

# MARYLAND'S LAND USE/LAND COVER MAP AND ASSOCIATED ANALYSIS

Maryland Department of Planning  
Daniel Baldwin  
Stephanie Martins  
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<http://www.planning.maryland.gov/>



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# PURPOSE

The primary purpose of the land use/land cover data set is to provide a generalized view of how developed land has changed throughout the state, primarily capturing the conversion of resource land to development and characterizing the type of development (e.g. low density or high density residential development, commercial, industrial).



# HISTORY

- First mapped statewide in 1973
- Several iterations throughout the 1980's and 1990's
- Most recent update in 2010



# 2010 LAND USE/LAND COVER

- 2007 NAIP Imagery (National Agriculture Imagery Program)
- 2002 Land Use/2010 Land Use
- 2008 Parcel Data
- Some County reference layers - incorporate county input on draft maps



# MAPPING BASICS

- The land use database is based on the Anderson Level II classification, a standard classification system used by land planners.
- Based on the number of housing units per acre, this classification scheme divides developed land into nine developed land use/cover categories
- Resolution 1:12,000
- Minimum mapping unit - 5 acres



# CLASSIFICATION SYSTEM

## Urban Land Uses

- 11 Low-density residential
- 12 Medium-density residential
- 13 High-density residential
- 14 Commercial
- 15 Industrial
- 16 Institutional
- 17 Extractive
- 18 Open urban land
- 191 Large lot subdivision  
(agriculture)
- 192 Large lot subdivision (forest)
- 80 Transportation

## Barren Land

- 71 Beaches
- 72 Bare exposed.
- 73 Bare ground

## Agriculture

- 21 Cropland
- 22 Pasture
- 23 Orchards/vineyards/horticulture
- 24 Feeding operations
- 241 Feeding operations
- 242 Agricultural building
- 25 Row and garden crops

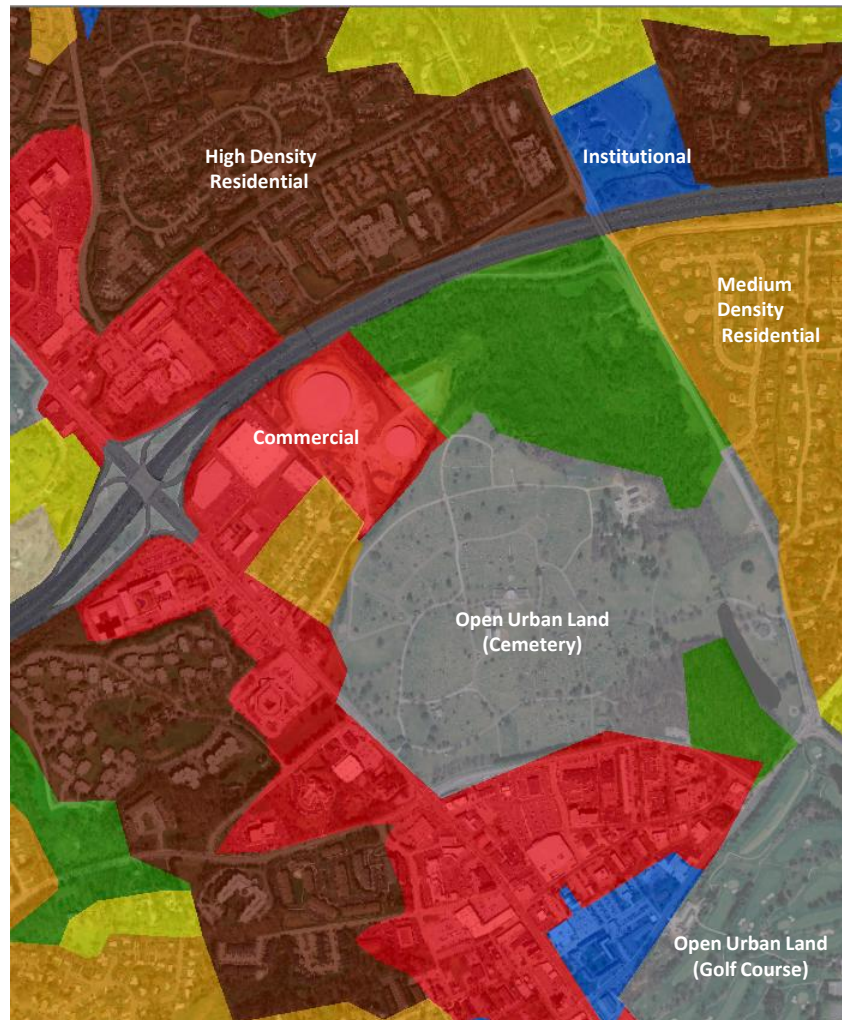
## Forest

- 41 Deciduous forest
- 42 Evergreen forest
- 43 Mixed forest
- 44 Brush
- 50 Water
- 60 Wetlands





# LAND USE TYPES



# MAPPING PROCESS

- Updated 2002 release of Land Use/Land Cover via visual analysis of 2007 NAIP; and
- Queried 2008 MDPV points to extract out different land uses (residential, commercial, industrial, institutional).

Anderson Level 1 schema

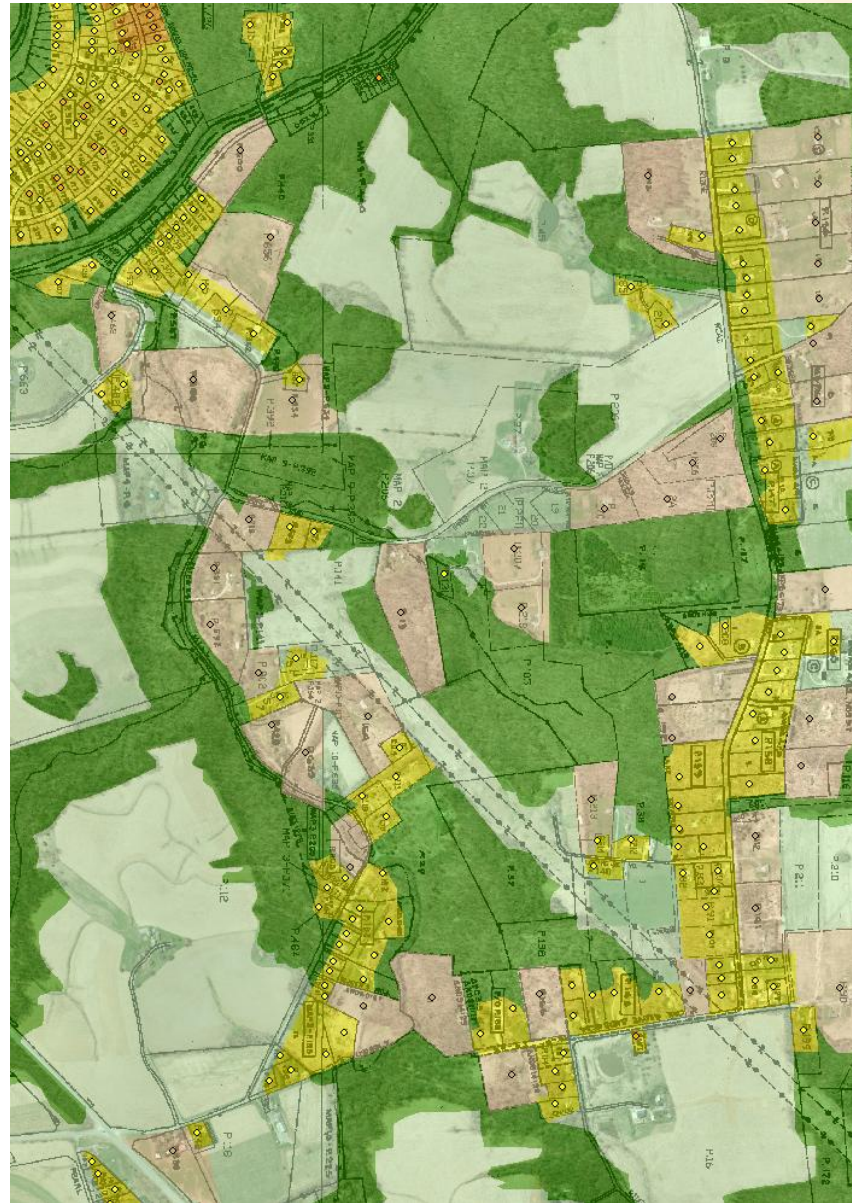
## ■ Example:

- **Very Low Density** = ( "NFMIMPVL" > 1000) AND(( "LU" = 'R' ) OR ( "LU" = 'RC' ) OR( "LU" = 'A' ) OR( "LU" = 'M' ) OR ( "LU" = 'TH')) AND(( "ACRES" >= 5) AND ( "ACRES" < 20))
- **Low Density**= ( "NFMIMPVL" > 1000) AND(( "LU" = 'R' ) OR ( "LU" = 'RC' ) OR ( "LU" = 'TH')) AND(( "ACRES" >= 0.5) AND ( "ACRES" < 5))
- **Commercial**= ( "NFMIMPVL" > 10000) AND(( "LU" = 'C' ) OR ( "LU" = 'CC' ) OR ("LU" = 'CR'))





# PARCEL QUERIES



# MAPPING RULES

- For most edits the tax map and parcel layer provided the general shape of the parcel if needed.
- Developed lands were generally defined as clusters of 5 or more developed parcel points.







# CAVEATS

- Changes within the Agriculture and Forest categories were not captured; for example updates were not made to whether forested land is deciduous or evergreen or whether agricultural land is cropland or pasture.
- This is a Generalized Land Use/Land Cover layer
- Data are not directly comparable to the previously released 2002 data set.



# FUTURE PLANS

- Update around 2015
- Working on alternate approaches focusing on data sharing and coordination using NAIP or other high resolution imagery
- Incorporate local land use/land cover data where available

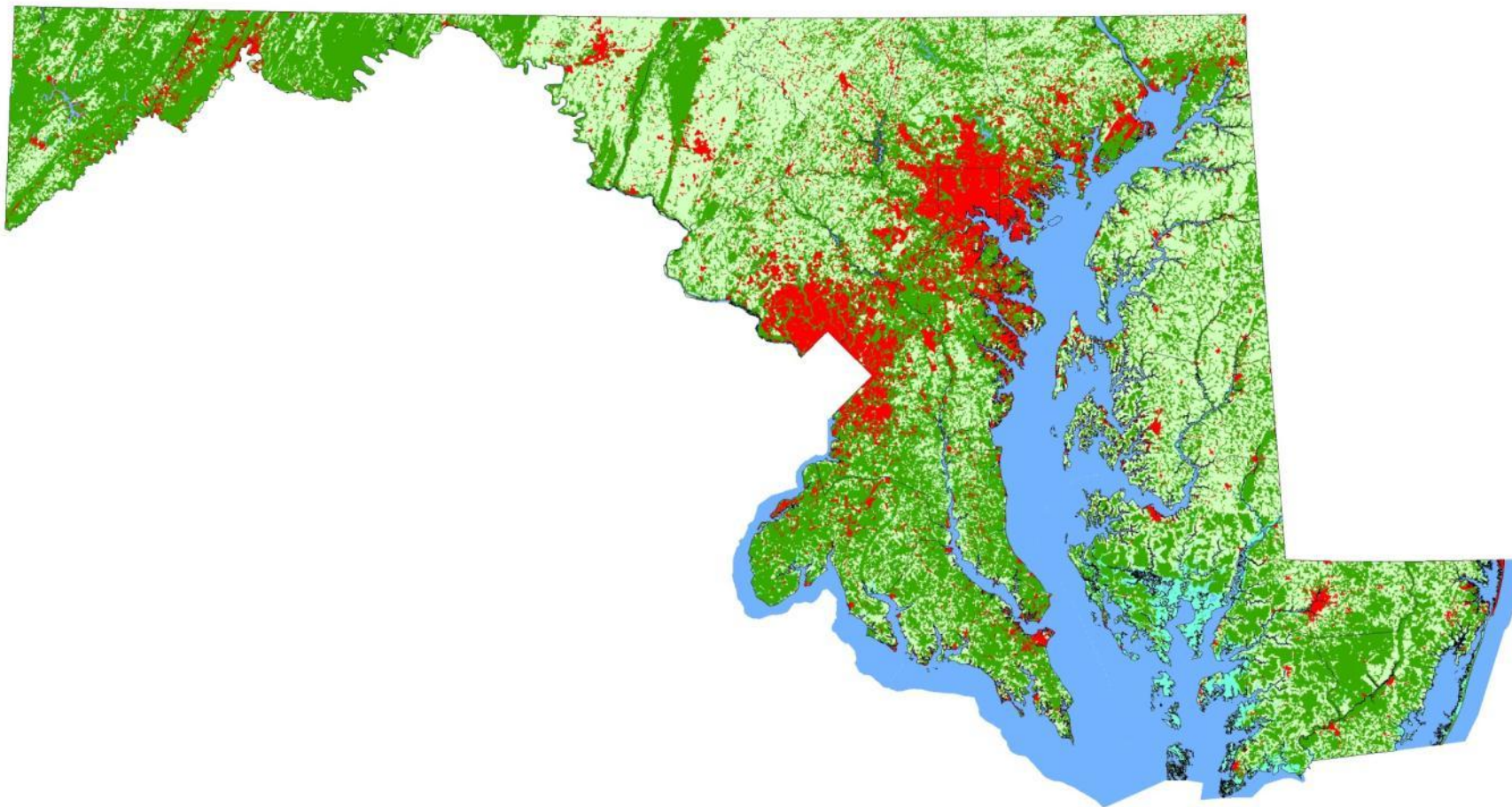




# ANALYSIS

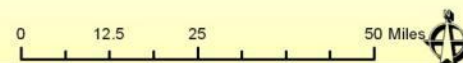


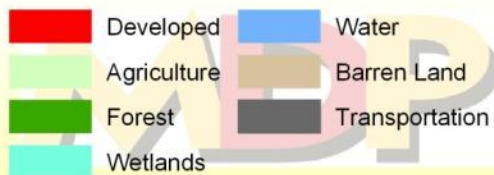
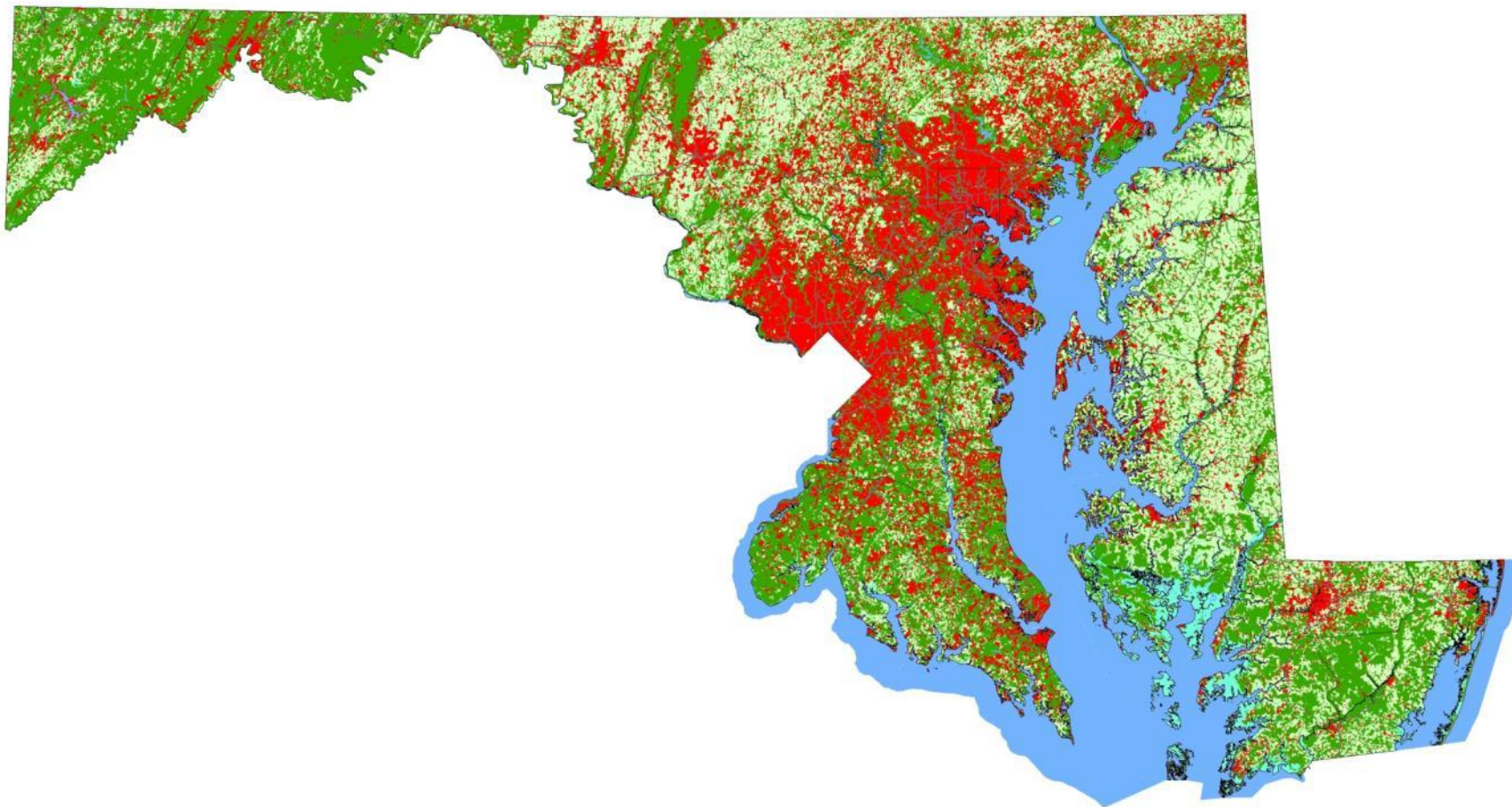
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### State of Maryland 1973 Land Use/ Land Cover

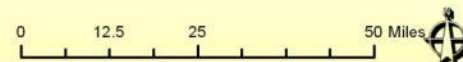
Maryland Department of Planning  
Land Use Planning and Analysis Division  
Map Created April 2011





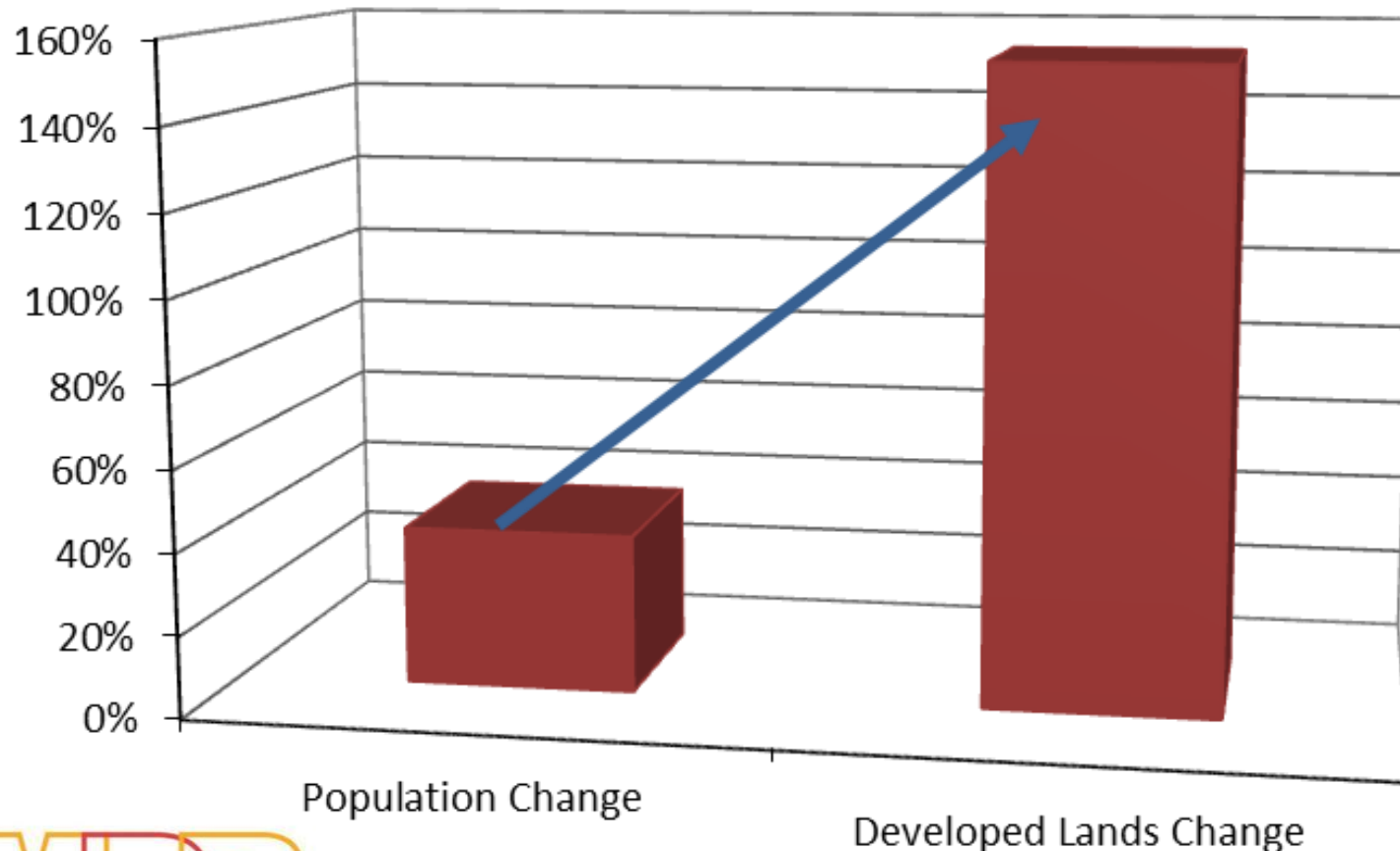
**2010** State of Maryland  
Land Use/ Land Cover

Maryland Department of Planning  
Land Use Planning and Analysis Division  
Map Created April 2011

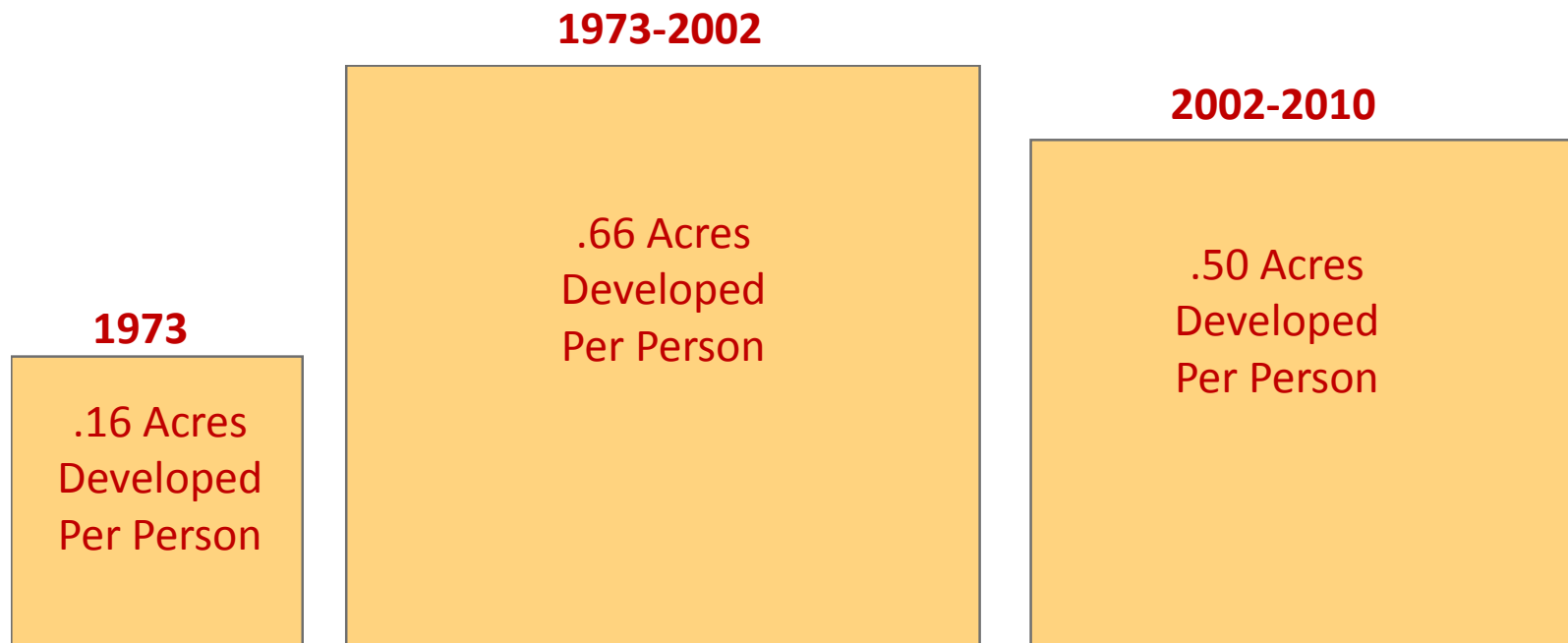


# *THE RATE OF DEVELOPMENT IN MARYLAND CONTINUES TO OUTPACE POPULATION GROWTH.*

Percent Change in Population & Developed Land  
1973-2010

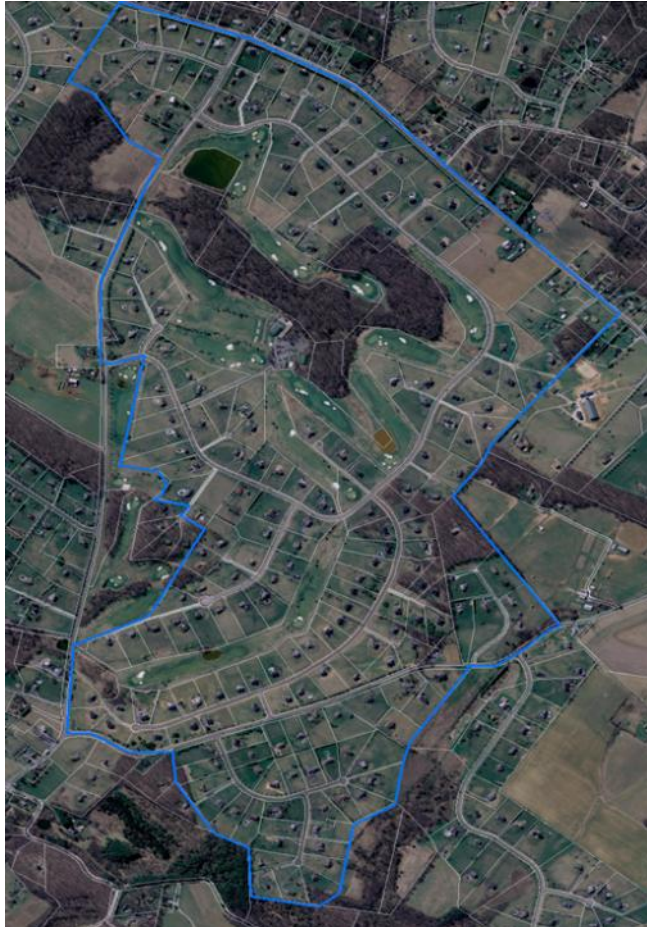


***THE NUMBER OF DEVELOPED ACRES PER  
PERSON HAS INCREASED BY MORE THAN 80  
PERCENT SINCE 1973.***





# LARGE LOT DEVELOPMENT CONTINUES TO DOMINATE OUR LANDSCAPE, COMPRISING MORE THAN HALF OF DEVELOPED LANDS.



Large lot development has consumed 879,000 acres, roughly half of the total developed land while only accommodating 15 percent of the State's total housing units. This is equivalent to the combined land area of Anne Arundel, Baltimore and Howard counties. **Needs to be better incorporated into 2017 model revision.**

# DEVELOPMENT ON SEPTIC SYSTEMS

- Parcel database
  - Maryland has a statewide parcel database that includes tax assessment information
  - Developed parcels can be selected from that database and related to sewer data
- Local Sewer Service maps
  - Locals share sewer service area data/maps
  - All improved parcels outside of “Existing Sewer Service” are assumed to be on septics



# Anne Arundel County Sewer Service Areas

A. Butler  
November 2012  
Maryland Department of Planning



## SEWER SERVICE CATEGORIES:

-  S1 - Existing Service Area
-  S-2 - Capital Facilities Areas (Within 6 Years)
-  S-3 - Planned Service Areas (Within 6 to 20 Years)
-  S4 - Future Service Areas (Programmed for Future Growth)
-  Other - Other Public or Private Service Entity
-  NP - No Planned Service

0 10 20 Miles



**Policy**

-Growth Print  
- Ag. Print  
- Green Print

**Data Input**

Parcels

Local  
ZoningProtected  
Lands

Land Use

Sewer

**Land Use Model**

Growth  
Simulation  
Model

**Scenarios**

-Trends  
- Smart Growth

**Statewide Impact Analysis**

Land Use  
Holding Capacity

Transportation  
VMT  
Green House Gas

Land Preservation  
Fragmentation  
Ag. Land Tracking

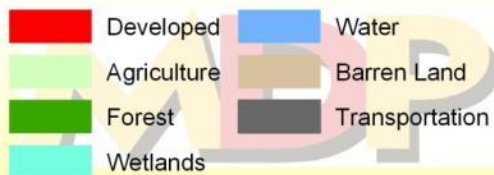
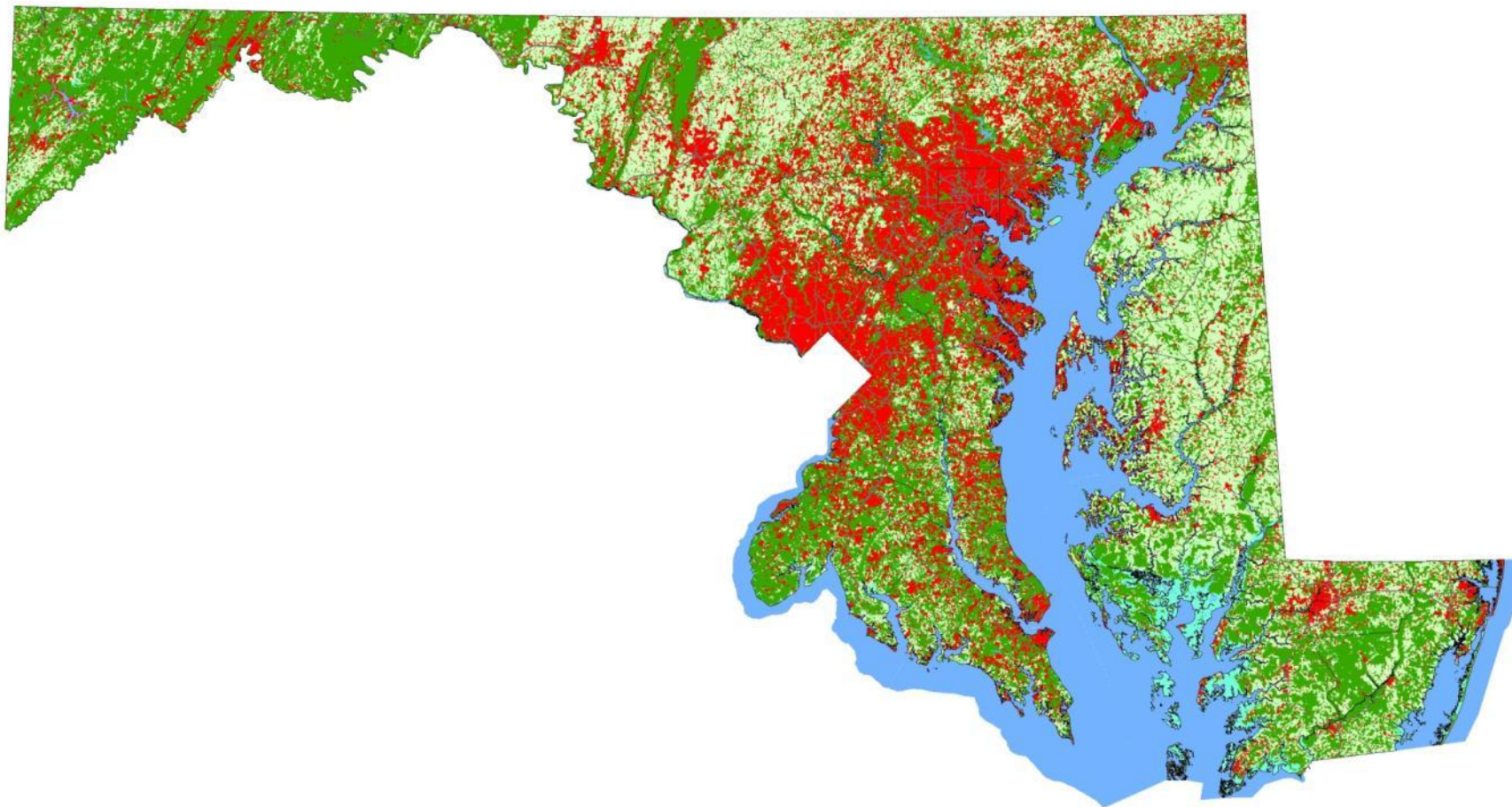
Water Quality  
Nutrient Loading  
Stormwater Runoff

Housing  
Affordability

Sustainable

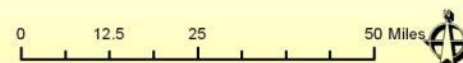
**MDP**



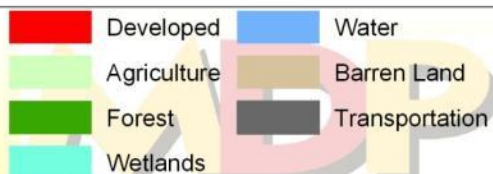
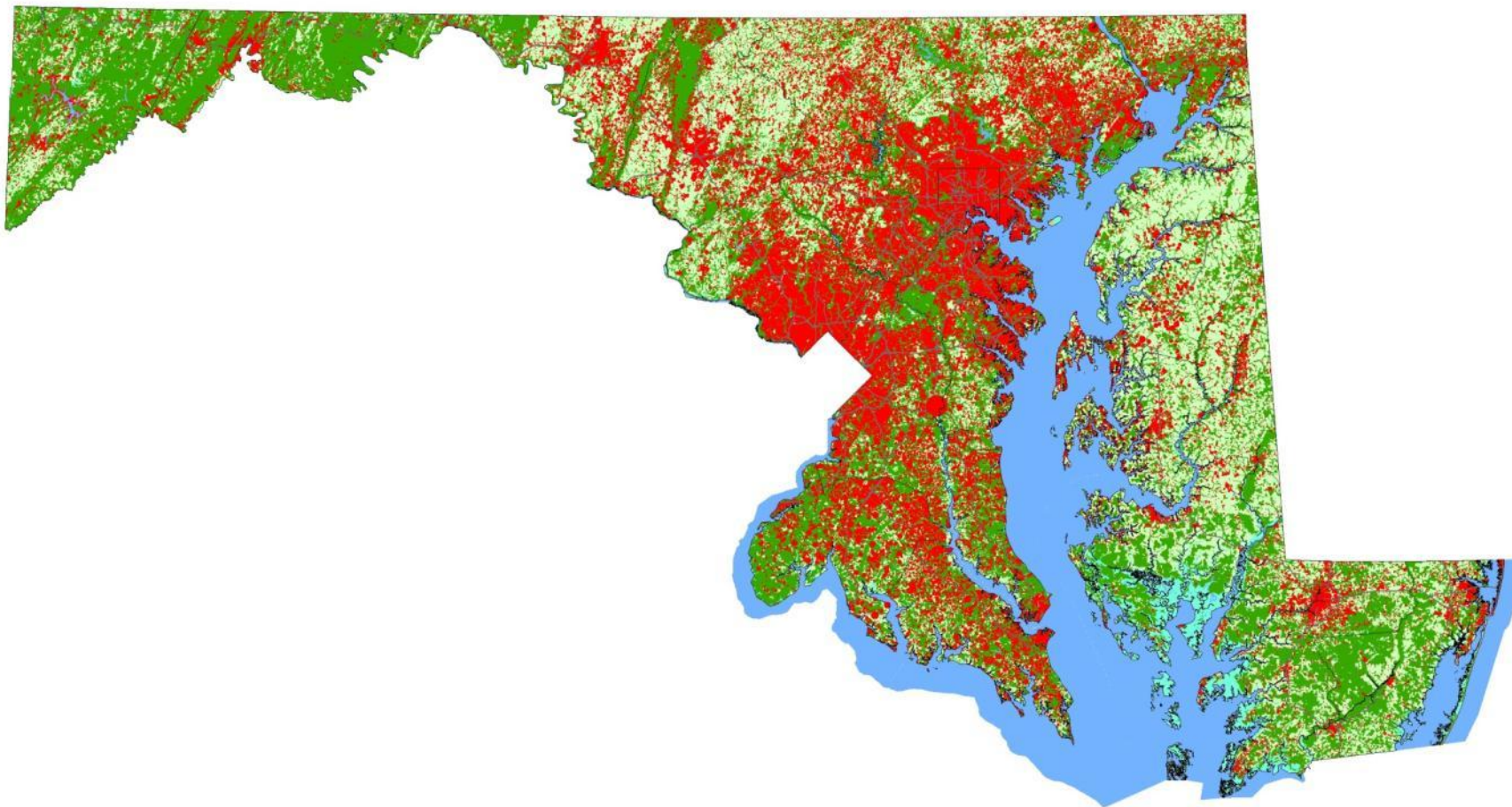


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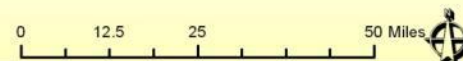


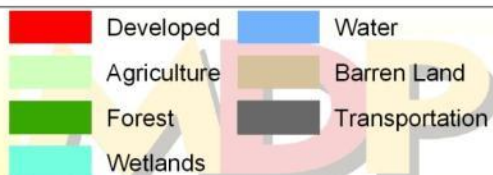
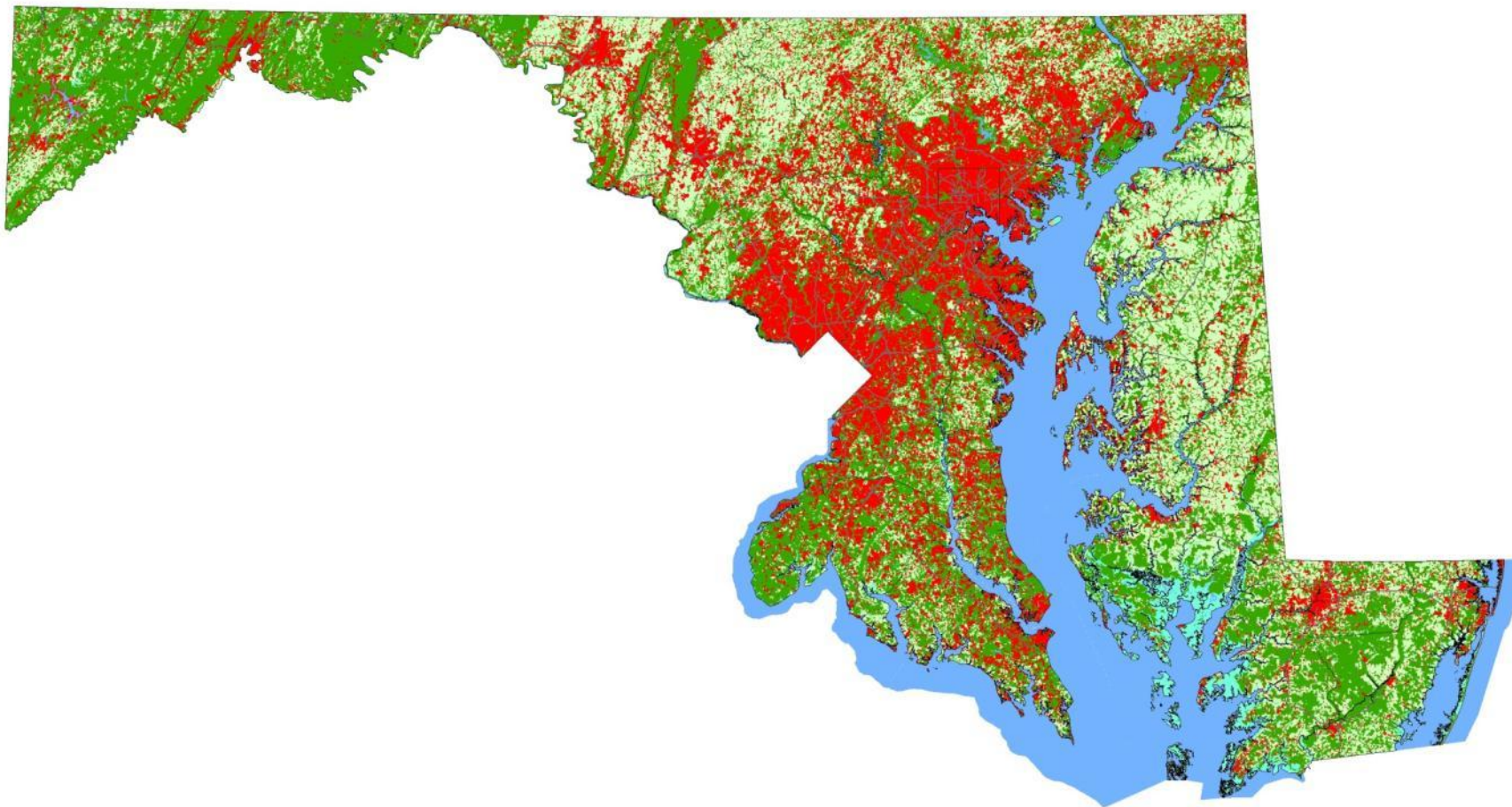




# State of Maryland Development, 2035 Current Trends Scenario

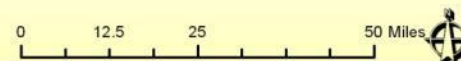
Maryland Department of Planning  
Land Use Planning and Analysis Division  
Map Created April 2011





# State of Maryland Development, 2035 Smart Growth Scenario

Maryland Department of Planning  
Land Use Planning and Analysis Division  
Map Created April 2011



# MDE GIS DATASETS

- GIS datasets accessible to MDE
  - Collected from local jurisdictions/permitted stormwater entities; varies per local jurisdiction/entity
    - Impervious Cover
    - LULC
    - Storm Drain Systems
    - Outfalls
    - Inlets
    - BMPs
    - BMP Drainage Areas
    - CIPs
    - Right-of-Way

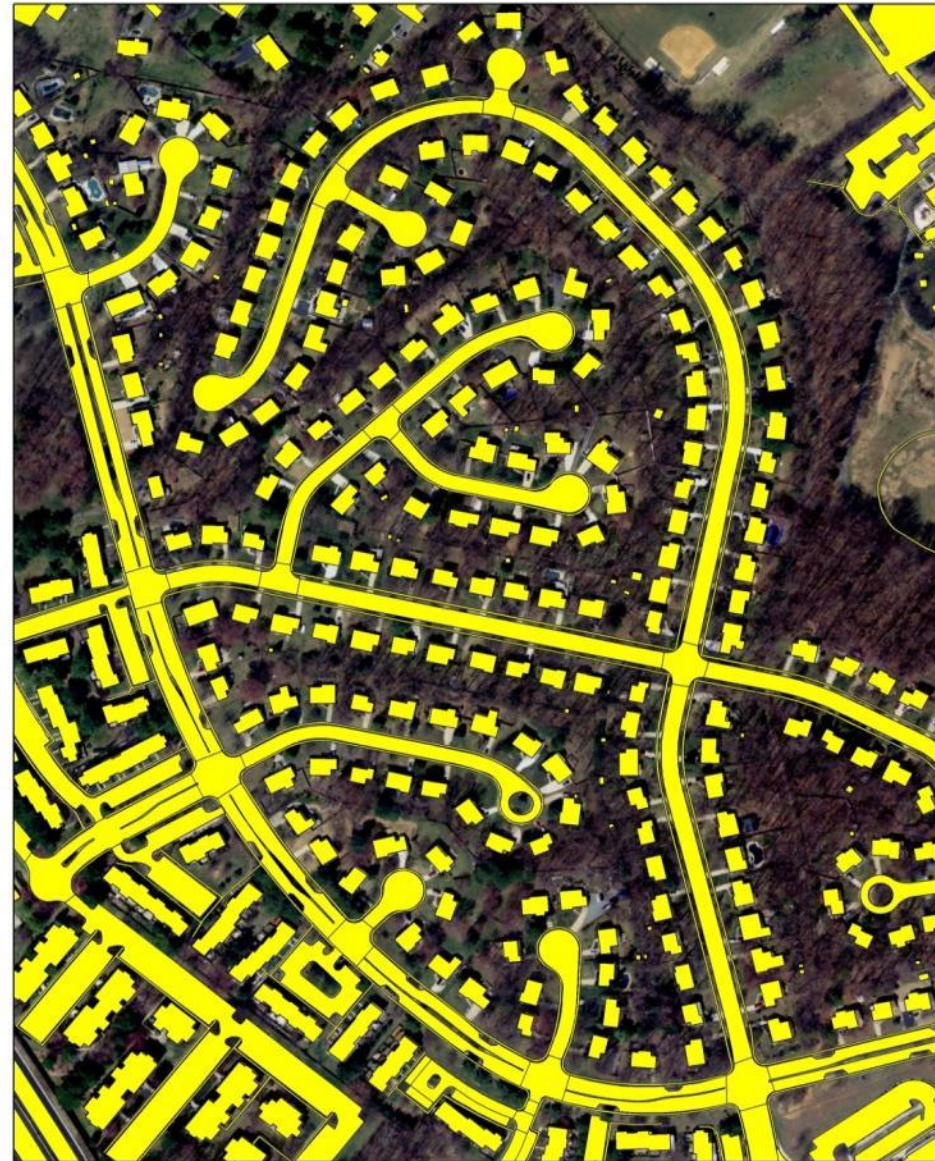
# IMPERVIOUS COVER DATASETS

- MDE currently has access to the following local impervious cover datasets
  - Phase I MS4s
    - Anne Arundel County
    - Baltimore County
    - Baltimore City
    - Harford County
    - Montgomery County
    - Prince George's County
    - Maryland State Highway Administration
      - *Missing data from: Frederick, Carroll, Howard, and Charles Counties.*
  - Phase II MS4s and Non-MS4s
    - Worcester County
    - Potentially more counties with available data without required reporting



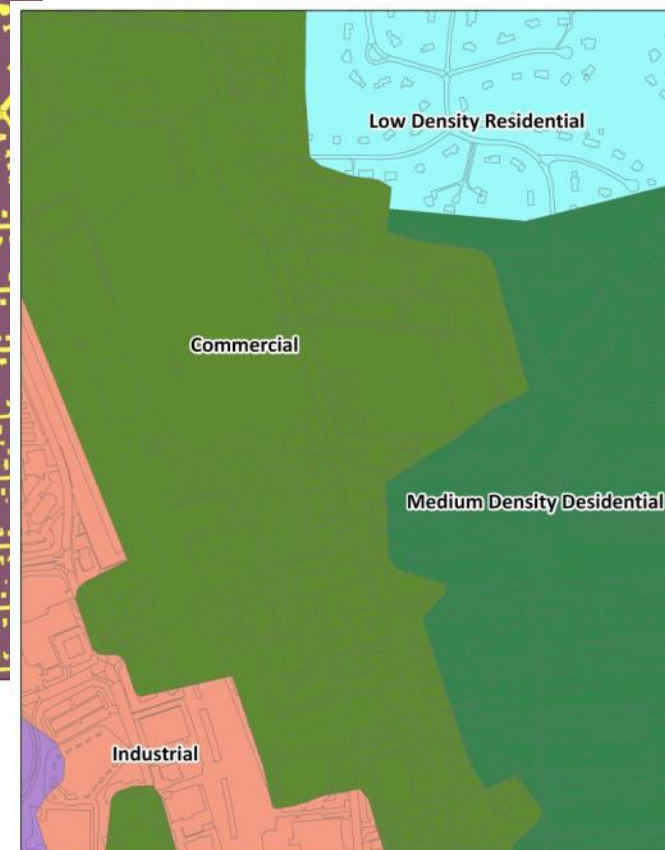
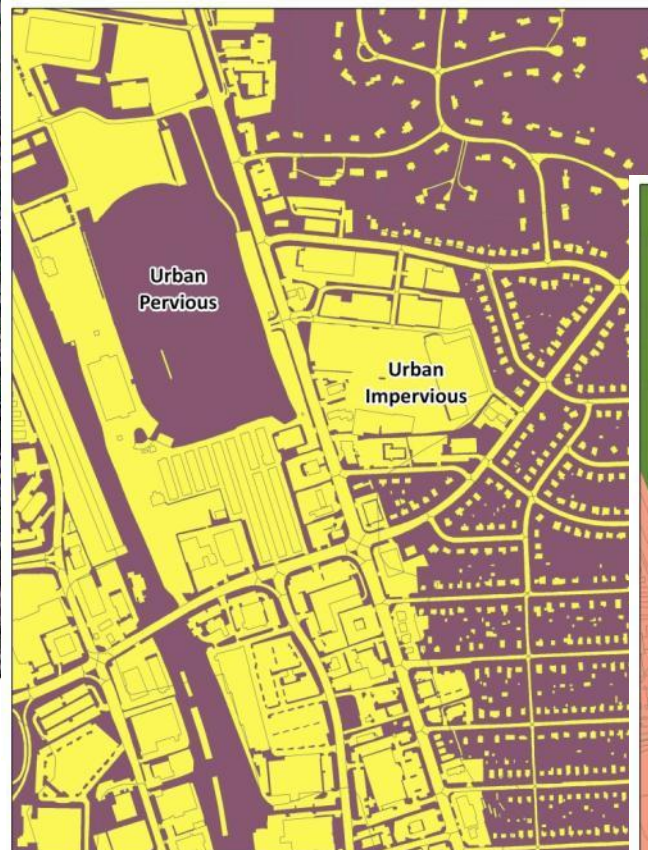
# MONTGOMERY COUNTY EXAMPLE

## IMPERVIOUS COVER



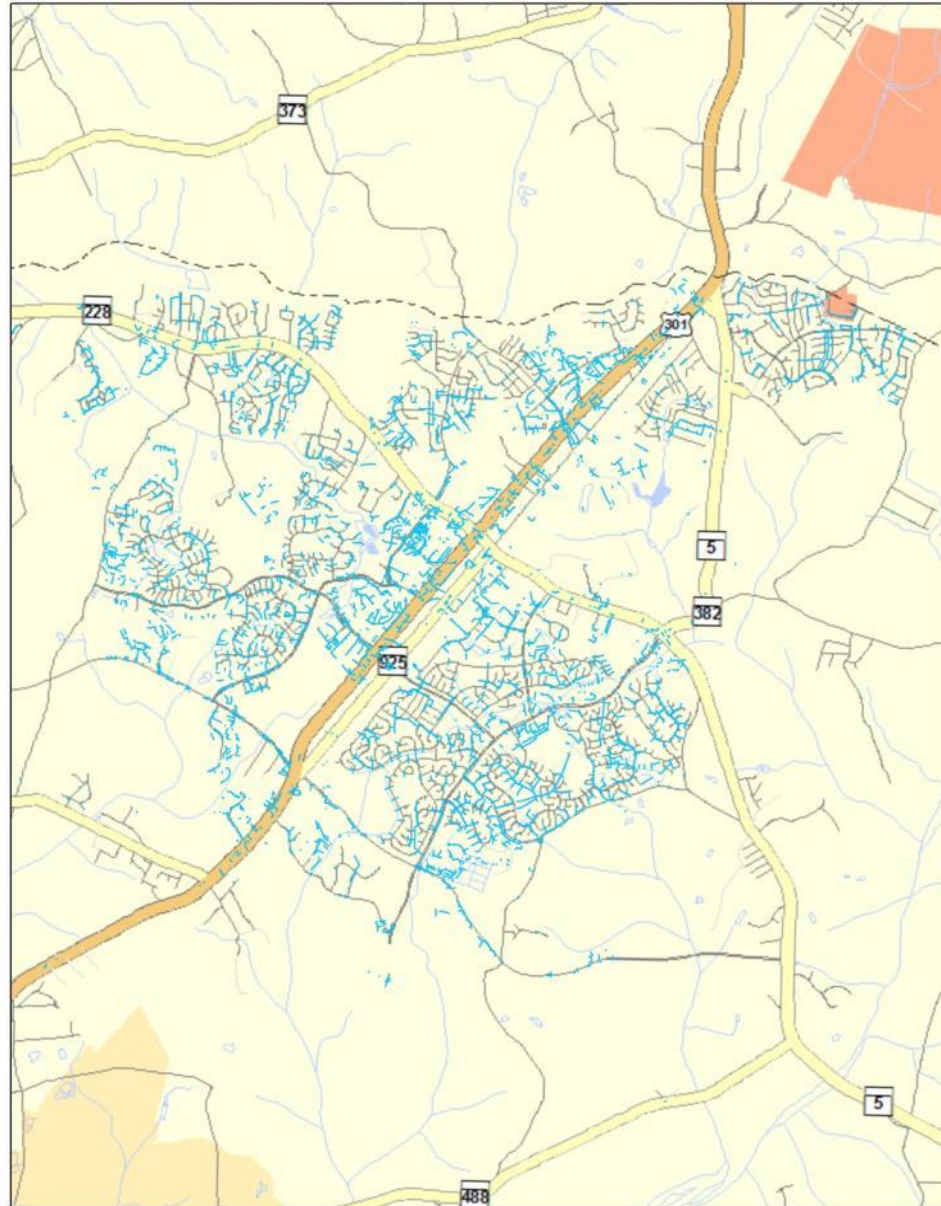


# BALTIMORE COUNTY LU/LC EXAMPLE





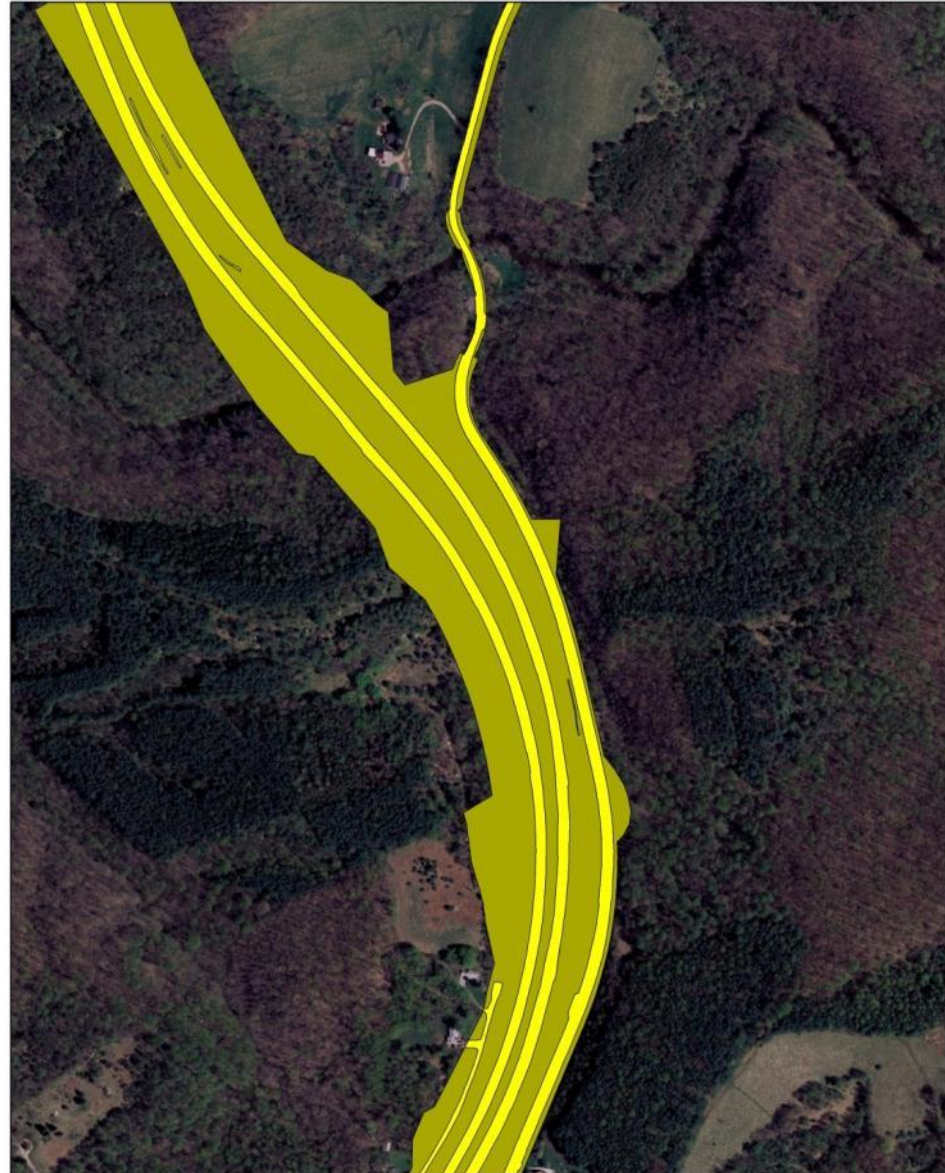
# CHARLES COUNTY STORM DRAIN EXAMPLE





# STATE HIGHWAY ADMINISTRATION

## RIGHT-OF-WAY EXAMPLE



# POTENTIAL APPLICATIONS

- Land Cover/Land Use Classification
  - Impervious Cover - MDE priority for incorporation into the 2017 model revision from local jurisdictions
  - Local LU/LC
- Connected vs. Disconnected Impervious
  - Classify based on runoff/drainage type
    - Storm Drain Systems
    - Outfalls
    - Inlets
- Regulated vs. Non-regulated
  - Classify based on stormwater permits and local data
    - Impervious Cover
    - Storm Drain Systems
    - Right-of-Way



# QUESTIONS?



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