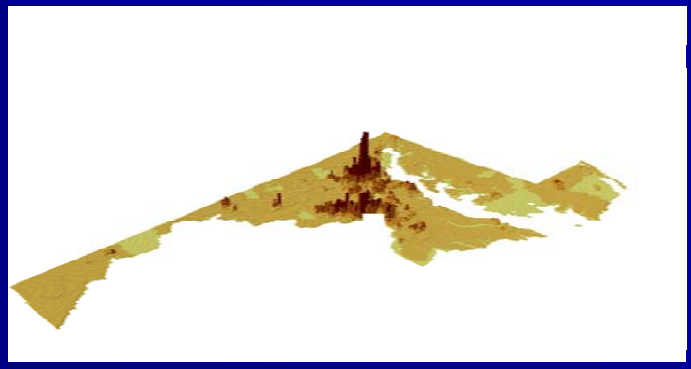
Alternative Futures for the Baltimore-Washington Area: The Maryland Scenario Project

Gerrit-Jan Knaap

Executive Director and Professor

National Center for Smart Growth

www.smartgrowth.umd.edu



The National Center for Smart Growth Research and Education

- Established in 2000;
- Four Schools:
  - Agriculture;
  - Architecture, Planning and Preservation; Engineering; and
  - Public Policy.
- Program areas:
  - Land Use and Environment,
  - Transportation and Public Health,
  - Housing and Community Development, and
  - International Development,
  - Environmental Finance.

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National and International Projects

- Land Market Monitoring (LILP, NAR, NAHB)
- Measuring Urban Form (LILP, Brookings)
- Regulatory Barriers to Affordable Housing (HUD)
- Physical Activity and Urban Form (RWJF)
- China Land Policy and TARA (LILP)
- Market Effects of Inclusionary Zoning (NAHB)
- Eight State Smart Growth Evaluation (LILP)

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The Maryland Agenda

- History and Structure of Land Use Governance in Maryland;
- Applied Policy Research;
- Public Engagement
- Model Development;
- Outreach and Education

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History and Structure of Land Use Governance in Maryland

Milestones in Maryland Land Use Policy

1935 – State Planning Commission
1969 - Program Open Space
1974 - State Development Plan
1977 - Maryland Agriculture Land Foundation
1983 – Chesapeake Bay Agreement
1984 – Critical Areas Program
1988 – Year 2020 Panel
1992 – Economic Growth, Resource Protection and Planning Act
1997 – Forest Conservation Act
1997 – Smart Growth Initiative
2000 – National Center for Smart Growth
2001 – Office of Smart Growth
2003 - Development Capacity Task Force
2006 - House Bill 1141 and House Bill 2

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Structure of Land Use Governance in Maryland

- 23 Counties
- 157 Municipalities
- Maryland Department of Planning
- Office of Smart Growth
- Smart Growth Cabinet

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1997 Smart Growth Legislative Package

- Priority Funding Areas
- Rural Legacy
- Brownfields Cleanup
- Job Creation Tax Credit
- Live Near Your Work

INCENTIVES, NOT REGULATIONS!

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Instant Accolades

- World Wildlife Fund (1/98):
  "Gift to the Earth"
- Keith Schnieder (3/98):
  "the most promising new tool for managing growth in a generation"
- Harvard University's Kennedy School of Government and Ford Foundation (2000)
  "one of the 10 most innovative new programs in the country."

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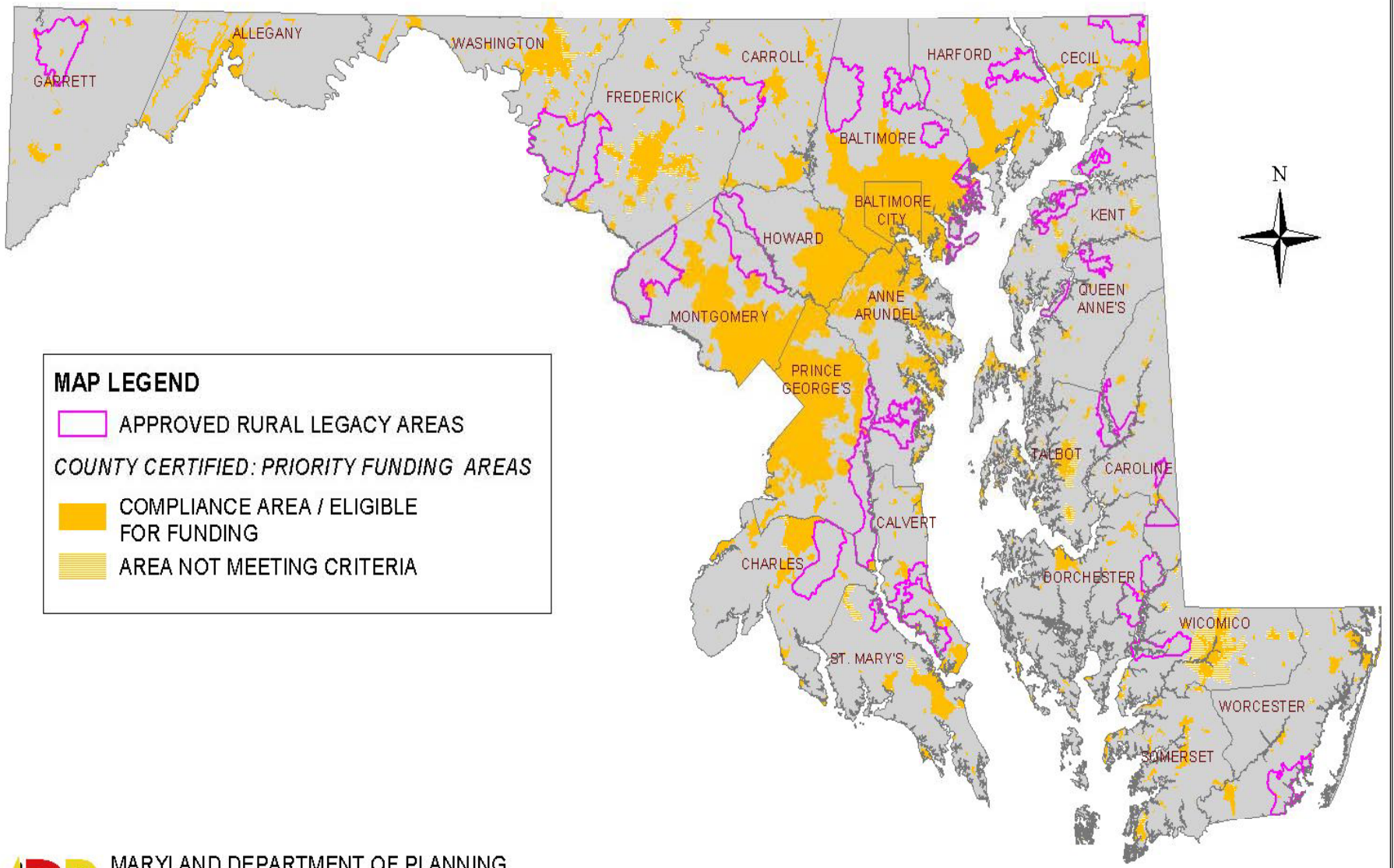
STATEWIDE PRIORITY FUNDING AND 2003 RURAL LEGACY AREAS



MARYLAND DEPARTMENT OF PLANNING
COMPREHENSIVE PLANNING DIVISION
JANUARY 2003

Applied Policy Research

Recent research on..

- Development trends,
- Development capacity,
- Development probability,

ITS NOT WORKING!

- Brownfield redevelopment,
- Job creation tax credit,
- Adequate public facilities ordinances,
- State agency spending.

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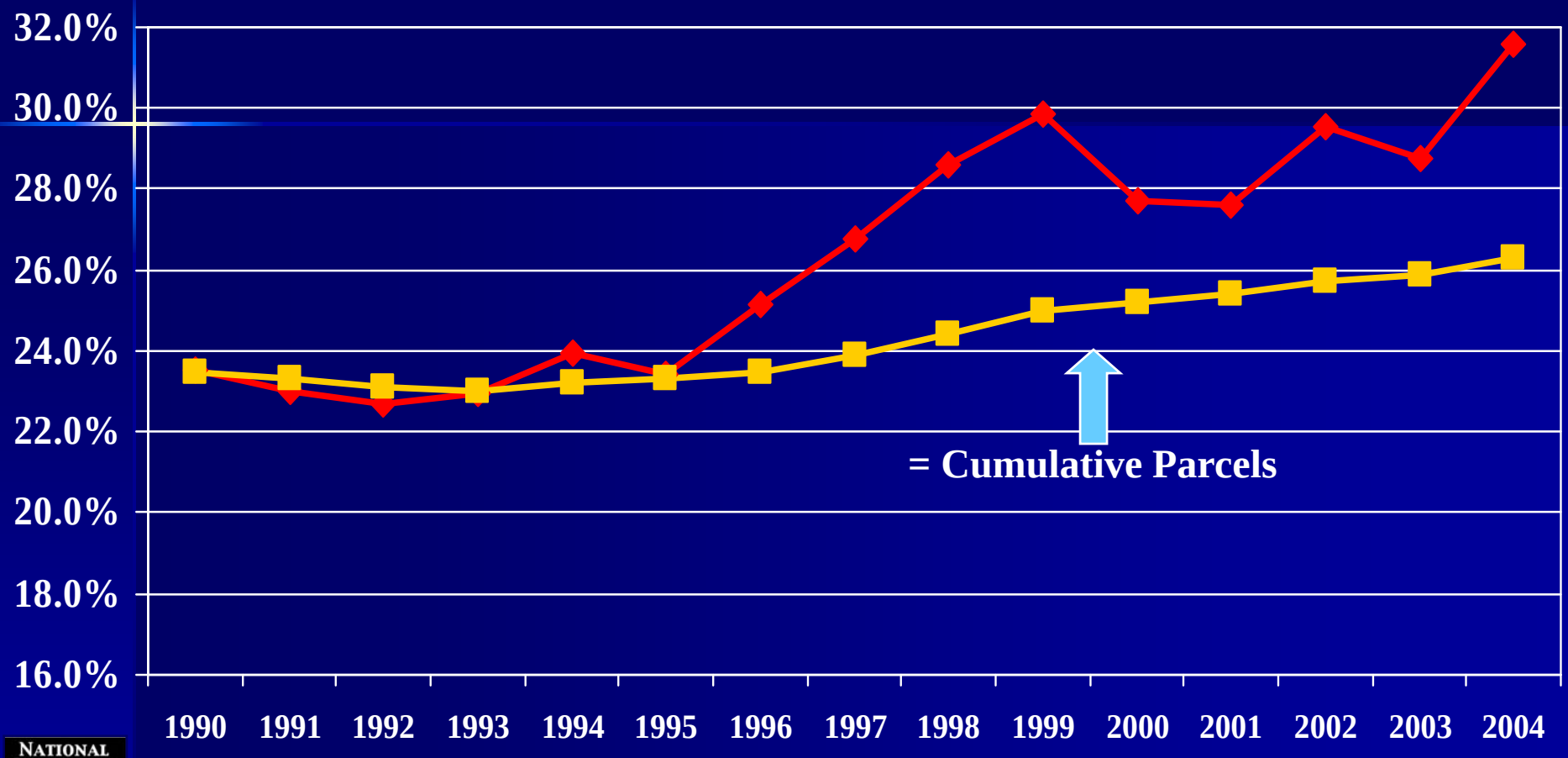
Improved Residential Parcels Outside of PFAs as a Pct. of Total Residential Parcels in Maryland, 1990 - 2004



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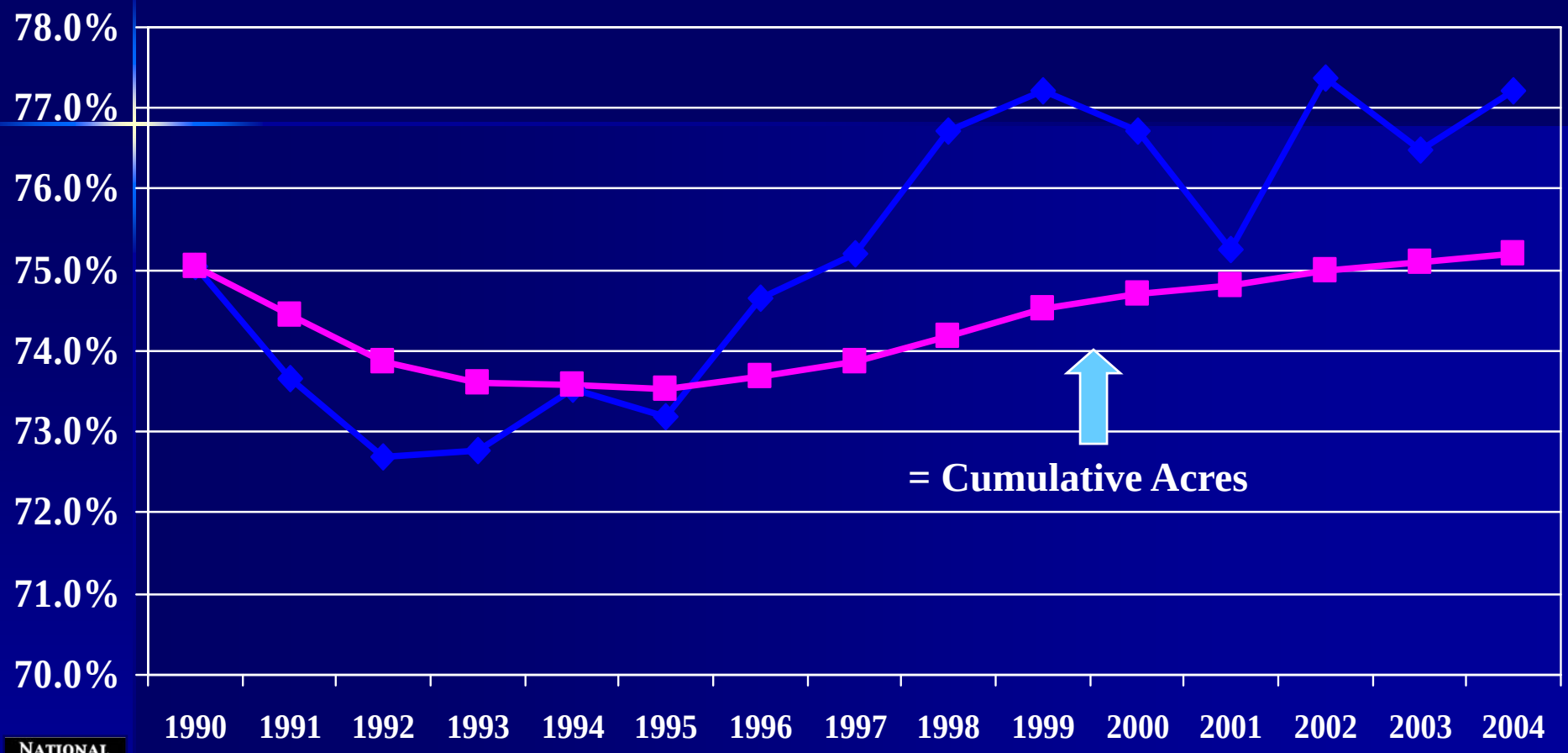
Prepared by the Maryland Department of Planning, Planning Data Services, November 2006. Source of data is MDProperty View. Data is for improved residential single-family parcels of $1,000 or more on parcels of 20 acres or less.

Improved Residential Acres Outside of PFAs as a Pct. of Total Residential Acres in Maryland, 1990 - 2004



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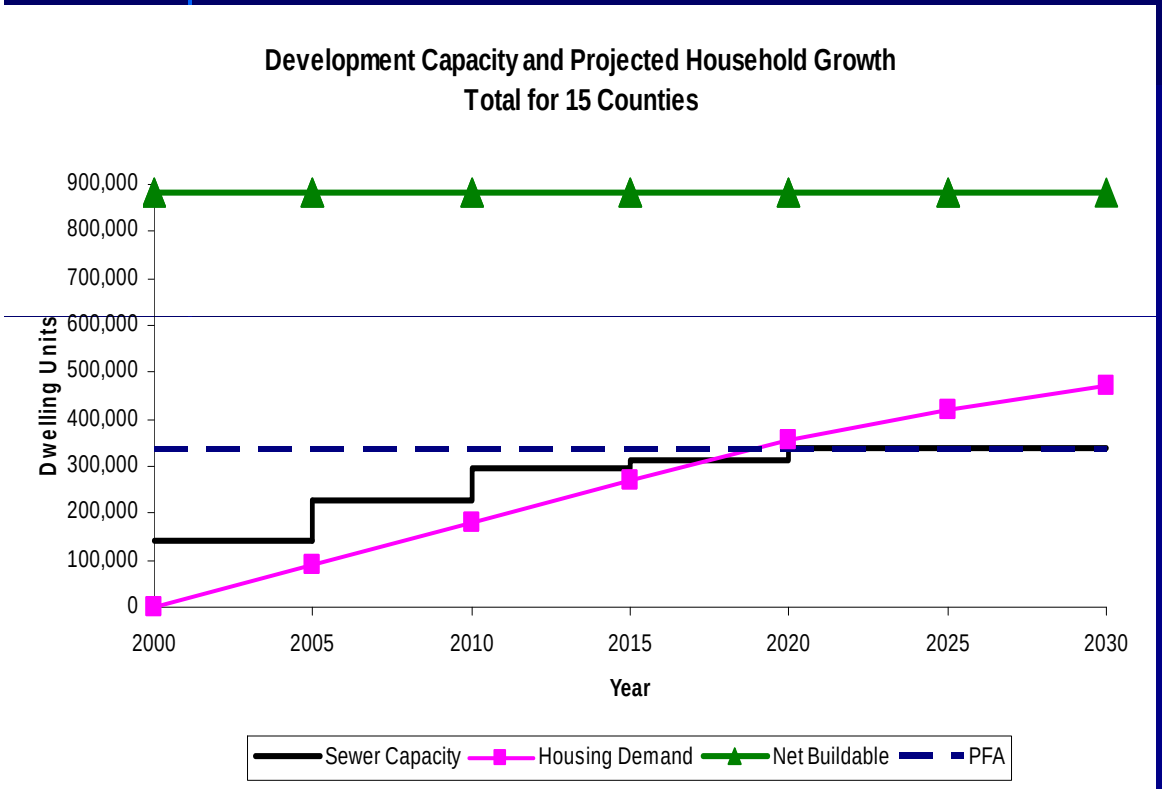
Prepared by the Maryland Department of Planning, Planning Data Services, November 2006. Source of data is MDProperty View. Data is for improved residential single-family parcels of $1,000 or more on parcels of 20 acres or less.

Development Capacity



- Identify vacant land
- Remove land subject to environmental constraints
- Remove land zoned for nonresidential use
- Remove land needed for public uses
- Remove land too small to develop
- Multiply remaining acres times maximum allowed density
- Overlay planned sewer areas
- Overlay priority funding areas
- Repeat for developable portions of improved land

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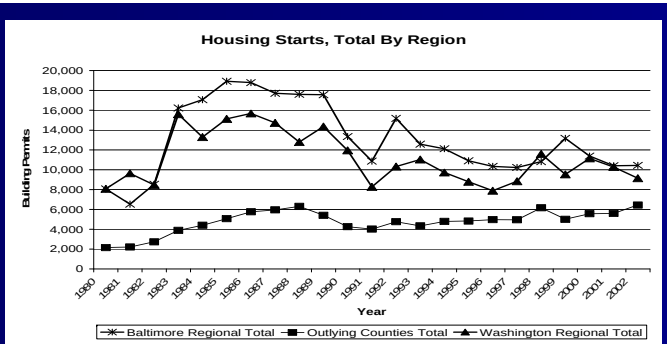

Job Creation Tax Credit

Very small effects on employment growth in certain sectors.

$$EMP_{it}^{j} = \alpha + \beta PFA_{it} + \varepsilon_{it}^{j}$$

$$EMP_{it}^{j} = \alpha + \beta PFA_{it} + \chi_i + \delta_i t + \sum_{t=1994}^{1998} \phi_t YEAR_t + \varepsilon_{it}^{j}$$

$$EMP_{it}^{j} = \alpha + \sum_{t=1997}^{1998} \beta_t PFA_{it} + \gamma LEPFA_i + \sum_{k=1}^{7} \varphi_k ZIP_{ik} + \sum_{t=1994}^{1998} \phi_t YEAR_t + \varepsilon_{it}^{j}$$

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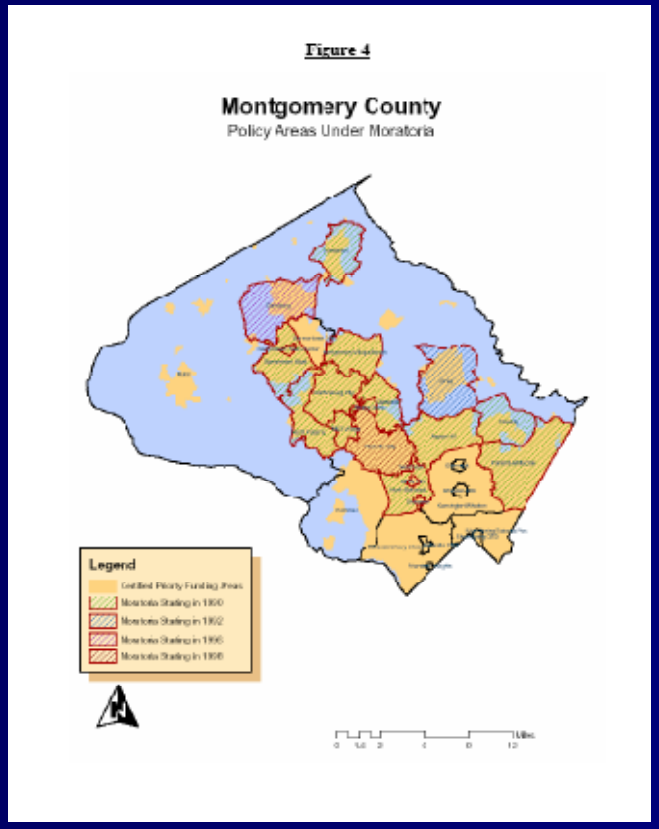
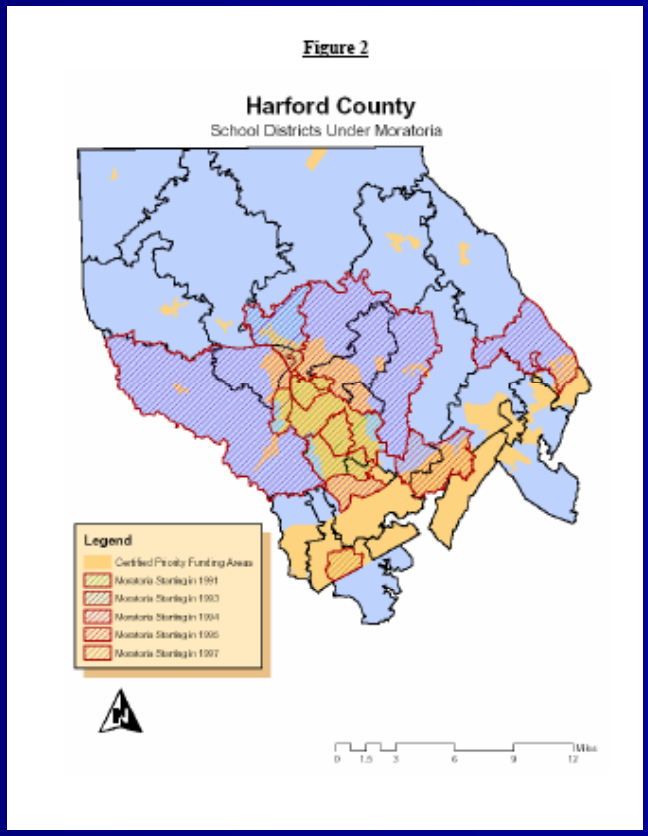
Priority Funding Areas and Adequate Public Facilities Ordinances





Treatment/ Control research design

10% Deflection outside PFAs

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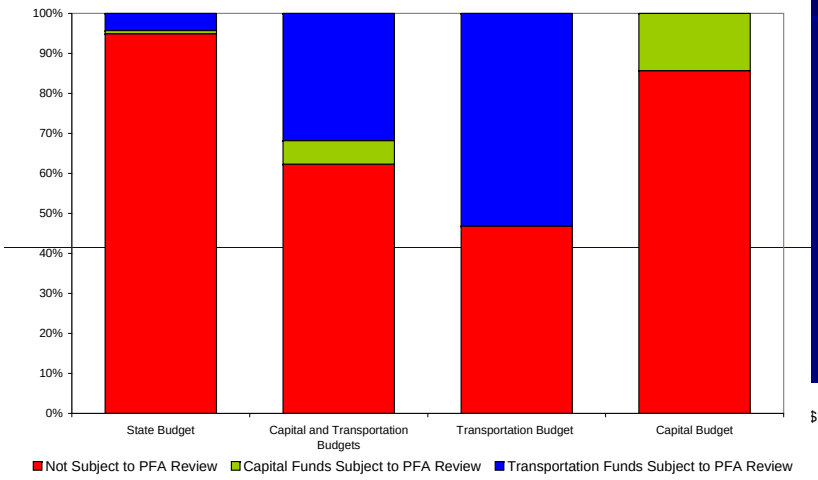
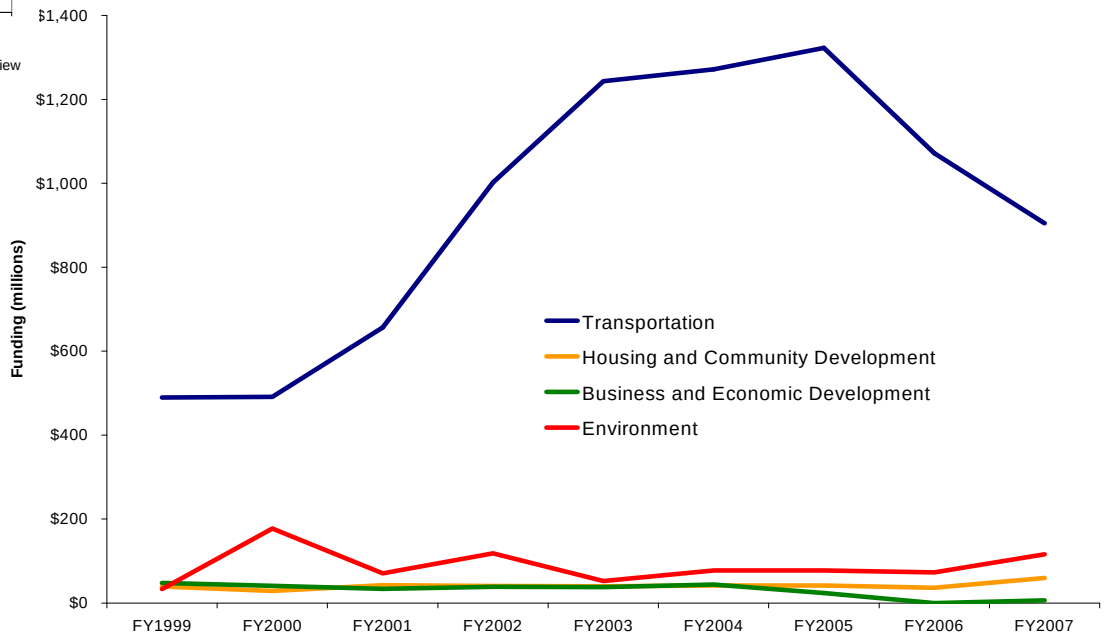
"Growth-Related" Spending by State Agencies





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The Media Matters

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THE SUN

LIGHT FOR ALL

O'S 10TH STRAIGHT LOSING SEASON ENDS

FIXING THE ORIOLES

MACPHAIL HAS HIS WORK CUT OUT FOR HIM >>>> SPORTS

TV PREVIEW // 'ALIENS IN AMERICA'

FISH OUT OF WATER

CW SITCOM WORTH WATCHING

>>>> TODAY

Ravens are rocked

Officials in Md. worry as Army signs deals

Base projects should share improvement costs, critics say

BY TIMOTHY B. WHEELER
[SUN REPORTER]

With "strength" as its watchword, the Army is going strong into real estate these days.

CHECKS ON MD. SPRAWL GO AWRY

Spending on projects not monitored as law requires, report says

BY TIMOTHY B. WHEELER
[SUN REPORTER]

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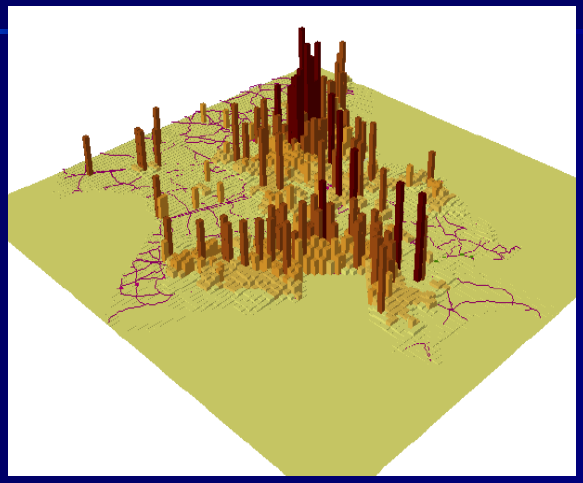
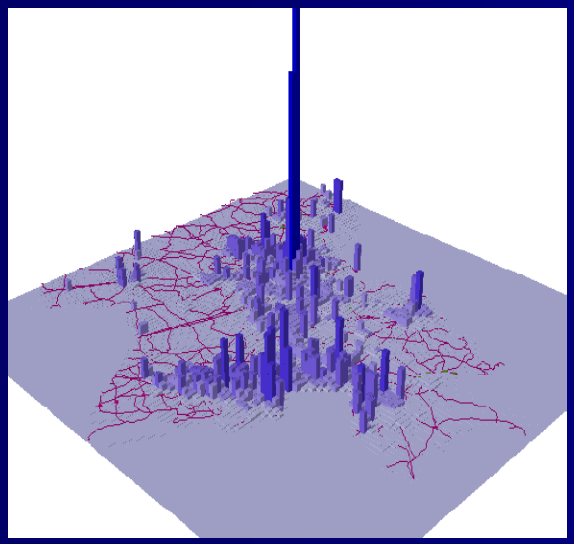
Public Engagement

Today's VISION...
Tomorrow's REALITY

Reality CheckPlus
Imagine Maryland

TABLE 1: Households and Jobs





INDICATORS	EXISTING	2030
JOBS NEAR TRANSIT	34	37
HH NEAR TRANSIT	21	26
JOBS IN PFA	84	85
HH IN PFA	80	83
AFFR. HH IN PFA	-	94
JOBS IN BELTWAY	45	46
HH IN BELTWAY	42	42

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Reality Check DC

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St. Mary's College

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Cambridge Hyatt

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Hagerstown Community College

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Baltimore Convention Center

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Alternative statewide allocations of households

FIGURE 2: Density of Existing Households (2000)

FIGURE 3: Density of Households – Reality Check Scenario (2030)

FIGURE 4: Density of Housing – Regional Planning Council Cooperative Forecasts

FIGURE 5: Density of Households – Build-Out Scenario

Compared with Buildout and COG forecasts, RCP results would have..

- More jobs and housing close to transit;
- More jobs and housing inside priority funding areas;
- Less development on green infrastructure; and
- Less new impervious surfaces;
- Fewer vehicle miles traveled.

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Urban Design Analysis Carroll Park, Baltimore

Existing Conditions

- Gross Area
  - 1.16 Square Miles
- Net Area
  - .61 Square Miles
- 1650 Housing Units
  - 700 Single Family
  - 200 Townhouse
  - 750 Apartment
- Commercial Space
  - 750,000 Square Feet
- Green Space/Parks
  - .40 Square Miles

Reality Check Results

- 500 New Housing Units
  - Along Route 1 Corridor
  - Mid-rise Housing (4-6 Stories)
  - Multi-family Housing
    - Apartments
    - Town Homes
- 600 New Jobs
  - 60,000 SF

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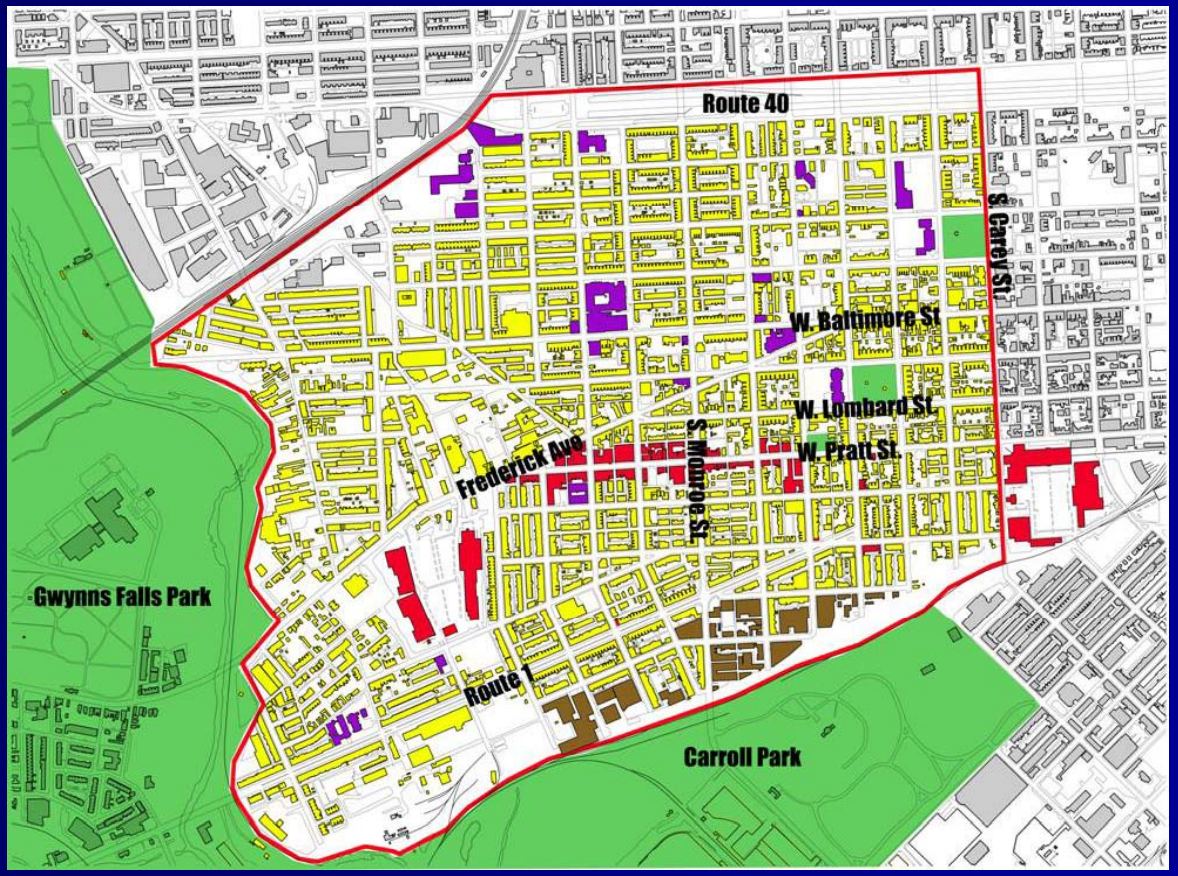
Soft Site Analysis



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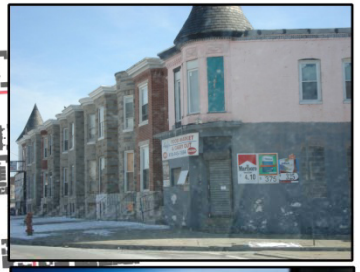
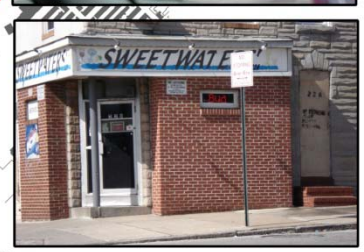
Soft Site C





The Corners

- **location for new higher density, mixed use projects**
- **expand upon the idea of existing corner retail locations**
- **allow for improvement and change without completely changing the existing character of the neighborhood**

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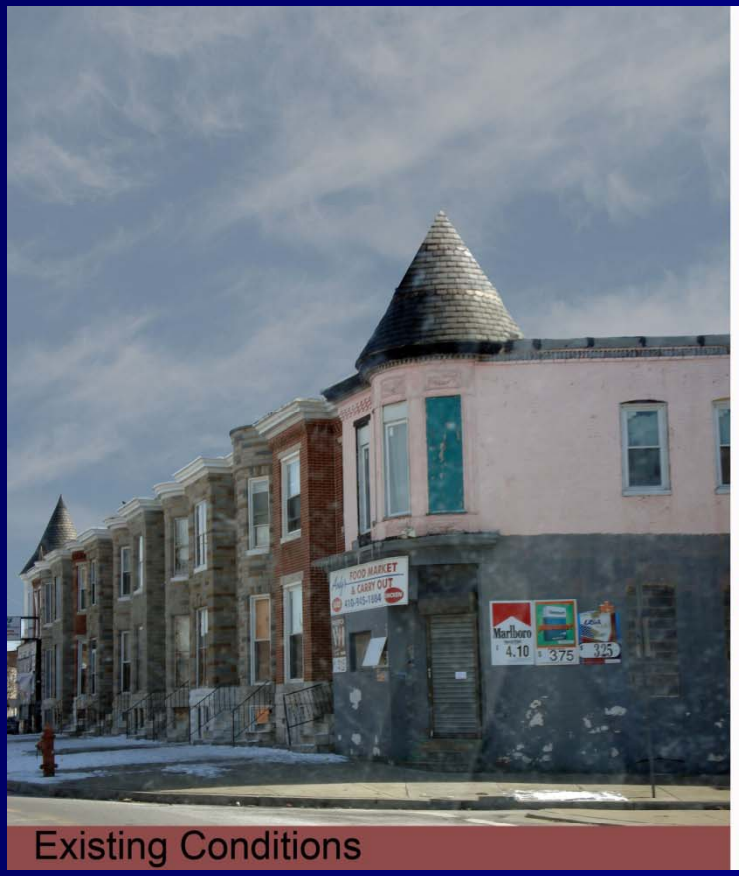
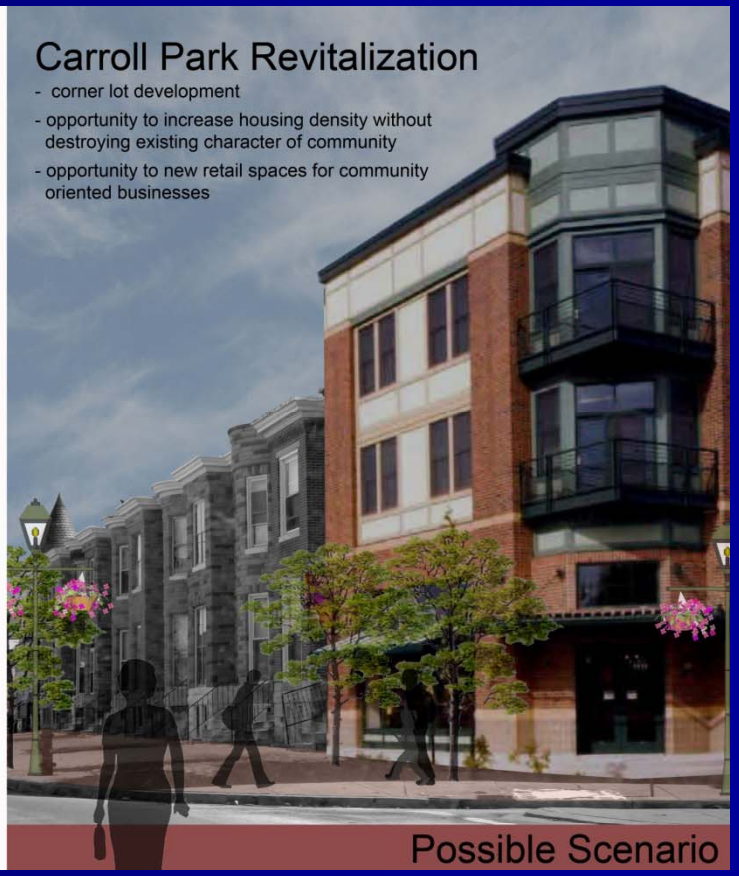


Existing Conditions



Carroll Park Revitalization

- corner lot development
- opportunity to increase housing density without destroying existing character of community
- opportunity to new retail spaces for community oriented businesses

Possible Scenario

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The Maryland Scenario Project

The purpose of the Maryland Scenario Project is....

- To take an informed and careful look at alternative long-term future scenarios;
- To conduct a quantitative assessment of each scenario;
- To identify where and how public policy decisions will increase the likelihood of more desirable scenarios;
- (To lay the foundation for a state development plan.)

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Washington Post, 7/5/08

Urging A Plan for Growth

O'Malley Officials Push State Initiative

By Miranda S. Spivack
Washington Post Staff Writer
Saturday, July 5, 2008; Page B01

For more than 30 years, Maryland has had a law on the books requiring officials to write a plan describing how the state should grow and develop. But with most land-use decisions made locally, and with little public pressure to create a wider vision for Maryland, no one sat down to write it.

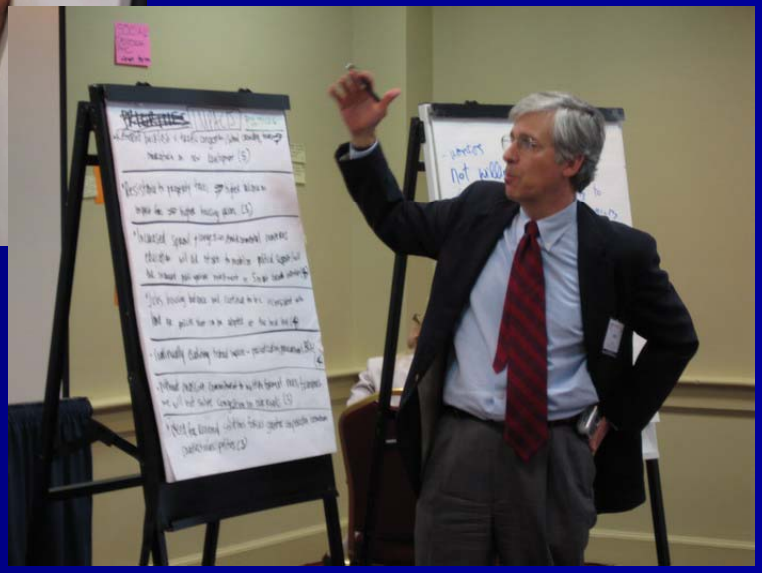
This year, that could change.

The administration of Gov. Martin O'Malley (D), concerned about the potential effect of unchecked growth on the water supply, greenhouse gases and the Chesapeake Bay, has been quietly setting the stage for the creation of a statewide plan to guide development.

O'Malley officials are worried about effects of growth. (Toni L. Sandys - The Washington Post)


Categories
• Social/Demographic
• Technology/Infrastructure
• Economic
• Environmental
• Political/Institutional/Governance/
Regulations

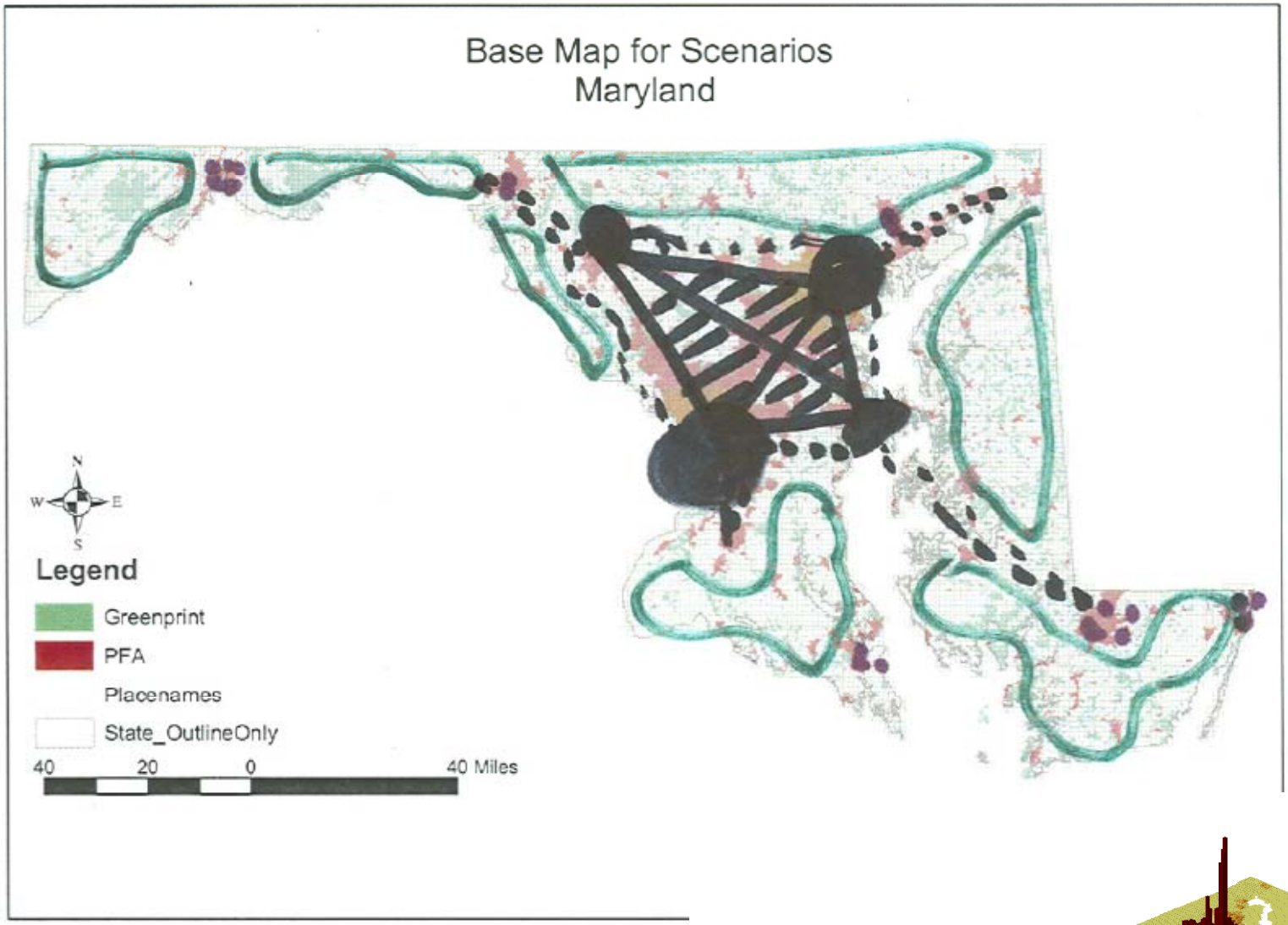

ECONOMIC
Inequality
Education
Services

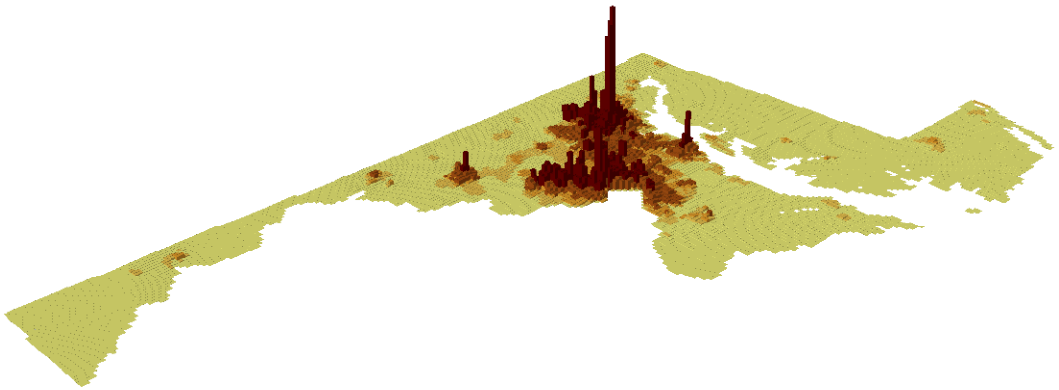


GREATEST IMPACT AND MOST UNCERTAIN

The following table shows the driving forces that the group thought (1) would have the greatest impact, and (2) were the most uncertain. In this group, the issues deemed as likely to have the most impact did not overlap with issues deemed uncertain. "Category" in the table refers to the ten categories above.

Cate-gory	Economic Driving Force	# of Group members saying…	
		Will Have Large Impact	Very Uncertain
8	Economic development in Baltimore – expansion of knowledge-based industries	***	✓✓✓✓
2	Increasing inequality in income and wealth	***	
5	Higher education policies to support knowledge-based industries and international competitiveness	***	
1	Job growth in the Federal Government	**	✓
6	Increasing pressure to compete in a global market	**	
9	Lack of requirement for job/housing balance resulting in longer commutes – disconnect between economic development and housing planning	**	
5	Role of Immigrants – both legal and illegal – in economic growth	**	
7	Maintaining and developing a viable economic base in rural Maryland	**	✓
4	Production of sustainable and renewable fuel	*	✓✓





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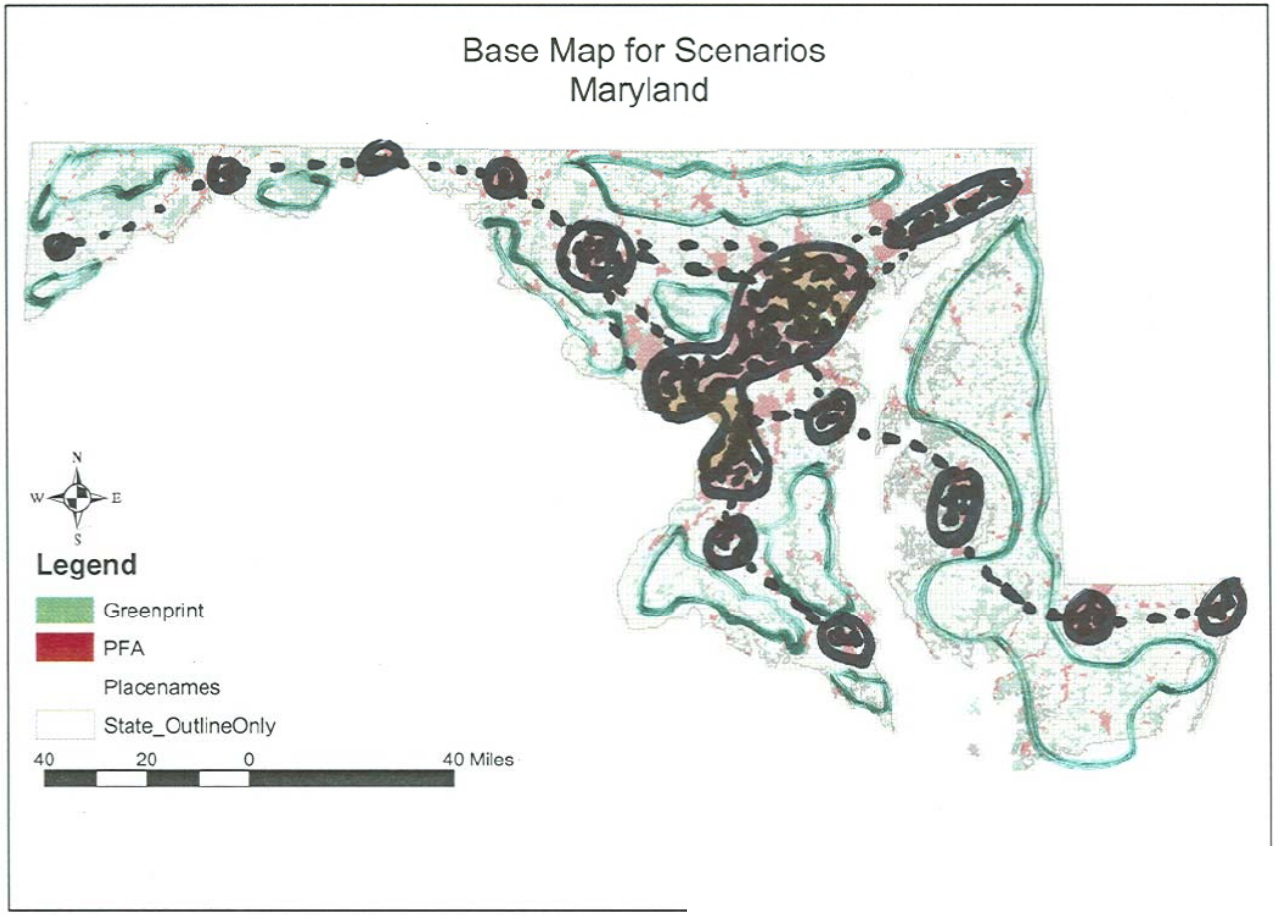
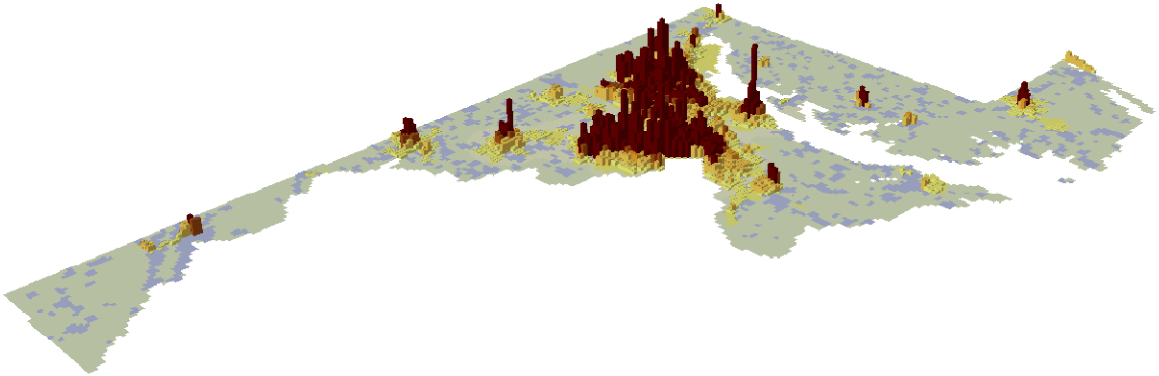
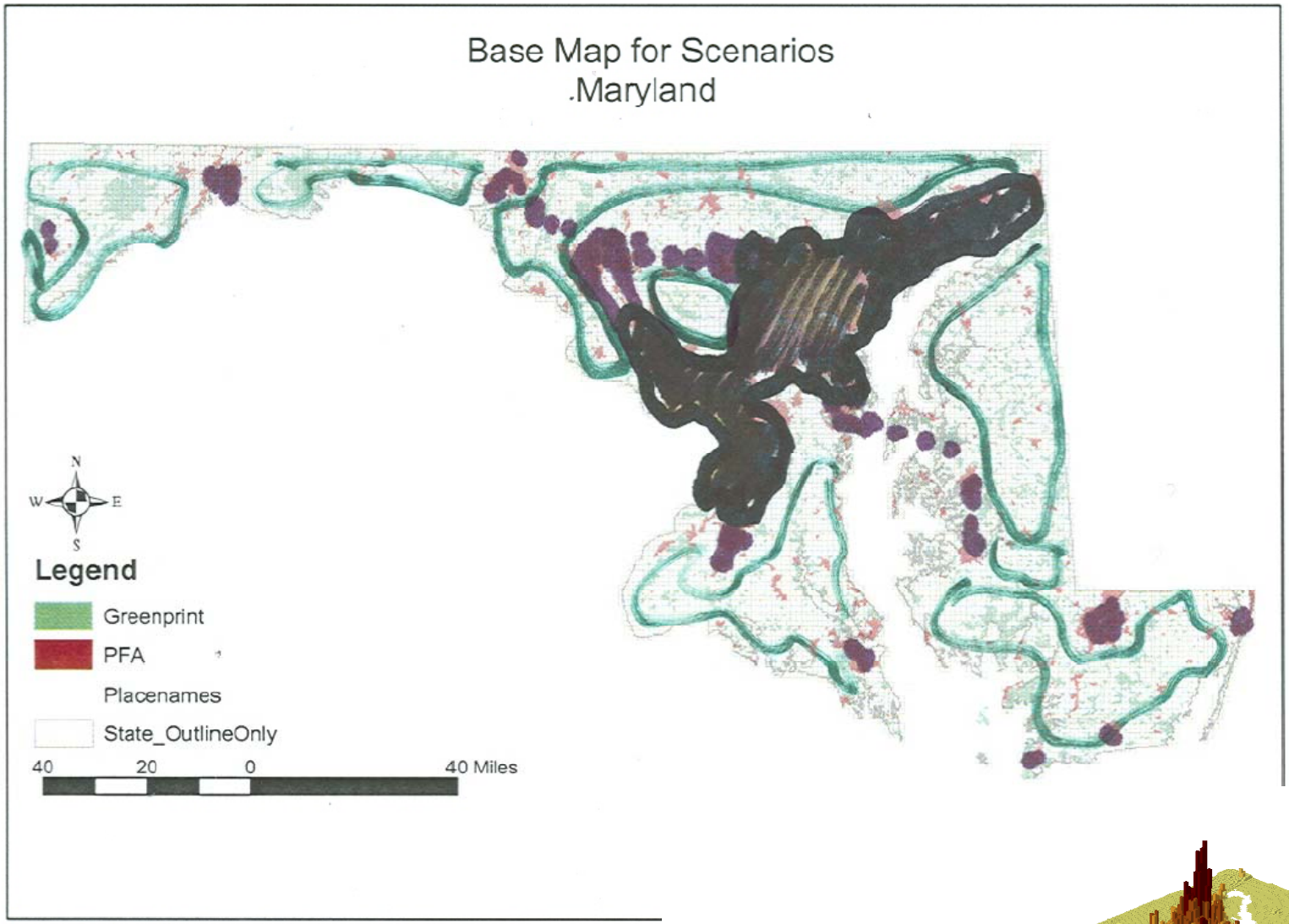
Capital Diamond



Urban Clusters





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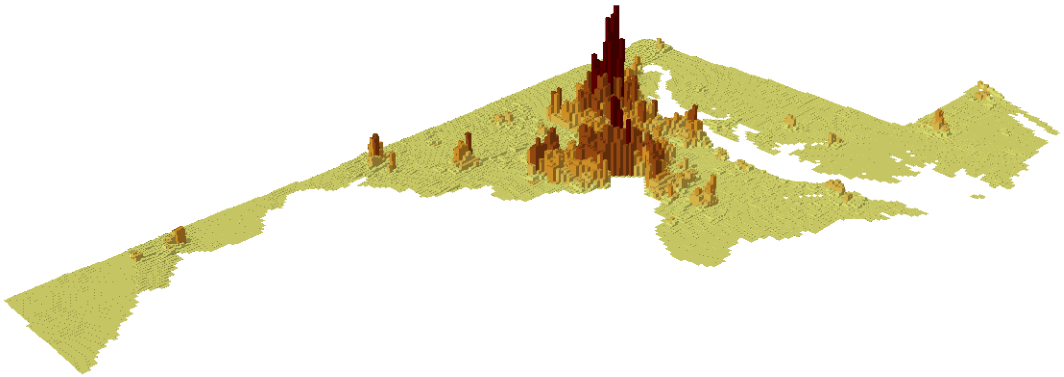
Smart Growth



Modeling and Analysis Infrastructure

- Regional transportation model
- Regional land use model
- Regional econometric model
- Residential energy consumption model
- Nutrient loading model
- Fiscal impact model
- Greenhouse gas model

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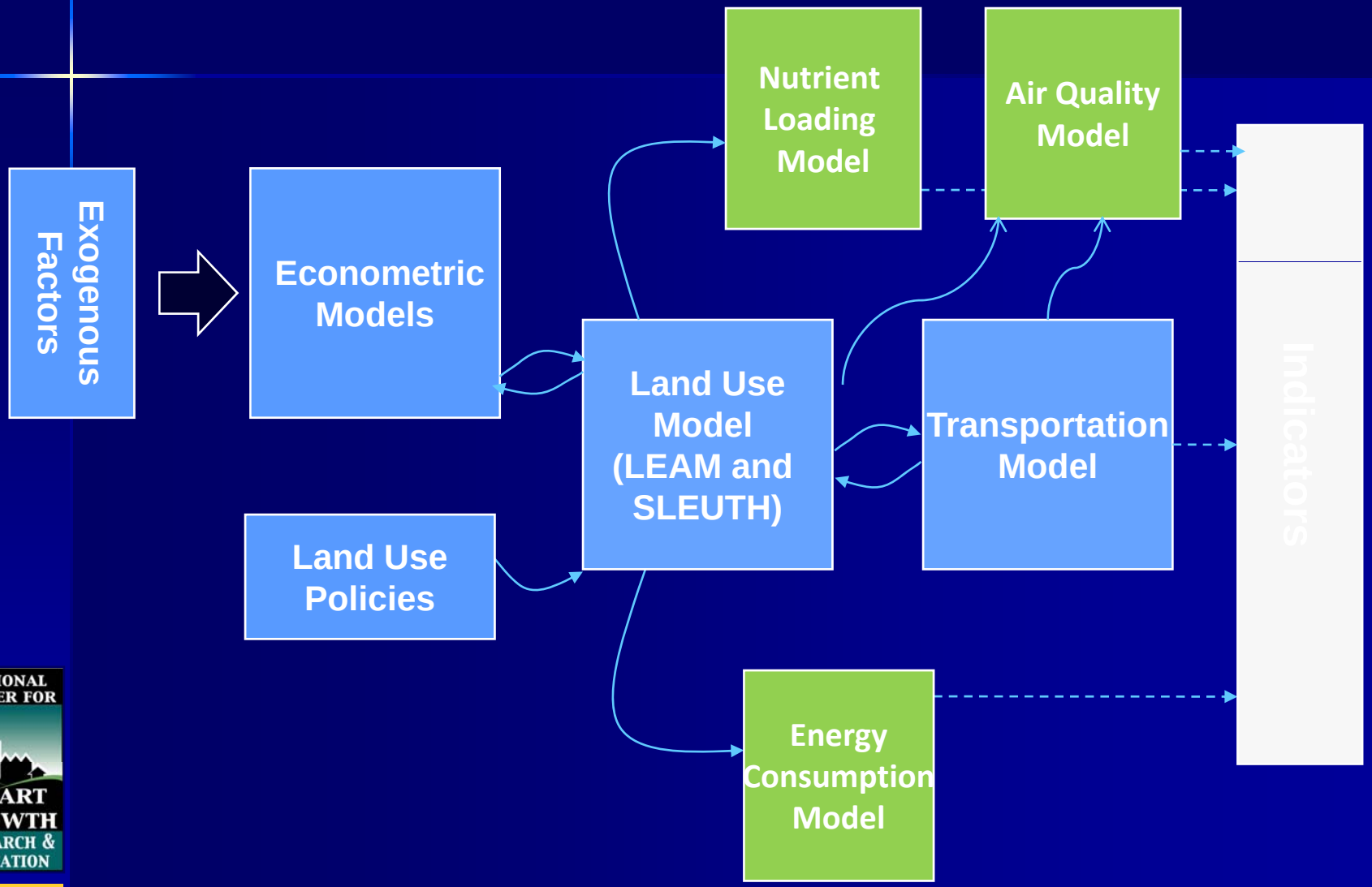
Modeling Frameworks



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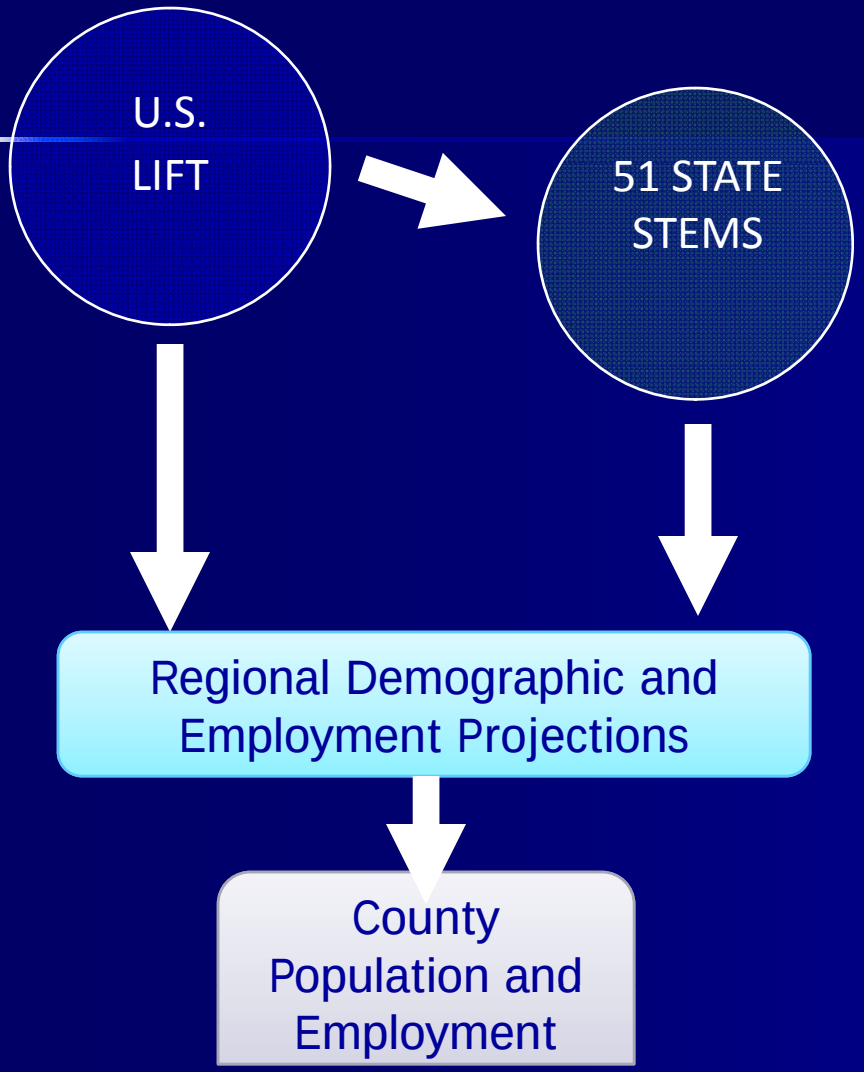
Econometric Model



National "Macro" Variables

- Population (immigration, age profile, etc.)
- Labor Force (participation)
- Energy Prices (oil, gas, coal, import and domestic)
- Savings Rate (consumer)
- Government Spending (Federal defense and nondefense, S&L educ, health and other)
- Government Transfers Payments (Social Security, Medicare and Medicaid, Other)
- Tax rates (various: income, sales, social security, etc.)
- Energy prices (oil and natural gas)
- Technology/Productivity
- Key Expenditure Items (Health, Education, Energy, Autos)
- International Activity (export market demand, import prices)
- Exchange Rates

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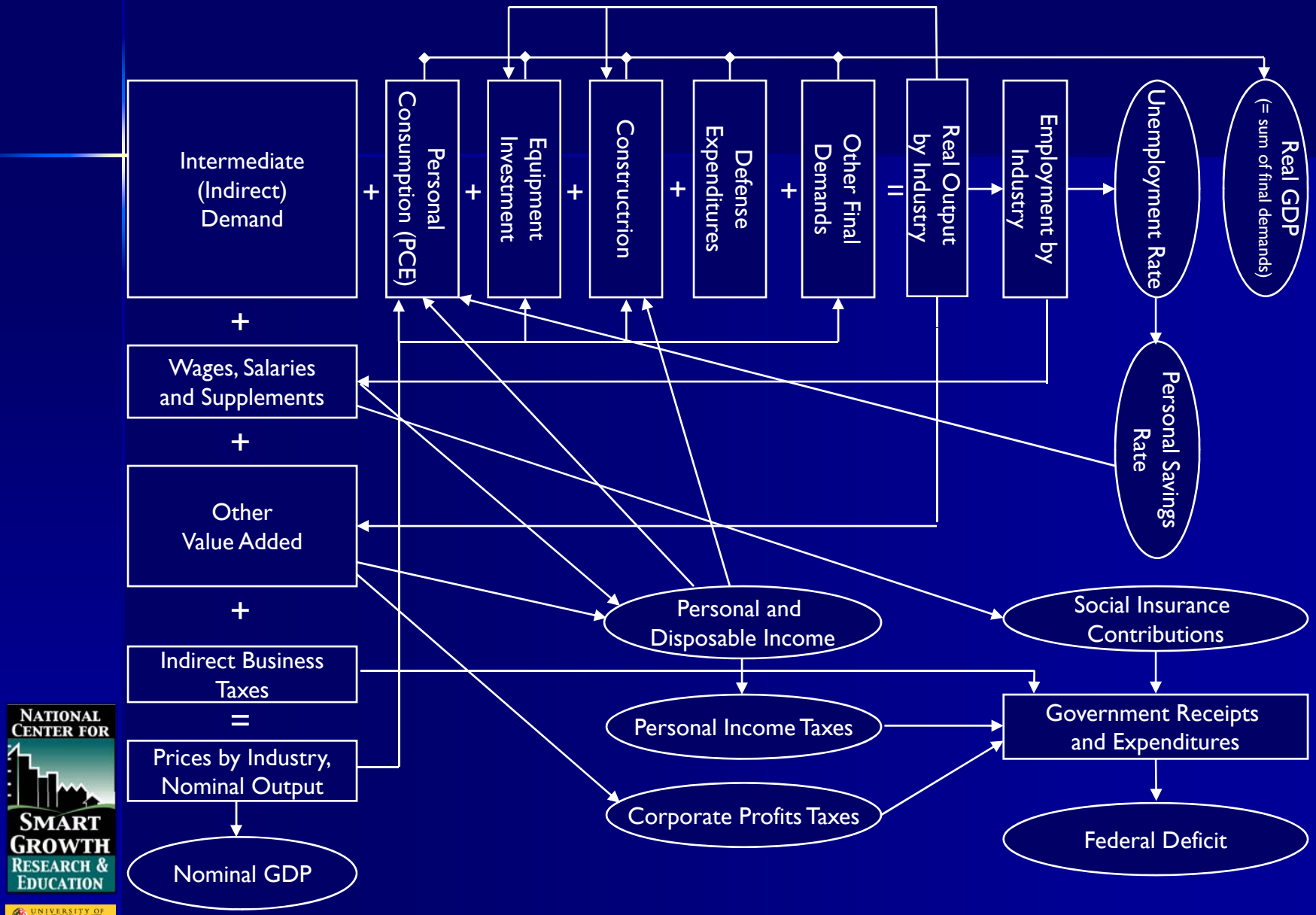
Schematic of Inforum's LIFT model



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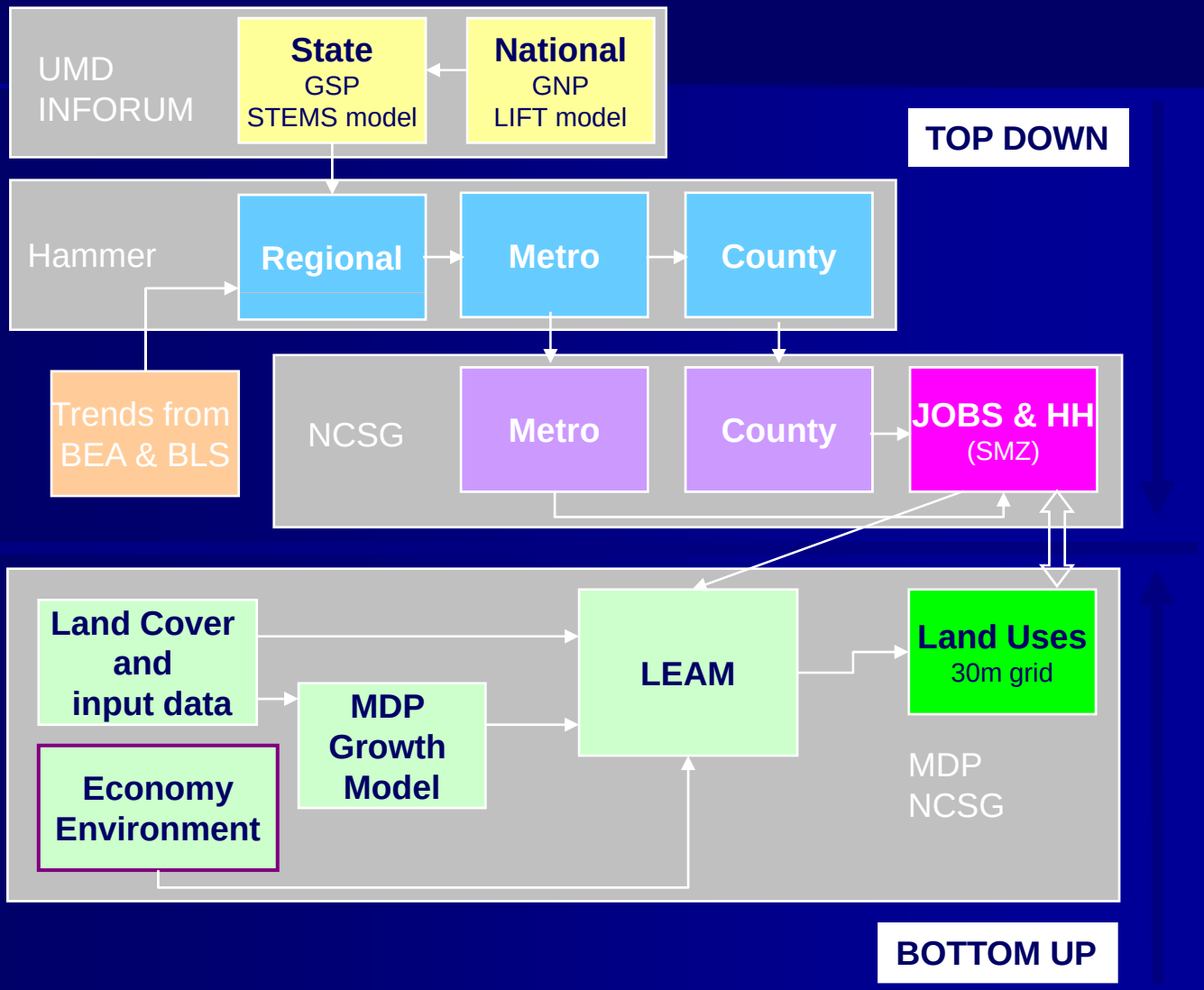
Top Down / Bottom Up Land Use Models



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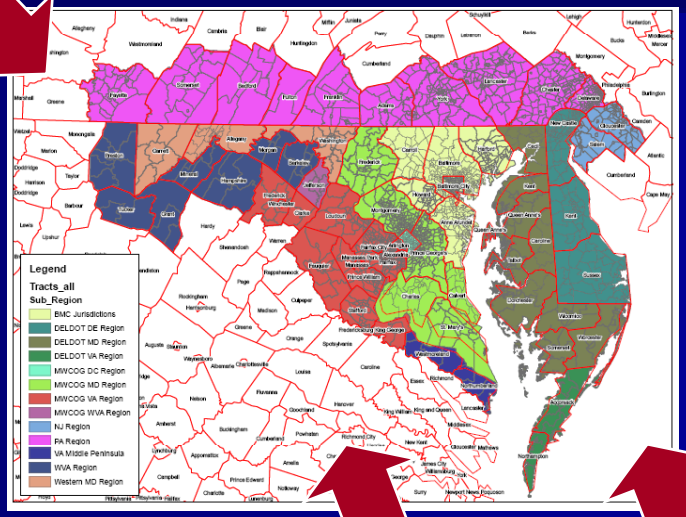
3-Level Transport

Top Level: National View

County/state zones; Interstate road/transit network

- Economic Forecast model
- FAF Commodity Flow model
- Long Distance Person Travel model

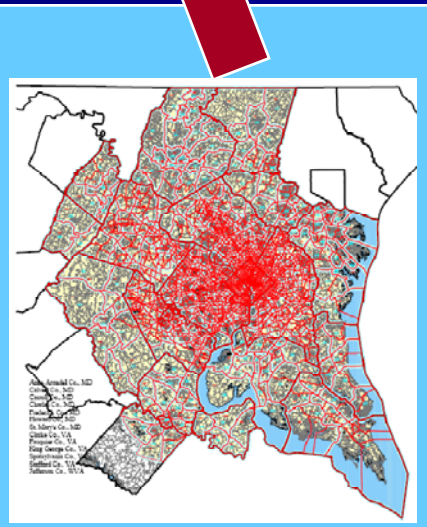


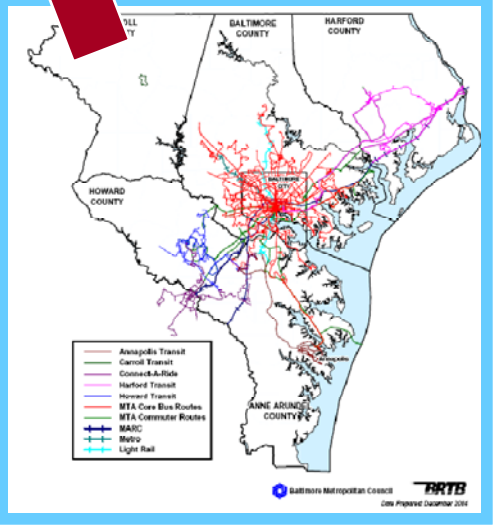
Middle Level: "Regional" View

Sub-county/aggregated MPO zones

Arterial network; External Stations

- Short Distance Person Travel model
  - Trip Generation
  - Trip Distribution
  - Mode Split
  - Assignment





Bottom Level: MPO View

MPO TAZs; Sub-arterial network

- No statewide modeling occurs
- MPO model data aggregation to compare with middle layer Statewide model

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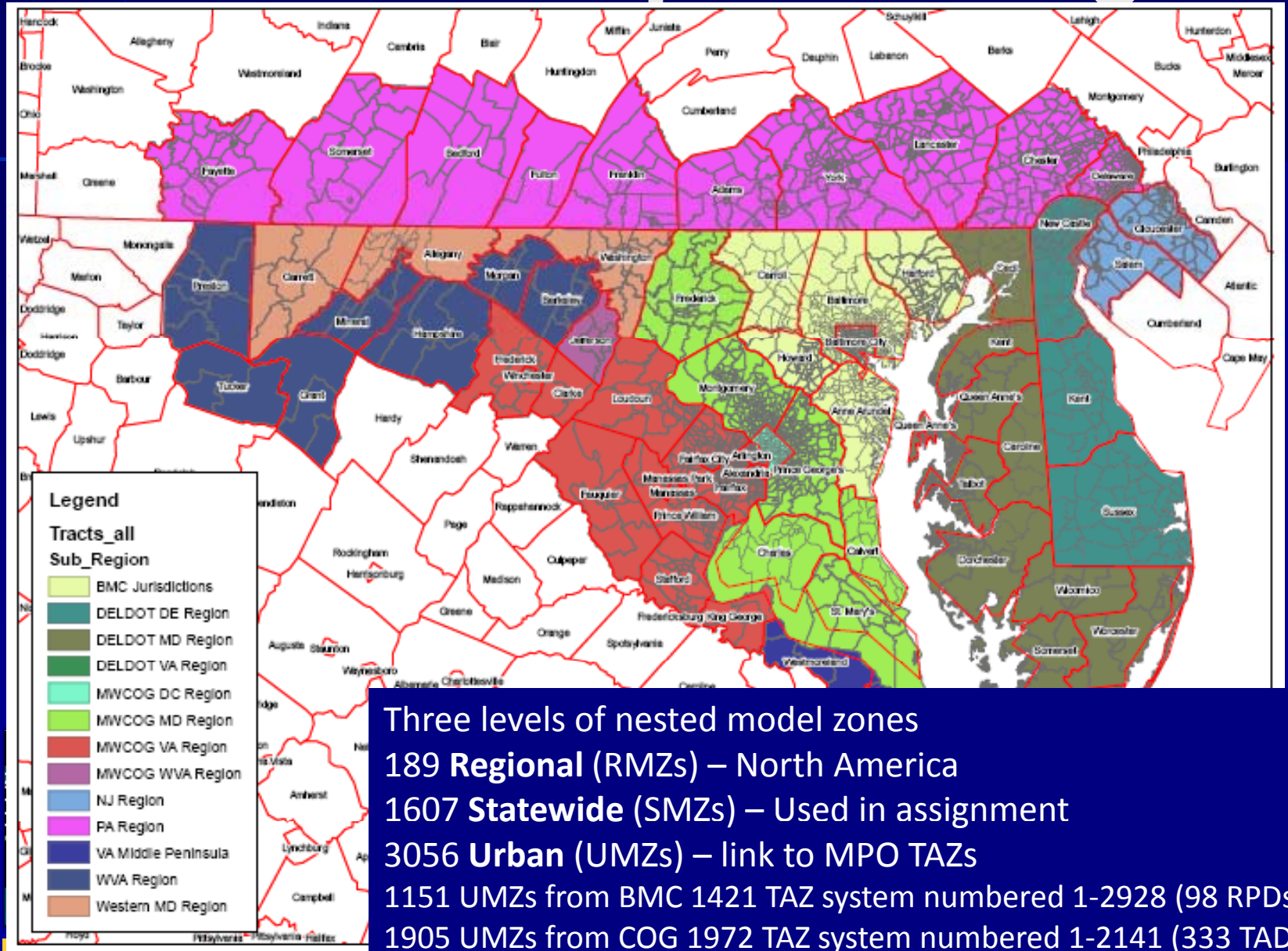
SMZ Development Regions



Three levels of nested model zones

189 **Regional** (RMZs) – North America

1607 **Statewide** (SMZs) – Used in assignment

3056 **Urban** (UMZs) – link to MPO TAZs

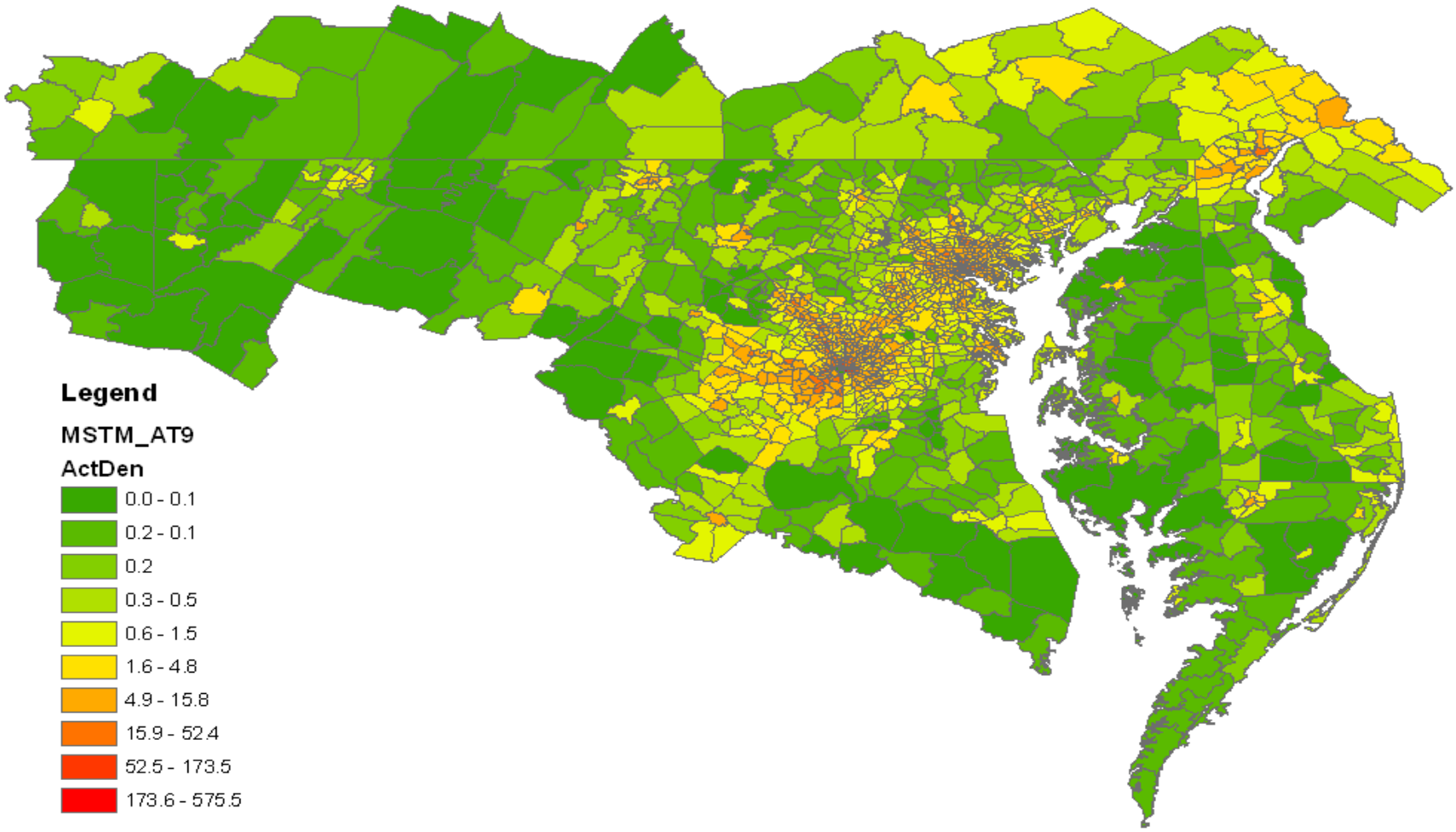
1151 UMZs from BMC 1421 TAZ system numbered 1-2928 (98 RPDs)

1905 UMZs from COG 1972 TAZ system numbered 1-2141 (333 TADs)

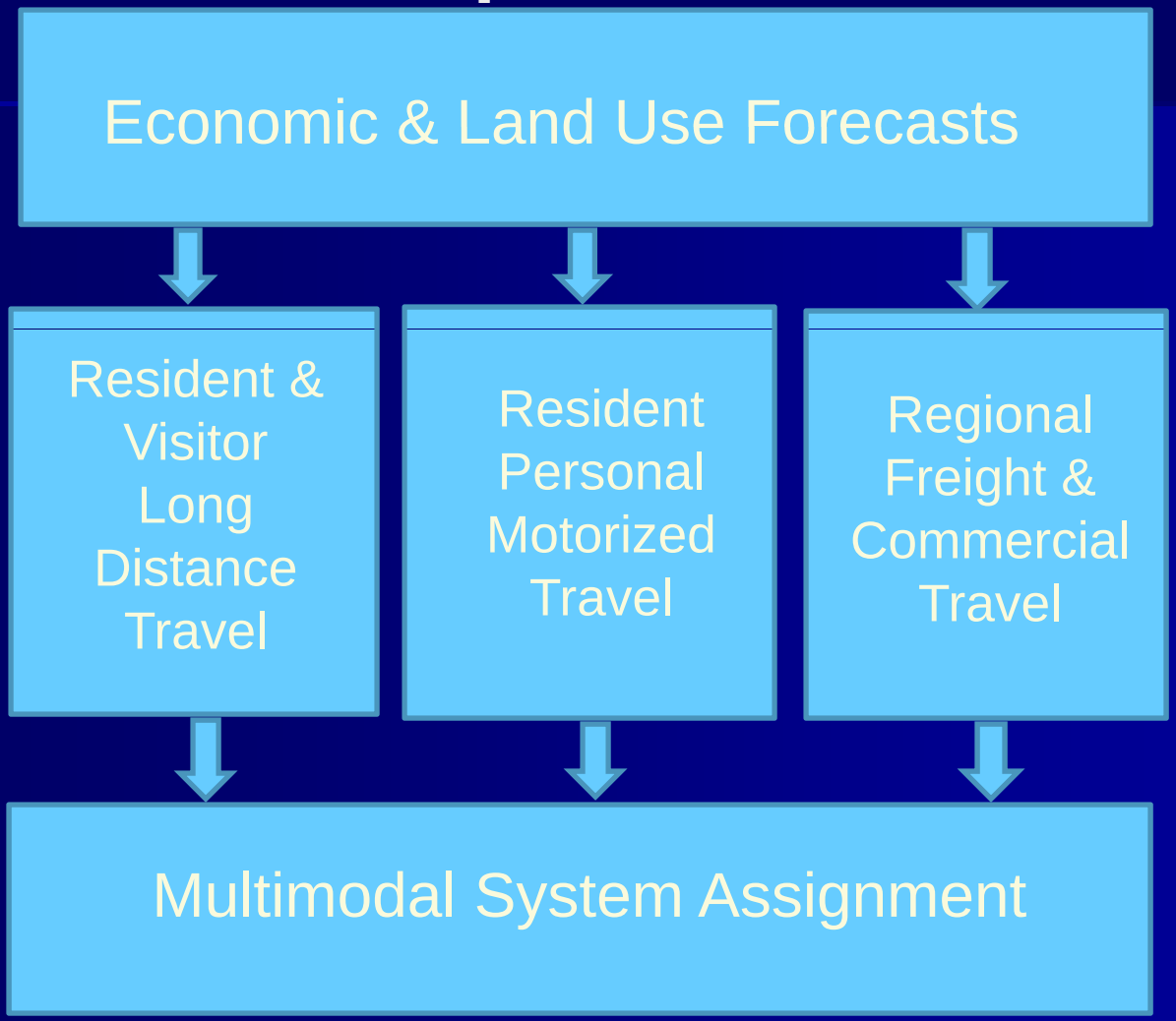
MSTM Person Travel Model Spatial Coverage

State	# of Counties	# of SMZs
Maryland	24	1151
District of Columbia	1	97
Delaware	3	84
Virginia	16	171
West Virginia	8	30
Pennsylvania	10	60
New Jersey	2	14
Total	**64**	**1607**

Activity Density



Model Components



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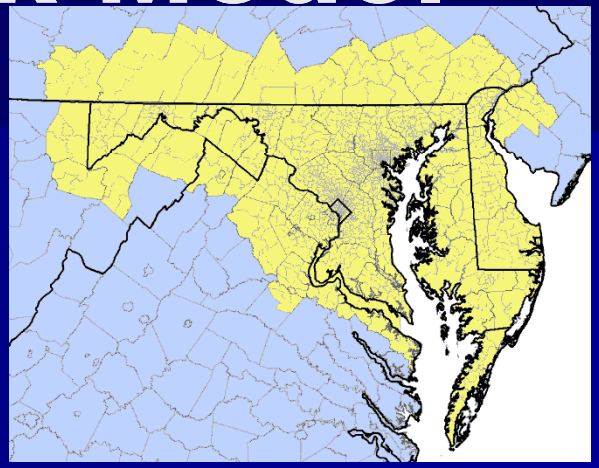
Statewide Truck Model

The Statewide Truck Model is an application of the

- **BMC Commercial Vehicle Model** and the
- **BMC Truck Model**,

which were developed by William G. Allen in 2002.



Employment and Households by SMZ are used as truck generators, and a gravity model is used to distribute truck trips.

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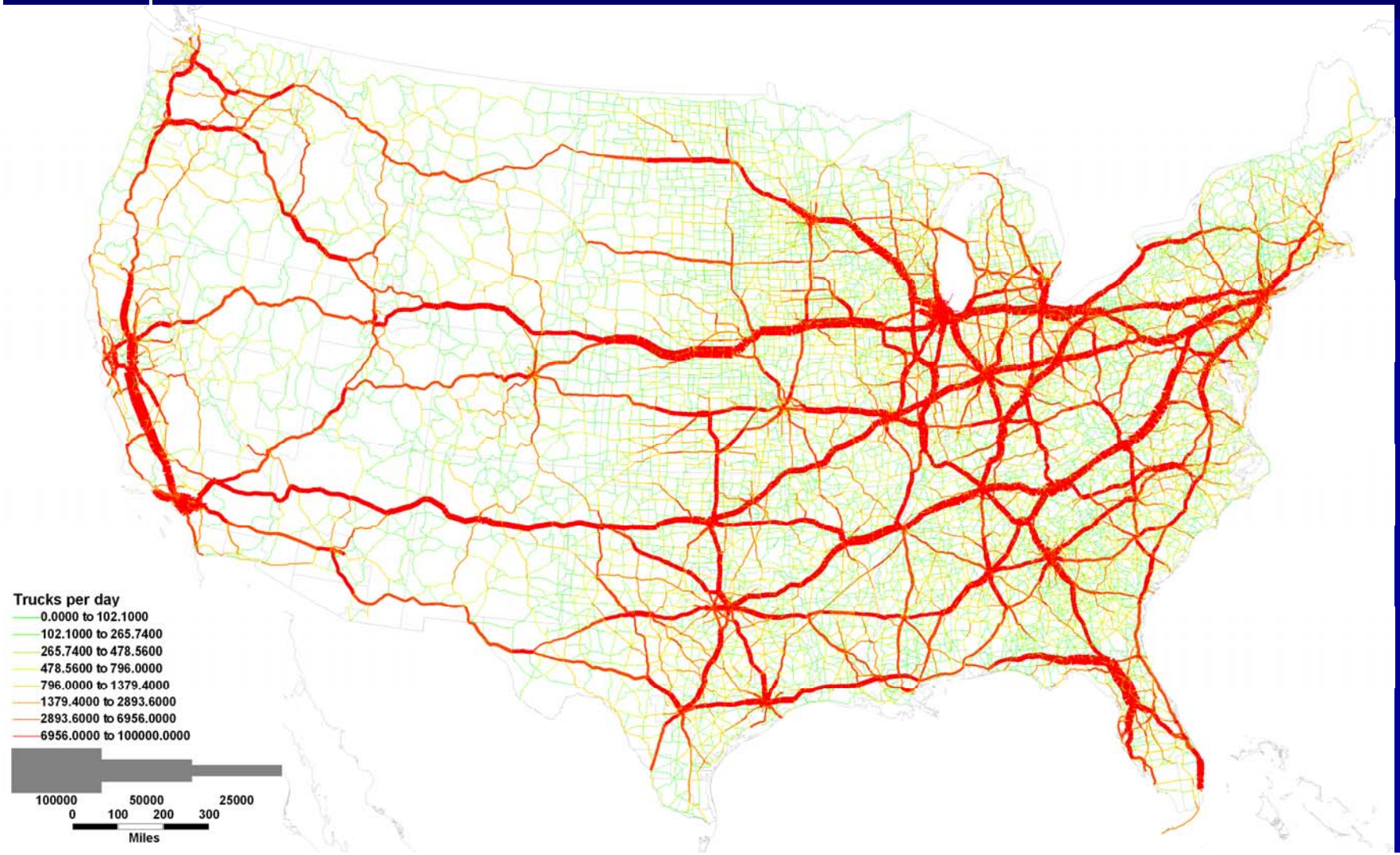
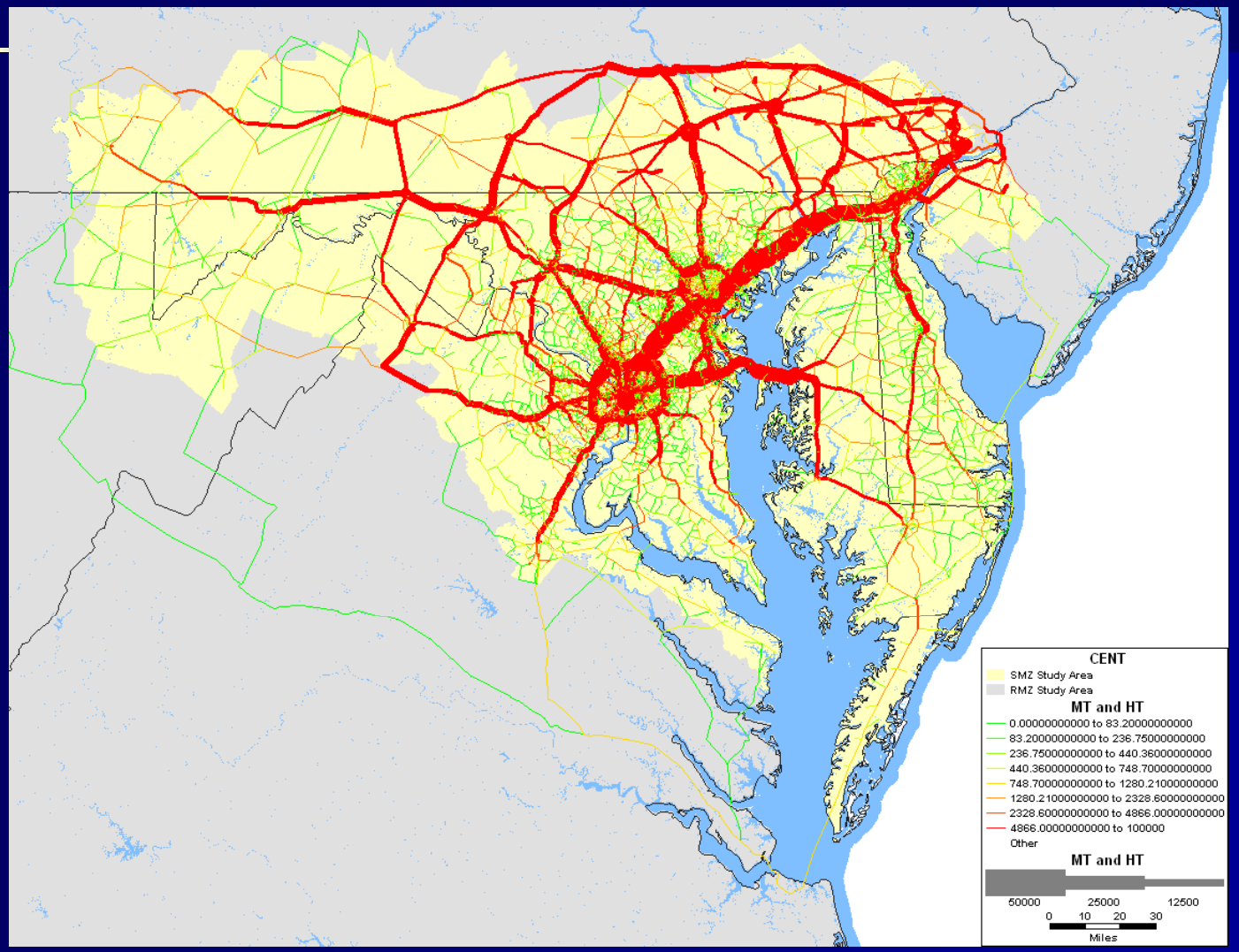
Regional Truck Trips in the U.S.



Assignment of MT and HT



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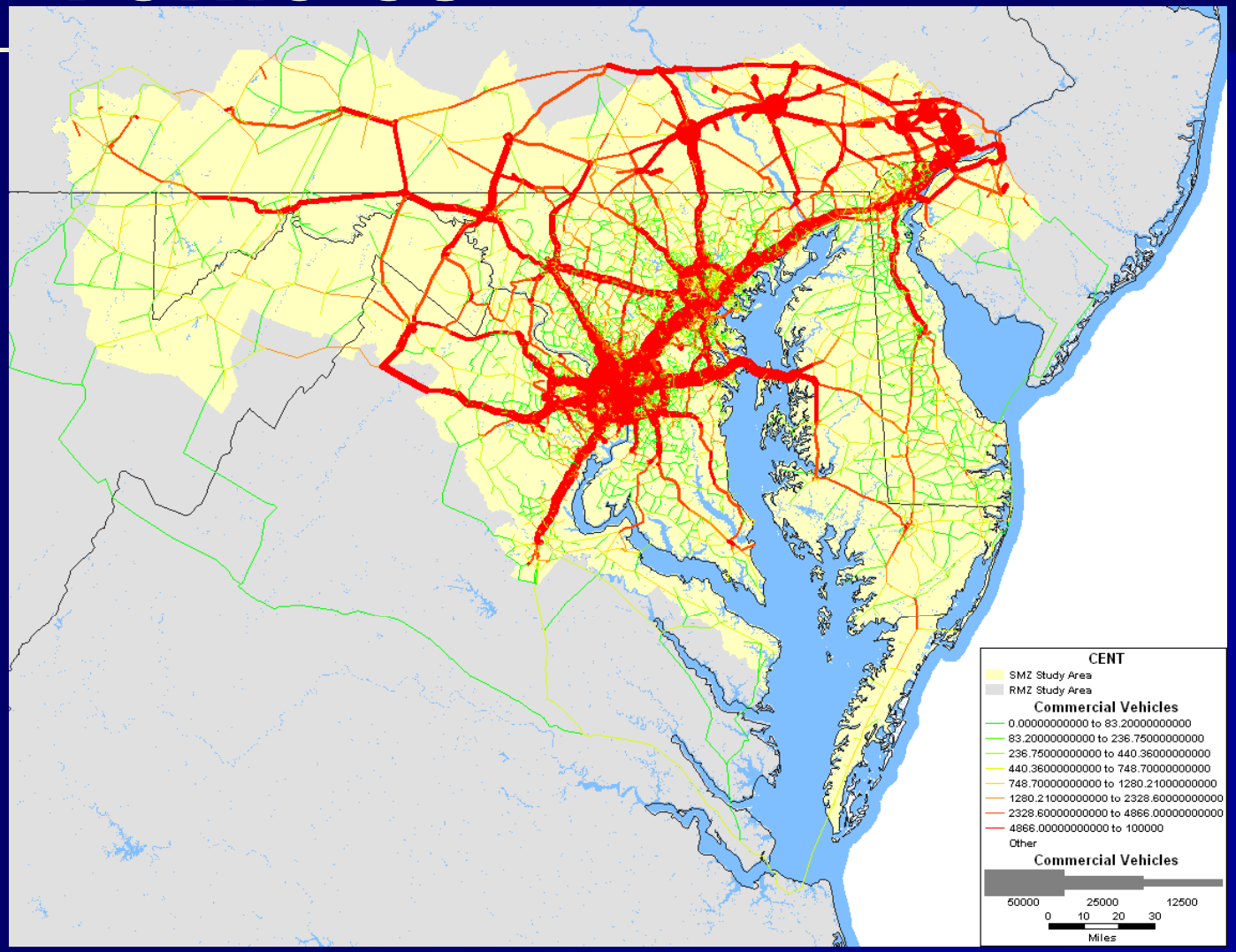
Assignment of Com. Vehicles



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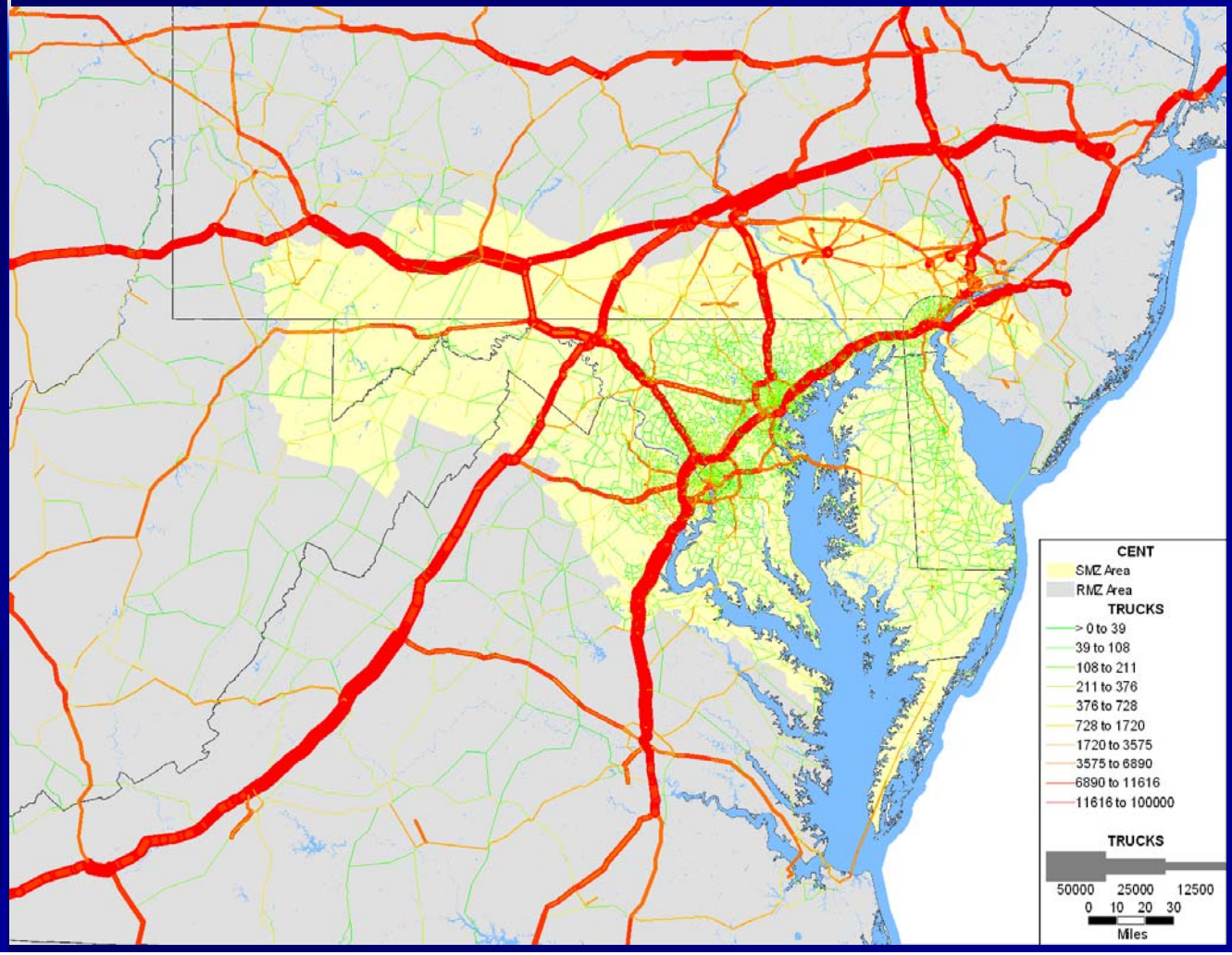
Regional and Statewide Truck Trips



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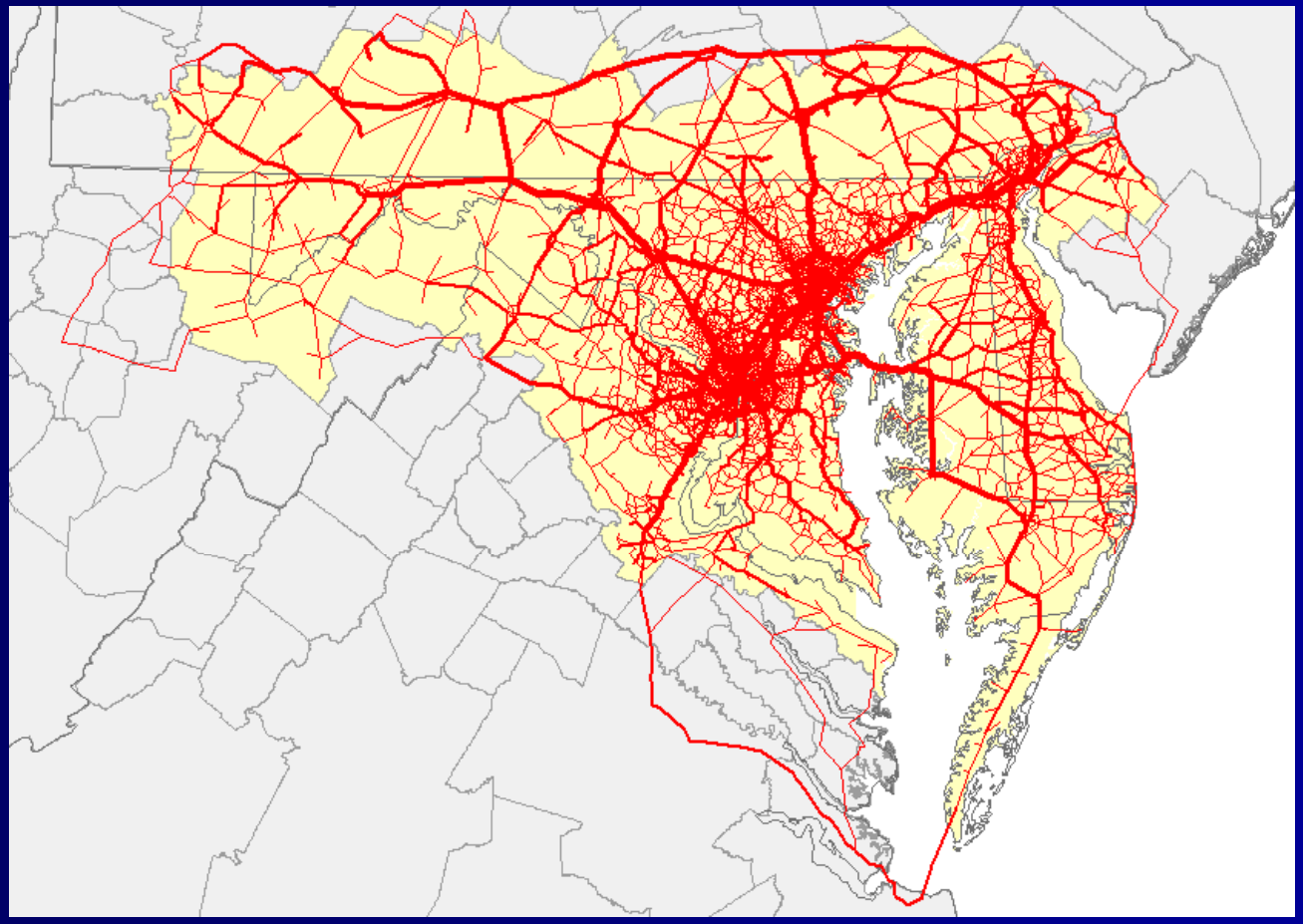
Assignment of Local Truck Trips



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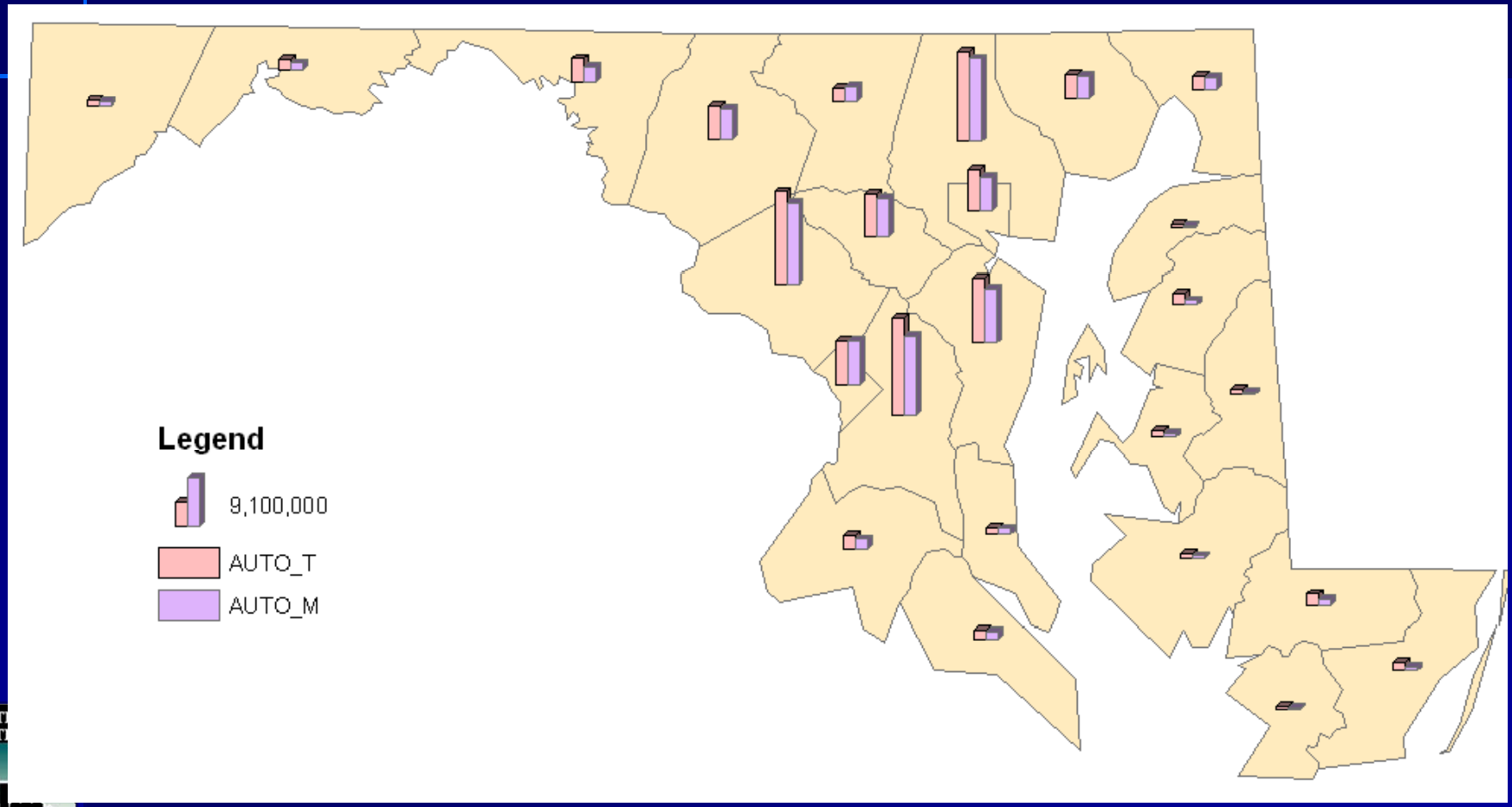
Target versus Model Auto VMT



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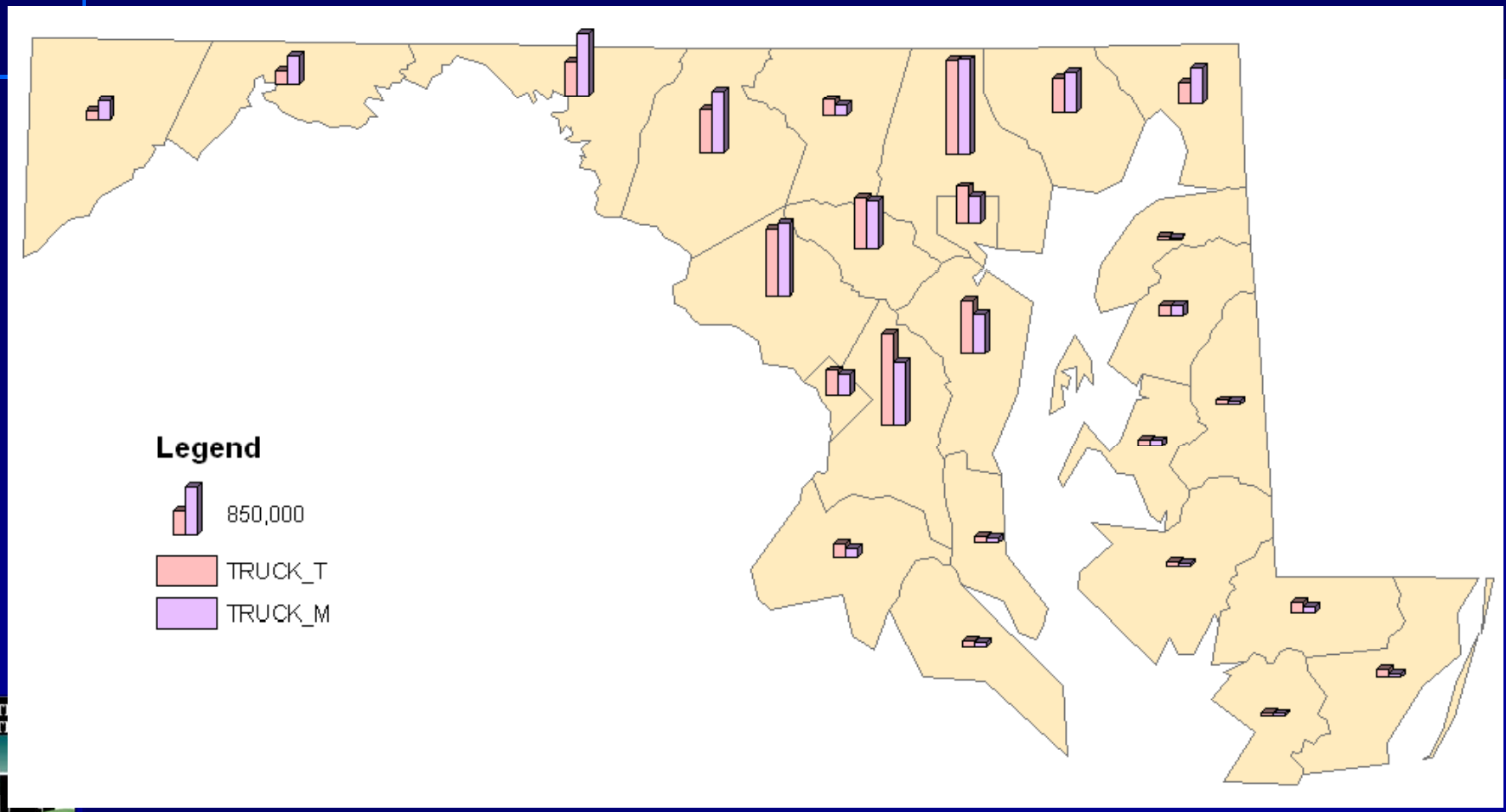
Target versus Model Truck VMT



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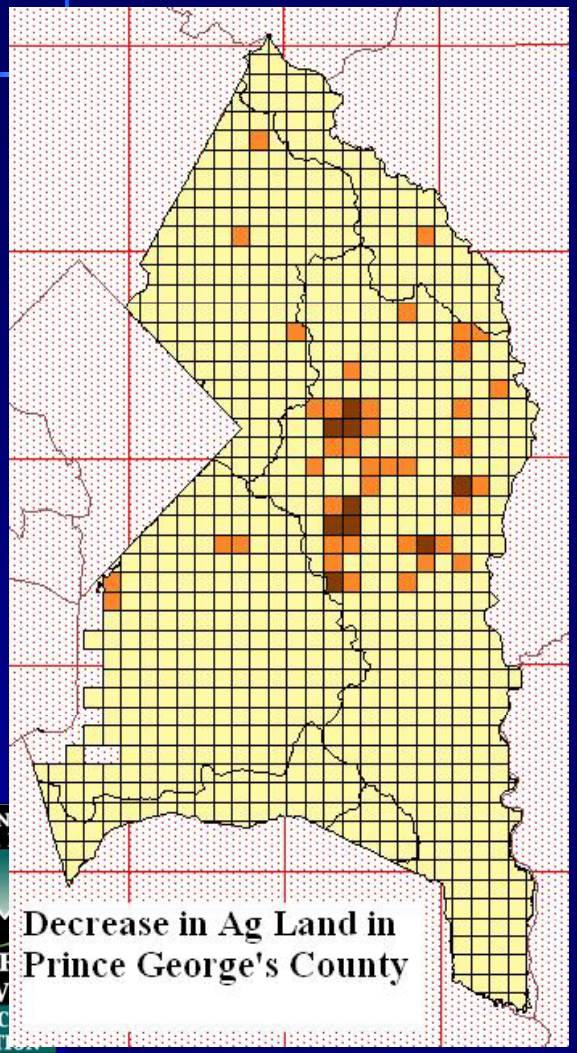
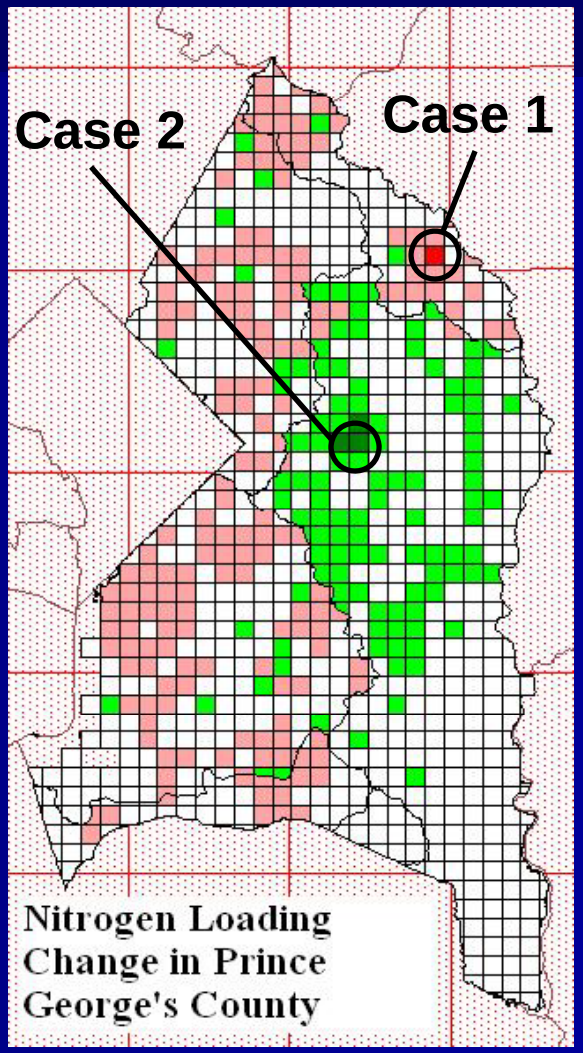
Land Use and Nutrient Loading changes in PG



Left Figure shows how agricultural land changes within PG County and Right Figure shows corresponding change in nitrogen loading

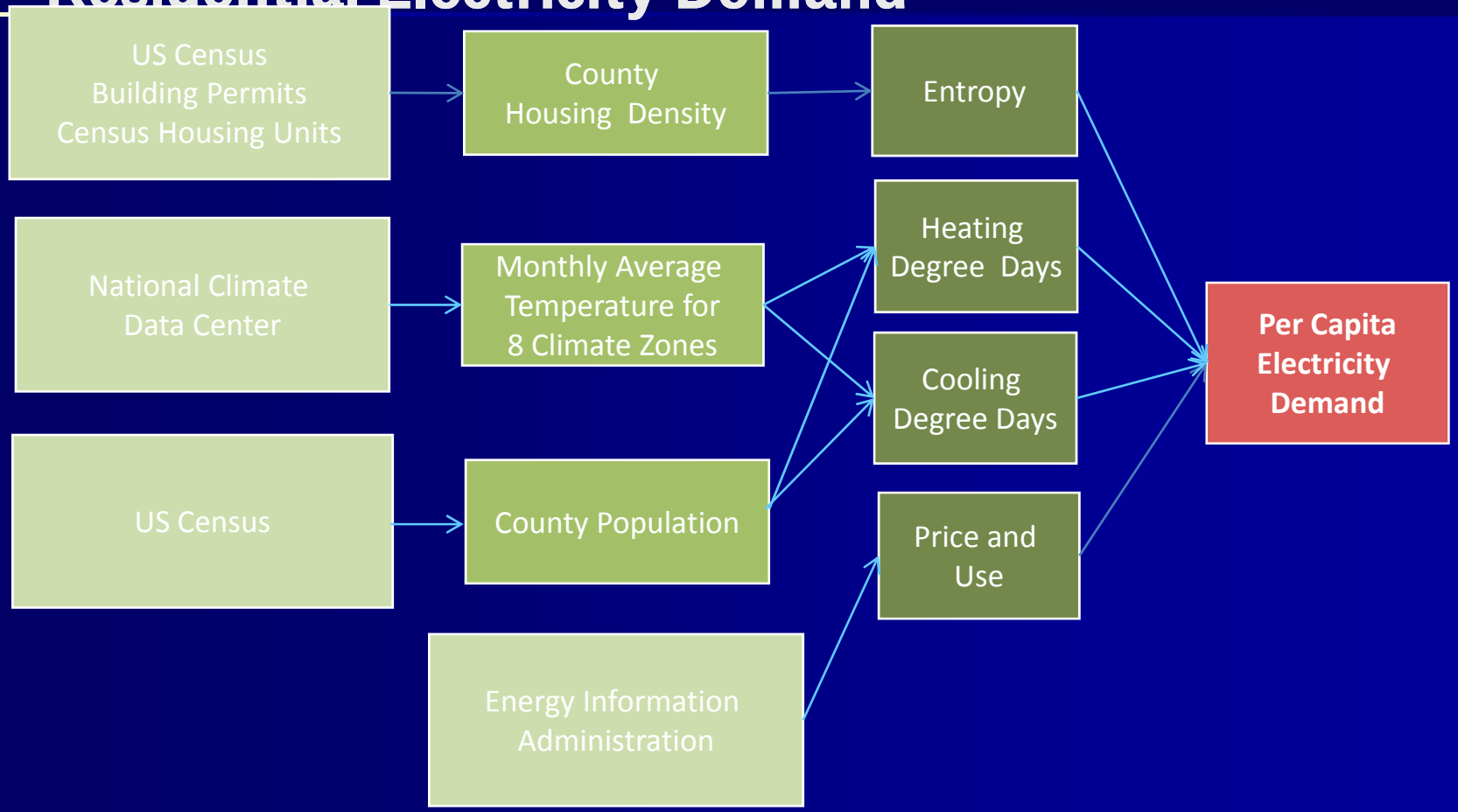


Darker shade means bigger Ag loss

Green = Loading Decrease Red = Loading Increase

Energy Consumption Model

Residential Electricity Demand



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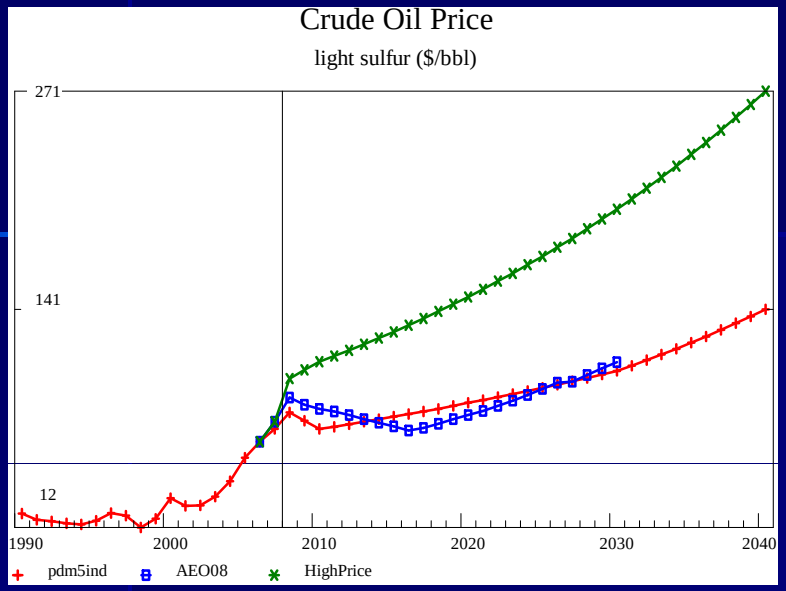
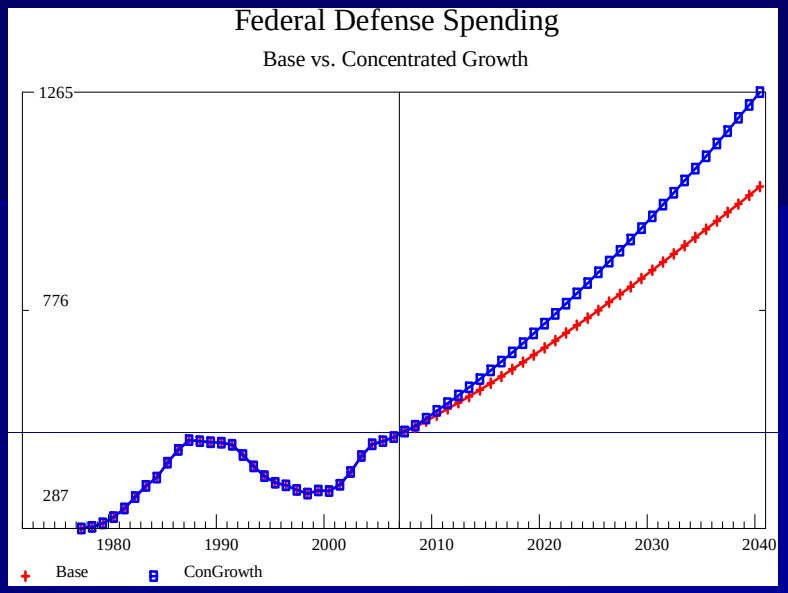
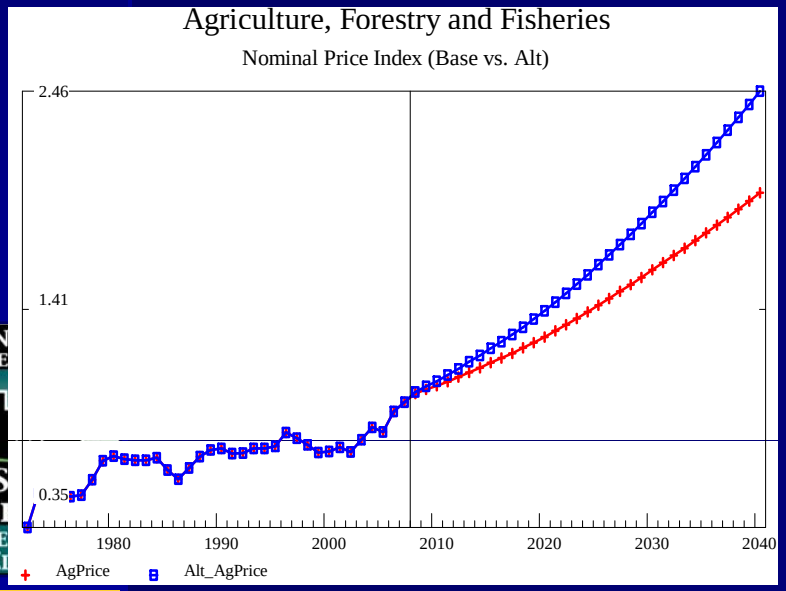
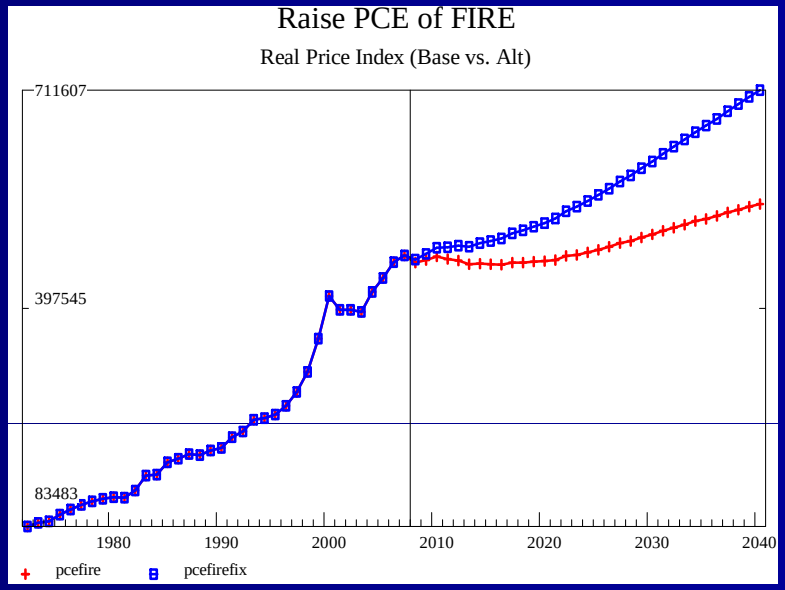
Constructing a High Energy Price Growth Scenario









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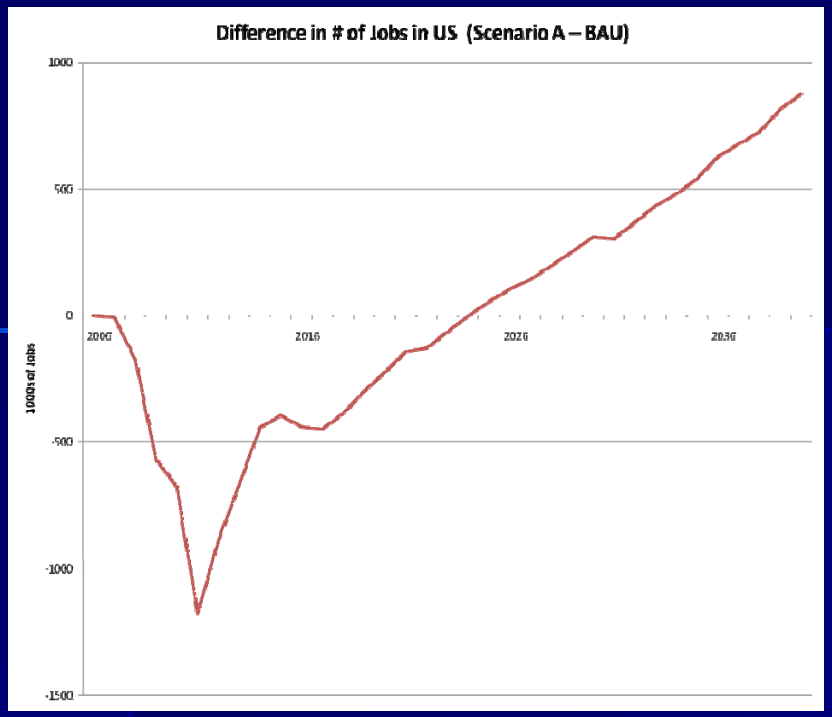

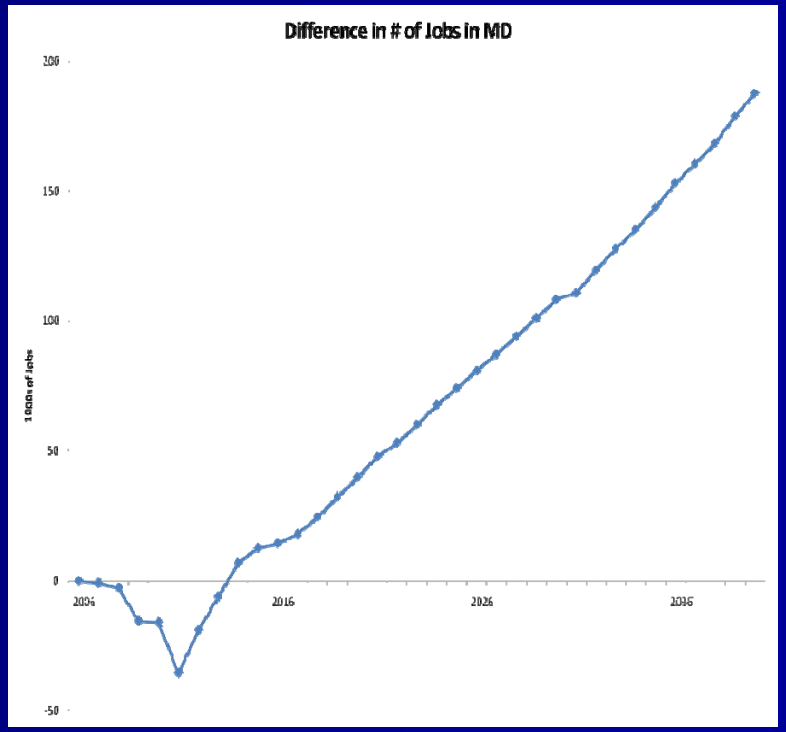

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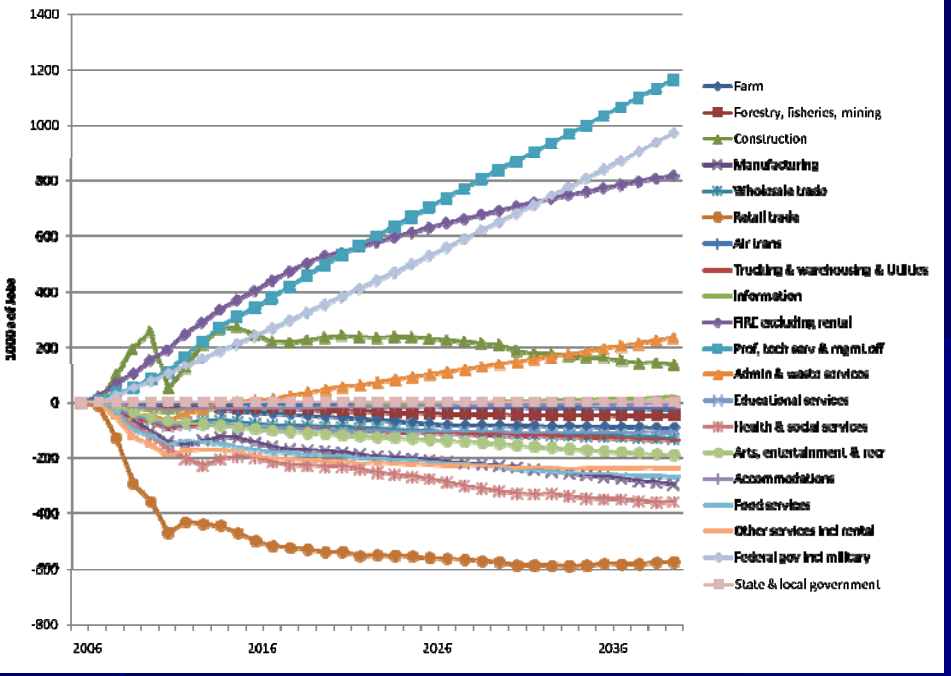
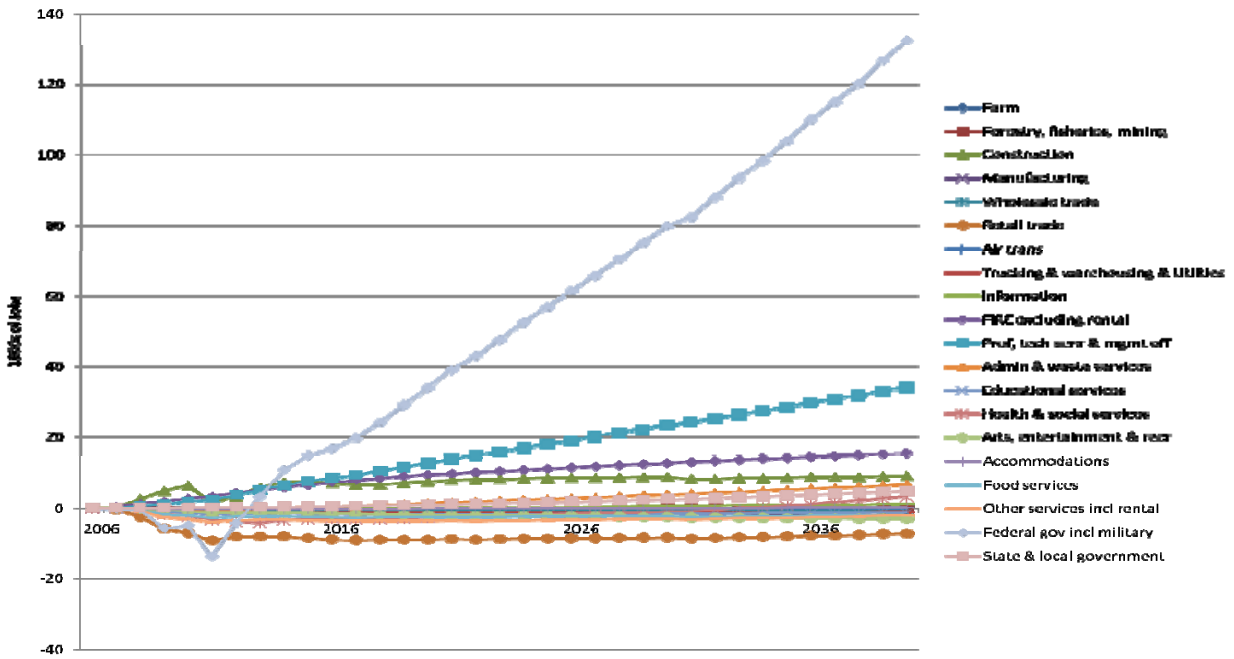
Differences in the # of Jobs by Industry in US (Scenario A - BAU)



Difference in # of jobs in Sectors (Maryland)



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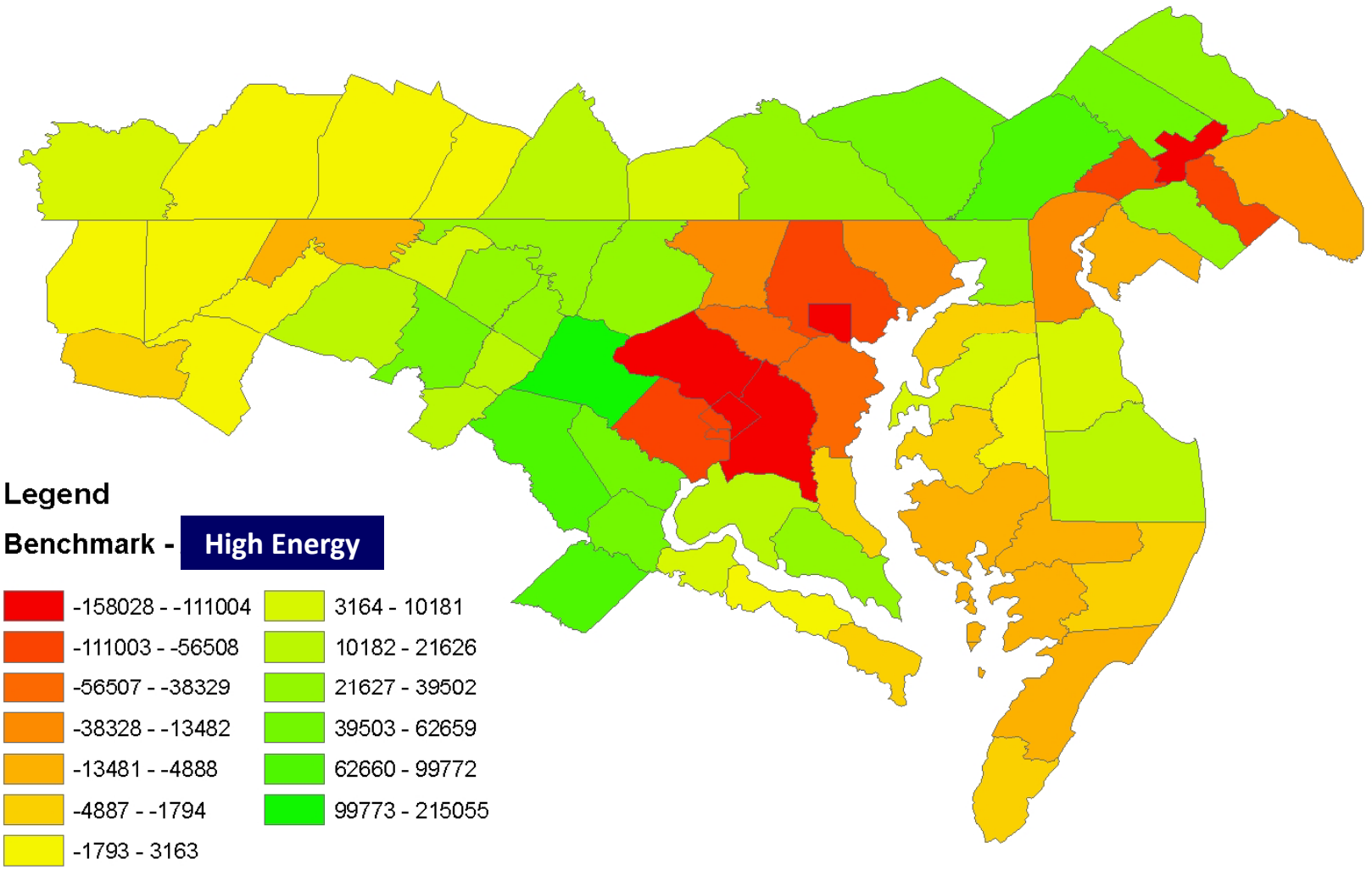
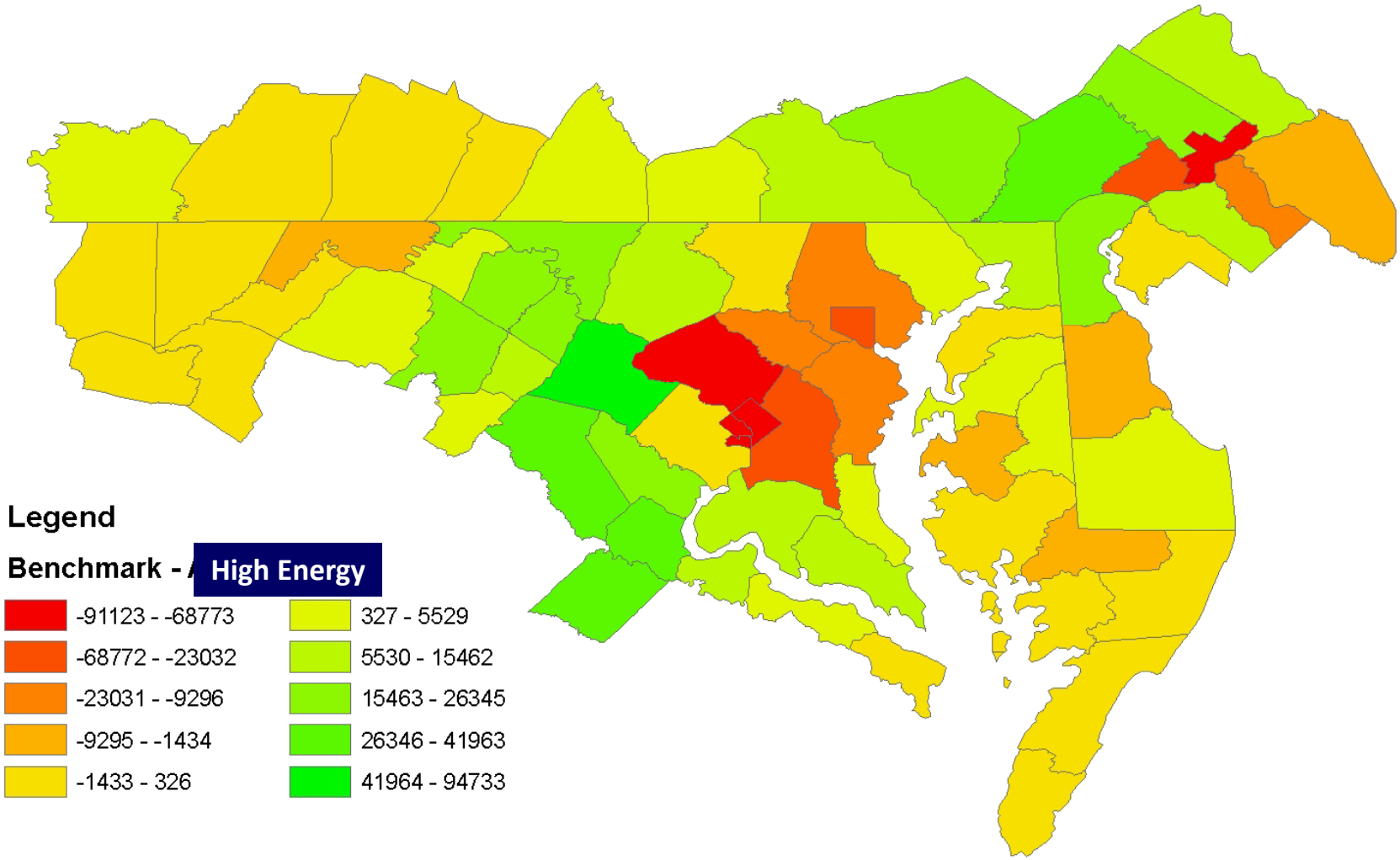
Population: Difference between High Energy and Benchmark



Employment: Difference between High Energy and Benchmark



MARYLAND SCENARIO PROJECT

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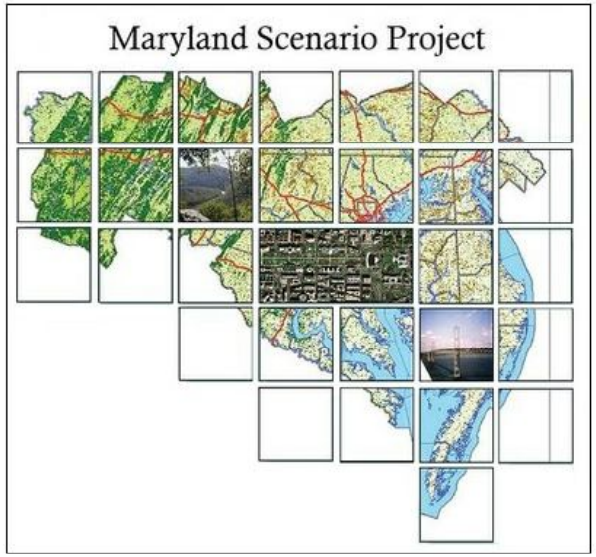

Already the fifth most densely populated state in the nation, Maryland is expected to grow from a population of 5.5 million in 2000 to more than 7 million in 2030 according to the U.S. Census Bureau. Such growth, as well as that of jobs and the built environment, has economic benefits for current and future residents and businesses. But it also has effects, many of which are negative, on issues of equity, cost of living, environmental quality, mobility, and many other aspects of quality of life in the State of Maryland.

Today, much of the new growth and development in Maryland is occurring far from Baltimore or other older cities and towns or even distant from the first tier of suburban counties. Having experienced the development of both first and second tier suburbs, the state is now experiencing the effects of third tier suburbs. Growth has migrated to formerly rural counties in Western Maryland, Southern Maryland, the Eastern Shore of the Chesapeake Bay and even across the state line into neighboring Delaware, Pennsylvania and West Virginia. This dispersed pattern of development is consuming large amounts of farmland and forests, requiring significant financial outlays for infrastructure and services from taxpayers, and promoting a sharp increase in long distance commuting and traffic congestion.

In an age defined by issues of homeland security and climate change, with the growing threat of sea level rise and other natural disasters, with an economy based heavily on a federal government presence, with growing retiree and immigrant populations, with congested roadways and aging infrastructure, and with limited water supplies and an unhealthy Chesapeake Bay, the National Center for Smart Growth Research and Education has embarked in recent years on an effort to develop and fully evaluate the impacts of Maryland's future regional and statewide

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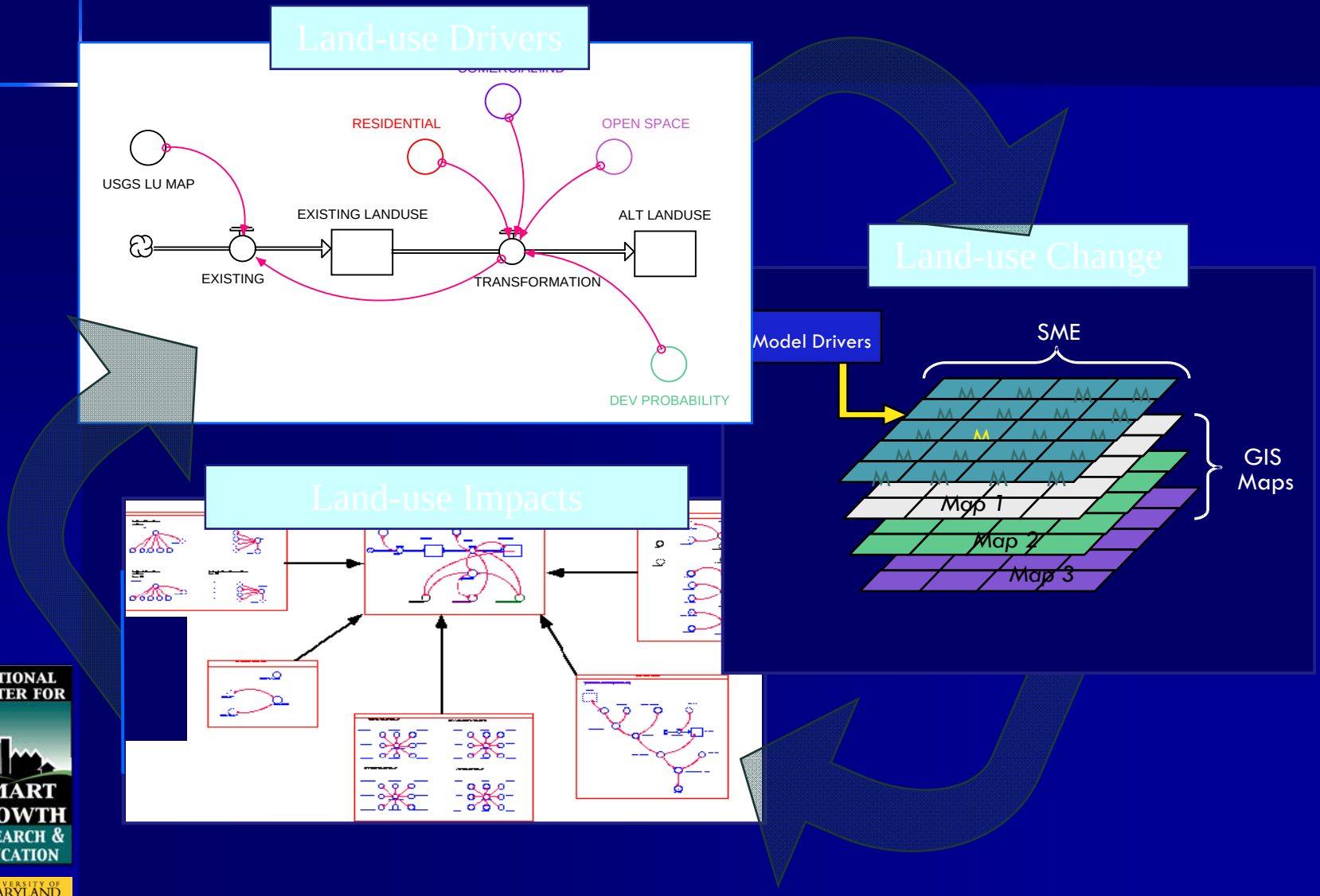
LEAM LAB, University of Illinois, Urbana-Champaign

LEAM Model Framework



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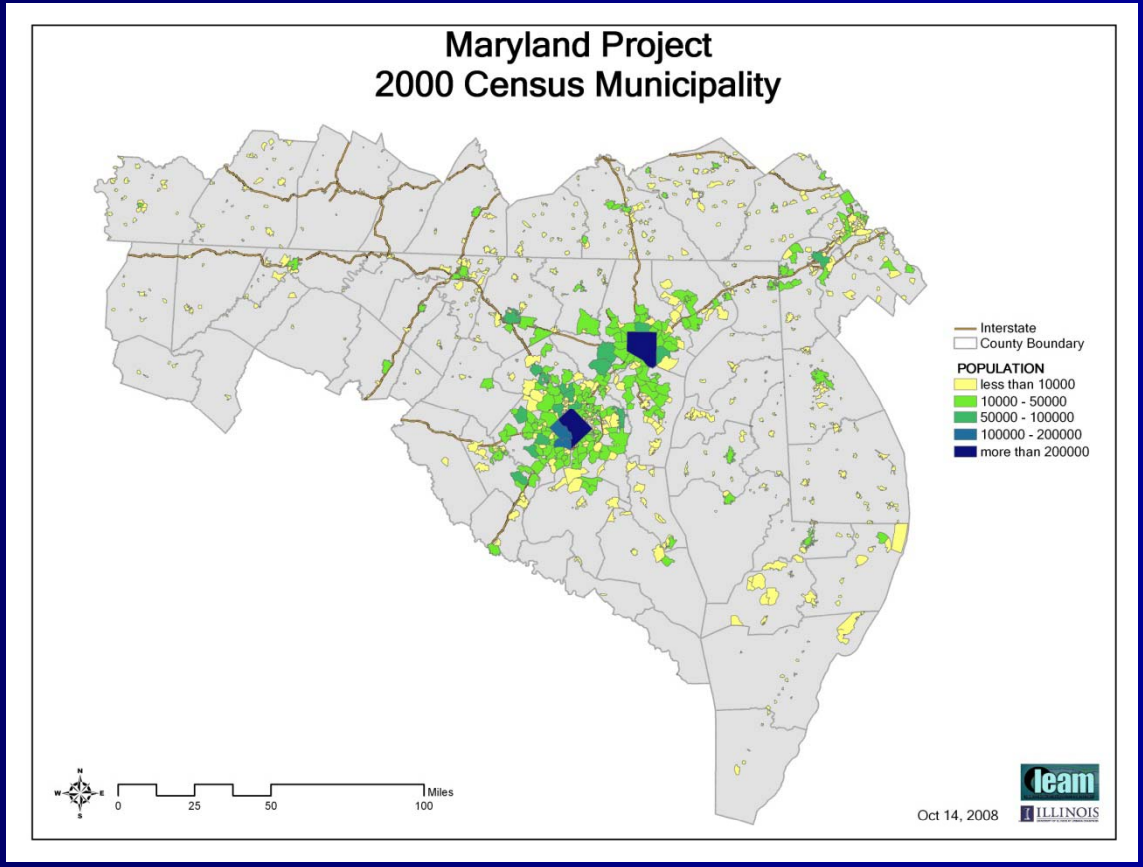
Drivers – Municipal Boundaries



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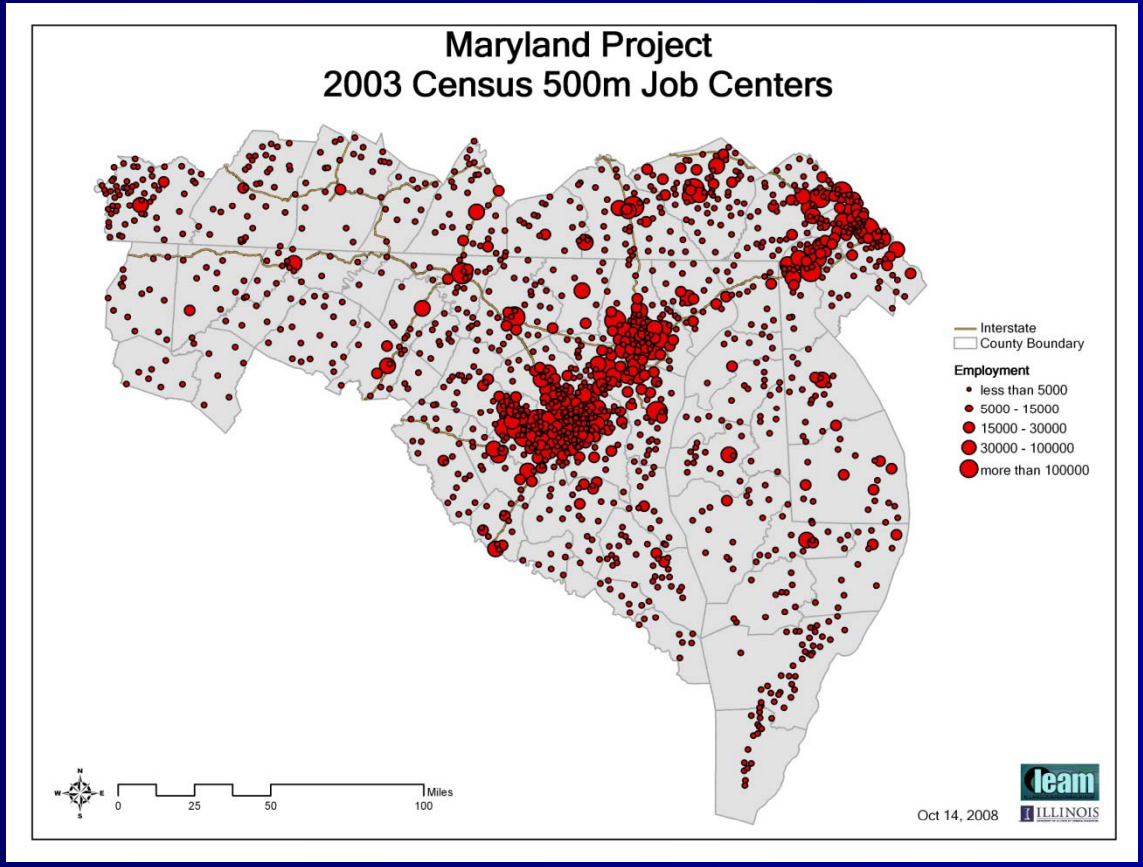
Drivers – Employment Centers



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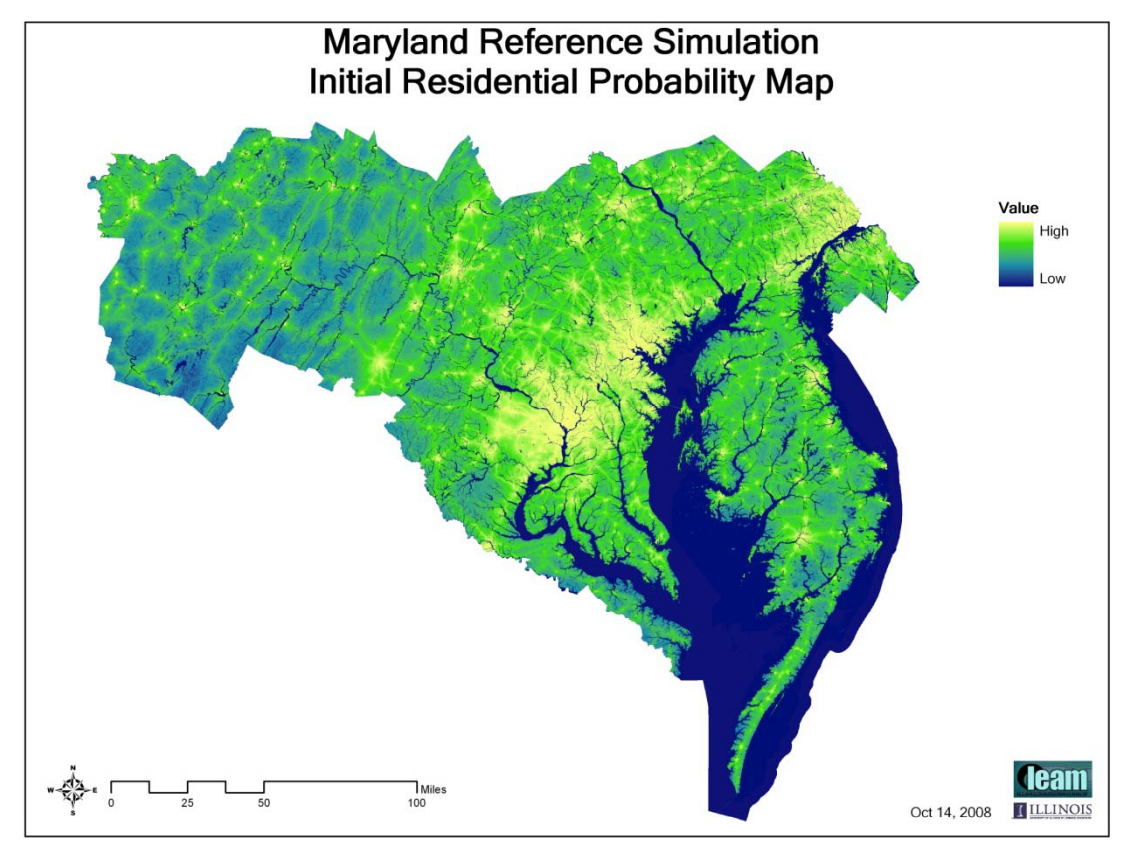
Residential Probability Map



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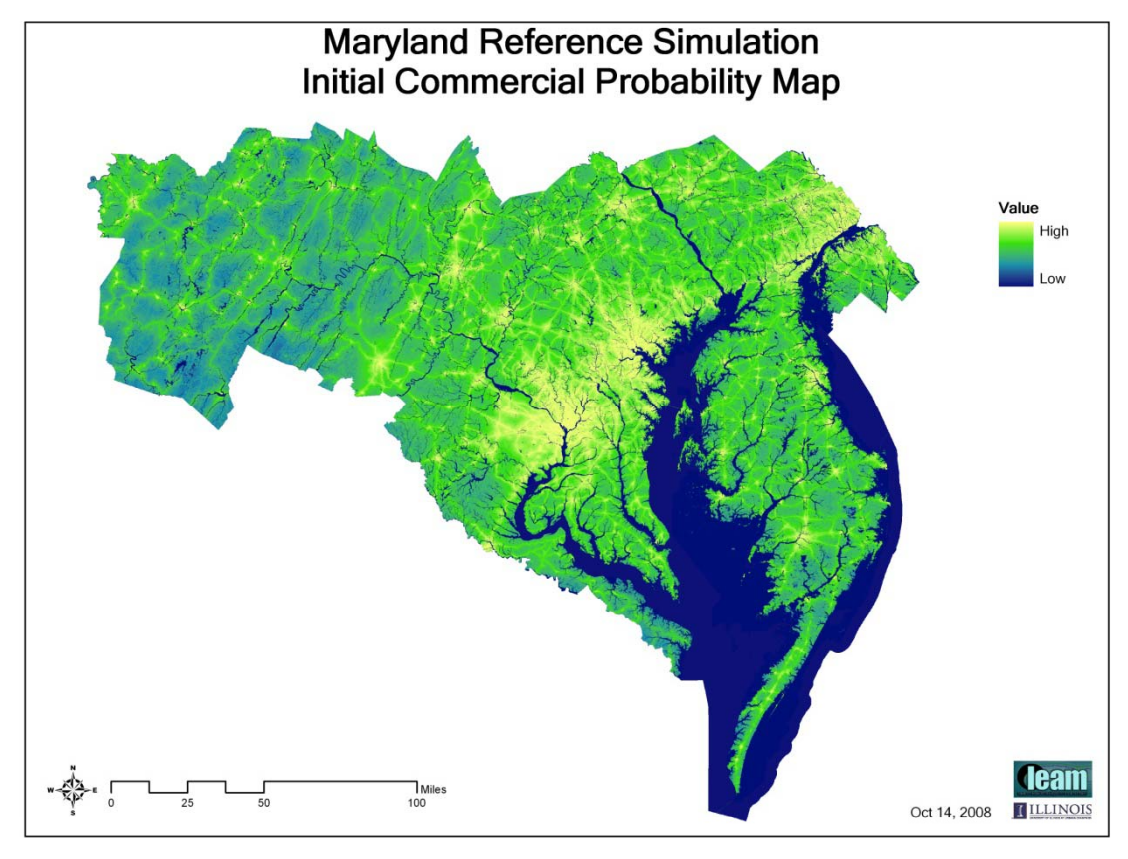
Commercial Probability Map



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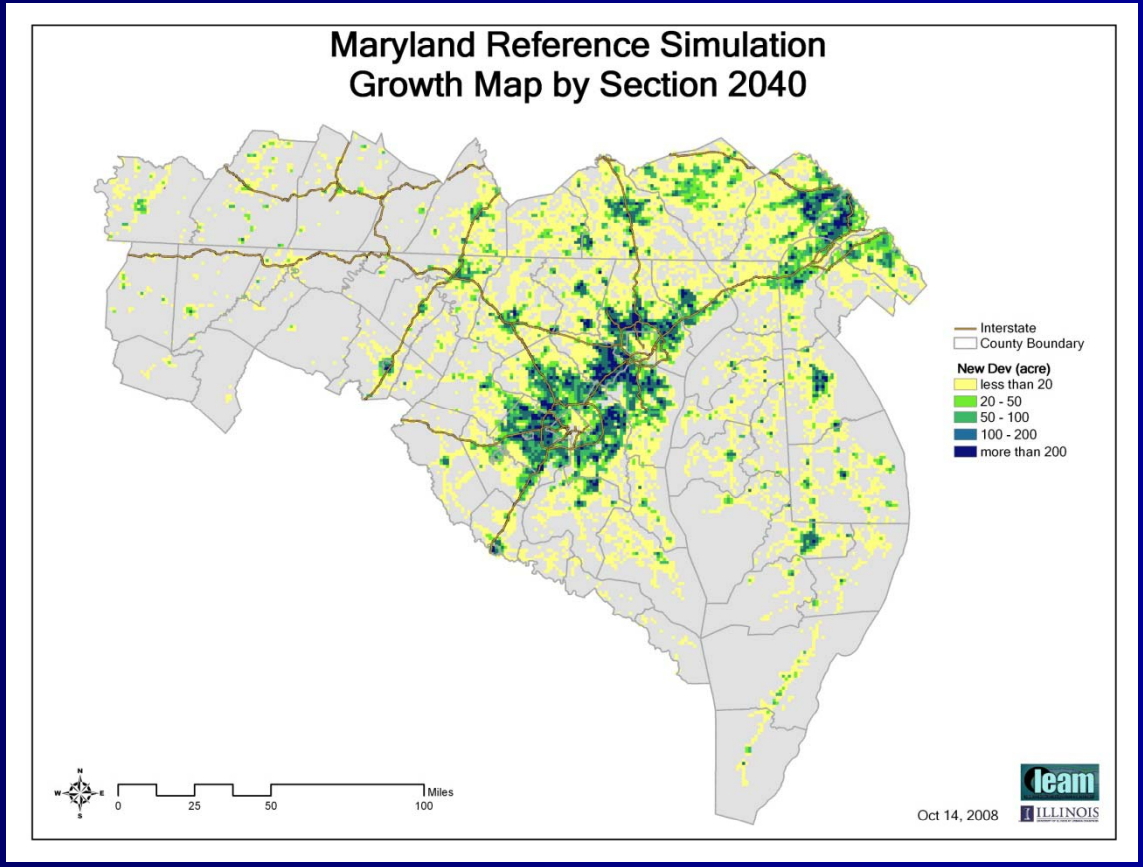
Growth - 2030



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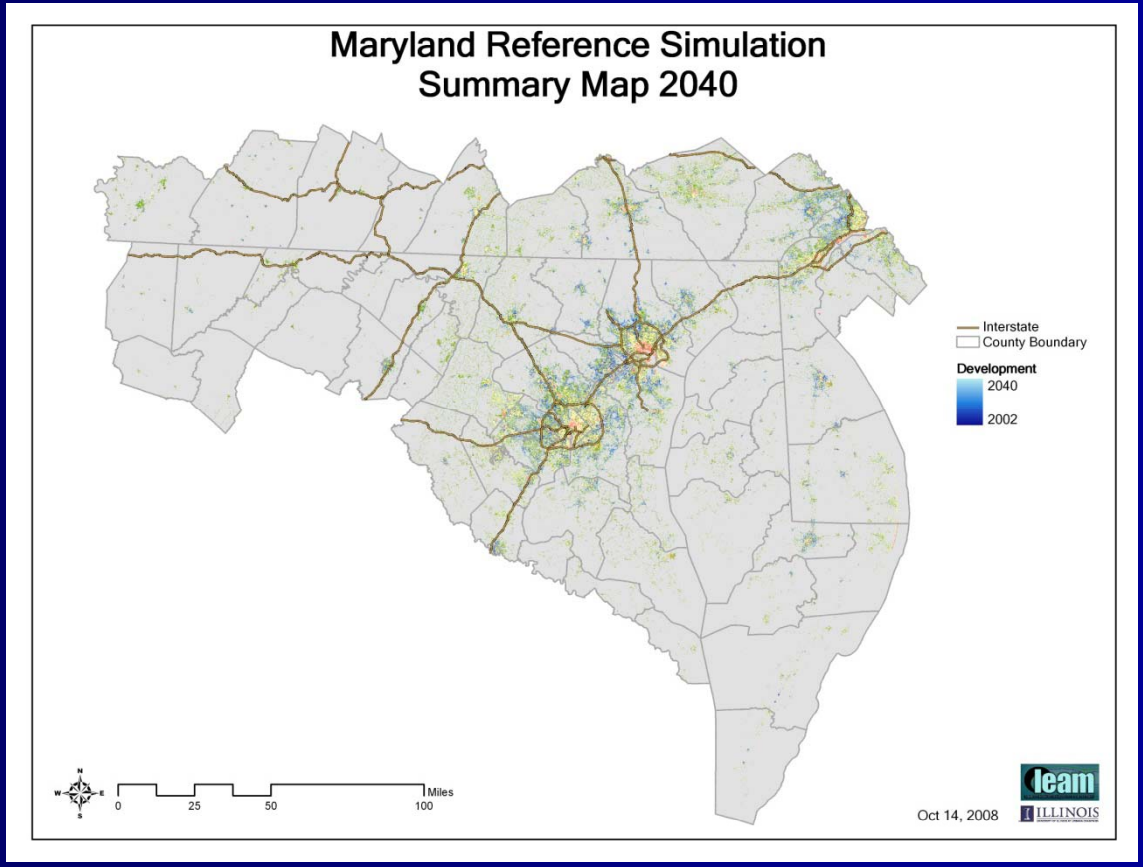
Summary - 2040



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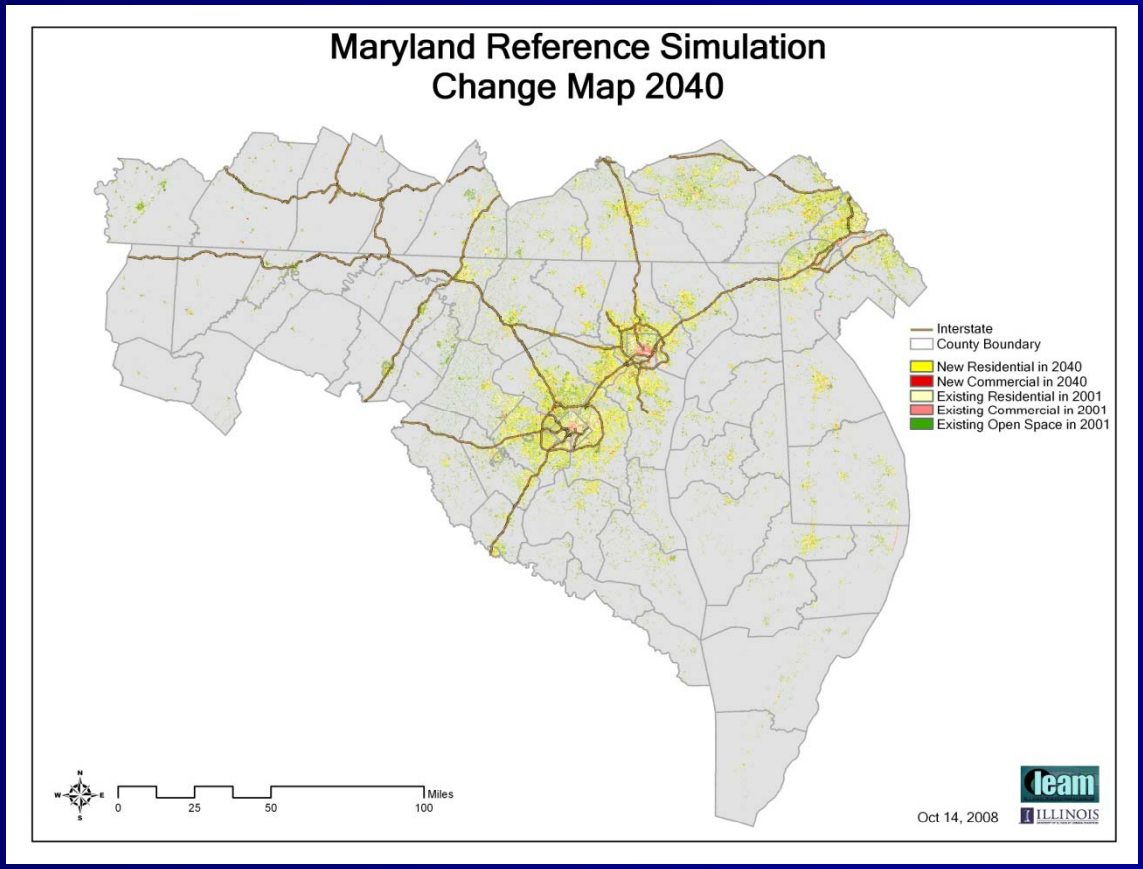
Change - 2040



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Where do we go from here?

- Refine both bottom up and top down land use models;
- Integrate land use and transportation models;
- Link land use/transportation models with Bay model;
- Develop “what would it take” scenario;
- Engage public in scenario evaluation;

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