Fiscal Impact Analysis

Analyzing the Effects of Smart Growth on Projected Road Development in 2030

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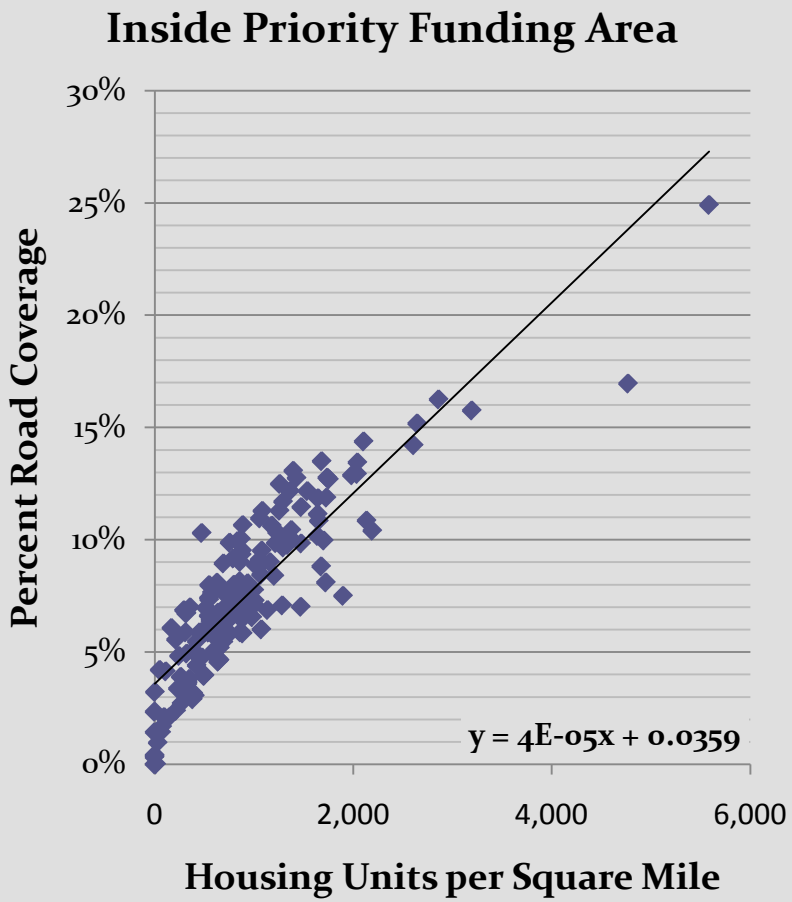
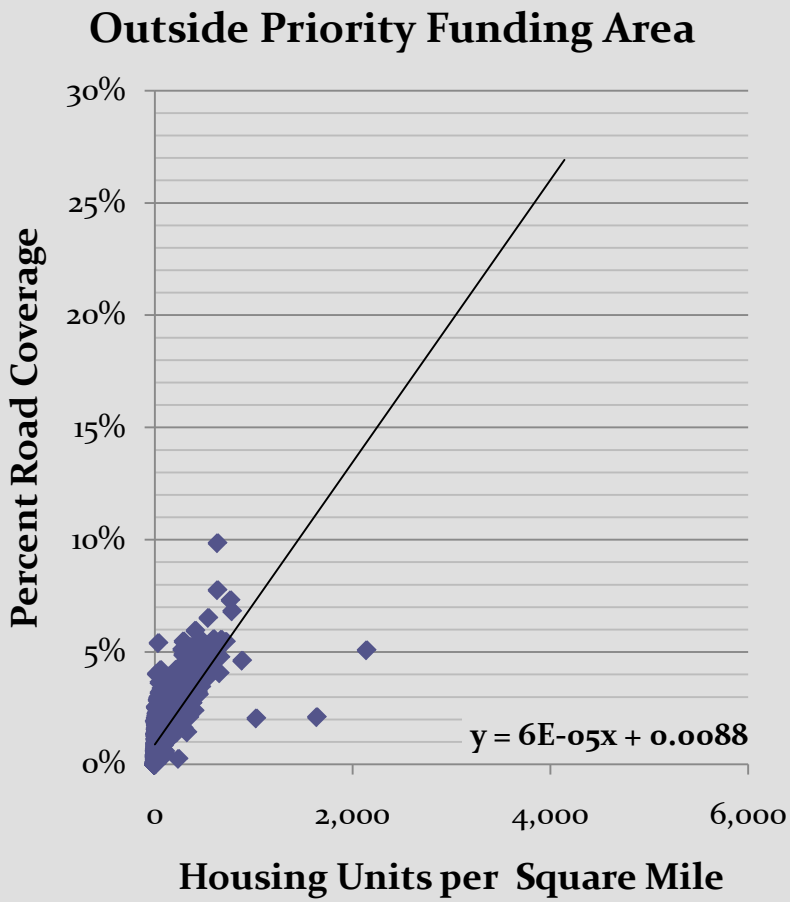
Maryland Department of Planning 2010

How does the Smart Growth scenario affect the development of road infrastructure in the State of Maryland?

Existing Housing Unit Density vs. Road Density



.24 Acre Roadway Developed per Unit

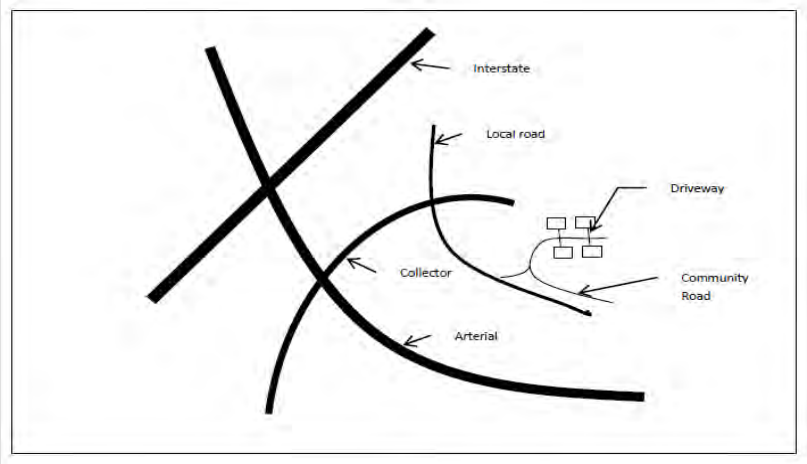


.36 Acre Roadway Developed per Unit

Community vs. General Roadway

Community Road

- Roads with residential housing on either side
- Proportional to unit number and inverse proportional to density



General Roadway

- Roadways including Interstate, State, County, Municipal and Local roads
- Projection compiled from Annual Mileage Report by MD State Highway Administration 1996-2008

Research Methodology

- Community roads:
  Digitized for each Maryland County based on housing locations and densities projected by the 2030 Smart Growth and Current Growth Scenarios from the MDP Growth Simulation Model.

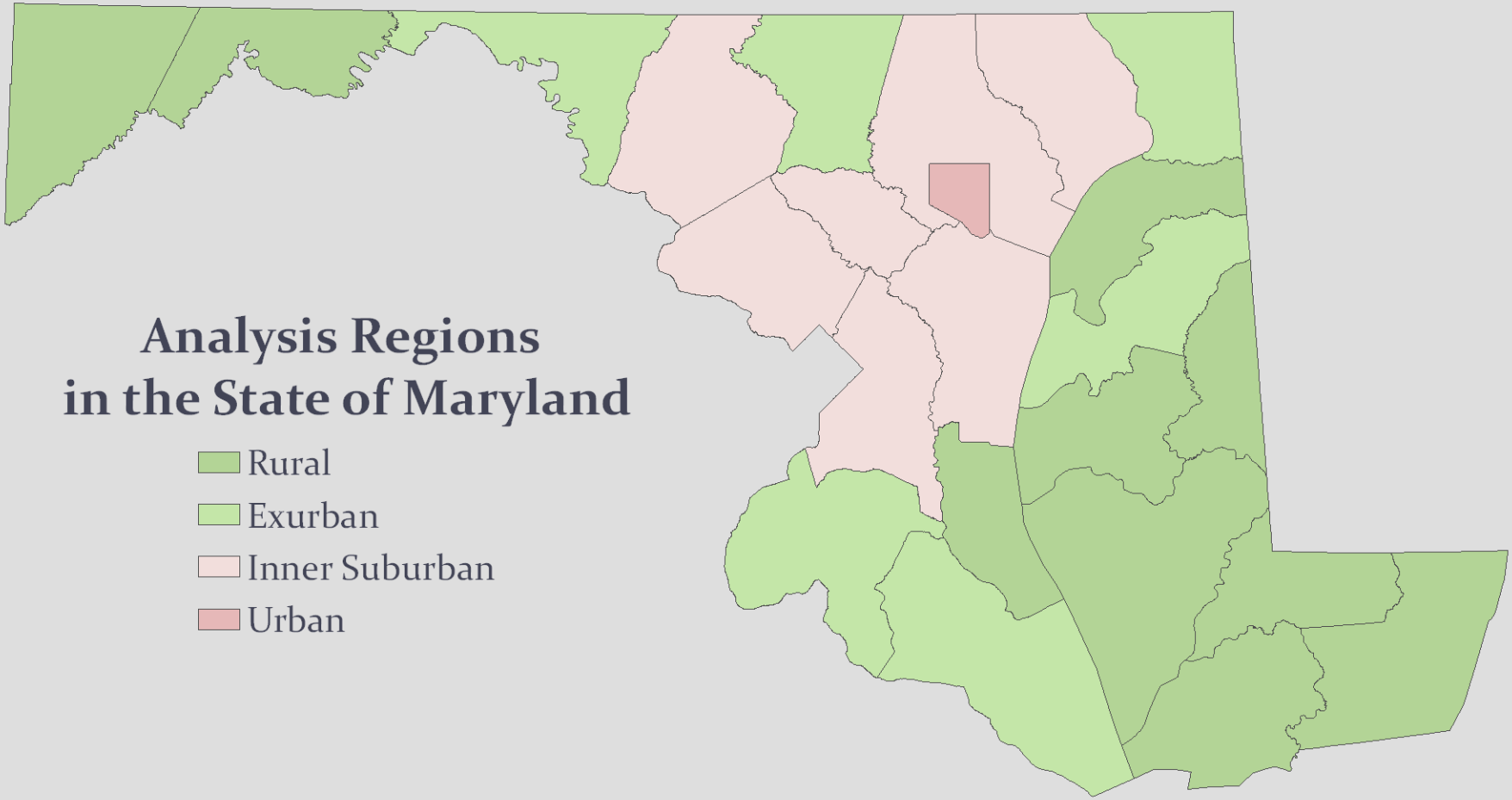
- General Roadway Systems:
  Projected based on a regression model of population against total road lane mileage.

Research Methodology

- Mileage of new road development is dependent upon the housing location, density and quantity of development units
- As density increases, the amount of roadway required to connect units will decrease
- Unit projections compiled from the Maryland Smart Growth Simulation Model

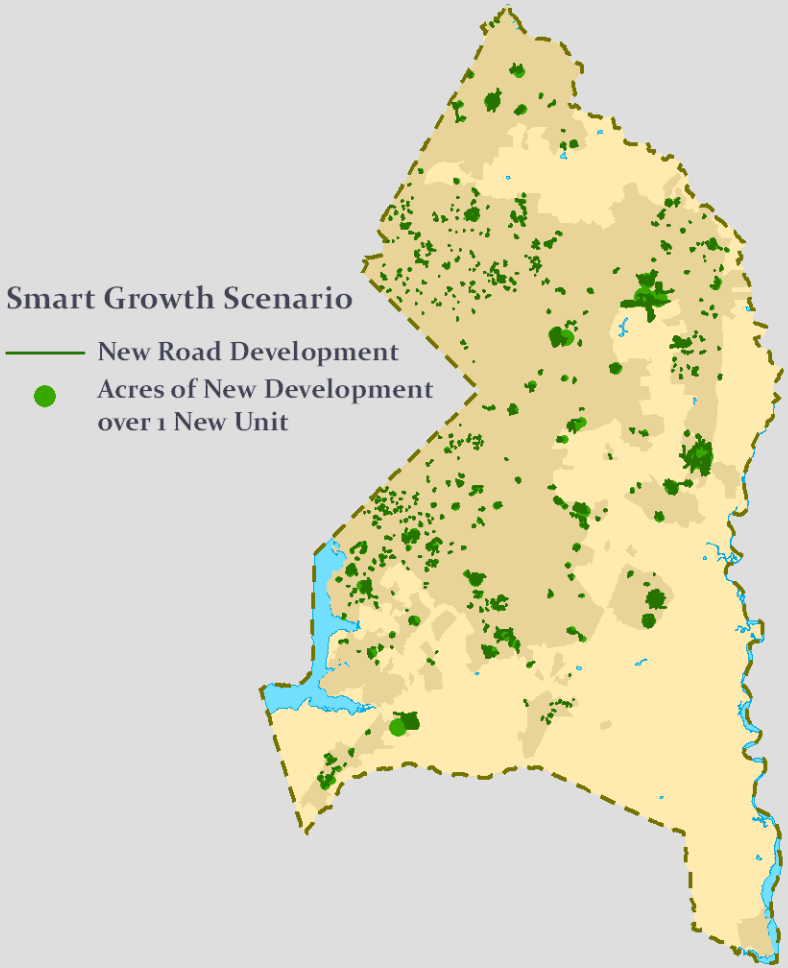
Digitizing Procedure

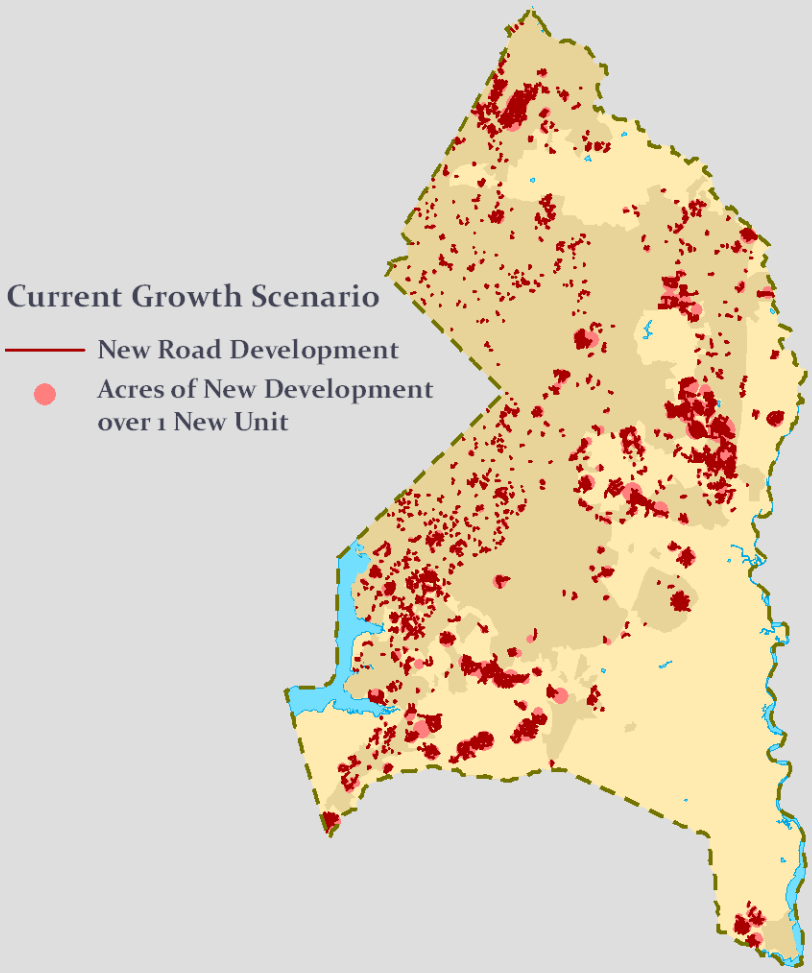
1. All digitizing was performed at either 1:5,000 or 1:10,000 scale to ensure standardization.
2. There should be uninterrupted access from the road to the vicinity of the parcel point without the obstruction of other properties. The presence of other properties was determined by loading the Maryland Property View shape file.
3. If the number of projected units was 4 or below, the projected road was digitized from the centroid of the projected point to the road. If the centroid was directly on an existing roadway, no new roadway was digitized.
4. If the number of projected units was above 4, the following equations were used: at a scale of 1:5,000 – "Inches Digitized = NHA / (3.5714 * RESULTDENS)", at a scale of 1:10,000 – "Inches Digitized = NHA / (7.1428 * RESULTDENS)".
5. Roadway for projected points was interconnected with already established developments if roadway connections permitted.
6. A grid pattern was utilized when a grid pattern was already present in the surrounding developments or when density of roadway and the density of units required compact development.
7. When two or more projected points overlapped and their densities and number of units allowed, the digitized roadway was combined. This formed neighborhoods or developments out of closely located projected points. This was particularly relevant in suburban areas where adjacent projected points are to be developed with over 100 units at densities around 3 Units per Acre.
8. If a projected point was located closer to another point than to the roadway, the furthest projected point was connected to the closer point and then connected to the roadway.
9. In some instances the projected point intersected with existing properties. In these instances the roadway was digitized as close as possible to the projected point.
10. The newly digitized roadway, wherever possible, was connected to existing roads at three or four way intersections at 90° angles.


Analysis Regions
in the State of Maryland
Rural
Exurban
Inner Suburban
Urban

Inner Suburban

Prince George's County





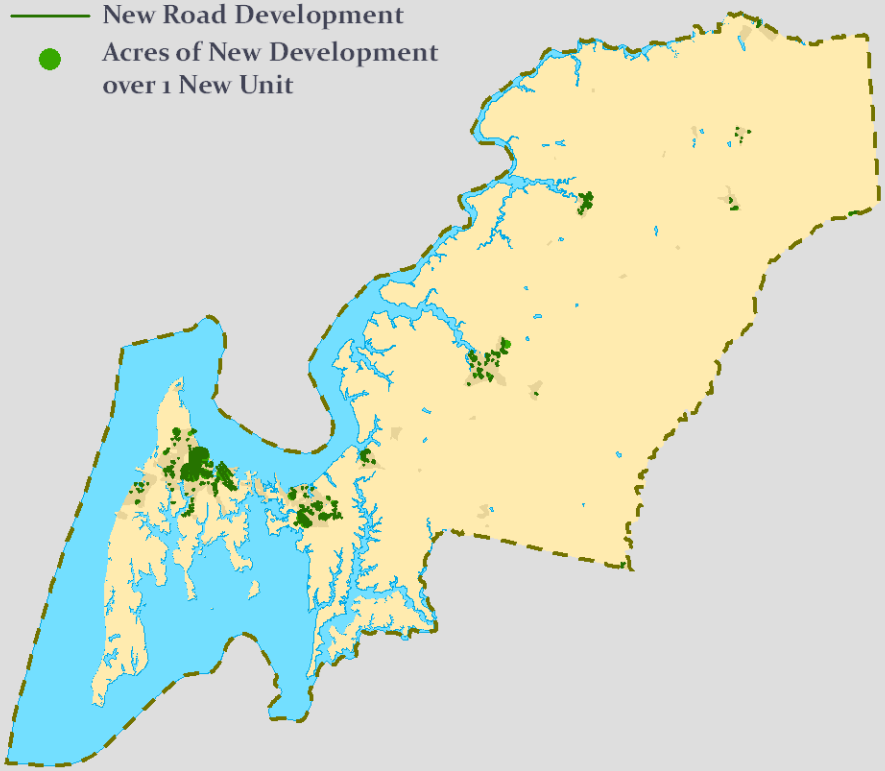
Exurban

Queen Anne's County

Smart Growth Scenario

New Road Development

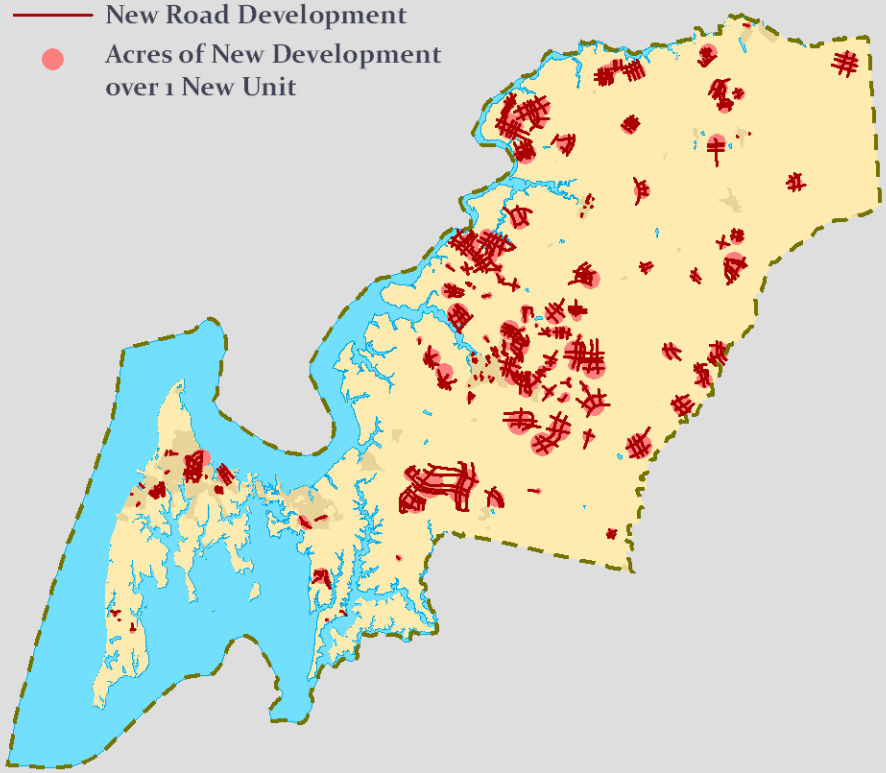
Acres of New Development over 1 New Unit



Current Growth Scenario

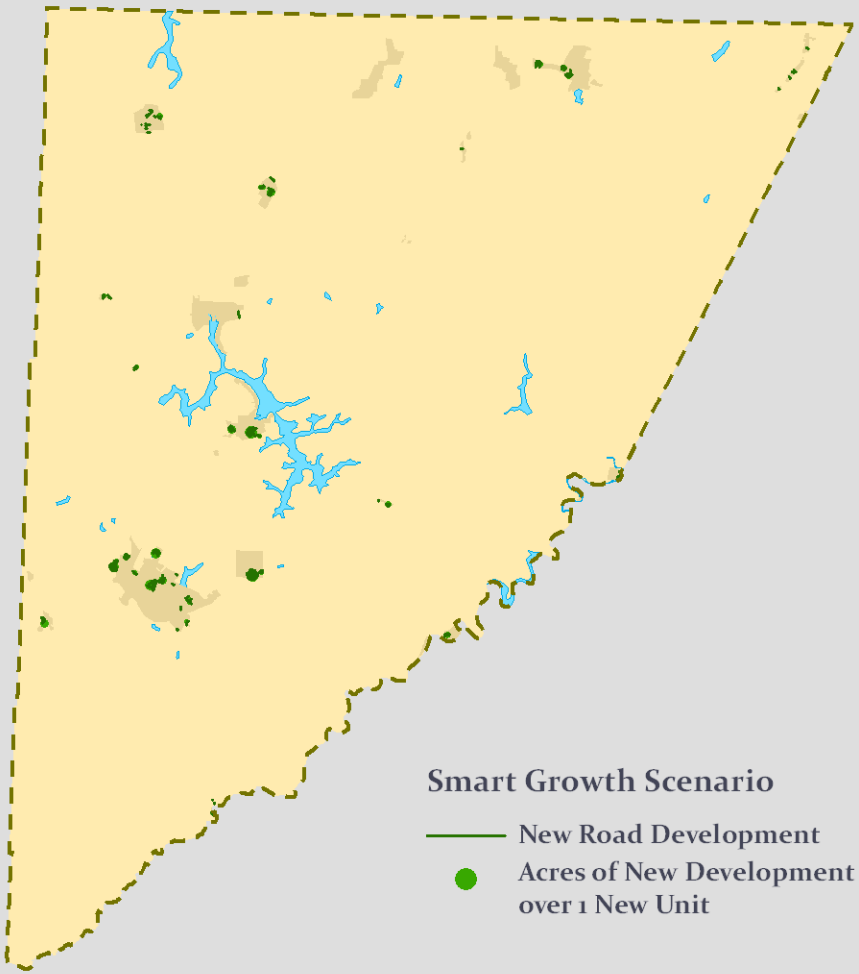
New Road Development

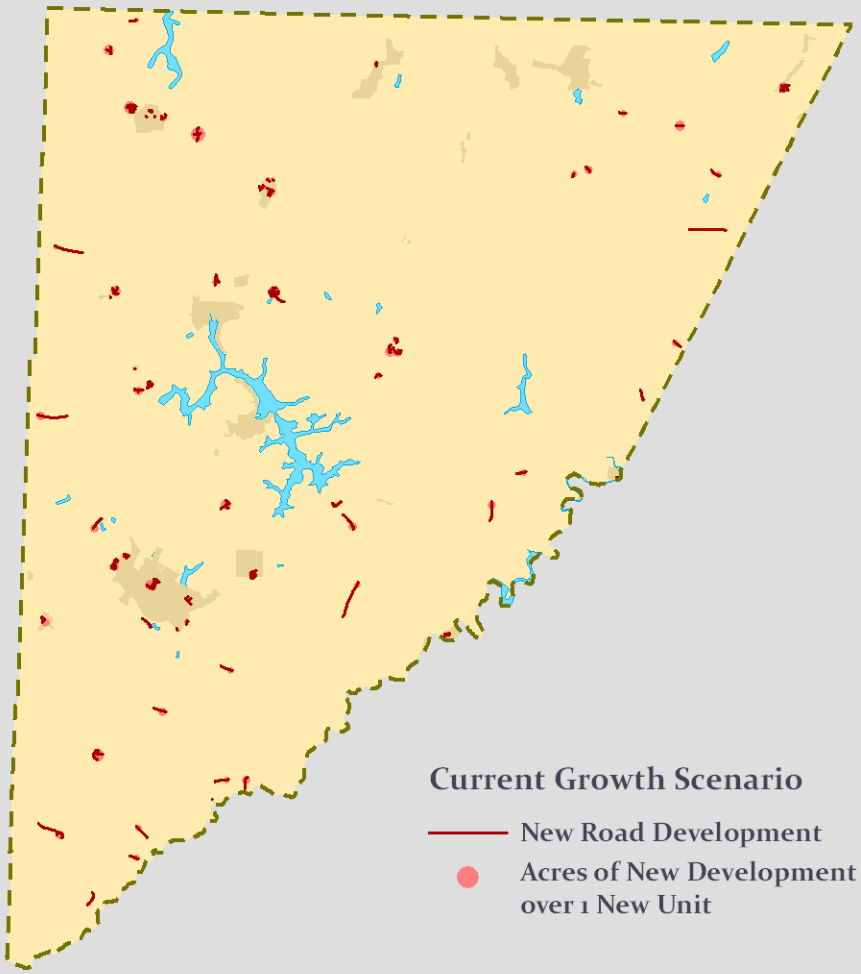
Acres of New Development over 1 New Unit



Rural

Garrett County





Inner Suburban

	Current Growth Scenario	Smart Growth Scenario
Road Mileage within PFA	1,008	985
Road Mileage out of PFA	1,045	60
Total Road Mileage	**2,053**	**1,045**
Costs within PFA	$4,233,657,000	$4,138,027,000
Costs out of PFA	$4,389,021,000	$253,704,000
Total Cost	**$8,622,678,000**	**$4,391,731,000**

Exurban

	Current Growth Scenario	Smart Growth Scenario
Road Mileage within PFA	303	528
Road Mileage out of PFA	1,937	72
Total Road Mileage	**2,240**	**600**
Costs within PFA	$1,273,486,000	$2,216,554,000
Costs out of PFA	$8,135,510,000	$300,970,028
Total Cost	**$9,408,996,000**	**$2,517,524,000**

Rural

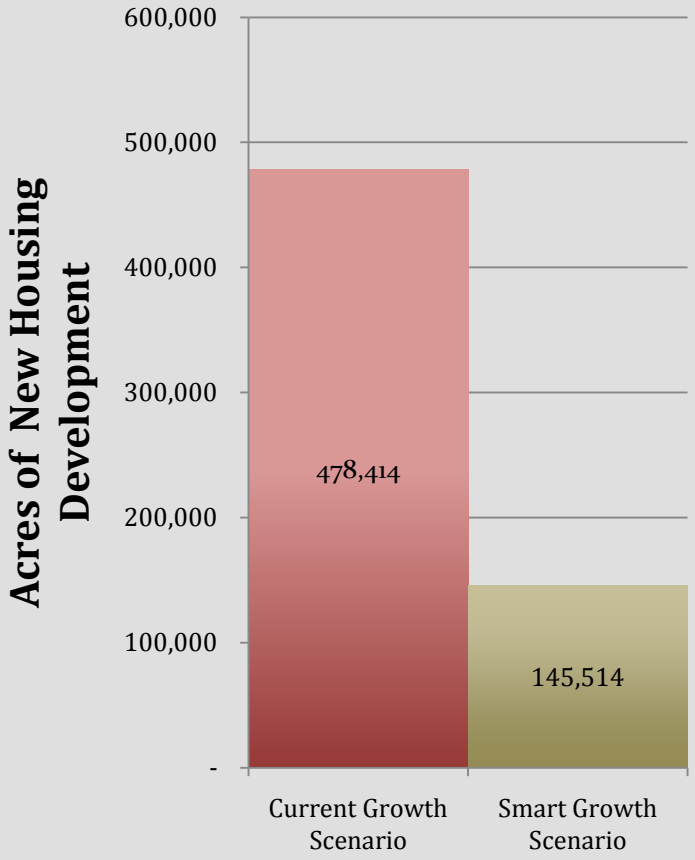
	Current Growth Scenario	Smart Growth Scenario
Road Mileage within PFA	105	191
Road Mileage out of PFA	414	31
Total Road Mileage	**519**	**222**
Costs within PFA	$442,842,000	$802,064,000
Costs out of PFA	$1,738,190,000	$131,000,484
Total Cost	**$2,181,032,000**	**$933,064,000**

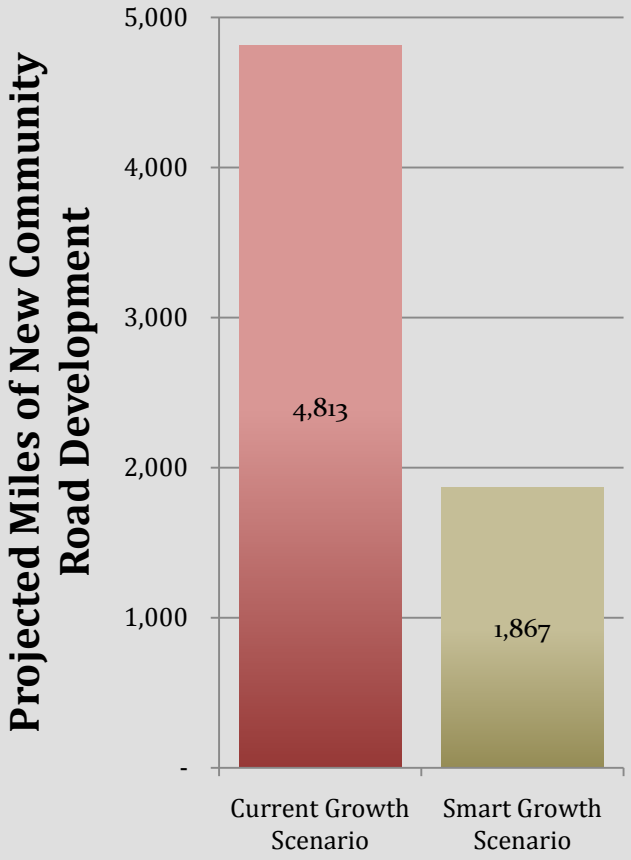
Compare Statewide Community Road Results: Current vs. Smart Growth

	Difference Projected New Housing Unit Development	Difference Projected Acres of New Housing Development	Difference in Miles Projected Community Road Development
Inner Suburbs	2%	143%	96.3%
Exurbs	1%	437%	273.7%
Rural	-3%	177%	133.7%
Statewide	**1.26%**	**229%**	**157.7% (2.5 time)**

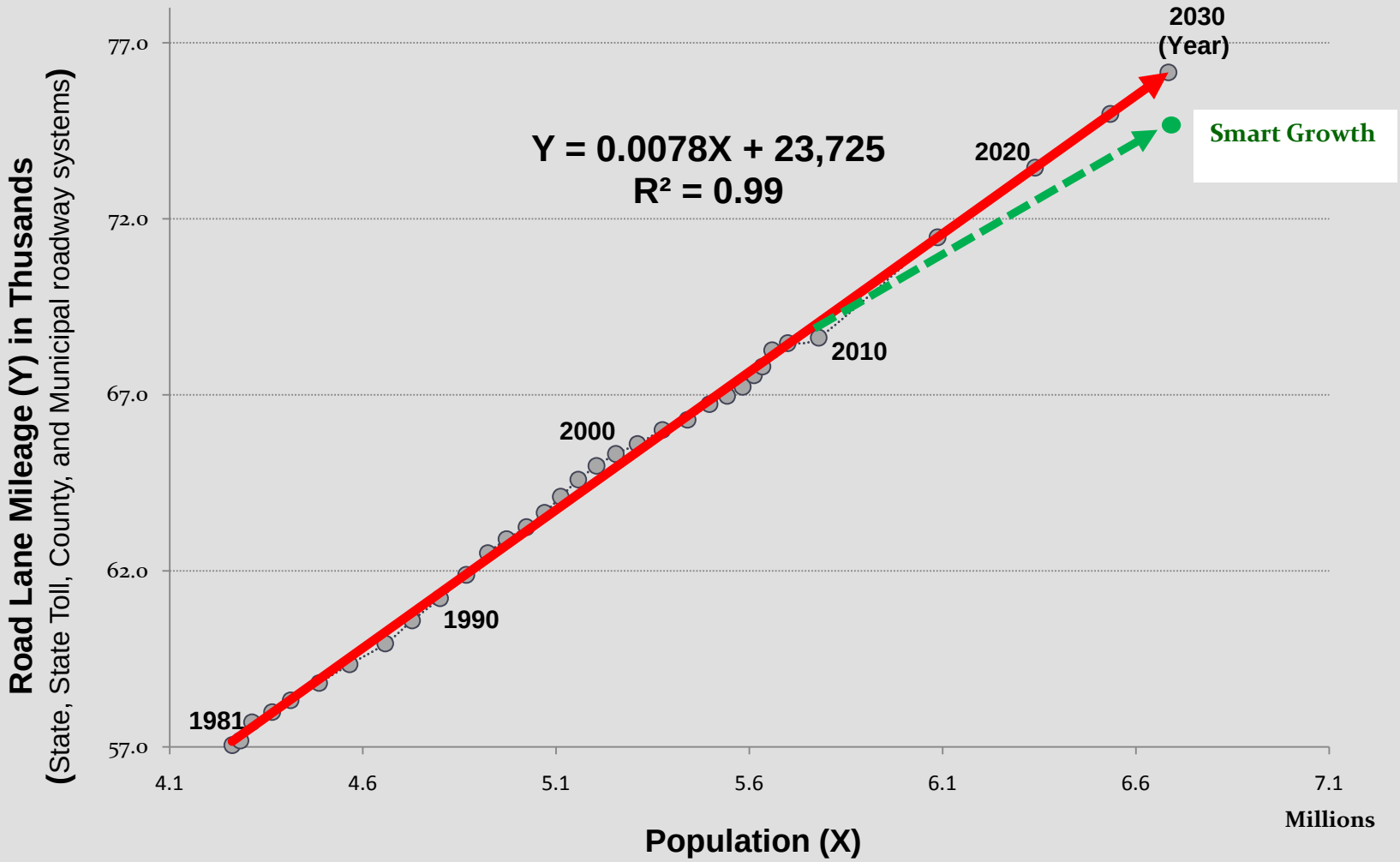
Current Growth scenario requires **2.5 times** more road construction than Smart Growth Scenario under Community Road

Compare Statewide Community Road Results





General Roadway Lane Mileages as the function of Population Growth



General Roadway

- Based on Regression Model
- 76,200 total road lane mileages w/ 6.7 million population in 2030
- Additional 7,536 lane mileages from now to 2030

- Smart Growth Scenario:

About 20% of total road of additional lane mileage for general roadway system in 2030 would be reduced

- Additional 6,029 lane mileages.

Fiscal Implication of Transportation 2030

Additional Need (between 2010 and 2030):	Current Trend	Smart Growth
Residential Development (Acres)	478,414	145,514
Community Road (miles)	*4,813*	1,867
General Roadway System (miles)	7,536	6,029
Construction: Community Road (Billions)	$20	$8
Construction: General Roadway System (Billions)	$83	$66
Maintenance : Community Road (Millions)	$414	$161
Maintenance: General Roadway System (Millions)	$649	$519
Total Estimated Transportation Cost (Billions)	**$104.3**	**$74.9**

Conclusions

1. Up to Year 2007, .24 and .36 Acre Roadway need per Unit in PFAs and Outside PFAs, respectively.
2. The Current Growth scenario results in low density development, thus high roadway demand, especially in exurban counties.
3. The Smart Growth scenario's focus on higher density development requires less new road development – 2.5 times less community road.
4. Higher density development results in much lower road infrastructure development costs ($29 Billion).

Questions?

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