-of-way during floods, sustaining the integrity of stream ecosystems and habitat.	The riparian or forested buffer should be constructed with a minimum 30-foot buffer. Buffers that are wider than 30 feet are encouraged. Buffers that are wider than 30 feet are encouraged. Buffers that are wider than 30 feet are encouraged.	An effective buffer management plan includes establishment, management, and distinctions of riparian and prohibited uses in the buffer zones. Buffer boundaries should be well defined and visible during and after construction. Buffers should be designed to capture urban stormwater runoff and reduce more maintenance if designated as a riparian or other engineered depression area.
7. Stormwater Management	Site Design	Low impacts of street design relate to stormwater management. The pattern of the street and how the street is constructed (width, materials, etc.) can impact the amount of "green streets" for smart growth. Smart growth involves a network of well-connected streets that support multiple transportation modes, and which encourage alternative modes, and which encourage alternative modes.	Some smart growth approaches to street design include: increasing street width, supporting the regular use of sidewalks, using permeable materials for sidewalks, using permeable materials for sidewalks, using permeable materials for sidewalks.	All types of systems should have regular maintenance to ensure they are functioning properly. Typical maintenance considerations for smart growth designs include street sweeping, catch basin cleaning, clearing blocked sewer lines, and other maintenance activities. Other maintenance activities include street sweeping, catch basin cleaning, clearing blocked sewer lines, and other maintenance activities.

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Strategy	Type	Description	Implementation	Maintenance
	Site Design	<p>Natural features that provide environmental, aesthetic, and recreational benefits, if preserved and protected, reduce the impacts of construction and development. Wetlands, riparian areas, floodplains, mature recharge areas, mature trees, woodlands, and other wildlife habitat. Restricted areas such as floodplains and steep slopes should also be protected from possible impacts from construction activities. Properties that are being redeveloped should have attractive open space, well-drained soils, or riparian areas that should be identified and considered for preservation early in the planning process.</p>	<p>Protect mature trees or woodlands, and steep slopes. Check erosion controls on exposed areas that will be cleared and graded and ensure they turnoff from these areas is diverted away from or around the slope. Areas with well-drained soils and those that have adjacent wetlands should be protected from compaction. Maintain existing vegetation where possible. Before planting permanent vegetation, aerate the soil to ensure that runoff infiltrates. Establish buffer zones and buffers, strips, or other wetlands and along stream corridors in which no construction activity occurs. Avoid activity adjacent to wetlands, streams, or other natural habitat on the property. Find out the date of other natural habitat on the property. Establish perimeter channels in nonrain areas.</p>	<p>Landscape maintenance can be reduced because natural areas do not require the same level of maintenance as turf grass. Preservation of natural areas also eliminates the need to mow, fertilize, and perform other lawn maintenance activities.</p>
9	Site Design	<p>Green roofs can be effectively used to reduce runoff from commercial, industrial, and residential buildings. Green roofs absorb, store, and later release rainwater, thereby acting as a stormwater management system and reducing the discharge of pollutants to a storm sewer system. Green roofs can also reduce the discharge of pollutants to a storm sewer system. Green roofs can also reduce the discharge of pollutants to a storm sewer system. Green roofs can also reduce the discharge of pollutants to a storm sewer system.</p>	<p>Green roofs should be installed on flat or low-slope roofs. Green roofs should be installed on flat or low-slope roofs. Green roofs should be installed on flat or low-slope roofs. Green roofs should be installed on flat or low-slope roofs.</p>	<p>Green roofs should be monitored regularly to ensure that they are thriving. During the first year, green roofs may need to be watered. If precipitation is not sufficient, precipitation, extensive green roofs may need to be inspected and lightly fertilized once per year. The roofs may need to be watered and may require some watering during dry periods.</p>
10	Site Design	<p>Urban forestry is the preservation, trees and forests located in and around the city. Urban forestry absorbs water, reduces air pollution, and provides shade. Urban forestry can help provide some of the environmental benefits that are associated with green infrastructure. Urban forestry can help provide some of the environmental benefits that are associated with green infrastructure.</p>	<p>Green roofs should be installed on flat or low-slope roofs. Green roofs should be installed on flat or low-slope roofs. Green roofs should be installed on flat or low-slope roofs. Green roofs should be installed on flat or low-slope roofs.</p>	<p>Urban forestry should be maintained regularly. Urban forestry should be maintained regularly. Urban forestry should be maintained regularly. Urban forestry should be maintained regularly.</p>

Urban Forestry
 (Trees and Tree
 Boxes)

See the Hudson County Community Forestry Plan

LOW IMPACT DEVELOPMENT / GREEN INFRASTRUCTURE / BEST MANAGEMENT PRACTICES
 For Sustainable Stormwater Management
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Strategy	Type	Description	Implementation	Maintenance
	Detention	<p>Stormwater wetlands (a.k.a. constructed wetlands) are structural practices similar to wetlands that incorporate wetland plants into the design of stormwater runoff flows. Wetlands are designed to achieve stormwater detention and pollutant removal is achieved through settling, biological uptake within the wetland, and variations of the stormwater wetland that design differing in the relative amount of water and deep water, and dry storage above the wetland.</p>	<p>Wetlands should be designed with non-clogging plants to reduce maintenance. Regular maintenance and inspection practices are needed, including clean and removal of debris from inlet and outlet structures; mowing side slopes; removal of vegetation; repairing undercut or eroded areas; and sedimentation control.</p>	
<p>12 Bioretention Rain Gardens</p>		<p>Bioretention practices are adapted to manage stormwater runoff. Bioretention practices are designed to manage stormwater runoff on islands or landscaped natural areas. Bioretention practices are designed to manage stormwater runoff on islands or landscaped natural areas. Bioretention practices are designed to manage stormwater runoff on islands or landscaped natural areas. Bioretention practices are designed to manage stormwater runoff on islands or landscaped natural areas.</p>	<p>Some considerations for bioretention will include: management practices for vegetation and soil; water table; and the need for regular maintenance. Bioretention practices are designed to manage stormwater runoff on islands or landscaped natural areas. Bioretention practices are designed to manage stormwater runoff on islands or landscaped natural areas.</p>	<p>landscaping maintenance (e.g., water plants daily for 2 weeks after installation); Re-mulch void areas, shrubs, and mow turf areas; and repair eroded areas (e.g., soil and repair eroded areas); debris (monthly); remove and replace tree stakes and wires.</p>
<p>13</p>	Filtration	<p>Vegetated filter strips (grassed filter strips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. Filter strips function by slowing runoff velocities, and by providing some infiltration into underlying soils. One challenge with vegetated filter strips, however, is that it is difficult to maintain them in flow.</p>	<p>Filter strips are best suited to treating runoff from paved areas, such as parking lots, and they are best suited to treating runoff from paved areas, such as parking lots, and they are best suited to treating runoff from paved areas, such as parking lots.</p>	<p>Maintenance is very important for filter strips, particularly in terms of ensuring that flow does not circumvent the practice. Typical maintenance includes regular removal of sediment build-up within the bottom; and annual inspection of pea gravel diaphragm for clogging; vegetation for rills and rills; and to ensure that grass has established in areas; and to ensure that grass has established in areas.</p>

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Strategy	Type	Description	Implementation	Maintenance
14. Porous Pavement	Infiltration	<p>Porous pavement is permeable pavement surface, often built with interlocking concrete pavers that temporarily store surface runoff before it infiltrates into the subgrade. Porous pavement replaces traditional pavement allowing parking, lot stormwater to infiltrate directly and receive water quality treatment. There are various types of porous surfaces, including porous asphalt, pervious concrete, and grass or permeable pavers. Porous pavement should be used on low to medium traffic areas, such as residential roads, overflow and special event parking, fire ways, utility and access roads, emergency access roads, fire lanes and alleys.</p>	<p>While porous pavement can be a highly effective treatment practice, maintenance and proper installation are necessary to ensure its long-term effectiveness. Soils permeability should be at least 0.5 inches per hour; the bottom of the storm reservoir should be flat, so that runoff can infiltrate through the entire surface. Seasonally high ground water table: At least 5 feet above the reservoir. It should be below the root zone. Design characteristics should include pretreatment treatment, conveyance, maintenance reduction and landscaping.</p>	<p>Regular maintenance is required in techniques of installation of pervious concrete, permeable pavers or porous asphalt will increase performance and longevity of the system. Monthly inspection is needed to ensure that paving area is clean of debris, the paving excavators between storms, and the area is clean of sediments. As needed (3-4 times/year) it is necessary to mow upland and adjacent areas, seal hard areas, vacuum sweep frequently to keep the surface free of sediment, and inspect the area for deterioration.</p>
15. Infiltration Trenches	Infiltration	<p>An infiltration trench (a.k.a. infiltration trench) is a rock-filled trench with no outlet that captures stormwater runoff. Stormwater runoff passes through some combination of pretreatment measures, such as a swale and detention basin, into the trench. Runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. The primary pollutant removal mechanism of this practice is filtering through the soil.</p>	<p>Runoff is restricted due to potential ground water contamination, soil, and debris. They still not be used where there is potential for saturated water to be used with existing infrastructure, and if the site soils have poor infiltration capacity, especially for their application. Runoff from the drainage area, above, and infiltration pretreatment (such as sand and gravel) from ground water swales and wet swales, infiltration trench shall include features for vegetation treatment, appropriate maintenance reduction, and landscaping.</p>	<p>Infiltration trenches should have an access path for maintenance activities such as an observation, well (PVC pipe) that can enable inspectors to monitor the swales, grate. Trenches should have a means to drain the practice if it becomes clogged, such as an overflow pipe. Standard maintenance includes remove sediment and oil/grease from pretreatment devices and overflow structures.</p>
16. Grassed Swales	Infiltration	<p>Swales (a.k.a. grassed channel, dry swale, wet swale, biofilter, or bioswale) are vegetated, open-channel management practices designed to treat and attenuate stormwater runoff for a specified water quality volume. As stormwater runoff flows into these channels, vegetation slows the water to allow sedimentation, filtering through a subsurface and/or infiltration into the underlying soils. Variations include the grassed channel, dry swale, and wet swale. The specific design features and methods of treatment differ in each of these designs.</p>	<p>Grassed swales are well suited for treating highway runoff. They are preferred because they are more readily maintained than other stormwater treatment practices. Grassed swales should preferably be installed in areas with relatively flat slopes of less than 4 percent. Swales with steep slopes, which may be used to reduce the potential of the swale from being eroded, should be installed with a grassed swale. Swales should be installed with a grassed swale. Swales should be installed with a grassed swale. Swales should be installed with a grassed swale.</p>	<p>Maintenance of grassed swales mostly involves litter control and maintaining the grass or wetland plant cover.</p>

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Urban bioswale



Bioswale along a residential street



Bioretention swale in a parking area



Rain garden on a residential property



Infiltration beds in a parking lot



Rain garden in parking lot

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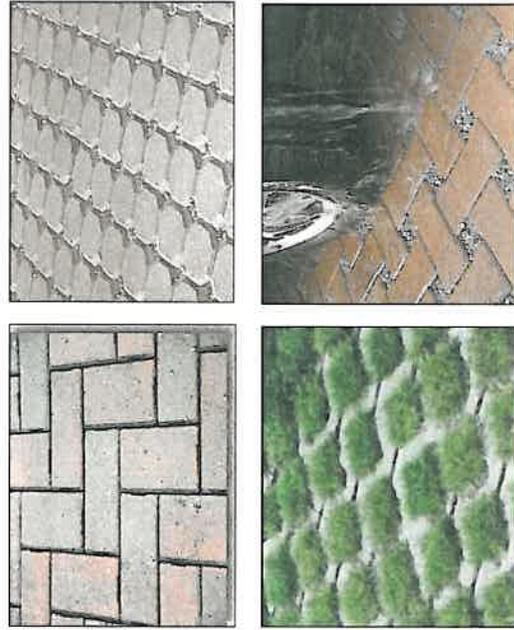
Bioretention swale retro-fit to roadway



Street Tree stormwater treatment retrofit



Native landscaping at a Chicago School



Permeable paving options



Permeable paver retrofit for a residential street



Permeable parking lot and bioretention system for commercial building

Appendix H

DESIGN STANDARDS FOR MUNICIPALITIES

Hudson County Planning Board

Design Standards for Smart Growth and Sustainable Development

Good subdivision and site design can create a functional and attractive development that is an asset to the community. The purpose of design standards in Hudson County is to ensure that new development is designed to provide a human scale and integrates new development with existing neighborhoods.

County standards in this document function most effectively if they are combined with site standards which are compatible with a multi-modal transportation realm. Municipalities are strongly encouraged to allow and even adopt site standards that create walking, biking and public transportation opportunities for all people.

Building Form and Mass

- 1) Building setbacks should take into consideration the setbacks for nearby buildings in order to maintain a consistent streetscape. Parking areas should be located behind the building line in order to maintain an appropriate and consistent street façade.
- 2) All buildings should relate harmoniously to the site's natural features and other on-site buildings, as well as other structures in the vicinity that have a visual relationship and orientation to the proposed buildings. Such features should be incorporated into the design of building form and mass, and assist in the determination of building orientation in order to preserve visual access to natural or man-made community focal points.
- 3) Large horizontal buildings (i.e., buildings with a linear dimension of more than 250 feet) should provide a visual and/or physical break, minimally every 100 feet linear feet. Visual breaks can be achieved through changes in building material, texture or color, vertical elements a minimum of 4 feet wide, actual building offsets or appurtenances such as canopies, overhangs or vestibules. Related architectural elements which eliminate a continuous uninterrupted facade building length may also be utilized to achieve a break in the linear dimension of the building walls.

Facade Treatment

- 1) Appropriate facade treatments should be imposed to ensure that new buildings are integrated with existing neighborhoods in a coordinated, complimentary architectural style.
- 2) Building elements such as entrances, graphic panels and display windows are encouraged as a means to provide a visually attractive environment.
- 3) Cornices, awnings, canopies, flagpoles, signage and other ornamental features should be encouraged as a means to enhance the visual environment. Such features may be permitted to project over pedestrian sidewalks, with a minimum vertical clearance of 8.5 feet, to within three feet of a curb.

DESIGN STANDARDS FOR MUNICIPALITIES

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- 4) A 'human scale' of development should be achieved at grade and along store frontages through the use of such elements as windows, doors, columns, awnings, canopies and vestibules.
- 5) Multi-tenant buildings shall provide varied storefronts and such elements as noted above for all tenants.
- 6) Design emphasis should be placed on primary building entrances. They should be distinct in character, particularly when there is the need to provide contrast with a long linear building footprint, and such details as piers, columns, and framing should be utilized to reinforce verticality. To the extent that side and rear elevations are visible, the side and rear elevations should receive similar design emphasis.
- 7) When parking decks are constructed, then the facade elevations of the parking deck should receive architectural treatment which complements the buildings located in close proximity to the site. For example, window cutouts, framing, and other architectural vernacular detailing should be used to reinforce the complementary appearance of the parking deck with nearby buildings.
- 8) Rooftop mechanical equipment should be screened in locations where such equipment is visible from off-site. Appropriate screening can be provided by panels of a color or material that complement the building's architecture, or as an alternative approach, raised parapet walls.

Material and Texture

- 1) A variety of complementary building materials should be utilized to create a coordinated architectural style.
- 2) The use of fabric or metal canopies is encouraged, especially over storefronts, at entrances or over display windows.
- 3) The use of creative lighting schemes to highlight building facades and related areas of a site is encouraged. The use of traditional style lanterns and similar fixtures is also encouraged. Exterior neon lights and lighting generating glare and unnecessary night-glow impact is prohibited.

Streetscape

- 1) The use of street furniture (benches, tables, trash receptacles, etc.) shall be encouraged, provided the materials used are consistent with the overall concept of the building and existing streetscape design
- 2) Whenever possible, light poles and fixtures should be integrated into landscaped islands.
- 3) Lighting poles and fixtures should be at a scale appropriate for the area (i.e., pedestrian-scale along sidewalks) and should have a design that reflects the character of the area.
- 4) Lighting systems should be energy-efficient and produce glare or encroach upon adjacent properties.

DESIGN STANDARDS FOR MUNICIPALITIES

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- 5) Street trees should be regularly integrated into the streetscape either in a planting strip or tree pits. Design and planting consideration should include the tree's potential root systems growth, likely height at maturity, maintenance and decorative tree pit walls.

Circulation

- 1) Traffic calming measures are encouraged to maintain pedestrian safety. Property owners and/or other responsible entities shall be responsible for the installation of traffic-calming features. The County will only maintain crosswalks that are within the County road ROW. Otherwise, all features must be maintained by the municipality or property owners. The following streetscaping measures are permitted within County road ROWs:
 - a) Providing pedestrian refuge areas on multi-lane crossings.
 - b) Street furniture (i.e. lampposts with banners, benches, etc.)
 - c) Curbed bulb-outs.
 - d) Textured (brick, or color-impregnated and stamped) crosswalks
 - e) Signage that is unique to the location, such as welcome signs
 - f) Gateways & cross-street banners
 - g) Lane striping
 - h) Medians
 - i) Walls and fences
 - j) Transit stops and bus shelters
 - k) Bicycle racks
 - l) Shade trees
- 2) Sidewalks. Sidewalks must be pleasing to walk on and provide direct, short linkages between public spaces and building entryways. Furthermore, the sidewalk itself should be an open public space with the help of street furniture.
- 3) Street furniture. Street Furniture, such as benches, tables, trash receptors, mailboxes, lampposts, above-ground planters, information kiosks, etc. are encouraged to be installed along pedestrian routes in or near the County Road ROW. The following guidelines apply:
 - a) Street furniture shall be located outside the carpath in relation to its function. For example, benches should face storefront windows or a common area where people gather. Bicycle racks should be placed near major entrances to buildings.
 - b) Different items of street furniture should relate to each other in terms of design and color.
 - c) Street furniture should be located at least two feet from the face of the curb.
- 4) Curbed Bulb-Outs
 - a) Dimensions: Bulb-outs should be used where there is onstreet parking or heavy lane-striping to keep the flow of traffic directed away from the bulb-out. The angle of the curb when transitioning from a wide to narrower carpath width shall be a minimum of 40 degrees and a maximum of 60 degrees from the direction of travel.
 - b) Curb Radius: The curb radius should be a minimum of 25 feet to 30 feet, or based on a demonstration by the design engineer that the largest common vehicle can negotiate the turn with at least a 2 foot buffer from the wheel tracks.

DESIGN STANDARDS FOR MUNICIPALITIES

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- 5) Textured Pavement: Textured crosswalks shall be paved with red bricks or stamped with a stained pavement texture. Textured crosswalks shall also have white borders at least 8 inches wide to make them visible to approaching motorists.
- 6) Banners: Lampposts should have mounting points for vertical banners. High-mounted temporary banners that span the entire street shall allow 16 feet of clearance from the roadway for large vehicles.
- 7) Lane striping: Striping should be wider, at 6 inches wide, white and painted 10 or 11 feet from the road centerline.
- 8) Medians: If provided, medians should be aesthetic, with low maintenance plantings and other decorative items such as stones, bollards, lampposts, etc. Medians and crosswalks should be integrated to create refuges for pedestrians. The median provides a spot for slow-walking pedestrians (or anybody crossing high-volume streets) to rest and turn their heads to watch for one direction of vehicular traffic at a time.
- 9) Fences and Walls: These regulations are for aesthetic purposes and are not to impinge on municipal ordinances: No chain-link fences are permitted along County roads in centers.
- 10) Transit: Transit stop shelters shall not block sidewalks and must include at least one bench, a transit schedule, and some degree of protection from the elements. Shelter design must meet NJTransit standards.
- 11) Bicycle Racks: Bicycle racks that are specifically designed to fit between sidewalks and curbs should be provided in front of storefronts and main entrances to buildings. They should be located at least 4 feet from other street furniture.
- 12) Refuse receptacles: Trash and recycling receptacles should be provided at regular intervals along busy pedestrian areas.
- 13) Parking: Parking areas should be designed to meet, not exceed, the minimum number of required parking spaces and the minimize size dimensions of parking spaces. Where possible, shared parking scenarios should be utilized. Vegetative medians should be interspersed throughout parking areas at a minimum ratio of one (1) tree median for every 15 parking spaces.
- 14) Paving materials: Porous paving materials are encouraged if appropriate for walkways, overflow parking, paved planting strips, etc.

Landscaping

- 1) All site vegetation should be tolerant to the climate of site location ("urban tolerant"), native to the area and selected with seasonal variety in mind.
- 2) Vegetative buffers should be installed to screen parking areas, storage and trash areas, and adjacent uses.
- 3) Onsite stormwater management should maximize the use of vegetative areas through bio-swales, vegetated medians in parking lot s, green roof design, etc.

