

NJ CONSERVATION BLUEPRINT

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Note for Blueprint Plus users:

This document describes the data and the process used to create the Conservation Blueprint Agriculture Priority Model. The model was originally created using a raster approach, in which land is evaluated without reference to parcel boundaries. In Blueprint Plus, the models are used to evaluate land at the parcel level. Although *Blueprint Plus uses the same data and the same scoring system as the raster model*, where necessary, some of the processing steps described here were modified to facilitate the application of the raster model to parcels.

Overview of Methodology for Priority Lands for Agricultural Preservation

Updated: April 2023

Indicator selection and scoring

Agricultural land preservation is an essential element of land conservation efforts. An **Agricultural Priority** theme was identified early on as one of the foundational components of the NJ Conservation Blueprint project. A sub-committee was formed in May 2016 to develop the priority model approach. Committee members from the New Jersey Conservation Foundation included: Greg Romano, Fran Rapa, Tim Brill, Tanya Nolte, Laura Szwak (facilitator). The State Agriculture Development Committee (SADC) also provided input and feedback through discussions and email correspondence.

Initial Indicator Discussion

The initial discussion included a longer list of possible indicators based on the agriculture map provided by the Rowan GeoLab and those suggested at previous subcommittee meetings.

Important agricultural soils

- Prime: 3 points
- Statewide: 2 points
- Locally important/unique soils: 1 point
- Not classified: 0 points
- Check Non-irrigated class 1 & 2 soils to determine if substantially different from prime soils: 1 point if different

Preserved farms—creating ag districts/core areas

- Adjacent to preserved farms: 1 points
- Links or fills a gap in a farmbelt: 1 point (surrounded by preserved farmland)
- Not adjacent but within 1/2 mile of preserved farm: 1 point

Agricultural land (from Land Use/Land Cover data)

- Classified as ag land
- modified wetlands: 3 Points

The group reviewed the indicators and felt that the above were the most important to identify agriculture priorities and the most feasible to develop into a priority model within a GIS environment.

Reference Layers

Further discussion revolved around whether other additional factors should denote priorities for agricultural preservation. Ultimately the following were, and were not, included in the priority model but are available as Reference Layers.

- Reference Layers included (*descriptions of each included in appendix*):
 - Agricultural Threshold Parcels
 - Farmland Tax Assessed Parcels
 - Open Space
 - Pinelands Management Area
 - Pinelands National Reserve Outline
 - Highlands Planning and Preservation Areas
 - Highlands Capability Zones
 - Wastewater Service Areas
 - County Ag Development Areas (ADAs)
 - County Farmland Project Areas
 - Non-highway Roads

- Highways
- Reference Layers NOT included:
 - Farms enrolled in the 8-year program should be given priority.
 - Access to water—not really a constraint in NJ (so far)
 - Tillable land—This is included in the LULC data and would be double-counted if included as a separate indicator.
 - Targeted Farms—This is not a good indicator for a statewide analysis because the landowner can opt out. Good for implementation at a more local level.
 - Map of historical farms and farm buildings. Different historic aerial maps, however, are available as base maps.

Developing the Model

The Rowan GeoLab developed and refined the current agricultural model based on the above criteria discussion.

- 1. Property Parcel-Based Model Unit** – the data layers that are incorporated into the agricultural priority model have varying geographic units in both vector and raster GIS format. For example, the agriculturally significant soils map uses vector polygons that are delineated by the NRCS to represent units of soil class and the active agricultural lands map uses polygons of land use that are air photo delineated. The map depicting infill areas between existing farmland preservation uses a raster approach with a neighborhood raster cell summary calculation. The feature boundaries of each of the component map layers rarely align and intersecting the maps into a unified data model makes for complex geographies of model output models.

Considering the complexity of the overlay of data and the fact that farmland preservation occurs at the property parcel level, the agricultural priority model employed a parcel-based unit approach. The model took advantage of the fact that a state-wide property parcel map now exists for New Jersey and the Mod 4 tax assessment database can be joined to the statewide parcel geometry. This allowed parcels that are farmland tax assessed to be incorporated into model. Property parcels are used for all proximity calculations and are available as an overlay labeled with lot and block.

Data links:

https://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp

- 2. Agricultural Threshold Property Parcels** – to be eligible for NJ's farmland preservation program certain minimum characteristics pertaining to farming viability must be met. Parcels must be at least 5 acres in size, must have at least 50% of its land area in active agricultural productivity for

parcels less than 50 acres or a minimum of 25 acres of active agricultural productivity for parcels larger than 50 acres. Farmland tax assessment (Q-Farm) is another precondition, however. This layer has left out the Q-Farm component since the Mod 4 tax data for Q-Farm is currently in questionable accuracy.

The Agricultural Threshold Parcels layer was created by the following methodology.

- Statewide parcels had all parcels smaller than 5 acres removed
- The resultant parcels greater than 5 acres data layer was intersected with the NJ DEP 2012 Land Use/Land Cover dataset.
- Summary statistics were generated for the total amount of agricultural land use contained in each parcel and added as a field back to the parcels greater than 5-acres layer.
- The final Agricultural Threshold Parcels layer was derived by selecting parcels smaller than 50 acres that had at least 50% of its land area in agricultural land use OR parcels greater than 50 acres that had at least 25 acres of land in agricultural land use.

Data links:

https://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp

Explanation of Point System

3. Priority Lands for Agriculture Model- Priority points (up to a maximum of 10) were assigned as follows:

- Agricultural Land Use: polygons including modified agricultural wetlands - **3 point**
(derived from the NJ DEP 2012 Land Use/Land Cover<<http://www.nj.gov/dep/gis/lulc12c.html>>).
- Agricultural Soils: (derived from the NRCS soil survey <<https://www.nrcs.usda.gov/wps/portal/nrcs/site/nj/home/>>)
 - i. Prime soils - **3 points**
 - ii. Statewide important soils - **2 points**
 - iii. Unique or locally important soils - **1 point**
- Proximity to Existing Preserved Agricultural lands: (see individual layer descriptions for details, Farmland Preserved Parcels was provided by the SADC).
 - i. Agricultural threshold parcels immediately **adjacent** to preserved farm parcels - **1 point**.
 - ii. Agricultural threshold parcels **within ½ mile** of preserved farmland - **1 point**.
 - iii. **Infill** lands between preserved farms - **1 point**.

- ***Agricultural Threshold Parcels: 1 point***

The methodology followed to produce each component layer is described below to represent the priority model point system described above. A "Grid_code" field was populated in each of the model component layers and calculated to represent the assigned point values. Component layers that were in vector format were converted to raster format with a 30' x 30' cell size. "NO_DATA" values within each layer were reclassified to 0.

The component layers were then mathematically summed. Lands that were already preserved under farmland preservation or open space or classified as "Urban" in the NJ DEP 2012 Land Use/Land Cover dataset were removed.

The total points were classified into the following 3 categories.

8-10 points = "High Priority"

6-7 points = "Medium Priority"

4-5 points = "Priority"

Explanation of Datasets Incorporated into Point System

4. Preserved Farmland – This dataset represents all farm parcels that have been preserved in the New Jersey State Farmland Preservation Program (NJSFPP) and farms that have received final approval for funding to the NJSFPP as of April 2020. The NJFPP shape file is produced and administered by the New Jersey Department of Agriculture (NJDA), State Agriculture Development Committee (SADC) and has a relational database containing attributes for the various aspects of the Program. Parcels preserved by SADC partners without SADC funding may not be represented.

Data links:

<http://www.nj.gov/agriculture/sadc/farmpreserve/resources/>

5. Farmland Soils – Data are from the Soil Survey Geographic (SSURGO) database developed and maintained by the NRCS conducted by the US Department of Agriculture. Soils are classified into four categories of agricultural importance:

- [NJ Prime Farmland Soils](#)
- [NJ Farmland Soils of Statewide Importance](#)
- [NJ Farmland Soils of Local Importance](#)
- [NJ Farmland Soils of Unique Importance](#)

Data links:

https://gdg.sc.egov.usda.gov/GDGHome_DirectDownload.aspx

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/nj/soils/?cid=nrcs141p2_018874

6. Active Agriculture – The data was derived from 2012 Land Use/Land Cover data and includes cropland, pastureland, other fields, and wetlands associated with agriculture.

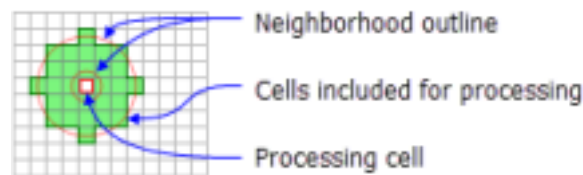
Data links:

Land Use/Land Cover data: New Jersey Department of Environmental Protection (NJDEP), Office of Information Resource Management (OIRM), Bureau of Geographic Information Systems (BGIS) Land Use/Land Cover 2015 Update: <https://njogis.newjersey.opendata.arcgis.com/datasets/6f76b90deda34cc98aec255e2defdb45>

7. Parcels Adjacent to Preserved Farms – This layer was produced by a spatial selection incorporating two other component layers; *Preserved Farmland* and the *Agricultural Threshold Property Parcels*. A spatial selection was performed to select Agriculture Threshold Property Parcels (i.e. greater than 5 acres AND minimum acres of active agriculture OR QFarm status) that were **within 75 feet** of a parcel under farmland preservation. The 75' distance was used to include parcels as adjacent that were not necessarily sharing a property line but rather bordering a preserved farm separated by a road.

8. Infill Lands Between Preserved Farms – This layer represents the sum of acres of preserved farmland within a 1-mile circumference to any given point on the map. Areas indicated represent 500 acres or more of preserved farmland within a 1 mile radius. Preservation of these lands will fill a gap or link within a farmbelt.

Development of the layer began with adding a GRIDCODE field to the vector-based Farmland Preservation layer and calculating the field value as 1. The vector farmland preservation layer was then converted to raster assigning the GRIDCODE field as the raster value. A Spatial Analyst Neighborhood Focal Statistic tool was run on the farmland preservation layer using a circular neighborhood with a radius of 5,280 feet (1 mile) and a static of SUM.



Raster values in the output represented the total sum number of raster cells of farmland preservation within the 1 mile radius. Since each cell represents 900 square feet (30' x 30' raster cell size) of farmland preservation, the layer was multiplied by 900 and then divided by 43,560 to produce an output in acres of farmland within 1 mile radius. The final step entailed selecting all sum acre values greater than 500 acres to produce the infill map layer.

9. Parcels within ½ mile of Preserved Farms – This layer was produced by generating a ½ mile buffer around existing farmland preservation parcels as of April 2020. The buffer was assigned 1 point in the model. Only the portion of a parcel that is inside the buffer has the point value.

Final Version 2020 Model Point Classification

- 0-3 points = Not in Model
- 4-5 points = Priority
- 6-7 points = Medium Priority
- 8-10 points = High Priority

(SEE BEGINNING OF NEXT PAGE)

APPENDIX

Description of Data Sets Incorporated into Priority Lands for Agricultural Preservation.

Preserved Farmland

Description: Identifies farmland that is permanently protected as farmland and parcels included in the New Jersey State Farmland Preservation Program (NJSFPP). Typically, this land is protected via a farmland easement, is privately owned, and has no public access.

Source of Publisher: New Jersey Department of Agriculture (NJDA), State Agriculture Development Committee (SADC)

Year of Publication: 2023

Metadata:

<https://www.arcgis.com/sharing/rest/content/items/f20260b686d0432988a715534af9eec7/info/metadata/metadata.xml?format=default&output=html>

Additional Information: The dataset includes all farms that have been preserved in the NJSFPP; and farms that have received final approval for funding to the NJSFPP. The data was compiled from sources including the NRCS, SADC, counties and non-profits. Parcels preserved by SADC partners without SADC funding may not be represented. Since the source data varies in scale and accuracy, this data is for display purposes only and cannot be used to determine the legal boundaries of preserved land.

Additional Information Link:

<http://www.nj.gov/agriculture/sadc/farmpreserve/resources/>

Farmland Soils

Description: Identifies soils most important for sustaining agricultural production. **Source of Publisher:** Soil Survey Geographic (SSURGO), NRCS US Department of Agriculture

Year of Publication: 2023

Metadata:

Additional Information: Data are from the Soil Survey Geographic (SSURGO) database developed and maintained by the NRCS conducted by the US Department of Agriculture. Soils are classified into four categories of agricultural importance: NJ Prime Farmland Soils, NJ Farmland Soils of Statewide Importance, NJ Farmland Soils of Local Importance, NJ Farmland Soils of Unique Importance

Additional Information Link:

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/nj/soils/?cid=nrcs141p2_018874

Agricultural Lands

Description: Identifies land in agricultural use as of 2015.

Source of Publisher: NJDEP Bureau of GIS

Year of Publication: 2015

Metadata:

<https://www.arcgis.com/sharing/rest/content/items/6f76b90deda34cc98aec255e2defdb45/info/metadata/metadata.xml?format=default&output=html>

Additional Information: The data was derived from 2012 Land Use/Land Cover data and includes cropland, pastureland, other fields, and wetlands associated with agriculture.

Parcels Adjacent to Preserved Farms

Description: Identifies lands in agricultural use adjacent to preserved farmlands. **Source of Publisher:** Rowan University GeoSpatial Research Lab

Year of Publication: 2023

Metadata:

Additional Information: This layer was produced by a spatial selection incorporating two other component layers: Preserved Farmland and the Agricultural Threshold Property Parcels. A spatial selection was performed to select Agriculture Threshold Property Parcels (i.e. greater than 5 acres AND minimum acres of active agriculture OR QFarm status) that were within 75 feet of a parcel under farmland preservation. The 75' distance was used to include parcels as adjacent that were not necessarily sharing a property line but rather bordering a preserved farm separated by a road.

Infill Lands Between Preserved Farms

Description: This layer represents the sum of acres of preserved farmland within a 1-mile circumference to any given point on the map. Areas indicated represent 500 acres or more of preserved farmland within a 1 mile radius. Preservation of these lands will fill a gap or link within a farmbelt.

Source of Publisher: Rowan University GeoSpatial Research Lab

Year of Publication: 2023

Metadata:

Additional Information:

Development of the layer began with adding a GRIDCODE field to the vector-based Farmland Preservation layer and calculating the field value as 1. The vector farmland preservation layer was then converted to raster assigning the GRIDCODE field as the raster value. A Spatial Analyst Neighborhood Focal Statistic tool was run on the farmland preservation layer using a circular neighborhood with a radius of 5,280 feet and a static of SUM.

Raster values in the output represented the total sum number of raster cells of farmland preservation within the 1 mile radius. Since each cell represents 900 square feet (30' x 30' raster cell size) of farmland preservation, the layer was multiplied by 900 and then divided by 43,560 to produce an output in acres of farmland within 1 mile radius. The final step entailed selecting all sum acre values greater than 500 acres to produce the infill map layer.

Parcels within ½ mile of Preserved Farms

Description: Identifies parcels greater than 5 acres that were within ½ mile of preserved farmlands.

Source of Publisher: Rowan University GeoSpatial Research Lab

Year of Publication: 2023

Metadata:

Additional Information: This layer was produced by generating a ½ mile buffer around all farmland preservation parcels as of April 2020.

Reference Layers

Agricultural Threshold Parcels

Description: This layer depicts parcels that have potential for agricultural importance.

Source of Publisher: Rowan University GeoSpatial Research Lab

Year of Publication: 2023

Metadata:

Additional Information: Potential parcels include those greater than 5 Acres that have 50% or more agriculture land use, or are at least 25 acres of agricultural land use, or are farmland taxed assessed.

Farmland Tax Assessed Parcels

Description: This layer depicts parcels that have been approved for a tax assessment reduction.

Source of Publisher: Rowan University GeoSpatial Research Lab

Year of Publication: 2023

Metadata:

Additional Information: To qualify for this reduction, a landowner must have no less than five acres of farmland actively devoted to an agricultural or horticultural use for the two years immediately preceding the tax year being applied for and meet specific minimum gross income requirements based on the productivity of the land.

Open Space

Description: Lands identified as Open Space

Source of Publisher: Various sources

Year of Publication: 2023

Metadata: TBD

Additional Information: This layer represents lands delineated as Open Space that may or may not be in permanent preservation. The layer is a composite of GIS data from various sources some of which have the Preserved Open Space status confirmed and Other Open Space for which the land is currently identified as open space but not necessarily in permanent preservation or the preservation status is unknown. This layer is provided AS-IS with the understanding that it is only appropriate for general planning purposes and information on individual properties should be field verified. The State is currently compiling a comprehensive Open Space Inventory which, when released, will replace this layer.

Pinelands Management Area

Description: This layer shows the nine management areas in the New Jersey Pinelands

Source of Publisher: NJ Pinelands Commission

Year of Publication: 2016

Metadata: <http://www.state.nj.us/pinelands/home/maps/datas/pma.txt>

Additional Information: In 2010 and in 2014 the PMAs within the Pinelands Area Boundary were adjusted to The State of New Jersey Composite of Parcels Data layer developed by the New Jersey Office of Information Technology and an updated zoning layer to make the lines coincidental where applicable. The composite parcel layer is "In work", so changes made in the composite parcel layer after the release of this data set will not be reflected in this version. The boundaries are intended to provide reasonable representation of the PMAs for planning purposes. They are not survey grade. The current geometry is not static and is prone to change.

Additional Information Link:

<http://www.state.nj.us/pinelands/home/maps/datas/>

Pinelands National Reserve Outline

Description: Identifies the boundary of the federally designated Pinelands National Reserve.

Source of Publisher: NJDEP Bureau of GIS

Year of Publication: 1994

Metadata:

<http://www.state.nj.us/dep/gis/digidownload/metadata/statewide/pinelands.htm>

Additional Information: Congress created the Pinelands National Reserve (PNR) through the passage of the National Parks and Recreation Act of 1978. The PNR is the first National Reserve in the nation. The PNR is approximately 1.1 million acres and spans portions of seven counties and all or part of 56 municipalities. The reserve occupies 22% of New Jersey's land area and it is the largest body of open space on the Mid-Atlantic seaboard between Richmond and Boston. The reserve is home to dozens of rare plant and animal species and the Kirkwood Cohansey aquifer system, which contains an estimated 17 trillion gallons of water. In 1979, New Jersey formed a partnership with the federal government to preserve, protect and enhance the natural and cultural resources of this special place. Land use is regulated within this special district.

Highlands Planning and Preservation Areas

Description: Identifies the boundary of the Highlands regional planning area as established by the Highlands Water Protection and Planning Act of 2004. **Source**

of Publisher: New Jersey Office of GIS (NJOGIS)

Year of Publication: 2004

Metadata:

https://geodata.state.nj.us/arcgis/rest/services/Features/Government_Boundaries/MapServer/6

Additional Information: This dataset was created by utilizing the Highlands Parcel Base, the NJDEP Hydrography Layer for 2002 and the New Jersey

Department of Transportation Local Road Files as references to the act description.
Additional Information Link: <https://njogis.newjersey.opendata.arcgis.com/datasets/new-jersey-highlands-preservation-and-planning-areas>

Highlands Capability Zones

Description: This layer is from the Highlands Land Use Capability Zone Map and uses overlay zones to address the requirements of the Highlands Water Protection and Planning Act (Highlands Act) and to provide regional guidance for the implementation of the policies in the Regional Master Plan.

Source of Publisher: New Jersey Highlands Water Protection and Planning Council (Highlands Council)

Year of Publication: 2020

Metadata:

http://www.highlands.state.nj.us/njhighlands/maps/gis_data/LUCZ.html

Additional Information: This layer is broken into seven overlay zones. The overlay zones distinguish between high resource value lands that are important to maintaining water quality, water quantity, and sensitive ecological resources and processes (Protection Zone), and those lands with regionally significant concentrated development that signify existing communities (Existing Community Zone). In addition, the Conservation Zone identifies those areas with significant agricultural use lands interspersed with associated woodlands and environmental features that should be preserved when possible.

Within the overlay zones exist overlay subzones which recognize the occurrence of environmentally significant features within the Protection, Existing Community and Conservation zones. The Wildlife Management Sub-Zone consists of both areas managed by the United States Fish and Wildlife Service as part of the National Wildlife Refuge System and Wildlife Management Area System administered by the NJDEP Division of Fish & Wildlife's Bureau of Land Management. These areas are part of a network of lands and waters for conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats and permit compatible wildlife-dependent recreational uses. The Existing Community Zone - Environmental Constrained Sub-Zone consists of significant contiguous critical habitat, steep slopes, and forested lands within the Existing Community Zone that should be protected from further fragmentation. The Lake Community Sub-Zone consists of patterns of community development around lakes that are within the Existing Community in order to protect water quality, resource features, shoreline development recreation, scenic quality and community character. The Conservation Zone - Environmental Constrained Sub-Zone consists of significant environmental features within the Conservation Zone that should be preserved and protected from non-agricultural development.

Additional Information Link:

http://www.highlands.state.nj.us/njhighlands/master/tr_land_use_capability_zon

[e_map.pdf](#)

Wastewater Service Areas

Description: Identifies areas within the State's Water Quality Management Plan that are planned to be serviced by existing or future wastewater facilities.

Source of Publisher: New Jersey Office of GIS (NJOGIS)

Year of Publication: 2020

Metadata:

<https://www.arcgis.com/sharing/rest/content/items/2ceba1ef852b4940afc3e0d94fb5d327/info/metadata/metadata.xml?format=default&output=html> **Additional**

Information: This layer shows the planned method of wastewater disposal for specific areas, such as whether the wastewater will be collected to a regional treatment facility or treated on site and disposed of through a Surface Water discharge or a groundwater discharge.

Areas not specifically mapped represent either water features where no construction will occur or land areas that default to individual subsurface disposal systems discharging less than 2,000 gallons/day where the site conditions and existing regulations allow.

Additional Information Link: <https://njogis>

newjersey.opendata.arcgis.com/datasets/2ceba1ef852b4940afc3e0d94fb5d327_6

County Agricultural Development Areas (ADAs)

Description: Identifies the geographic area where a county agriculture development board has determined that agriculture is the preferred, but not necessarily the exclusive, use of land over the long term. All parcels considered for farmland preservation must be included in the ADA. All public body or public utility projects which intend to exercise eminent domain or extend non-agricultural development within the ADA are subject to review pursuant to N.J.S.A. 4:1C-19.

Source of Publisher: SADC

Year of Publication:

Metadata: TBD

Additional Information:

Additional Information Link:

<http://www.nj.gov/agriculture/sadc/home/genpub/comprehensiveplans.htm>

County Farmland Project Areas

Description: Separate discrete areas, within the Agricultural Development Area, the county has identified as the focus of its preservation efforts to create contiguous blocks of preserved farmland. These are identified with a county's comprehensive farmland preservation plans.

Source of Publisher: SADC

Year of Publication: TBD

Metadata: TBD

Additional Information:

<http://www.nj.gov/agriculture/sadc/home/genpub/comprehensiveplans.htm>

| Coastal Planning Areas

Description: The NJDEP Coastal Planning Areas data layer identifies the boundaries of the Coastal Planning Areas used in CAFRA permitting by NJDEP.

Source of Publisher: NJDEP Bureau of GIS

Year of Publication: Originally published: 2001. Last updated: 2003

Metadata:

http://www.nj.gov/dep/gis/digidownload/metadata/statewide/coast_pa.htm

Additional Information: The planning area boundaries were mapped by the NJ Office of Smart Growth as part of the 2001 State Development and Redevelopment Plan, and subsequent revisions, and have been reviewed and accepted as Coastal Planning Area boundaries by the NJDEP for the purposes of CAFRA.

There are five types of Coastal Planning Areas: Metropolitan, Suburban, Fringe, Rural and Environmentally Sensitive Coastal Planning Areas. Each Coastal Planning Area has associated with it a corresponding, pre-determined impervious cover limit and vegetative cover requirement.

Non-highway Roads

Description: Identifies non-highway New Jersey roads.

Source of Publisher: New Jersey Geographic Information Network

(NJGIN) **Year of Publication:** Originally published: 2012. Last updated:

2020 **Metadata:** TBD

Additional Information: This layer has been modified from its original version to include only roads classified as non-highways.

Additional Information Link:

<https://www.arcgis.com/sharing/rest/content/items/a845e8b133e34c6eb4da0062bedb99dc/info/metadata/metadata.xml?format=default&output=html>

Highways

Description: Identifies major New Jersey highways.

Source of Publisher: New Jersey Geographic Information Network

(NJGIN) **Year of Publication:** Originally published: 2012. Last updated:

2015. **Metadata:** TBD

Additional Information: This layer has been modified from its original version to include only roads classified as highways.

Additional Information Link:

<https://www.arcgis.com/sharing/rest/content/items/a845e8b133e34c6eb4da0062bedb99dc/info/metadata/metadata.xml?format=default&output=html>