# ICE Analysis Training Program

**Module 5:**
**How to Prepare the Analysis and Reach ICE Analysis Conclusions**

# ICE Analysis Training Program

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SHA State Highway Administration
Maryland Department of Transportation

## Overview

- **Introduction**
- **Levels of ICE Analysis**
- **Data Collection**
- **Regulations/Laws**
- **Map Environmental Resources and Land Use (Module 4)**
- **Identify Methodologies/Conduct Analysis**
- **How to Reach ICE Analysis Conclusions**

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## Introduction

- **The analysis phase begins following SHA's request for concurrence on Alternatives Retained for Detailed Study.**
- **Varying levels of analysis (detail) may be used for different types of projects. (The level of detail will be dependant on the complexity of the project and the extent of impacts.)**
- **Analysis results may be quantitative and / or qualitative.**
- **It is important to consider regulatory programs in the analysis.**
- **The ICE Analysis results for Alternatives Retained for Detailed Study are included in the draft and final environmental document.**

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## Introduction

### KEY POINTS TO REMEMBER

**Do not develop predictive models to fill in data gaps. Instead, use "existing readily available" data.**

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## Introduction

### DEVELOPING SHA'S ICE ANALYSIS CONSULTANT TEAM

- **It is recommended that the consultant responsible for conducting direct impact analyses also conduct the ICE Analysis to ensure compatibility of findings for direct, indirect and cumulative impacts. (This is particularly important for Socio-Economic information related to land use data, master/sector plans and transportation projects).**

- **If different natural environmental, cultural and socio-economic consultants are used, it is important that land use data layers be transmitted by the socio-economic consultant to the other consultants for analysis consistency.**

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## Introduction

### DEVELOPING SHA'S ICE Analysis CONSULTANT TEAM – CONTINUED

- **Conduct an early team coordination meeting if multiple consultants are being used to conduct the ICE Analysis. This will avoid duplication of the work effort and help ensure consistency.**

- **In situations where there are multiple consultants, the consultants should reach agreement on the past, present and future land use scenarios prior to conducting the analysis.**

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## Introduction

- **Refinement of ICE Analysis Boundaries**
  - **Prior to conducting the ICE Analysis technical analysis, it may be necessary to adjust the ICE Analysis geographical boundary based upon agency coordination and/or new information learned collecting land use information.**
  - **Any adjustments to the ICE Analysis geographical boundary should be completed prior to undertaking any of the analytical methodologies proposed to assess impacts within the ICE Analysis boundary.**

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## Levels of ICE Analysis


**The level of ICE Analysis should be tailored to the project type. The following factors are considered in determining the level of analysis:**

- **Availability of Data**
  - **Limit quantitative analysis to resources having readily available quantitative data.**
  - **Conduct qualitative analysis for resources lacking readily available quantitative data.**
  - **Document the rationale for the level of analysis conducted**

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## Levels of ICE Analysis

- **Presence of Direct or Indirect Impacts**
  - **If project alternatives do not result in direct or indirect effects on a resource, no further analysis is necessary although documentation must occur.**
- **Resources within the ICE Analysis Boundary**
  - **If Indirect or cumulative effects for a resource are not relevant to decisions about the proposed action, it is not necessary to perform ICE Analysis for that resource (e.g. soils and geology).**

Determine Level of ICE Analysis Analysis → Collect Resource Data → Identify Regulatory Programs → Map Resources & Land Use (Module 4) → Identify Methodologies/ Conduct Analysis

## Determining Cumulative Effects

**STEP 1**

**Identify where additional build-out can occur based on:**
- **Land Use**
- **Zoning**

**STEP 2**

**Identify the existing urban environment**

**STEP 3**

**Identify where build-out cannot occur because of environmental constraints or growth controls**

**STEP 4**

**Identify the remaining developable areas, which is the difference of the first three steps: 1-(2+3)**

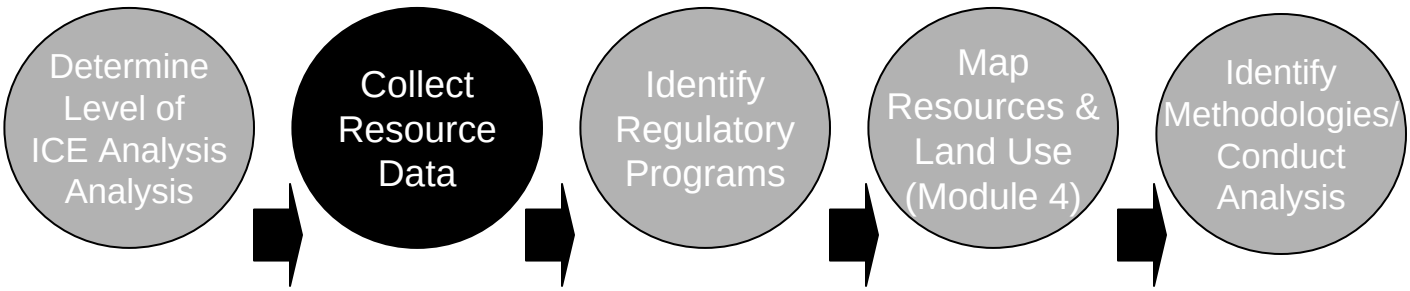
Resources in the areas determined in **Step 4** are those that may incur cumulative effects

# ICE Analysis Training Program

**Module 5:**
**How to Prepare the Analysis and Reach ICE Analysis Conclusions**

## Data Collection

- **Collect Appropriate Data**
  - **It is necessary to collect data prior to performing any of the analytical methodologies necessary to assess indirect and cumulative effects. Some of this data may have been collected in the initial scoping process. The data available will often determine which analysis methodology can be used.**



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## Regulations/Laws

### Regulatory Programs

- **Certain regulatory programs, (i.e., wetlands and public parklands) essentially provide a degree of protection from direct impacts to applicable resources due to the fact that they have "teeth" and contain mitigation requirements. This is especially important when conducting trends analysis. Predicting a future condition based on a past trend should factor in how recent laws and regulations will alter the trend of impacts to a particular resource. These programs should be considered in the analysis portion of the ICE Analysis.**

Determine Level of ICE Analysis Analysis → Collect Resource Data → **Identify Regulatory Programs** → Map Resources & Land Use (Module 4) → Identify Methodologies/ Conduct Analysis

# ICE Analysis Training Program

**Module 5:**
**How to Prepare the Analysis and Reach ICE Analysis Conclusions**

## Regulations/Laws

| Regulatory Program | Agency Having Jurisdiction | Applicable Resource |
|---|---|---|
| County Flood Management Ordinances | County Planning Offices or Departments of Environmental Resources | Floodplains |
| 1991 State Forest Conservation Act | DNR - administered by local government | Forests |
| County Forest Conservation Act | County Planning Offices or Department of Environmental Resources | Forests |
| 1973 Endangered Species Act (Federal) | USFWS, DNR Wildlife and Heritage Division | Rare, Threatened and Endangered Species |
| 1973 Maryland Endangered Species Act (State) | Counties (private lands within Critical Areas) | |
| 1975 Maryland Nongame and Endangered Species Conservation Act (State) | | |
| Maryland Agricultural Land Preservation Program and Transfer of Development Rights (TDR) Program | County Planning Offices or Department of Environmental Protection | Active Farmland |
| County Agricultural Land Preservation Ordinances | | |
| 1966 National Historic Preservation Act (Section 106) | Maryland Historical Trust | Historic and Archaeological Sites |
| 1966 National Historic Preservation Act (Section 110) | Advisory Council on Historic Preservation | |
| Archeological and Historic Preservation Act | | |
| Archeological Resources Protection Act | | |
| Maryland Historic Preservation Act | | |
| * U.S. Department of Transportation Act of 1966, Section 4(f) | FHWA | Public Parks, Historic Sites, Recreational Areas and Wildlife Refugees |

* Note that Section 4(f) only applies to federally funded transportation projects

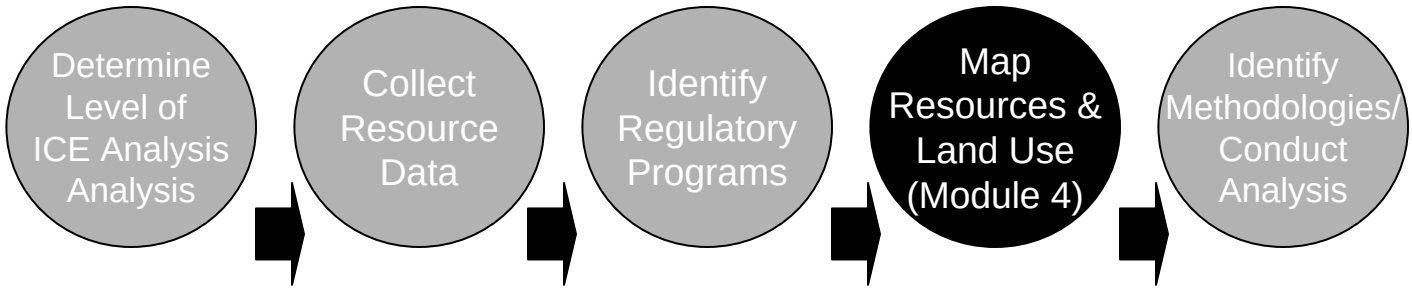
## Regulations/Laws

| Regulatory Program | Agency Having Jurisdiction | Applicable Resource |
|---|---|---|
| Code of Maryland Regulations (COMAR) 26. 08. 02 | Maryland Department of the Environment (MDE) | |
| Stormwater Management Program | MDE - delegated to Counties | Surfacewater Quality |
| Soil Erosion and Sediment Control Act | Soil Conservation Districts | |
| Individual Well and Septics Program | MDE | Groundwater Quantity (withdrawl) and Quality (discharges) |
| Individual Onsite Sewage Systems and Private Wells | County Health Department | |
| 1970 Tidal Wetlands Act | MDE | Tidal Wetlands |
| 1989 Nontidal Wetlands Protection Act | MDE | Nontidal Wetlands |
| Water Quality Certification Program (Section 401 of the CWA) | MDE | Wetlands |
| 1972 Coastal Zone Management Act | MDE | Wetlands |
| 1972 Federal Water Pollution Control Act, as amended by 1977 CWA (Section 404) | US Army Corps of Engineers (ACOE) and US Environmental Protection Agency (USEPA) | Wetlands |

## Map Environmental Resources and Land Use

### Mapping Resources and Land Use

- **Mapping environmental resources and land use within the ICE Analysis boundary provides a base from which many of the analytical methodologies can be performed. As highlighted in Module 4, land use mapping should be prepared for past, present and future time frames. This step must be conducted prior to performing the analyses.**



# ICE Analysis Training Program

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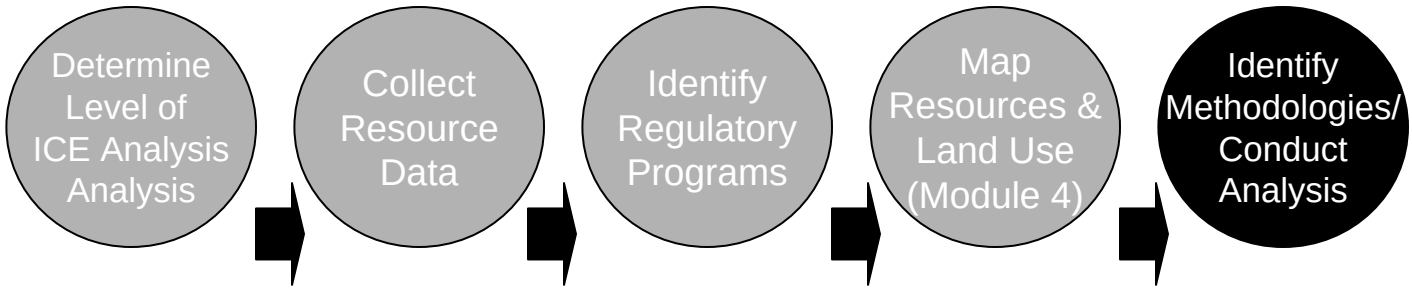
## Identify Methodologies & Conduct Analysis

**Basic ICE Analysis methodologies:**

- **trends analysis**
- **overlay analysis**

Displaying this information in **matrices** and supplementing technical data with **interviews** is used were appropriate.



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**Module 5:**
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## Identify Methodologies & Conduct Analysis

- **Integrating different ICE Analysis methodologies for different resources can be used within a ICE Analysis geographical boundary. For example:**
  - **Trends (qualitative analysis) for wetland losses in a watershed or sub-watershed basin can be applied to the ICE Analysis boundary to assess past, and possibly future, impacts to wetlands.**
  - **Overlays (quantitative analysis) of existing land use/land cover maps can be combined with future land use maps to assess future forest effects. Note that it is possible to perform qualitative and quantitative analysis on the same resource.**
- **These methodologies can be used together to assess cumulative effects to a single resource. For example:**
  - **Quantitative GIS and qualitative trend results from different years can be compared to identify past, present, and future resource loss trends.**

# ICE Analysis Training Program

**Module 5:**
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## Identify Methodologies & Conduct Analysis

### RATIONALE FOR DETERMINING ICE ANALYSIS METHODOLOGIES

**The methodologies to use for a particular resource should be based on:**

- **availability of data (use existing, readily available data).**
- **appropriateness of the data to the ICE Analysis study area. Document what scale or geographical unit is available for each data source (i.e., state level, county level, census tract level, etc.)**
- **ease of manipulating mapped data (overlays).**
- **past or future impacts (overlays often cannot be used to assess past impacts because mapping of past resources may not be available).**
- **impact of regulatory programs (especially regarding future impacts).**



## Identify Methodologies & Conduct Analysis

### TRENDS ANALYSIS

- **Trends analysis is the comparison of historic data to determine the historic loss and / or projected future resource effects.**

- **Reports and studies gathered from various sources may have important information on past effects to resources within the ICE Analysis boundary. Note: Care must be taken in application of regional/statewide trends data to a smaller ICE Analysis boundary.**

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## Identify Methodologies & Conduct Analysis

Sample Trends Analysis Process

Identify resource to be analyzed

Identify years to be analyzed

Past to Present Time Frame

| 1970 | 1980 | 1990 | 2000 |
|---|---|---|---|
| Obtain Data Sources | Obtain Data Sources | Obtain Data Sources | Obtain Data Sources |
| Identify Resource Loss/ Gain | Identify Resource Loss/ Gain | Identify Resource Loss/ Gain | |

**Identify Trends**

Apply trends to the future timeframe considering the influence of resource protection legislation



## Identify Methodologies & Conduct Analysis

### OVERLAY ANALYSIS

- **Quantitative or qualitative analysis entails overlaying present and future land use maps over existing resources to determine present and future effects. Can be used to determine past impacts, provided past resource mapping is available.**

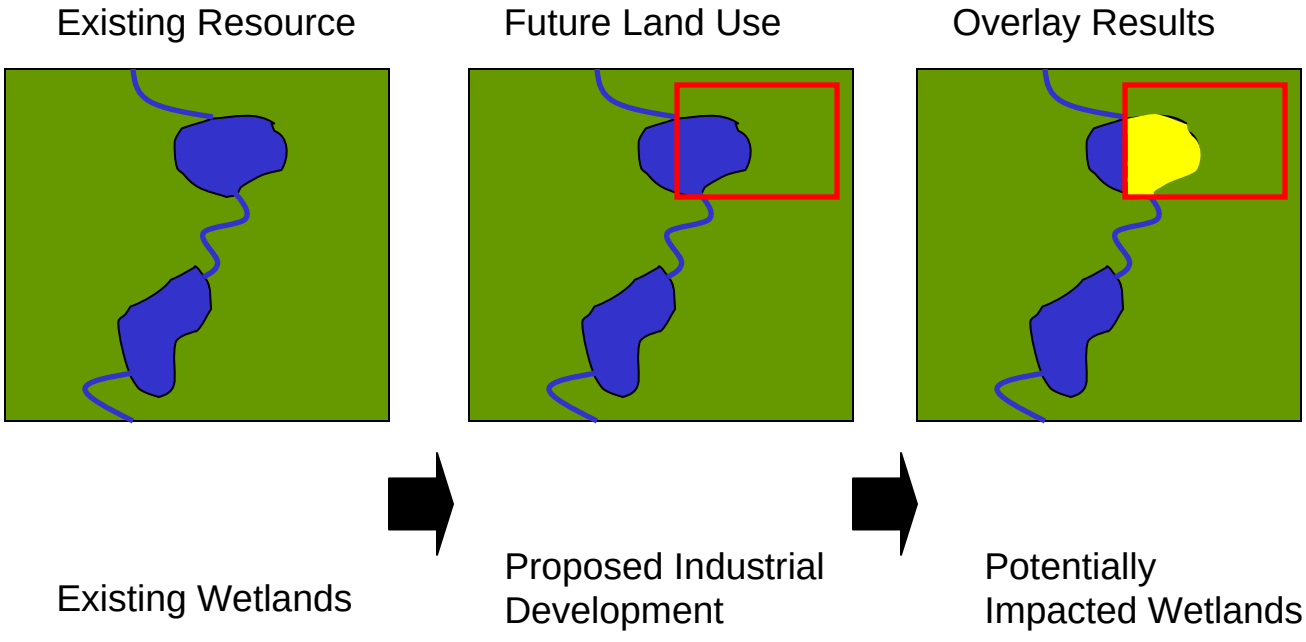
- **Overlays can be used to develop trends, which, in turn, can be used to project likely future effects. Remember to consider regulatory programs in projecting future effects.**

- **Sources of mapped data for determining past resource impacts include NWI/DNR wetlands mapping (wetlands), and aerial photography (forests, RTE species habitat, and active farmland).**

## Identify Methodologies & Conduct Analysis

### OVERLAY ANALYSIS - CONTINUED

- **Overlay your future land use map upon an existing resource such as wetlands, floodplains, farmlands, woodlands and cultural resources. Identify where there is overlap between the resource and the future land use. The overlap between the resource and the future land use is your total impacted area.**



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## Identify Methodologies & Conduct Analysis

*Sample Wetlands Overlay Analysis*

| Past | Present | Future |
|---|---|---|
| **Data Sources** | **Data Sources** | **Data Sources** |
| • *1970 wetlands mapping* | **Land Use** | **Land Use** |
| • *1990 wetlands mapping* | • *Existing land use map* | • *Future land use map* |
| | • *Proposed near future (1 - 5 yrs) development* | • *Updated existing land use map* |
| | **Resources** | **Resources** |
| | • *1990 wetlands mapping* | • *1990 wetlands mapping* |
| **Analysis Methodology** | **Analysis Methodology** | **Analysis Methodology** |
| • *Overlay 1970 wetlands mapping with 1990 wetlands mapping* | • *Update existing land use map with proposed near future development* | • *Overlay your future land use map with the updated existing land use map to identify potential new development areas* |
| | • *Overlay updated existing land use map with the 1990 wetlands mapping* | • *Overlay the new development areas with the 1990 wetlands mapping* |
| | • *Factor in Regulations* | • *Factor in Regulations* |
| *Estimated wetlands loss/gain for past time frame* | *Estimated wetlands loss/gain for present time frame* | *Estimated wetlands loss/gain for future time frame* |

## Identify Methodologies & Conduct Analysis

### MATRIX ANALYSIS

- **Matrices alone cannot quantify effects, but they are a useful means of presenting and manipulating quantitative results of trends analysis or overlay process.**

- **Matrices can be used to show/illustrate trends of impacts to resources. For example, wetland impacts can be shown for pre- and post-regulation time frames to highlight the effects of regulatory programs.**

## Identify Methodologies & Conduct Analysis

### INTERVIEWS

- **Expert interviews are most useful where "hard" data is not readily available and may potentially be the most accurate and efficient method for assessing impacts to certain resources. Interviews can also be used to gather background data in the ICE Analysis boundary.**

## Identify Methodologies & Conduct Analysis

### Interviews - continued

| Expert Interview Sources | Information Provided |
|---|---|
| USGS Water Resource Specialists | groundwater quality problem areas, centralized sewer/water service areas, historic groundwater quality data, past and current stresses and impacts to groundwater resources. |
| County Health Dept Staff | |
| USFWS and MD -DNR Wildlife and Heritage Division | habitat requirements, sighting locations and critical habitat areas for R/T/E species and forest interior birds species, past, present and anticipated stresses and impacts to these species. |
| County Land Use Planners | existing and proposed centralized sewer/water service areas, future land use plans, open space proposals, demographic data and proposed developments. |
| USDA, SCS Soil Scientists/Agricultural Agents | trends in farmland acreage losses, information on farmland preservation programs. |
| County Engineers | trends in floodplain losses, information on County floodplain ordinances. |
| Local/County Historians | historic and archeological sites of local/county significance, past and current stress and impact to cultural resources. |

# ICE Analysis Training Program

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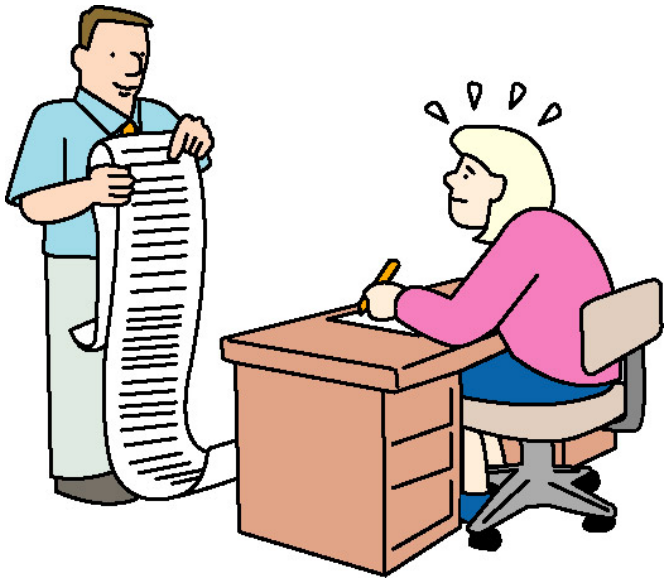
## How to Reach ICE Analysis Conclusions

**The ICE Analysis should "count what counts." The ICE Analysis "should not produce superficial analysis of a long laundry list of issues that have little relevance to the effects of the proposed action on the eventual decisions" (CEQ's Considering Cumulative Effects under the National Environmental Policy Act.)**



## How to Reach ICE Analysis Conclusions

### KEY POINTS TO REMEMBER

**Be sure to document all indirect and cumulative effects. Concluding that there are Indirect and cumulative effects is part of the overall ICE Analysis process, so be sure to document when they occur. Keep the purpose of identifying and documenting, even if qualitatively, any of these effects at the forefront of your ICE Analysis process.**

## How to Reach ICE Analysis Conclusions

### FACTORS TO CONSIDER

- **Draw on experience of project team members to reach ICE Analysis conclusions.**
- **Document when there is not sufficient data to analyze effects on a particular resource.**
- **Do not arbitrarily present data if no conclusions can be drawn.**
- **Use tables (matrices) to help you interpret data.**

## How to Reach ICE Analysis Conclusions

### FACTORS TO CONSIDER

- **Existing and proposed regulatory controls and how these controls will affect past, present and future impacts to resources.**
- **Local, county and state planning initiatives. (Smart Growth, County Master Plans/Zoning)**
- **Local preservation programs in place or proposed. (farmland preservation, open space preservation, etc.)**
- **Future private development proposals and associated land use changes.**

## Resources To Be Considered in the Impact Analysis in the Evaluation of Indirect and Cumulative Effects

| Regulatory Program | Agency Having Jurisdiction | Applicable Resource |
|---|---|---|
| County Flood Management Ordinances | County Planning Offices or Departments of Environmental Resources | Floodplains |
| 1991 State Forest Conservation Act | DNR - administered by local government | Forests |
| County Forest Conservation Act | County Planning Offices or Department of Environmental Resources | Forests |
| 1973 Endangered Species Act (Federal) | USFWS, DNR Wildlife and Heritage Division | Rare, Threatened and Endangered Species |
| 1973 Maryland Endangered Species Act (State) | Counties (private lands within Critical Areas) | |
| 1975 Maryland Nongame and Endangered Species Conservation Act (State) | | |
| Maryland Agricultural Land Preservation Program and Transfer of Development Rights (TDR) Program | County Planning Offices or Department of Environmental Protection | Active Farmland |
| County Agricultural Land Preservation Ordinances | | |
| 1966 National Historic Preservation Act (Section 106) | Maryland Historical Trust | Historic and Archaeological Sites |
| 1966 National Historic Preservation Act (Section 110) | | |
| Archeological and Historic Preservation Act | Advisory Council on Historic Preservation | |
| Archeological Resources Protection Act | | |
| Maryland Historic Preservation Act | | |
| * U.S. Department of Transportation Act of 1966, Section 4(f) | FHWA | Public Parks, Historic Sites, Recreational Areas and Wildlife Refugees |

## Resources To Be Considered in the Impact Analysis in the Evaluation of Indirect and Cumulative Effects (continued)

| Regulatory Program | Agency Having Jurisdiction | Applicable Resource |
|---|---|---|
| Code of Maryland Regulations (COMAR) 26. 08. 02 | Maryland Department of the Environment (MDE) | |
| Stormwater Management Program | MDE - delegated to Counties | Surfacewater Quality |
| Soil Erosion and Sediment Control Act | Soil Conservation Districts | |
| Individual Well and Septics Program | MDE | Groundwater Quantity (withdrawl) and Quality (discharges) |
| Individual Onsite Sewage Systems and Private Wells | County Health Department | |
| 1970 Tidal Wetlands Act | MDE | Tidal Wetlands |
| 1989 Nontidal Wetlands Protection Act | MDE | Nontidal Wetlands |
| Water Quality Certification Program (Section 401 of the CWA) | MDE | Wetlands |
| 1972 Coastal Zone Management Act | MDE | Wetlands |
| 1972 Federal Water Pollution Control Act, as amended by 1977 CWA (Section 404) | US Army Corps of Engineers (ACOE) and US Environmental Protection Agency (USEPA) | Wetlands |

## Land use / zoning Controls on Development

### MARYLAND SMART GROWTH INITIATIVES

- Priority Funding Areas (PFA's)
- Priority Places

### LOCAL ZONING ORDINANCES (COUNTY LEVEL)

### COMPREHENSIVE PLANNING

- County-wide Master Plans
  (identifying areas for growth/restriction on growth)
- Local Master Plans/Sector Plans
  (small scale development controls)

## Resource Preservation Plans

### MARYLAND PRESERVATION PLANS

- **Historic Preservation Plan (Historic and Cultural Resources)**
- **Maryland Wetland Conservation Plan (Wetlands and Waters of the United States)**
- **Clean Water Action Plan (Watershed and waters)**

### COUNTY PRESERVATION PLANS

- **Land Preservation, Parks and Recreation Plan (Parks and Recreation, )**
- **Local Master Plans/Sector Plans (Areas slated for preservation/limiting development)**

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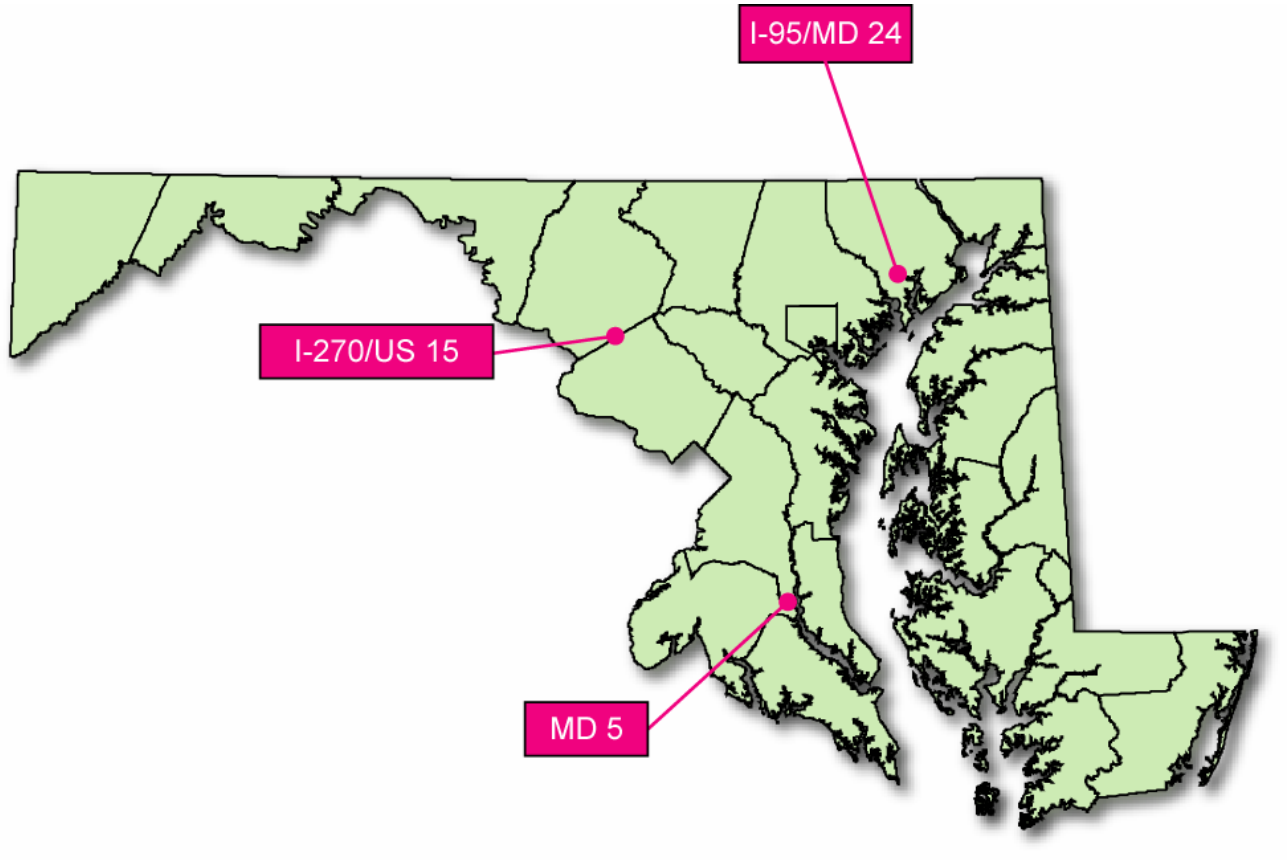
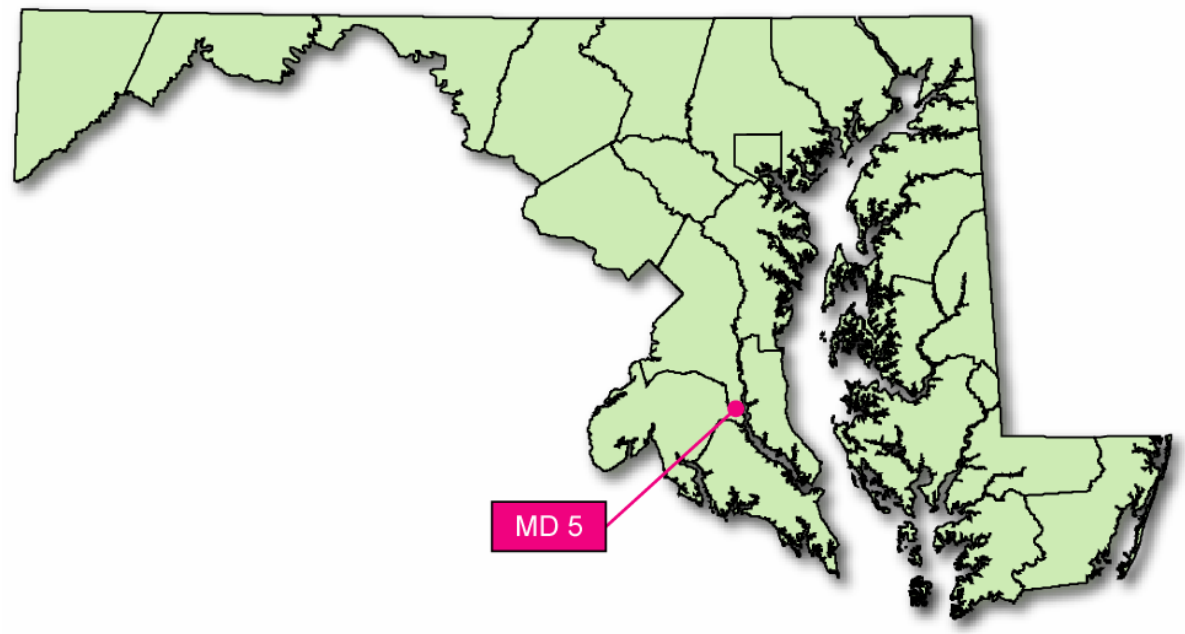



## Case Studies

- **MD 5 - Hughesville Transportation Improvement Project**
- **I-270/US 15 Multi-Modal Corridor Study Draft EIS**
- **I-95/MD 24 Improvement Study Categorical Exclusion (CE)**



## MD 5 – Hughesville Transportation Improvement Project




### PROJECT PURPOSE

**The purpose of the MD 5 - Hughesville Transportation Improvement Project was to address and alleviate the following:**

- **Existing/future congestion at the MD 5/MD 231 intersection; and**
- **Future congestion along MD 5 in the Hughesville area;**
- **Existing/future safety at the MD 5/MD 231 intersection and along MD 5 in the Hughesville area.**

## MD 5 - Hughesville Transportation Improvement Project

| Resource | Analysis Methodology | | | |
|---|---|---|---|---|
| | Trends | Overlays | Matrices | Interviews |
| Water Resources | 🗐 | | | |
| Wetlands | 🗐 | 🗐 | 🗐 | |
| Floodplains | 🗐 | | | |
| Forest Habitat | 🗐 | 🗐 | 🗐 | |
| Endangered and Threatened Species | | 🗐 | | |
| Active Farmlands | 🗐 | 🗐 | 🗐 | |
| Historic & Archeological | | 🗐 | 🗐 | |

Note: Interviews are generally used as a last resort

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## MD 5 - Hughesville Transportation Improvement Project

### INTEGRATING TRENDS AND OVERLAY ANALYSIS

- **Trends analysis and overlays can be used together to assess past and future effects to the same resource. For the MD 5 project, trends were both extracted from existing published trends data and developed through overlay analysis of data sources.**

**PAST**

- **Past wetland impacts (1972 to present) were assessed by review of statewide trends for the period of 1955 to 1978 as extracted from a USFWS publication.**

**PRESENT**

- **Trends for 1981-1993 were developed by use of GIS (overlay) analysis.**

**FUTURE**

- **Projection of past trends into the future with additional consideration of regulatory programs. Had a proper future land use scenario been developed, present wetlands could have been overlaid onto the future land use scenario to develop a conservative estimate of wetlands potentially impacted.**

MD 5 Land Use Note - Please refer to the MD 5 example in Module 4.



## MD 5 - Hughesville Transportation Improvement Project

### OVERLAY ANALYSIS

- **Past Impacts to Wetlands: Comparison of 1981 NWI mapping with 1993 DNR mapping.**
- **Past Impacts to Forests: Comparison of 1973 and 1994 Land Use/Land Cover (LU/LC) maps from Maryland Department of Planning (MDP).**
- **Future Impacts to Forests: Comparison of 1994 Forests per LU/LC maps with proposed development.**
- **Past and Future Impacts to Active Farmlands: same as per Forests.**
- **Future Impacts to Cultural Resources: Comparison of NRHP and Maryland Inventory of Historic Places site maps with proposed development (standing structures) and archeological site grid cells with proposed development (archeological resources).**

MD 5 Land Use Note - Please refer to the MD 5 example in Module 4.

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## MD 5 - Hughesville Transportation Improvement Project

## *Wetlands - Integrating Overlay, Trends and Matrix Analyses*

**Determining Past to Present Trends**

**Data Sources**

**Published Trends**

- 1981 - 1989 Charles County Trends (USFWS)

**Resource Mapping**

- 1981 National Wetlands Inventory (NWI) wetlands mapping
- 1993 Department of Natural Resources (DNR) wetlands mapping

**Analysis Methodology**

**Overlay**
- Overlayed 1981 NWI wetlands mapping with 1993 DNR wetlands mapping.

**Matrix**
- Compared differences between the 1981 and 1993 wetlands data. (*See matrix on following slide. )

**Trends**
- Compared results of overlay analysis with county-wide published trends.

**Trends**
- Projected past to present wetland losses to the future time frame

**Conclusion that cumulative effects to wetlands will occur but may be less than historic trends based upon regulations**

MD 5 Land Use Note - Please refer to the MD 5 example in Module 4

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## MD 5 - Hughesville Transportation Improvement Project

### *Wetlands - Possible Analysis Following SHA ICE Analysis Guidelines*

| Past | Present | Future |
|---|---|---|
| **Data Sources**<br>• *1981 NWI wetlands mapping*<br>• *1993 DNR wetlands mapping* | **Data Sources**<br>**Land Use**<br>• *Existing land use map*<br>• *Proposed near future (1-5 yrs) development*<br>**Resources**<br>• *1993 DNR wetlands mapping* | **Data Sources**<br>**Land Use**<br>• *Future land use map (developed from travel forecasting model)*<br>• *Updated existing land use map*<br>**Resources**<br>• *1993 DNR wetlands mapping* |
| **Analysis Methodology**<br>• *Overlay 1981 NWI wetlands mapping with 1993 DNR wetlands mapping* | **Analysis Methodology**<br>• *Update existing land use map with proposed near future development*<br>• *Overlay updated existing land use map with the 1993 wetlands mapping*<br>• *Factor in Regulations* | **Analysis Methodology**<br>• *Overlay your future land use map with the updated existing land use map to identify potential new development areas*<br>• *Overlay the new development areas with the 1993 wetlands mapping*<br>• *Factor in Regulations* |
| *Estimated wetlands loss for past time frame* | *Estimated wetlands loss for present time frame* | *Estimated wetlands loss for future time frame* |

## MD 5 - Hughesville Transportation Improvement Project

## Natural Environmental Resources - Wetlands

*Comparison of 1981 NWI Wetlands (USFWS 1981) and 1993-94 DNR*

| Wetland Classification | 1981 | 1993 | Net Difference | % Change |
|---|---|---|---|---|
| | acres | | | |
| **Estuarine Emergent** | 255.9 | 246.1 | -9.9 | -3.9% |
| **Estuarine Scrub Shrub** | --- | 5.9 | 5.9 | --- |
| **Total Vegetated Estuarine** | 255.9 | 252.0 | -3.9 | -1.5% |
| **Palustrine Emergent** | 20.7 | 39.0 | 18.3 | 88.3% |
| **Palustine Scrub Shrub** | 48.1 | 53.7 | 5.6 | 11.7% |
| **Palustrine Forested** | 722.1 | 692.8 | -29.3 | -4.1% |
| **Total Vegetated Palustrine** | 790.9 | 785.5 | -5.4 | -0.7% |
| **Combined Total Vegetated (Estuarine/Palustrine)** | 1046.8 | 1037.4 | -9.4 | -0.9% |
| **Palustrine Open Water** | 20.8 | 26.9 | 6.1 | 29.3% |
| **Lacustrine** | 44.0 | 45.5 | 1.4 | 3.2% |

# ICE Analysis Training Program

**Module 5:**
**How to Prepare the Analysis and Reach ICE Analysis Conclusions**

SHA State Highway Administration
Maryland Department of Transportation

## MD 5 - Hughesville Transportation Improvement Project

### Historic Properties - Overlay Analysis

| Past to Present | Present to Future |
|---|---|
| Documented coordination with Office of Preservation Review which identified no readily available data regarding <u>past loss</u> of cultural resources within the ICE Analysis geographical boundary. | **Data Sources**<br>**Land Use**<br>• Proposed Charles County Development (Near Future 1-5 yrs)<br>**Resources**<br>• NRHP eligible sites identified within the project's <u>direct impact</u> study area<br>• NRHP listed sites<br>• MD Inventory of Historic Properties (MIHP) sites. |

**<u>Analysis Methodology</u>**

**Overlay**
- **Overlay "NRHP" listed / eligible and "MIHP" sites with proposed development (including the proposed project action) within the ICE Analysis geographical boundary.**

**Conclusion that cumulative effects to historic sites will occur but will be minimized based upon Federal and State regulations.**

MD 5 Land Use Note - Please refer to the MD 5 example in Module 4.

# ICE Analysis Training Program

**Module 5:**
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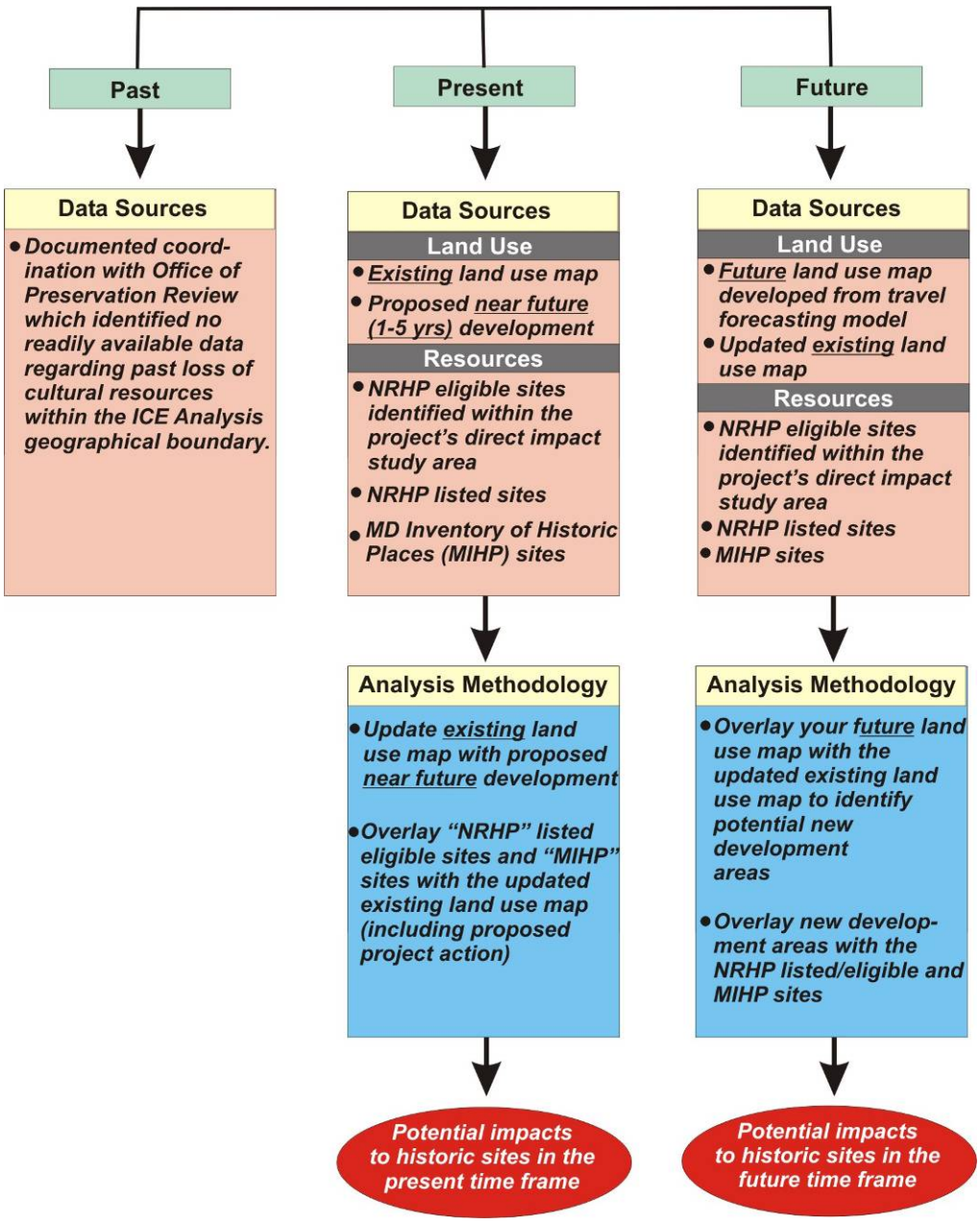
Maryland Department of Transportation

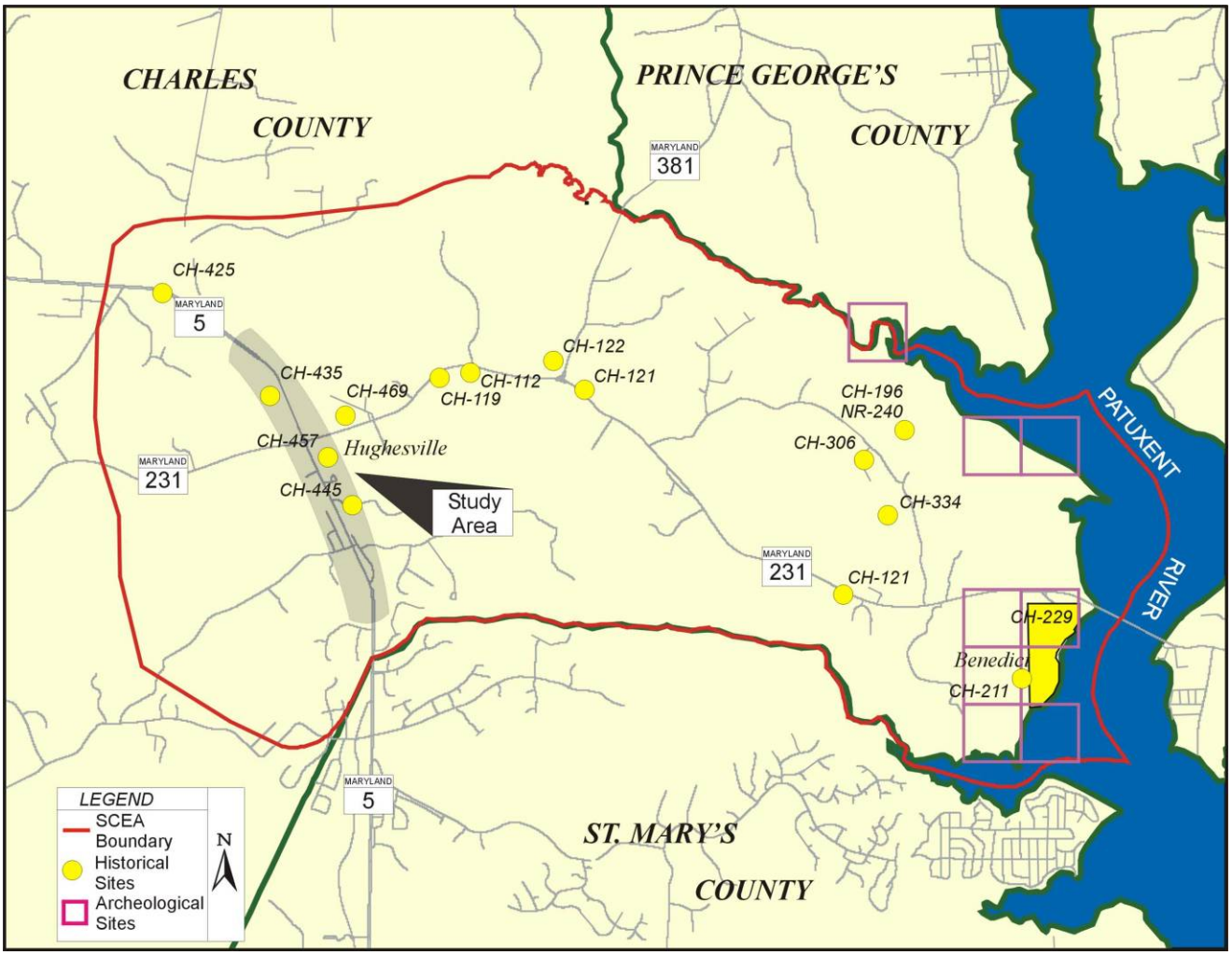
## MD 5 - Hughesville Transportation Improvement Project

### Historic Properties - Possible Overlay Analysis following SHA ICE Analysis Guidelines



## MD 5 - Hughesville Transportation Improvement Project

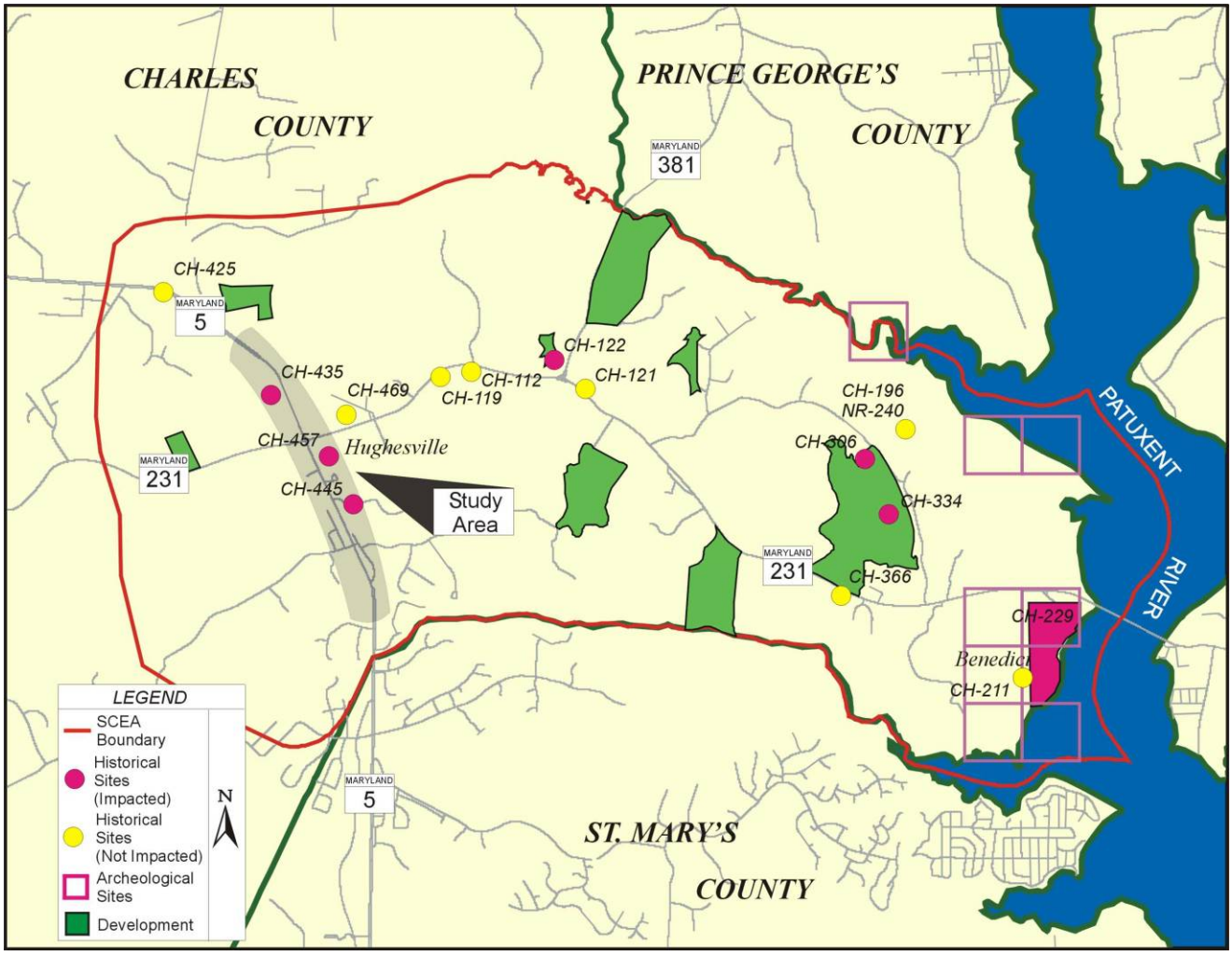
- **National Register of Historic Places and Maryland Inventory of Historic Places**



## MD 5 - Hughesville Transportation Improvement Project

**National Register of Historic Places and Maryland Inventory of Historic Properties shown with proposed development**

MD 5 Land Use Note - Please refer to the MD 5 example in Module 4.



# ICE Analysis Training Program

**Module 5:**
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Maryland Department of Transportation

## MD 5 - Hughesville Transportation Improvement Project

### National Register of Historic Places and Maryland Inventory of Historic Properties - Summary of Indirect and Cumulative Effects

| Historic Resource | Classification | Address | Zoned Area | Cumulative Impact |
|---|---|---|---|---|
| **National Register of Historic Places** | | | | |
| Maxwell Hall | NR-240, CH-196 | Teagues Point Rd | AC | |
| **National Register Eligible Sites (Identified through SHA's Historic Inventory)** | | | | |
| William Chappelear Property | CH-445 | 8780 Leonardtown Road | AC | * |
| Quaker Cemetery | CH-457 | NE Corner of Leonardtown Road and Lukes Lane | RV | * |
| W.H. Winstead Company Inc. Property | CH-435 | 8275 Leonardtown Road | CV | * |
| Jesse M. Herbert Property | CH-469 | 15610 Prince Frederick Road | AC | |
| Caroline Christ Farm | CH-425 | 7761 Leonardtown Road | AC | |
| **Maryland Inventory of Historic Properties** | | | | |
| Old Fields Chapel | CH-112 | Prince Frederick Hughesville Rd. (231) | AC | |
| Herbert House | CH-119 | Prince Frederick Hughesville Rd. (231) | AC | |
| Benedict Road House | CH-121 | Prince Frederick Hughesville Rd. (231) | AC | |
| Patuxent City House | CH-122 | Brandywine Rd (MD 381) | AC | |
| Benedict Hill House, site (Higdon House) | CH-211 | Center Street | AC | |
| Prior's Cleave (The Heights, Truman's Place) | CH-225 | Wilkerson Road | AC | |
| Benedict | CH-229 | | RV, CV | |
| Hawkin's Log House | CH-306 | Teagues Point Rd | AC | |
| Dearbought | CH-334 | Teagues Point Rd | AC | |
| St. John AME Church | CH-366 | Prince Frederick Hughesville Rd. (231) | AC | |

* Historic Properties within the direct impacts area of the MD 5 project

# ICE Analysis Training Program

**Module 5:**
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SHA State Highway Administration
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## MD 5 - Hughesville Transportation Improvement Project

## MD 5 ICE Analysis Conclusions

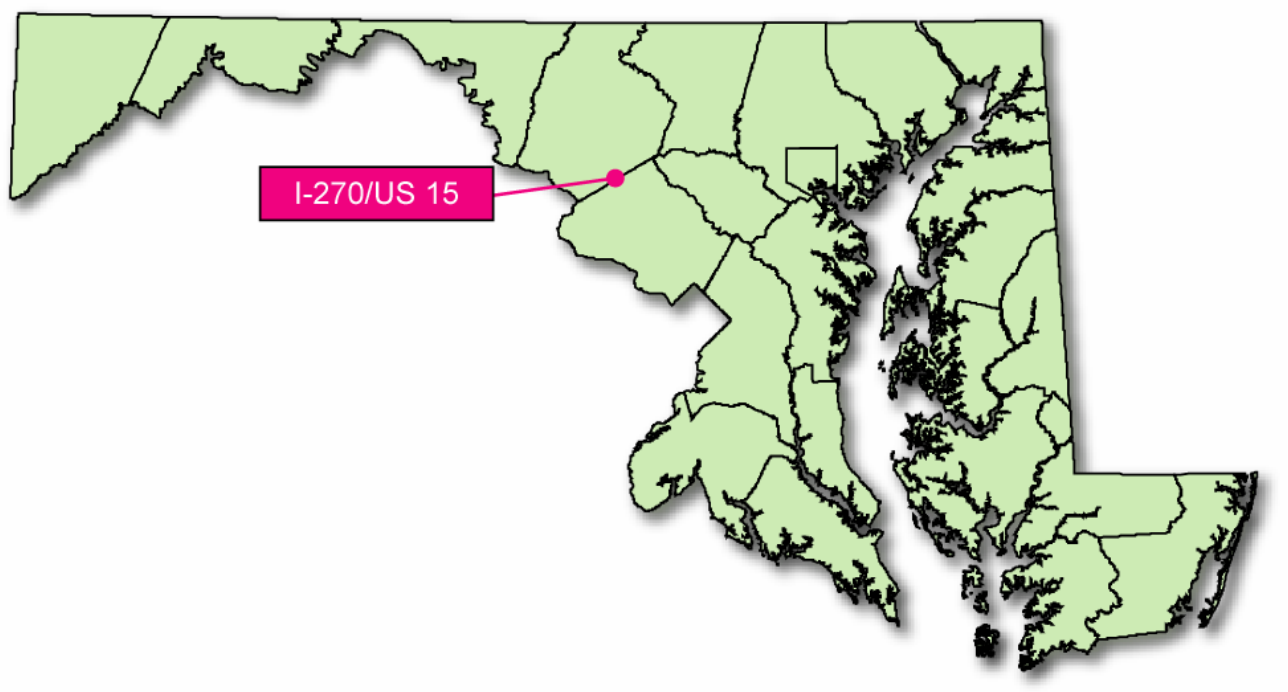
| Potential Cumulative Effects | Factors which should Minimize Cumulative Effects |
|---|---|
| Surface Water | |
| The cumulative effects of all proposed and/or potential developments (highway and non-highway) to fisheries and water quality of the watershed within the ICE Analysis boundary would be a continued degradation of water quality and watershed stability, especially to Gilbert Creek and Swanson Creek. | Comprehensive implementation of BMP's, such as stream buffer protection and enhancement, may partially offset effects to streams during and after development. |
| Wetlands | |
| It is anticipated that the percentages of future wetland loss/conversion within the ICE Analysis boundary will be less as compared to the past data trends. | This anticipated decline in future wetland loss is based on the notion that government regulatory programs will minimize wetland destruction in the future. |
| Floodplains | |
| Implementation of the MD 5 Hughesville Transportation Improvement Project will not adversely affect regulated 100-year floodplains. Future cumulative effects to floodplains are expected to be negligible to none. | This rationale is based on the current County floodplain regulations per the Floodplain Management Ordinance (1992). |

## MD 5 - Hughesville Transportation Improvement Project

## MD 5 ICE Analysis Conclusions - continued

| Potential Cumulative Effects | Factors Which Should Minimize Cumulative Effects |
|---|---|
| **Forest Habitat** | |
| The estimated potential cumulative forest habitat impact is 1,496 acres. It should be noted that this figure represents the maximum estimated forest impact that would occur, based on the proposed development known at this time. | The cumulative effects of this highway project coupled with other highway or non-highway development projects would likely be that certain species of concern (such as FIDS) would decrease from substantial declines in their populations due to continued loss or fragmentation of habitat. Because of current regulations and standards that protect forests/forest buffer zones, some of the unknown and/or potential forest habitat areas within the proposed development sites will remain undeveloped. |
| **Active Farmland** | |
| The estimated potential agricultural land impact due to potential cumulative effects is 334 acres of existing (1994) agricultural land. | This figure represents the maximum impact based on proposed development within the ICE Analysis boundary. |
| **Historic and Archeological Sites** | |
| Potential impacts to 3 NRHP eligible properties and 4 sites on the Maryland Inventory of Historic Properties. No archeological grids within the ICE Analysis geographical boundary were identified in areas having valid preliminary subdivision plans. | Section 106 of the National Historic Preservation Act along with Section 4(f) of the Department of Transportation Act will minimize effects to NRHP eligible properties in the project's direct impact area. |

# I-270/US 15 Multi-Modal Corridor Study Draft EIS




## PROJECT PURPOSE

**The purpose of the I-270/US 15 Multi-Modal Corridor Study is to investigate options to address congestion and improve safety conditions along the I-270/US 15 Corridor.**

# I-270/US 15 Multi-Modal Corridor Study Draft EIS

## UTILIZING THE EXPERT LAND USE PANEL'S ESTIMATES TO ASSESS RESOURCE IMPACTS

**While determining the Indirect and cumulative effects to several ICE Analysis resources for this project, the estimates of the Expert Land Use Panel were utilized. These findings were most appropriate for most of the socio-economic resources and agricultural resources, including:**

- **Parklands**
- **Historic Sites**
- **Water Resources**
- **Farmlands**

# I-270/US 15 Multi-Modal Corridor Study Draft EIS

## IMPACTS TO PARKLANDS

- 11 parks directly impacted by the project alternatives
- Section 4(f) of the US Department of Transportation Act of 1966, requires that the proposed use of land from a publicly-owned public park, recreation area, wildlife and/or waterfowl refuge, or any significant historic site, as part of a federally funded or approved transportation project, is permissible only if there is no feasible and prudent alternative to the use.
- Section 4(f) requirements apply only to transportation improvement projects and therefore parks that may be impacted by other land use changes would not be protected in the same manner.

# I-270/US 15 Multi-Modal Corridor Study Draft EIS

## IMPACTS TO PARKLANDS

- The Land Use Expert Panel identified the potential for residential and business development in some of the forecast zones that straddle the Corridor that is in excess of what the Master Plans describe.

- In particular, these zones may develop differently than as planned for in the county Master Plans:
  - Lewistown Zone #3,
  - Frederick City Zone #5,
  - Urbana Zone #8,
  - Damascus-Brookeville Zone #10,
  - Clarksburg Zone #15,
  - Germantown Zone #17,
  - Seneca Creek Zone #18, and
  - Gaithersburg Zone #19

- Strong stewardship of parklands will be required to protect these resources from impacts from future development

# I-270/US 15 Multi-Modal Corridor Study Draft EIS

## IMPACTS TO HISTORIC RESOURCES

- Total of 61 historic properties are listed in the National Register of Historic Places are located within the ICE Analysis boundary.
- Section 4(f) of the US Department of Transportation Act of 1966, requires that the proposed use of any significant historic site, as part of a federally funded or approved transportation project, is permissible only if there is no feasible and prudent alternative to the use.
- Section 4(f) requirements apply only to transportation improvement projects and therefore historic resources that may be impacted by other land use changes would not be protected in the same manner.

# ICE Analysis Training Program

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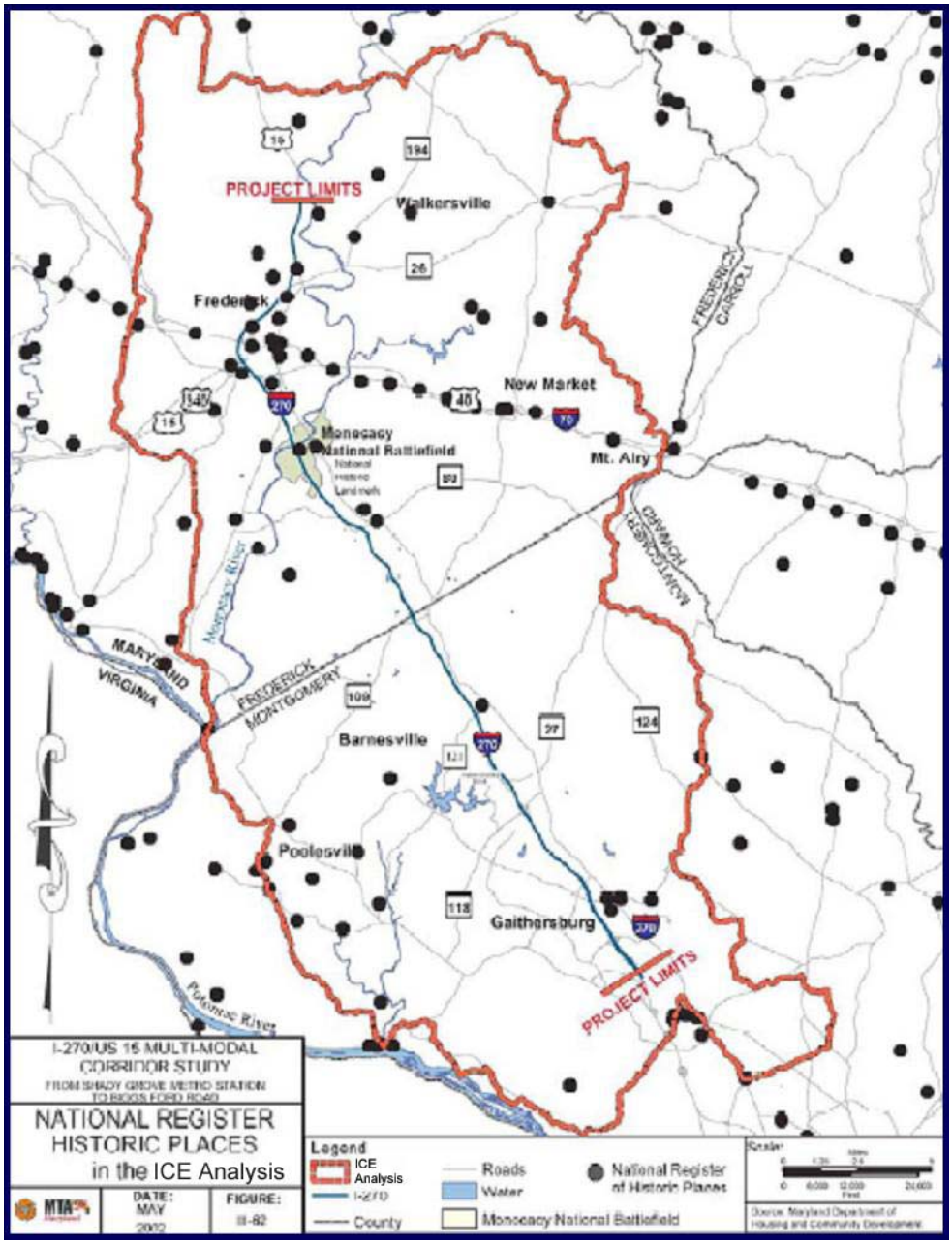
## I-270/US 15 Multi-Modal Corridor Study Draft EIS



# I-270/US 15 Multi-Modal Corridor Study Draft EIS

## IMPACTS TO HISTORIC RESOURCES

- Cultural resources located in forecast zones that may be under more pressure for redevelopment than anticipated under the Master Plans should be given special attention.
- Cultural resources located in these forecast zones may be under more pressure for redevelopment than anticipated under the Master Plans.
- Special attention should be given to those resources for which the settings are contributing factors in the historic significance.



## I-270/US 15 Multi-Modal Corridor Study Draft EIS

### IMPACTS TO WATER RESOURCES

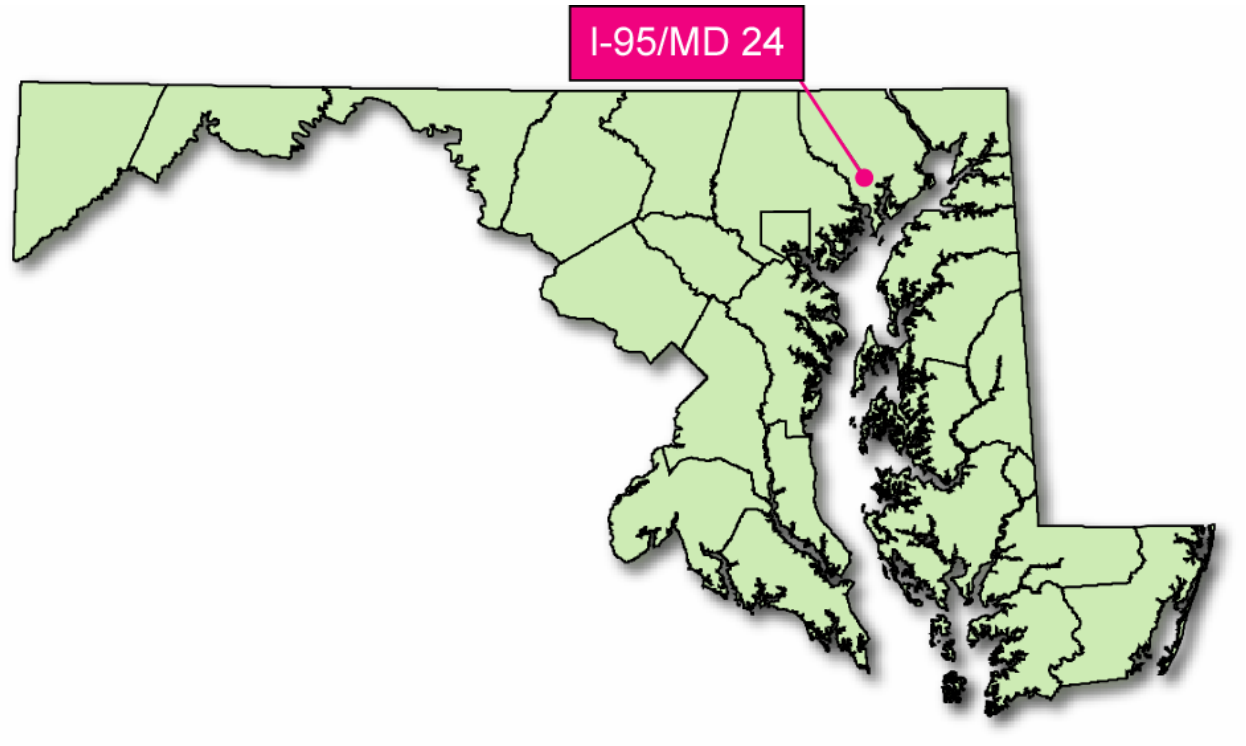
- **Surface waters within the ICE Analysis boundary include 23 major streams.**
- **The conversion of open-space and forested areas to impervious areas or manicured landscapes would be expected to increase surface runoff and peak storm flows as well as introduce sediment and other pollutants into waterways.**
- **The Monocacy River and its tributaries is the only river in the ICE Analysis boundary that is included in the Wild and Scenic Rivers Program.**
- **Although several segments of Seneca Creek (totaling approximately 3 miles), north of MD 124 may not be identified as parkland, the same areas were identified as parkland in the Damascus-Brookeville Zone #10 of the Land Use Expert Panel. This is very important, because Zone #10 is expected to grow considerably by approximately 6,000 people (20%), and 1,500 jobs (20%).**
- **This area of Seneca Creek lies in an area that is mostly undeveloped, and may be under threat by future development, if the area is, in fact, not protected as parkland.**

# I-270/US 15 Multi-Modal Corridor Study Draft EIS

## IMPACTS TO FARMLAND

- The areas that will be under the most threat of future development in particular will be Lewistown Zone #3, Frederick City Zone #5, Urbana Zone #8, Damascus, Brookeville Zone #10, Clarksburg Zone #15, Germantown Zone #17, and Gaithersburg Zone #19.
- For these zones, the Land Use Expert Panel anticipates that the I-270 improvements will increase development above what the BCMP calls for.
- A greater threat would be placed upon farmland in this area because of this project, as pressure will increase to develop on open land.

## I-95/MD 24 Improvement Study Categorical Exclusion (CE)




### PROJECT PURPOSE

- **The purpose of the I-95/MD 24 Improvement Project is to enhance safety conditions, reduce congestion and provide sufficient traffic capacity to serve existing and future development needs in the surrounding area.**

# I-95/MD 24 Improvement Study Categorical Exclusion (CE)

## ICE Analysis ANALYSIS

- Past to present ICE Analysis resource impacts were determined through an overlay analysis, which identified changes in ICE Analysis resources from the past to present land use scenarios.

- Overlay analysis indicated that future development would be contained within already developed areas making impacts to ICE Analysis resources minimal.

# ICE Analysis Training Program

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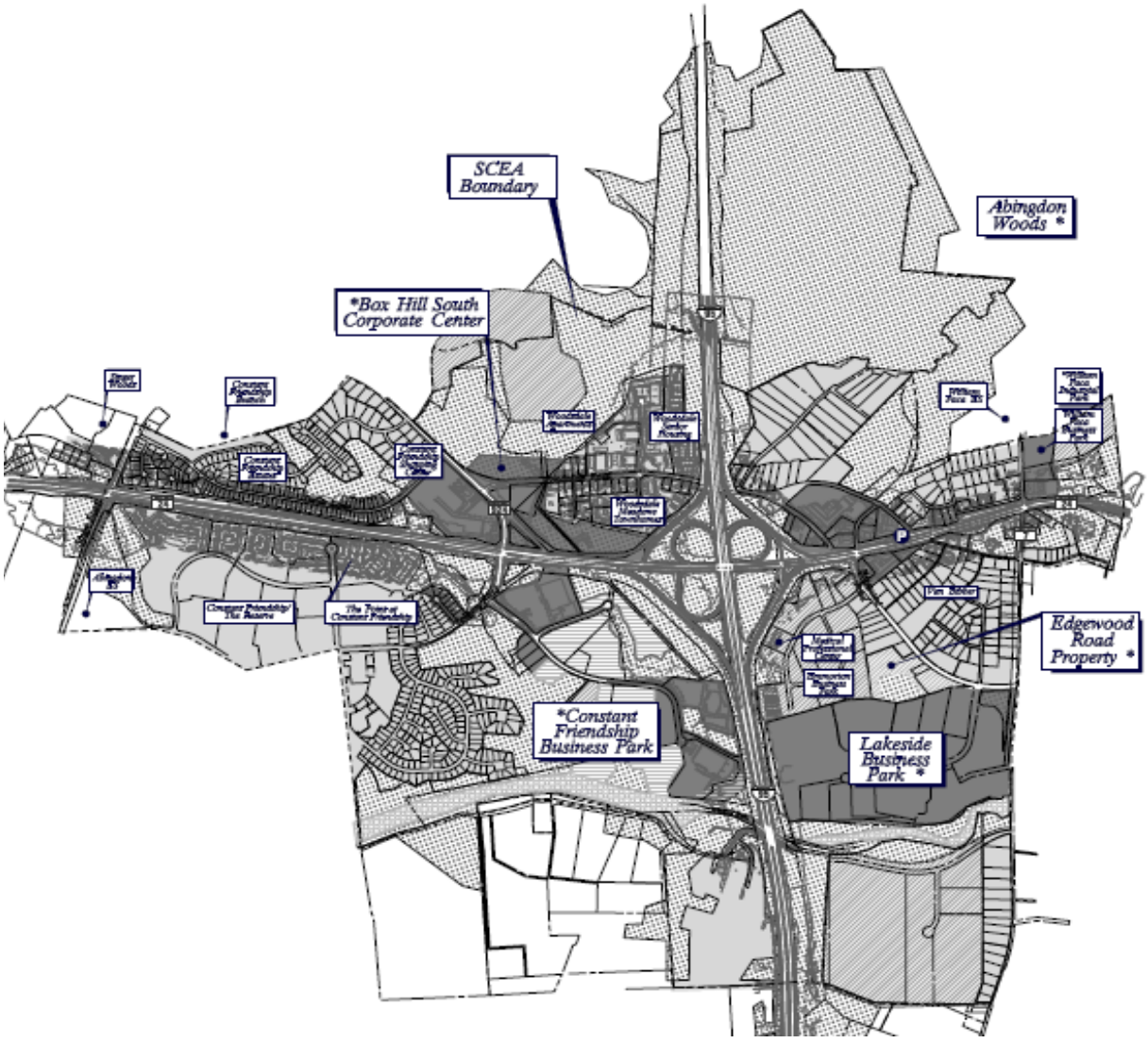
## I-95/MD 24 Improvement Study Categorical Exclusion (CE)




## Overlay Analysis

# I-95/MD 24 Improvement Study Categorical Exclusion (CE)

## RESULTS

- **Streams -** Two streams exist within the ICE Analysis boundary: Winters Run (located west of MD 24), crossing I-95 and Haha Branch (located east of MD 24), also crossing I-95. Potential impacts to WUS are not likely for Haha Branch because this stream is surrounded by thick forest, which acts as protection to the stream.

- **Wildlife and Terrestrial Habitat -** would be most affected by expanding existing development areas, which could potentially impact forested areas throughout the ICE Analysis study area.

- **Commercial Development** - The Lakeside Business Park contains vacant lots that have the potential for commercial development.

### KEY POINTS TO REMEMBER

**An ICE Analysis analysis for a CE project should be concise but accurately and thoroughly describe all potential indirect and cumulative effects. Please refer to SHA's ICE Analysis Guidelines for Categorical Exclusions.**

# Group Exercise

## Developing Land Use Information and Conducting the Analysis

## Developing Land Use Information

### THE ELUP AND THE DELPHI METHOD

- **A highly structured technique used by the ELUP in which participants provide their individual assessment of likely future events**
- **Panelists were asked to allocate estimates of households and employment within 34 forecast zones surrounding the ICC study area and for three different scenarios: No-Action, Corridor 1 and Corridor 2**
- **Each panelist completed iterative rounds of questions, and a moderator tallied and summarized the results of each round to provide overall results**
- **The use of expert panels and the Delphi process are widely recognized methods for analyzing transportation and land use alternatives (NCHRP Project 8-326, 2002; NCHRP Project 8-32(3), 1998; FHWA – Toolbox for Regional Policy Analysis, 2002)**

# ICE Analysis Training Program

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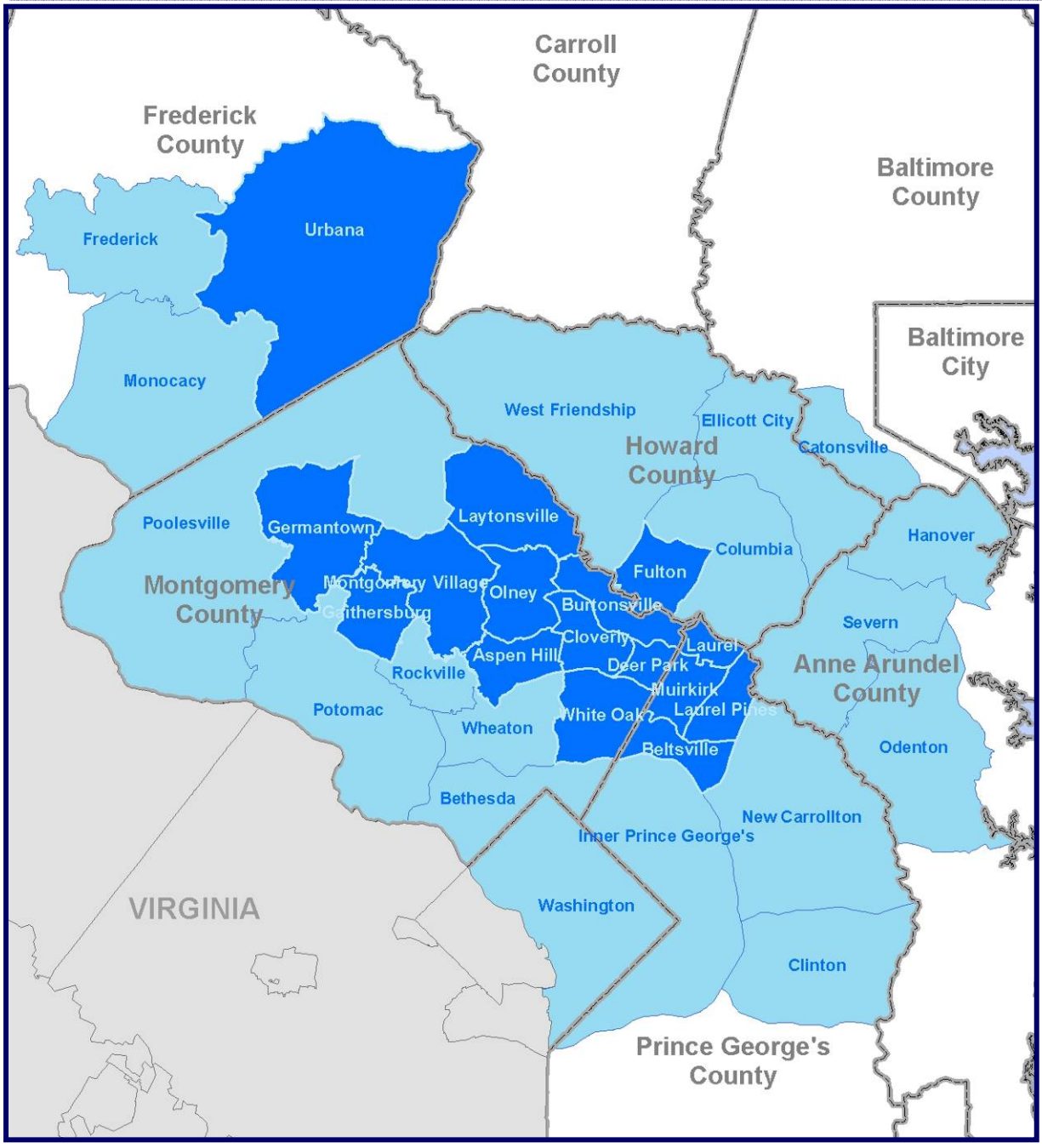
## The ELUP and the Delphi Method - Estimates

| | | | Households | | | | | Jobs | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| County | ICC Zone Number | ICC ZONE NAME | 2000 | MPO 2030 | ELUP 2030 Base | ELUP 2030 Build Southern | ELUP 2030 Build Northern | 2000 | MWCOG 2030 | ELUP 2030 Base | ELUP 2030 Build Southern | ELUP 2030 Build Northern |
| Frederick | 1 | Frederick | 31,560 | 48,198 | 48,684 | 48,501 | 48,588 | 71,385 | 119,488 | 111,543 | 111,031 | 110,954 |
| Frederick | 2 | Monocacy | 3,444 | 7,370 | 7,808 | 7,911 | 7,848 | 10,452 | 25,535 | 24,644 | 25,161 | 23,867 |
| Frederick | 3 | Urbana | 14,293 | 26,333 | 27,195 | 28,259 | 28,566 | 7,182 | 14,098 | 14,503 | 15,276 | 15,245 |
| **Frederick Total** | | | **49,297** | **81,901** | **83,686** | **84,672** | **85,001** | **89,019** | **159,121** | **150,691** | **151,468** | **150,066** |
| Montgomery | 4 | Poolesville | 11,097 | 14,612 | 15,166 | 15,283 | 15,222 | 6,503 | 6,835 | 6,920 | 6,938 | 6,944 |
| Montgomery | 5 | Germantown | 26,106 | 47,435 | 47,801 | 49,499 | 49,062 | 24,038 | 55,952 | 54,905 | 57,691 | 58,086 |
| Montgomery | 7 | Potomac | 28,224 | 34,114 | 34,879 | 35,632 | 35,606 | 15,341 | 16,319 | 16,422 | 16,297 | 16,291 |
| Montgomery | 8 | Gaithersburg | 23,005 | 35,309 | 35,137 | 37,151 | 36,854 | 73,785 | 99,221 | 98,996 | 104,192 | 103,978 |
| Montgomery | 9 | Montgomery Village | 25,530 | 29,140 | 29,665 | 31,263 | 31,243 | 29,868 | 37,406 | 37,144 | 40,397 | 40,108 |
| Montgomery | 10 | Olney | 10,725 | 12,690 | 13,441 | 14,697 | 14,654 | 7,134 | 7,440 | 7,533 | 8,008 | 8,015 |
| Montgomery | 11 | Laytonsville | 1,041 | 1,656 | 1,825 | 1,967 | 2,071 | 311 | 349 | 330 | 381 | 381 |
| Montgomery | 12 | Burtonsville | 1,499 | 1,899 | 2,012 | 2,624 | 3,461 | 1,895 | 2,143 | 2,121 | 2,975 | 3,431 |
| Montgomery | 17 | Rockville | 17,972 | 30,255 | 32,530 | 33,970 | 33,664 | 95,127 | 136,594 | 138,442 | 138,510 | 138,501 |
| Montgomery | 18 | Aspen Hill | 23,742 | 26,237 | 27,238 | 28,584 | 28,413 | 8,242 | 8,562 | 8,625 | 9,862 | 9,857 |
| Montgomery | 19 | Cloverly | 5,636 | 6,606 | 6,993 | 8,175 | 8,227 | 1,883 | 2,053 | 2,037 | 3,108 | 3,103 |
| Montgomery | 20 | Deer Park | 8,391 | 9,041 | 9,237 | 10,780 | 10,191 | 4,436 | 4,765 | 4,763 | 5,607 | 5,600 |
| Montgomery | 26 | Bethesda | 68,482 | 80,879 | 83,097 | 83,300 | 83,279 | 146,661 | 174,071 | 179,365 | 179,430 | 179,430 |
| Montgomery | 27 | Wheaton | 46,148 | 60,110 | 64,687 | 65,475 | 65,501 | 97,796 | 110,959 | 112,003 | 114,075 | 113,912 |
| Montgomery | 28 | White Oak | 24,330 | 27,230 | 29,001 | 30,562 | 30,474 | 28,448 | 38,621 | 39,630 | 43,619 | 42,141 |
| **Montgomery Total** | | | **321,928** | **417,213** | **432,710** | **448,962** | **447,922** | **541,468** | **701,290** | **709,237** | **731,092** | **729,778** |
| Howard | 6 | West Friendship | 9,665 | 16,545 | 18,493 | 18,517 | 18,433 | 8,139 | 16,182 | 16,123 | 16,196 | 16,023 |
| Howard | 13 | Fulton | 1,900 | 4,752 | 5,145 | 5,418 | 5,550 | 6,149 | 14,669 | 14,924 | 15,682 | 15,627 |
| Howard | 14 | Columbia | 48,889 | 58,486 | 66,615 | 67,482 | 67,862 | 102,321 | 147,046 | 160,024 | 161,050 | 161,297 |
| Howard | 15 | Ellicott City | 30,496 | 41,937 | 48,199 | 48,244 | 48,434 | 43,395 | 72,001 | 78,359 | 78,276 | 79,077 |
| **Howard Total** | | | 90,950 | **121,720** | **138,452** | **139,661** | **140,279** | **160,004** | **249,898** | **269,430** | **271,204** | **272,024** |
| **Baltimore** | 16 | Catonsville | **17,828** | **19,289** | **19,311** | **19,336** | **19,336** | **26,324** | **27,383** | **27,364** | **27,383** | **27,383** |
| Prince George's | 21 | Muirkirk | 4,765 | 10,358 | 10,842 | 12,885 | 12,756 | 24,124 | 42,553 | 38,607 | 44,291 | 43,523 |
| Prince George's | 22 | Laurel | 7,158 | 7,464 | 8,559 | 9,750 | 9,984 | 6,901 | 8,489 | 8,460 | 9,600 | 9,747 |
| Prince George's | 23 | Laurel Pines | 10,408 | 11,206 | 11,759 | 13,393 | 13,314 | 13,234 | 17,855 | 16,832 | 19,064 | 18,809 |
| Prince George's | 29 | Beltsville | 9,359 | 11,212 | 11,910 | 12,774 | 12,753 | 18,874 | 26,807 | 25,118 | 27,263 | 27,161 |
| Prince George's | 30 | New Carrollton | 46,123 | 58,891 | 59,312 | 59,312 | 59,416 | 44,311 | 78,586 | 72,320 | 72,202 | 72,564 |
| Prince George's | 33 | Inner Prince George's | 142,866 | 163,361 | 161,226 | 161,584 | 161,392 | 155,981 | 256,809 | 229,468 | 229,968 | 229,388 |
| Prince George's | 34 | Clinton | 16,739 | 29,760 | 30,539 | 30,486 | 30,458 | 18,377 | 27,078 | 25,631 | 25,583 | 25,527 |
| **Prince George's Totals** | | | **237,418** | **292,252** | **294,147** | **300,185** | **300,072** | **281,802** | **458,177** | **416,435** | **427,971** | **426,720** |
| Anne Arundel | 24 | Severn | 21,806 | 32,294 | 34,376 | 35,332 | 35,152 | 50,614 | 64,702 | 70,098 | 72,172 | 71,235 |
| Anne Arundel | 25 | Hanover | 27,120 | 31,443 | 33,153 | 33,142 | 32,954 | 98,610 | 106,603 | 116,257 | 115,522 | 114,861 |
| Anne Arundel | 31 | Odenton | 22,491 | 30,724 | 34,471 | 34,502 | 34,444 | 19,757 | 21,009 | 22,644 | 22,521 | 22,436 |
| **Anne Arundel Totals** | | | **71,417** | **94,461** | **102,000** | **102,976** | **102,549** | **168,981** | **192,314** | **208,999** | **210,215** | **208,532** |
| **District of Columbia** | 32 | Washington | **248,866** | **304,972** | **290,748** | **290,206** | **290,001** | **678,641** | **832,142** | **829,021** | **827,886** | **826,668** |
| ***Study Area Totals*** | | | **1,037,704** | **1,331,808** | **1,361,055** | **1,385,997** | **1,385,160** | **1,946,239** | **2,620,325** | **2,611,177** | **2,647,219** | **2,641,171** |

## The ELUP and the Delphi Method – Total Acres of Development per Forecast Zone



# ICE Analysis Training Program

**Module 5:**
**How to Prepare the Analysis and Reach ICE Analysis Conclusions**

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## Discussion Topic:

**Using the information presented (estimates and locations of population and employment) how might you establish a useful land use assessment tool?**

# ICE Analysis Training Program

**Module 5:**
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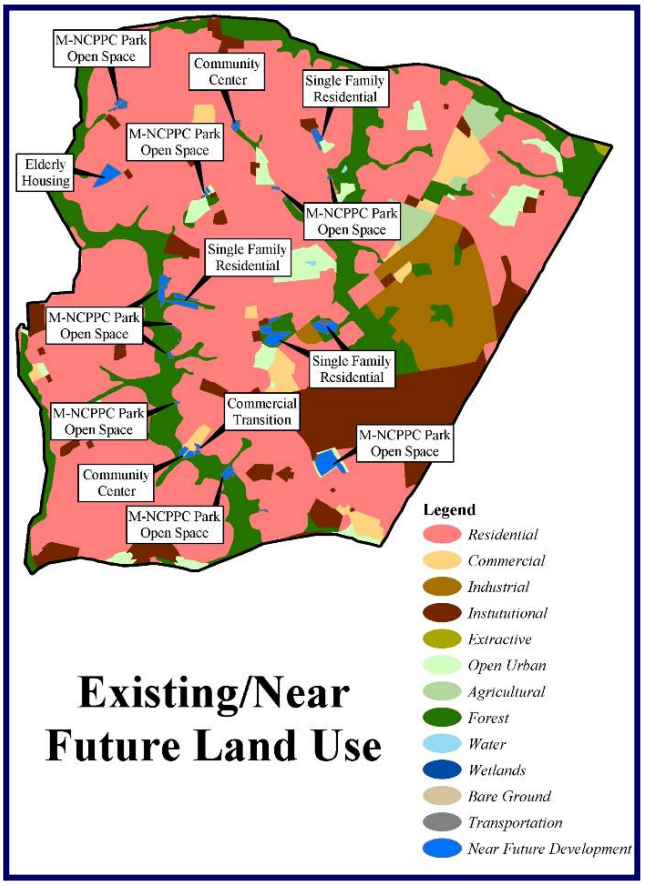
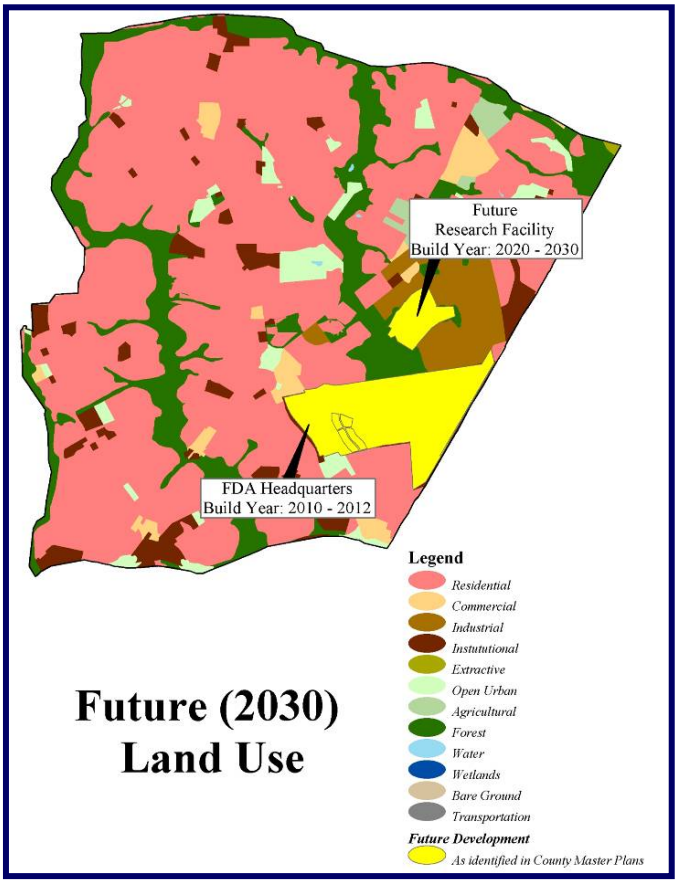
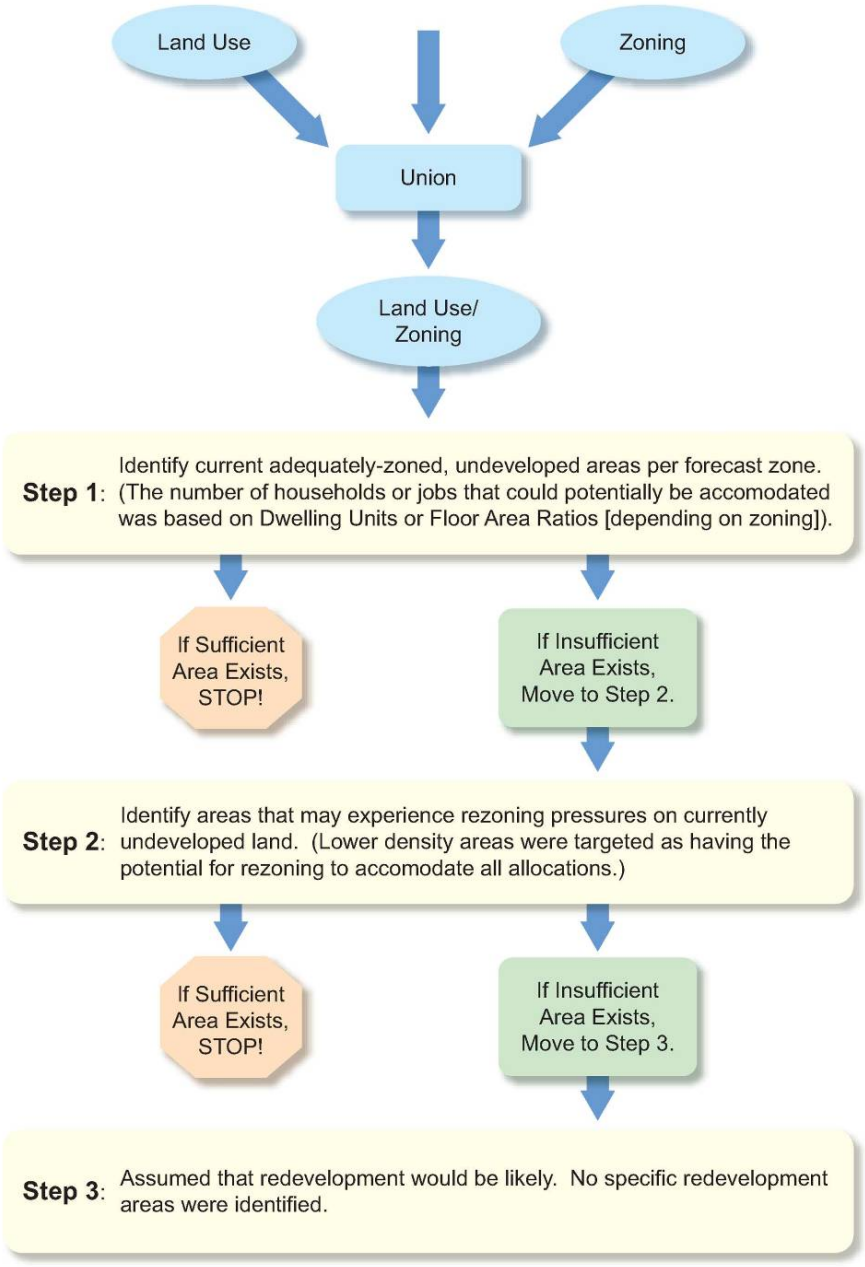
## Developing Land Use Information




**Areas of near future and future development per planning area were identified based on area master/sector plans and coordination with local jurisdictions.**



## Process for Identifying ELUP Development Areas:



# ICE Analysis Training Program

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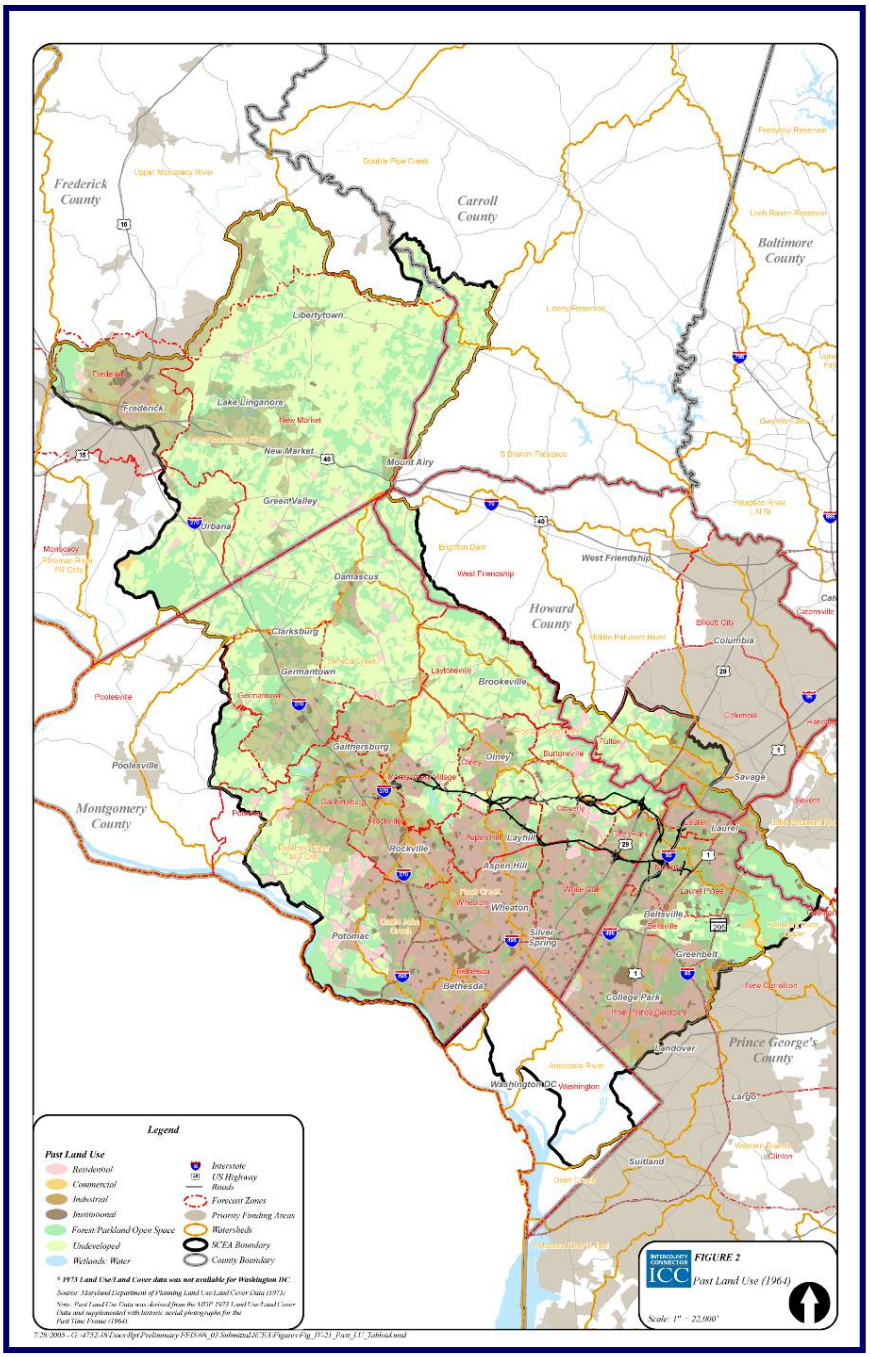
## Developing Land Use Information

**PAST LAND USE MAP (1964): The past land use scenario was derived from Maryland Department of Planning (MDP, 1973) Statewide Coverage.**



# ICE Analysis Training Program

**Module 5:**
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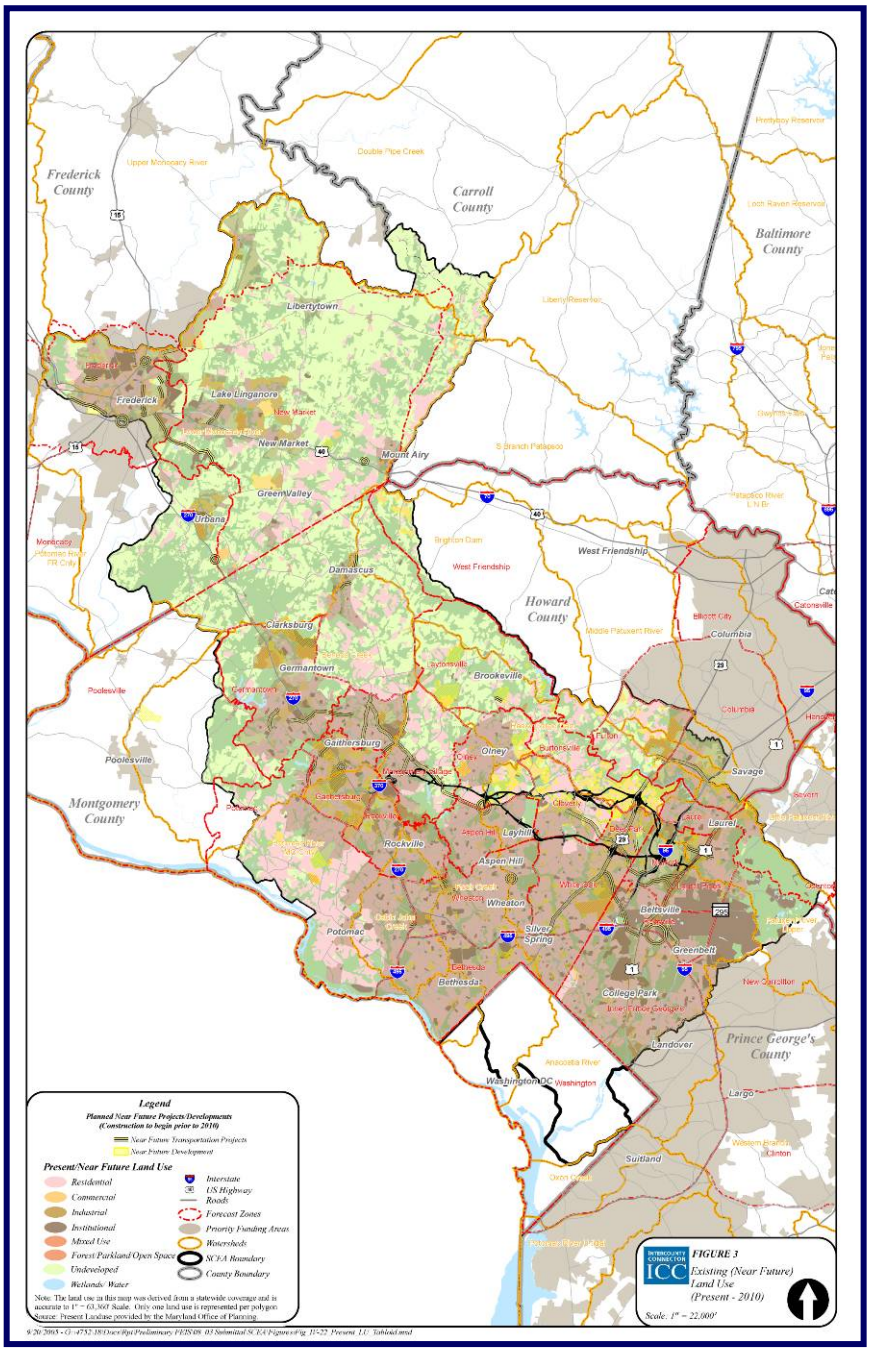
## Developing Land Use Information

**NEAR FUTURE LAND USE MAP (2010): Based on 2000 Montgomery and Prince George's Counties Land Use data / MDP 2000 land use**

**Planned (Pipeline) Development/ Projects (identified from County Master Plans, Coordination with the County and the Constrained Long Range Plan (CLRP)) were superimposed on top.**



# ICE Analysis Training Program

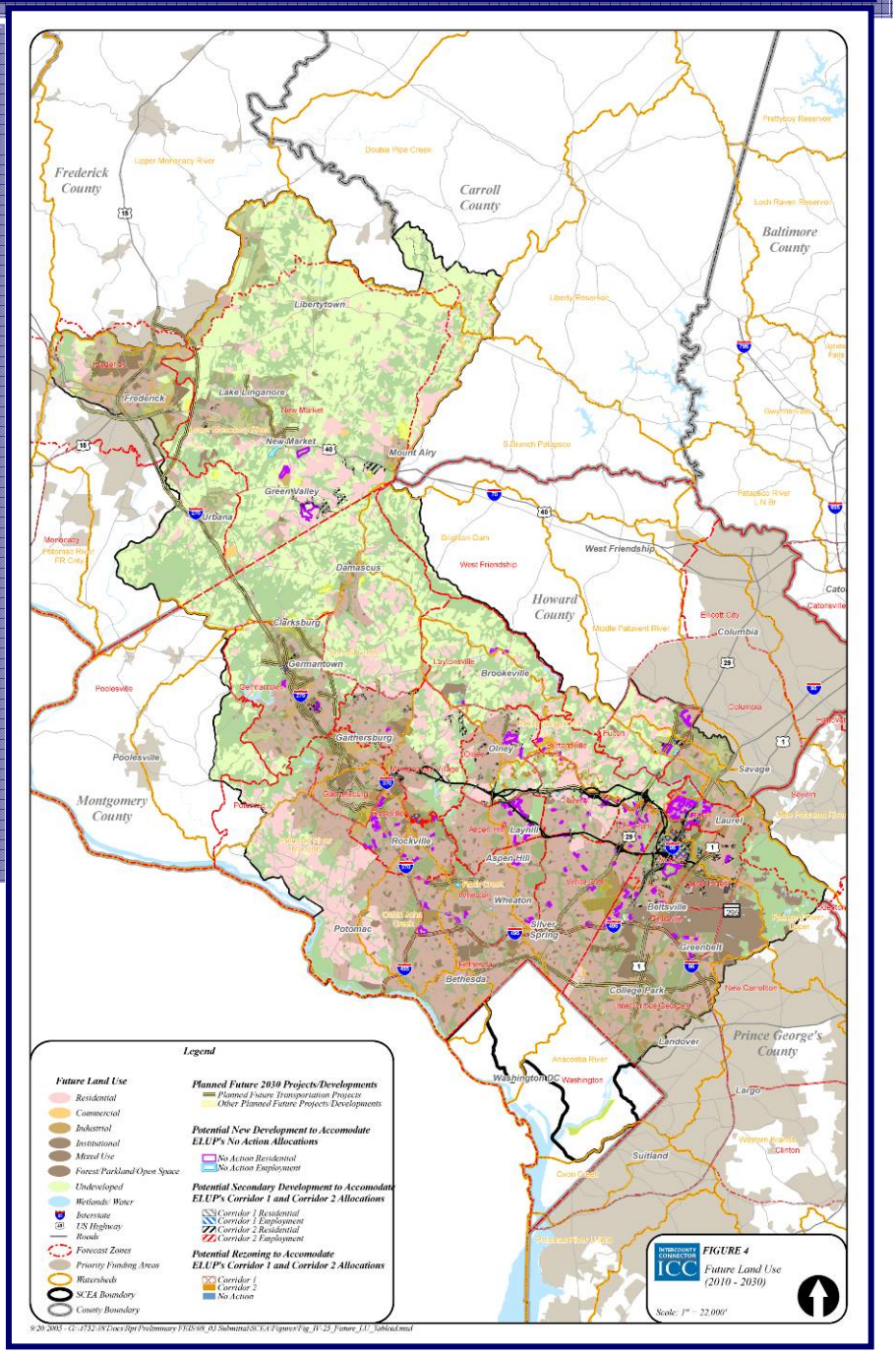
**Module 5:**
**How to Prepare the Analysis and Reach ICE Analysis Conclusions**

SHA State Highway Administration
Maryland Department of Transportation

## Developing Land Use Information

**FUTURE LAND USE MAP (2030):**

- **The near future map was adjusted by adding planned 2030 Development Projects (identified from Master Plans and CLRP) and ELUP estimates.**



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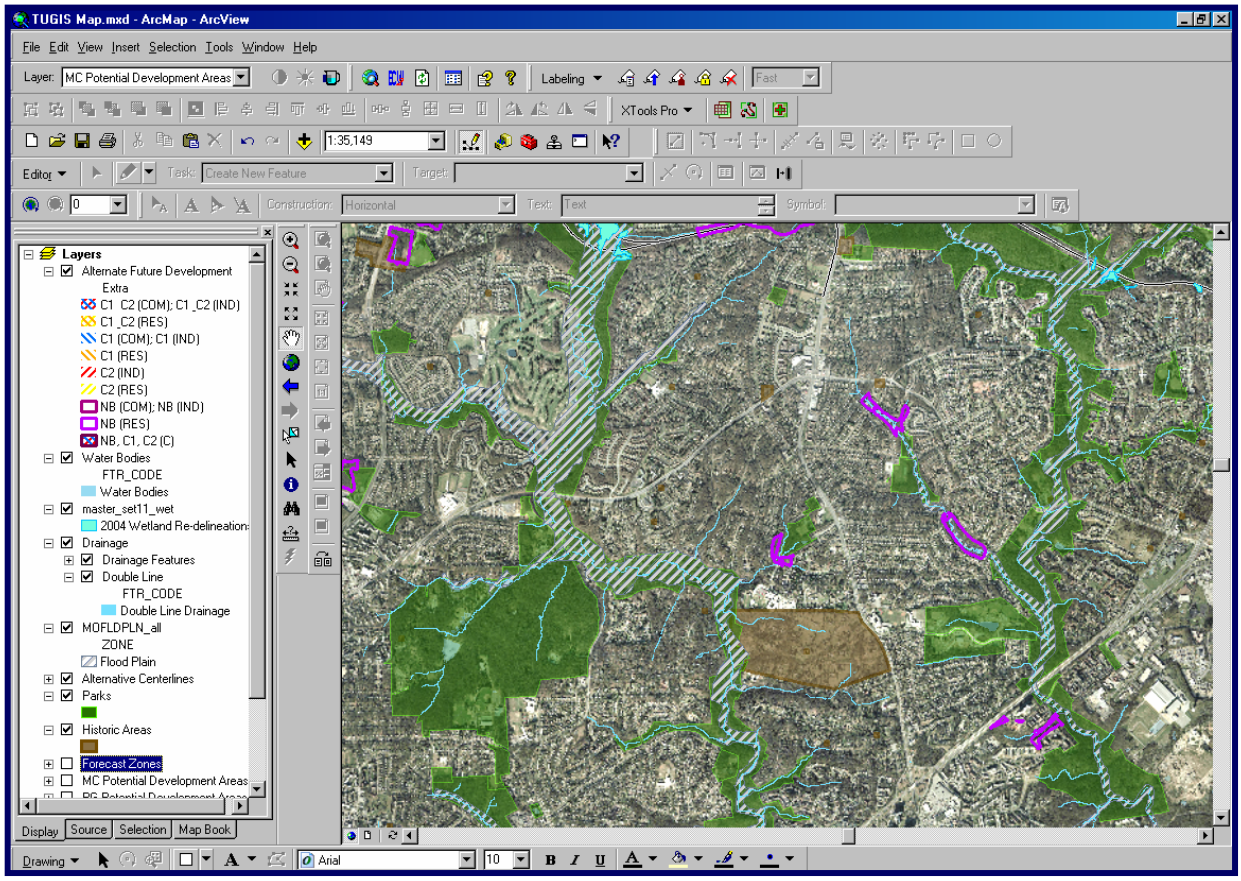
## Conducting the Analysis

- **Overlay potential development areas and resources to determine potential resource impacts for the near future and future time frames.**



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## Conducting the Analysis

- **Quantifying the results:**

| Resource | Corridor 1 | Corridor 2 |
|---|---|---|
| Farmland | 1,319 | 1,565 |
| Forest | 2,213 | 2,236 |
| Floodplain | 253 | 251 |
| Wetlands | 160 | 166 |
| RTE | 33 | 33 |
| Stream | 78,803 | 80,794 |
| Impervious Area | 2,500 | 2,818 |
| Reservoirs | 313 | 659 |

**Total potential development required for the entire SCEA boundary based on ELUP estimates:**

- **No Action – 2,512 acres**
- **Corridor 1 – 4,945 acres**
- **Corridor 2 – 5,546 acres**

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## Discussion Topic:

- **What post processing method would you use to verify your results?**

## Discussion Topic:

- **What tools / materials would be useful in gathering information on near future / future development and transportation projects?**