

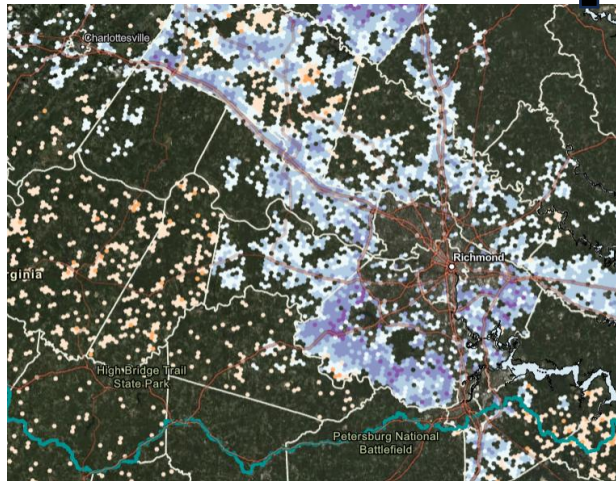
Chesapeake Bay Land Change Model (CBLCM)

Translating Forecasted Development to Phase 7 Land Use

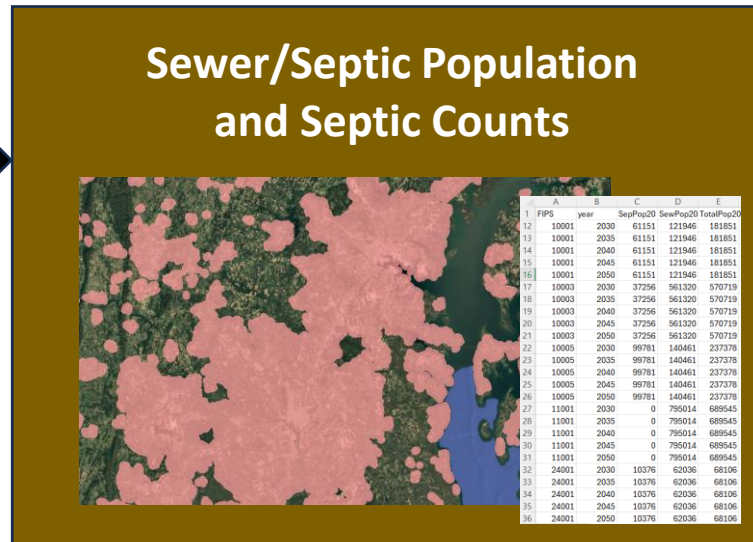
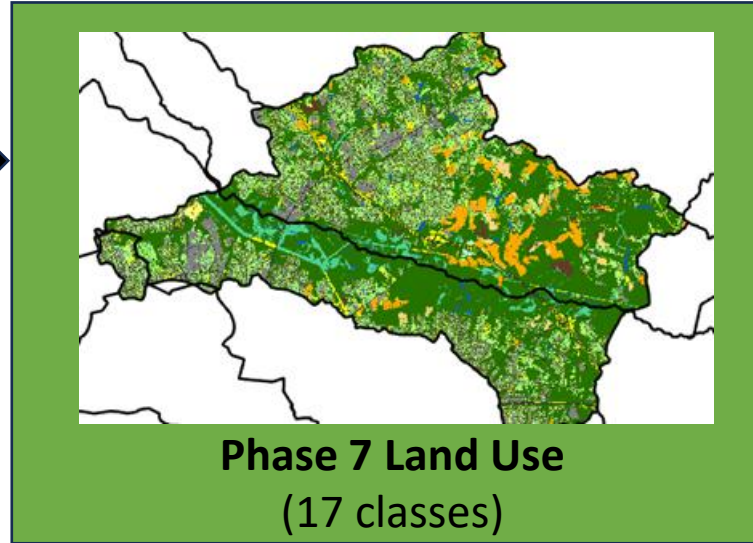
Sarah M. McDonald, Peter R. Claggett, Michelle P. Katoski, Labeeb Ahmed, Jackie A. Pickford
Lower Mississippi-Gulf Water Science Center, U.S. Geological Survey

Land Use Work Group Office Hours
September 16th, 2026

Translating Forecasted Development to Land Use: Process



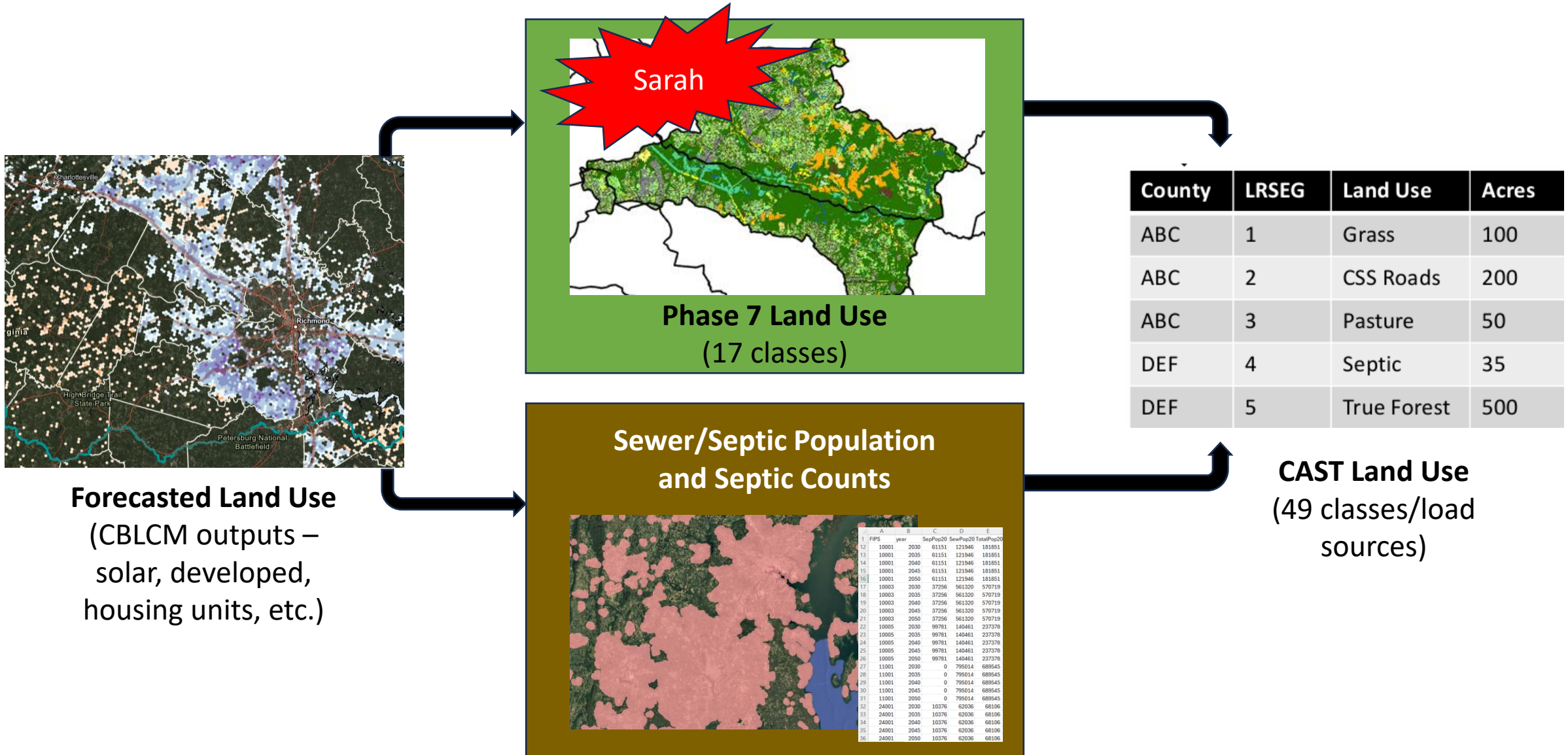
Forecasted Land Use
(CBLCM outputs –
solar, developed,
housing units, etc.)



County	LRSEG	Land Use	Acres
ABC	1	Grass	100
ABC	2	CSS Roads	200
ABC	3	Pasture	50
DEF	4	Septic	35
DEF	5	True Forest	500

CAST Land Use
(49 classes/load
sources)

Translating Forecasted Development to Land Use: Process



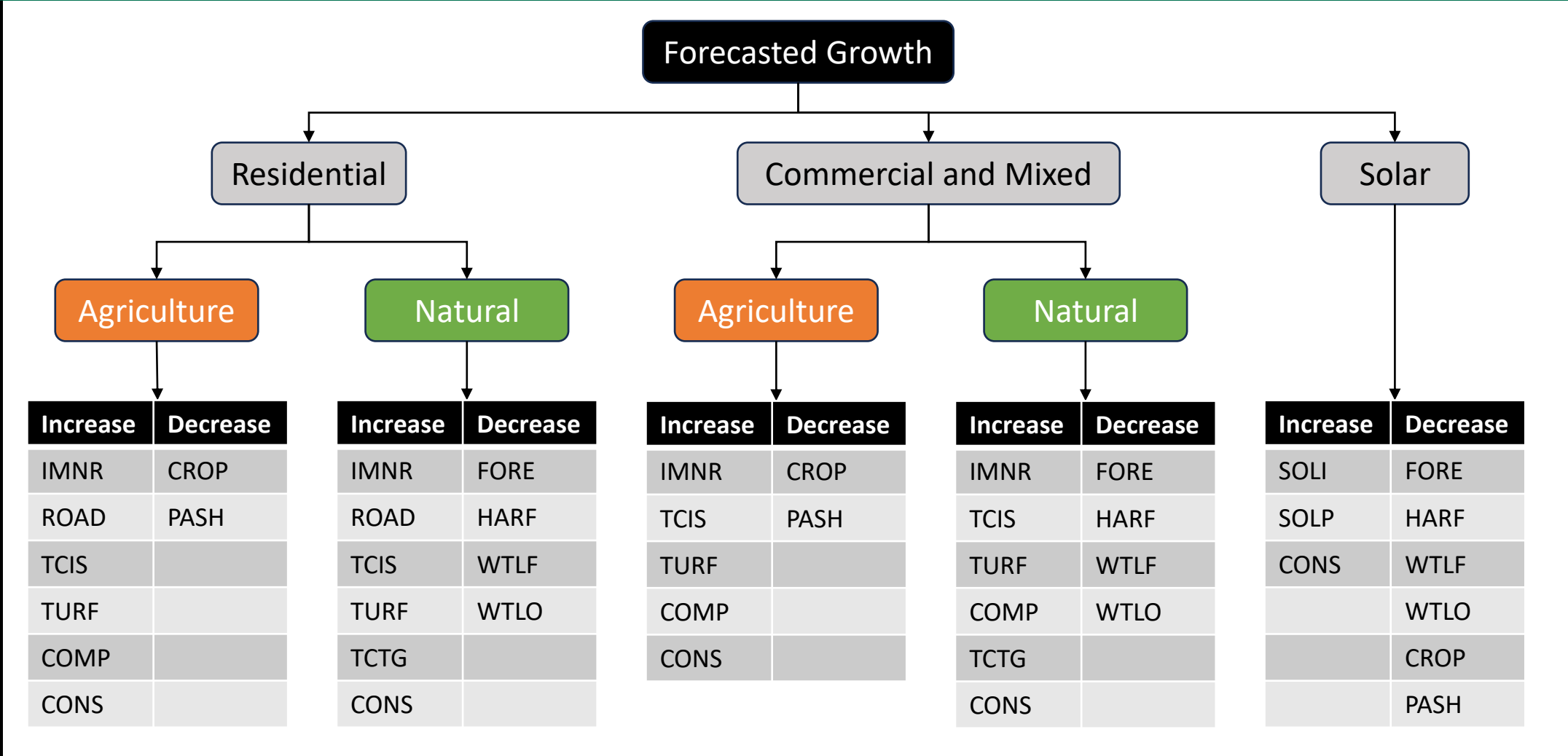
Translating Forecasted Greenfield Development to Phase 7 Land Use

Simulated development

Type of development that grew / was simulated

Sector that was converted to development

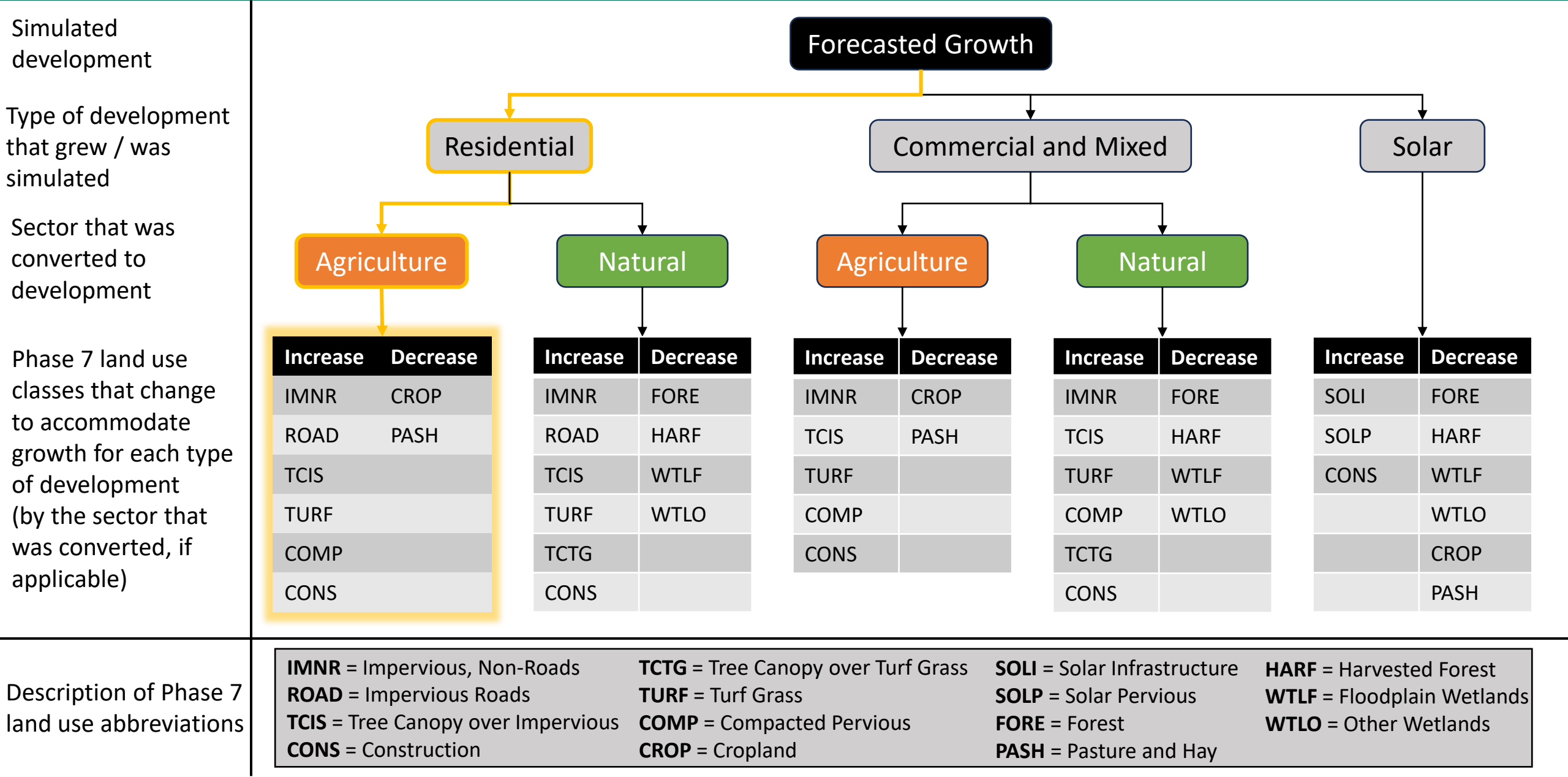
Phase 7 land use classes that change to accommodate growth for each type of development (by the sector that was converted, if applicable)



Description of Phase 7 land use abbreviations

IMNR = Impervious, Non-Roads	TCTG = Tree Canopy over Turf Grass	SOLI = Solar Infrastructure	HARF = Harvested Forest
ROAD = Impervious Roads	TURF = Turf Grass	SOLP = Solar Pervious	WTLF = Floodplain Wetlands
TCIS = Tree Canopy over Impervious	COMP = Compacted Pervious	FORE = Forest	WTLO = Other Wetlands
CONS = Construction	CROP = Cropland	PASH = Pasture and Hay	

Translating Forecasted Greenfield Development to Phase 7 Land Use



Translating Residential Growth from Agriculture to Phase 7 Land Use

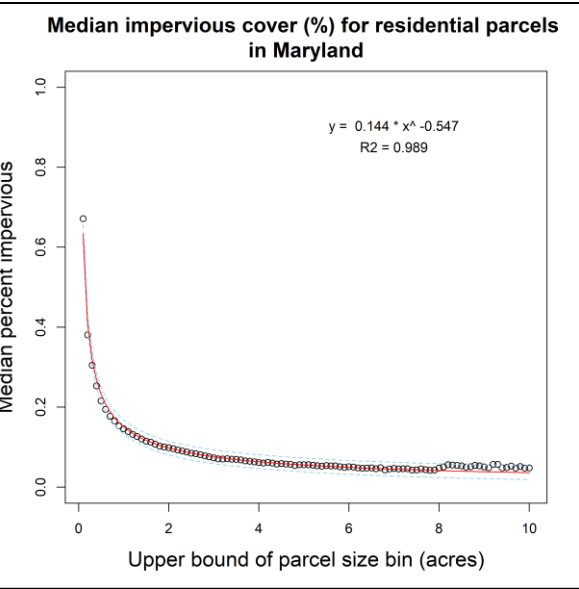


Figure 1: State-specific impervious equations relating residential lot size and % impervious. Impervious = Impervious non-roads + TC over impervious

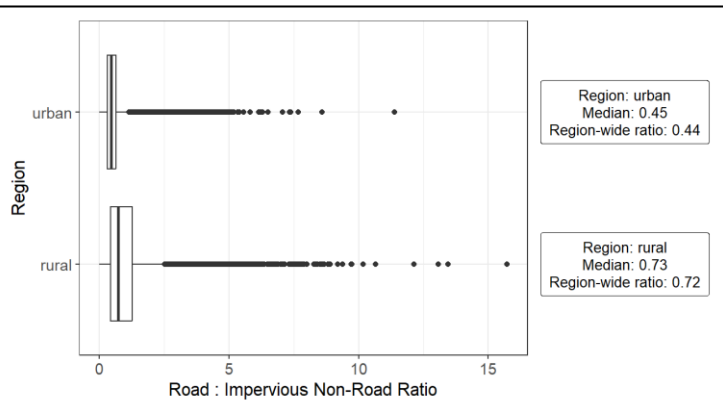
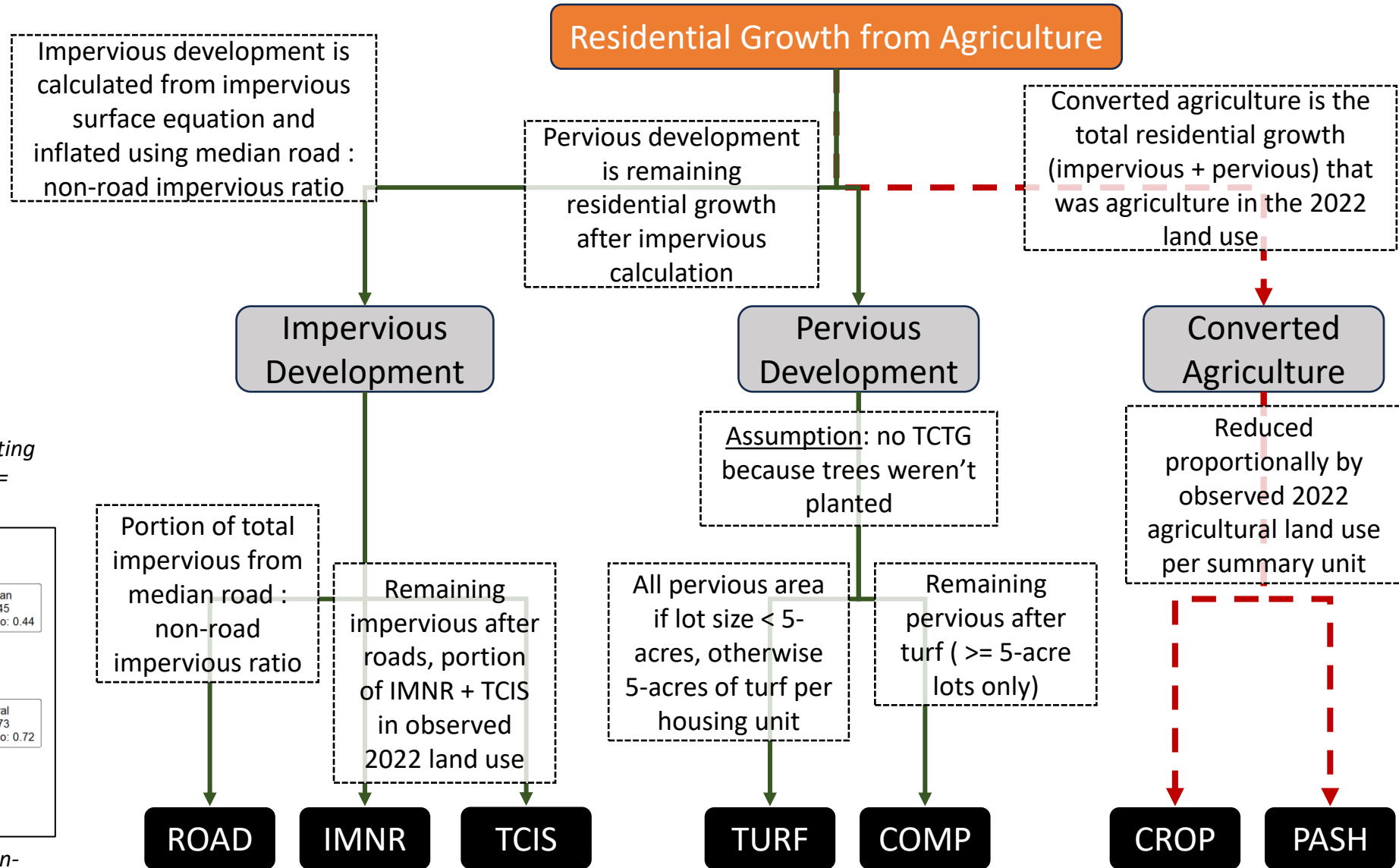


Figure 2: Sampled ratio of roads to impervious non-roads of all residential neighborhoods in 17 counties, grouped by urban and rural zones.



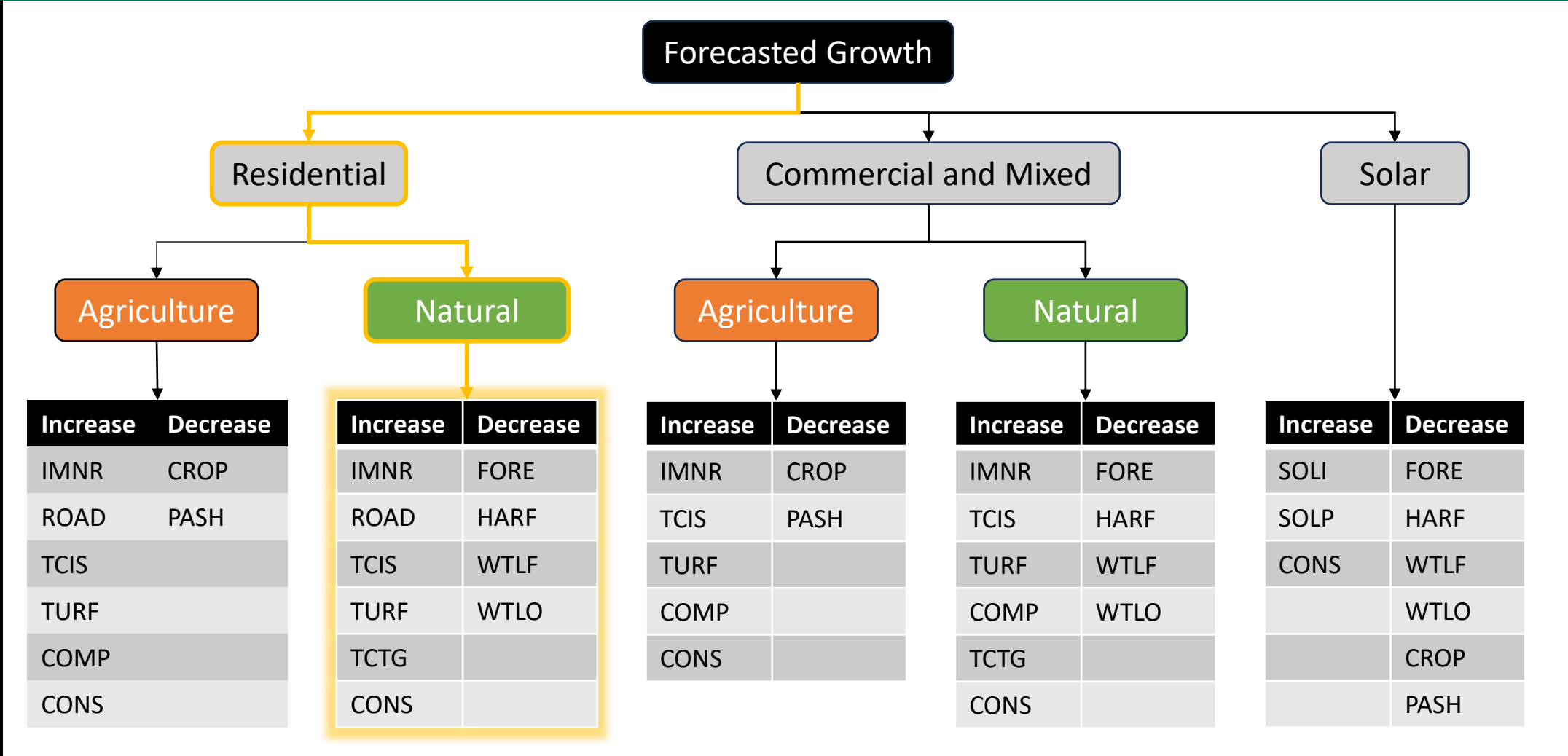
Translating Forecasted Greenfield Development to Phase 7 Land Use

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Type of development that grew / was simulated

Sector that was converted to development

Phase 7 land use classes that change to accommodate growth for each type of development (by the sector that was converted, if applicable)



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Translating Residential Growth from Natural to Phase 7 Land Use

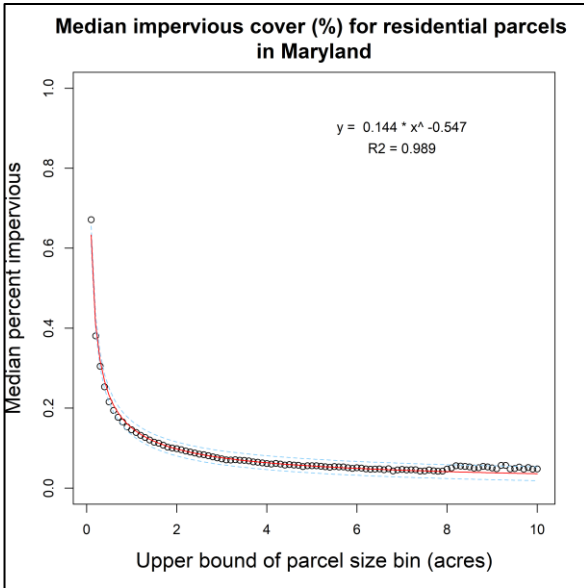


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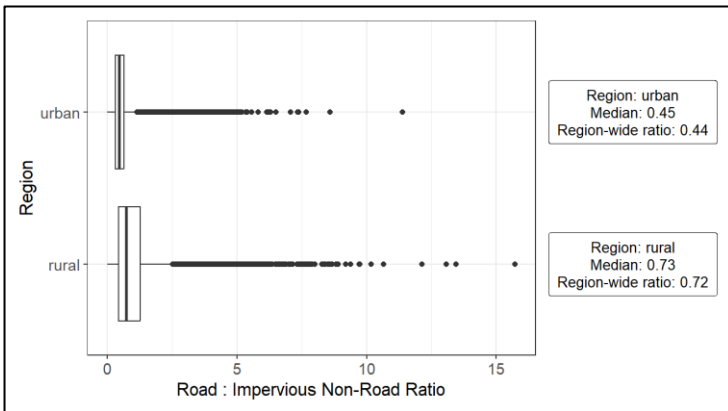
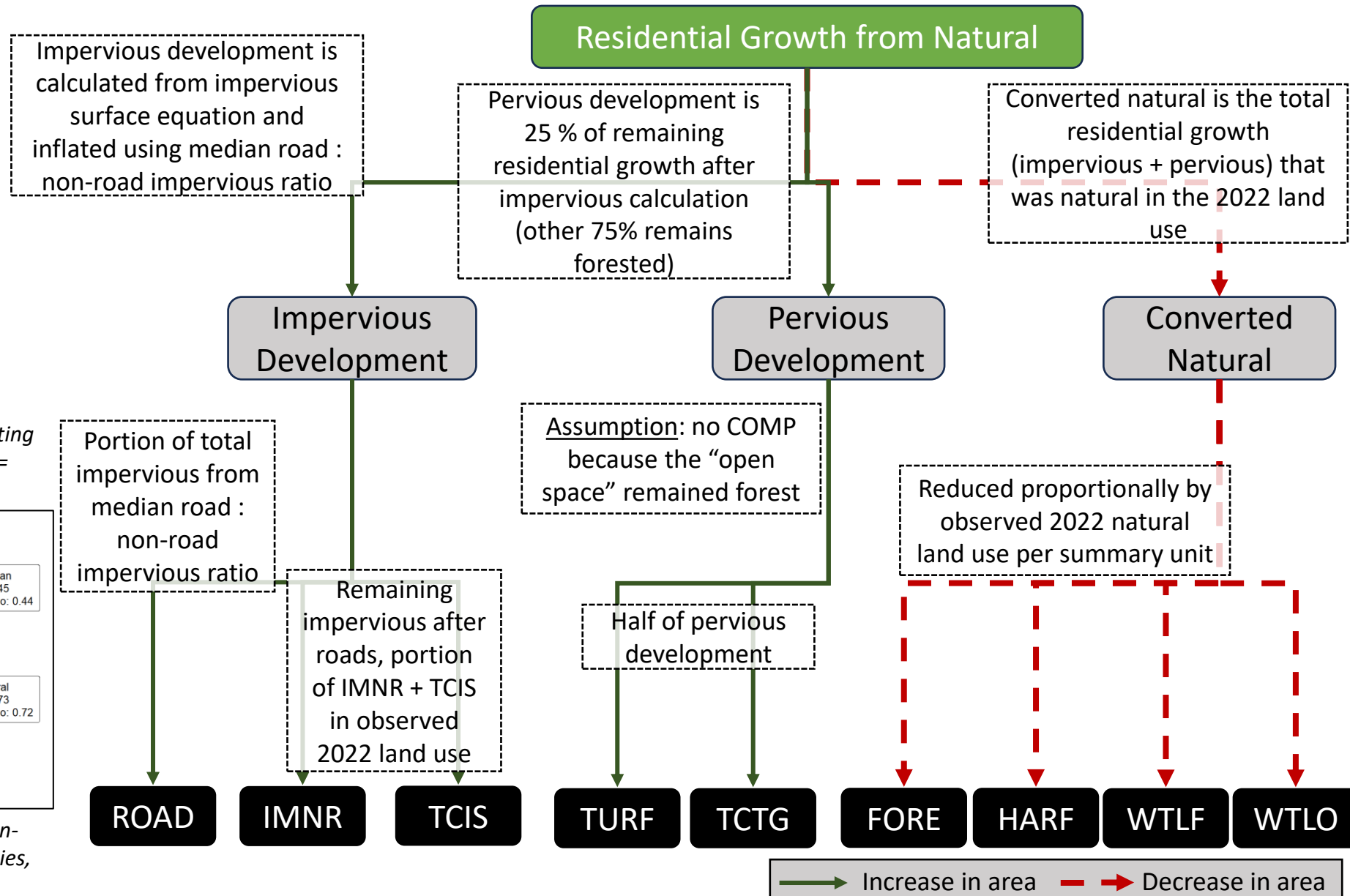
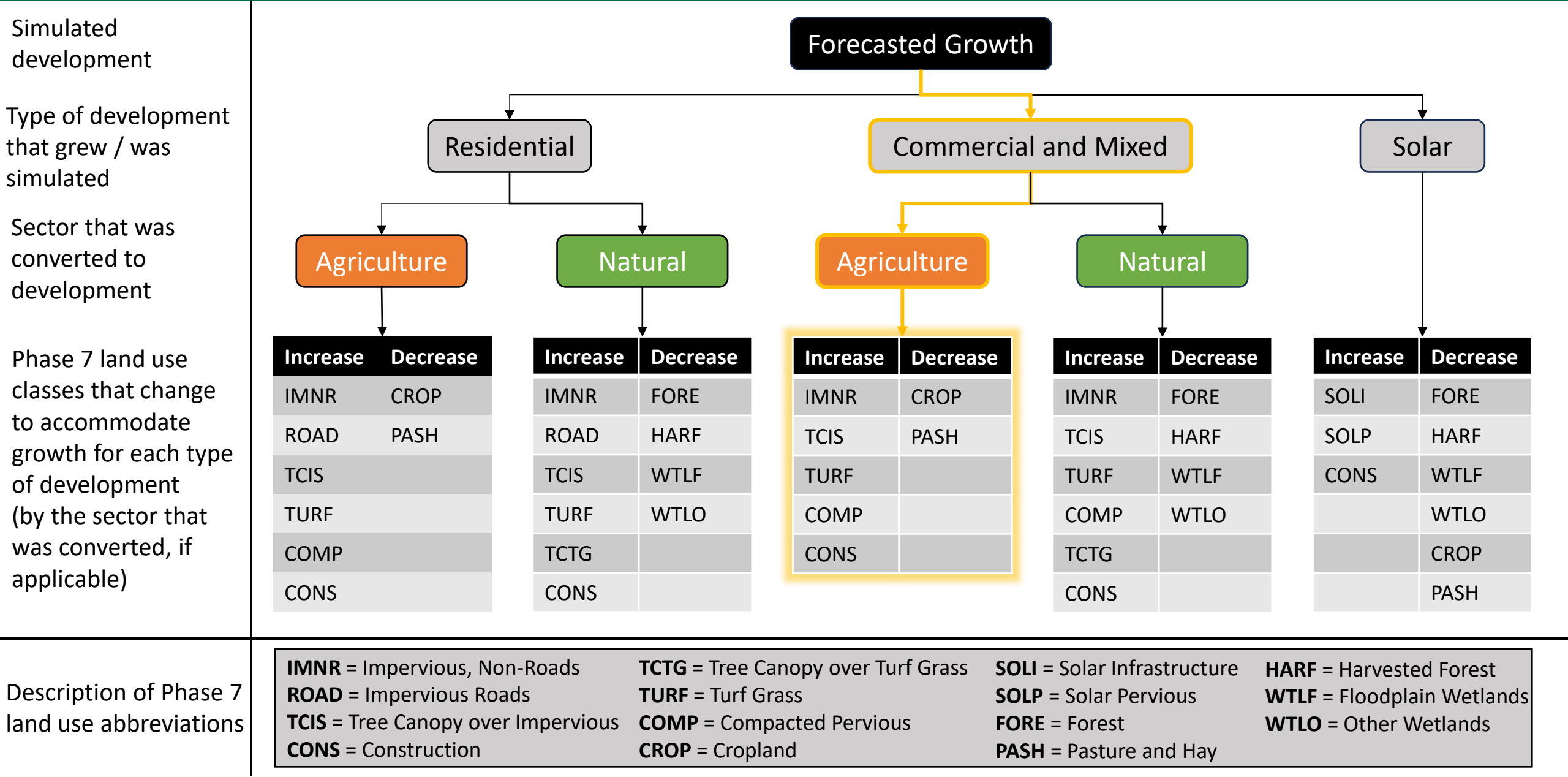


Figure 2: Sampled ratio of roads to impervious non-roads of all residential neighborhoods in 17 counties, grouped by urban and rural zones.



Translating Forecasted Greenfield Development to Phase 7 Land Use



Translating Commercial and Mixed Growth from Agriculture to Phase 7 Land Use

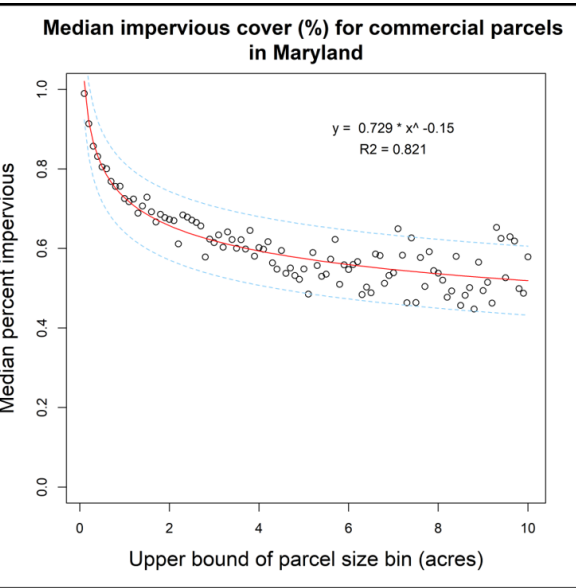
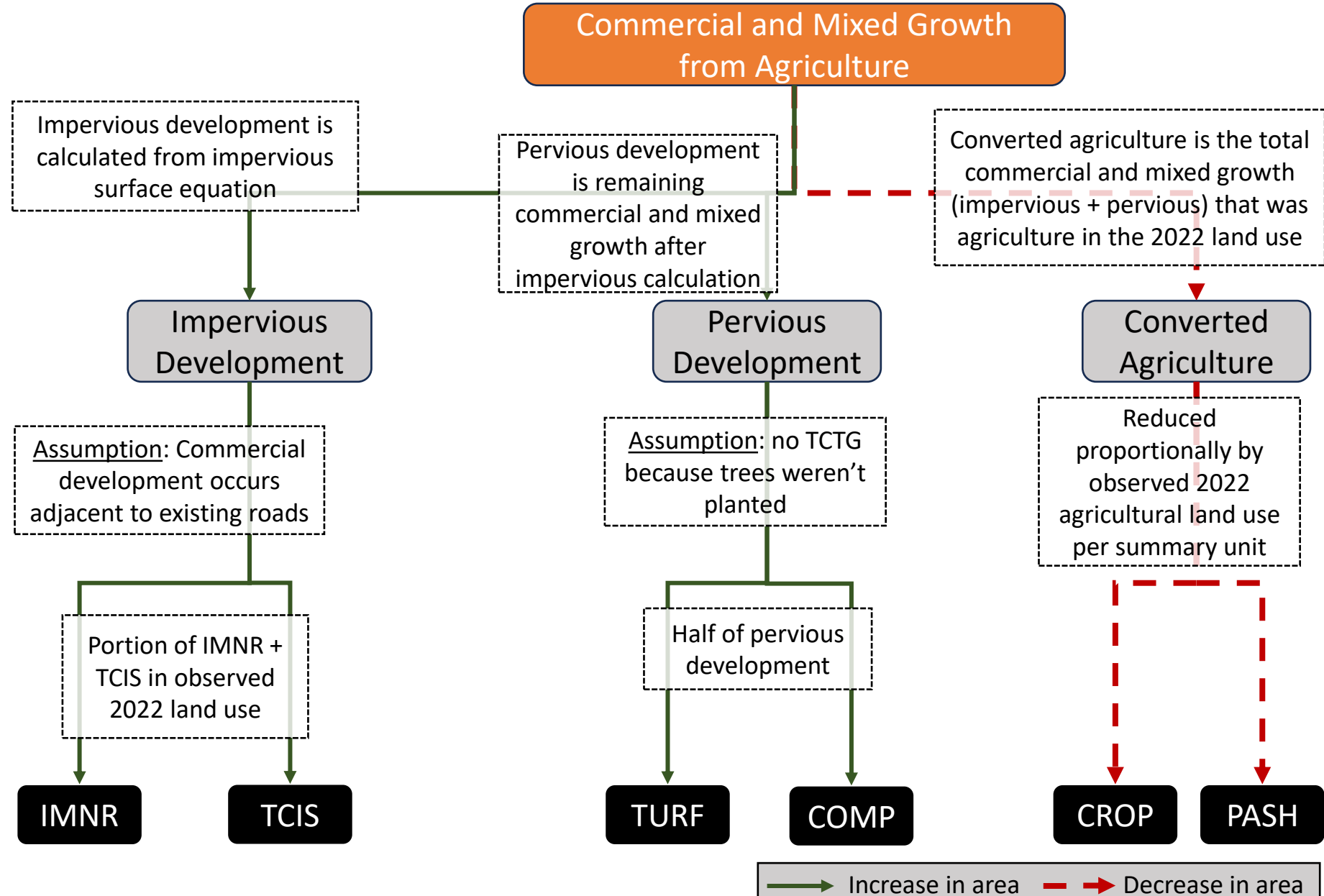
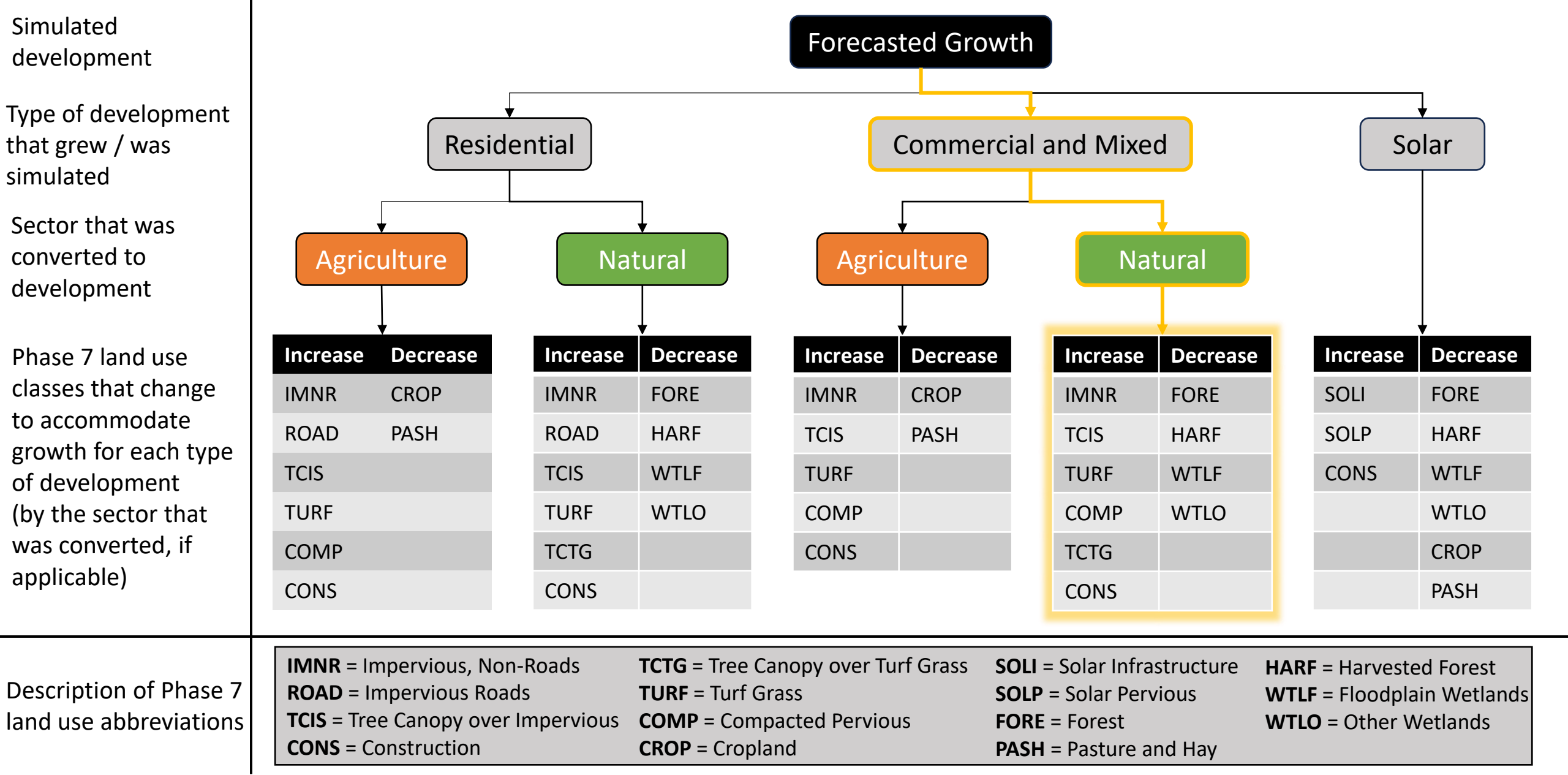


Figure 1: State-specific impervious equations relating commercial lot size and % impervious. Impervious = Impervious non-roads + TC over impervious



Translating Forecasted Greenfield Development to Phase 7 Land Use



Translating Commercial and Mixed Growth from Natural to Phase 7 Land Use

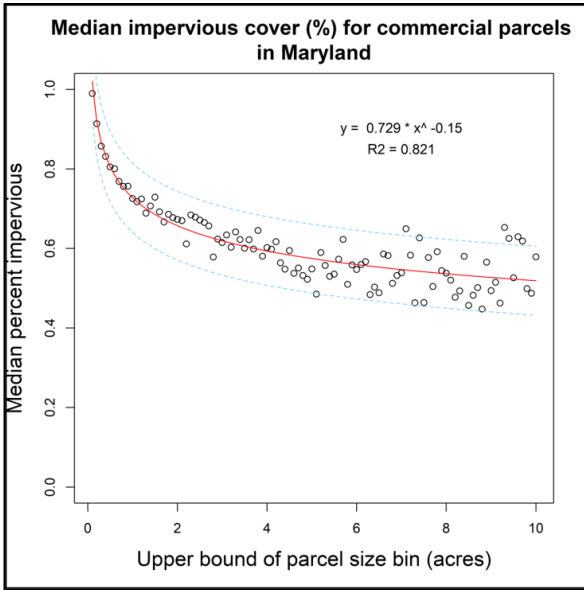
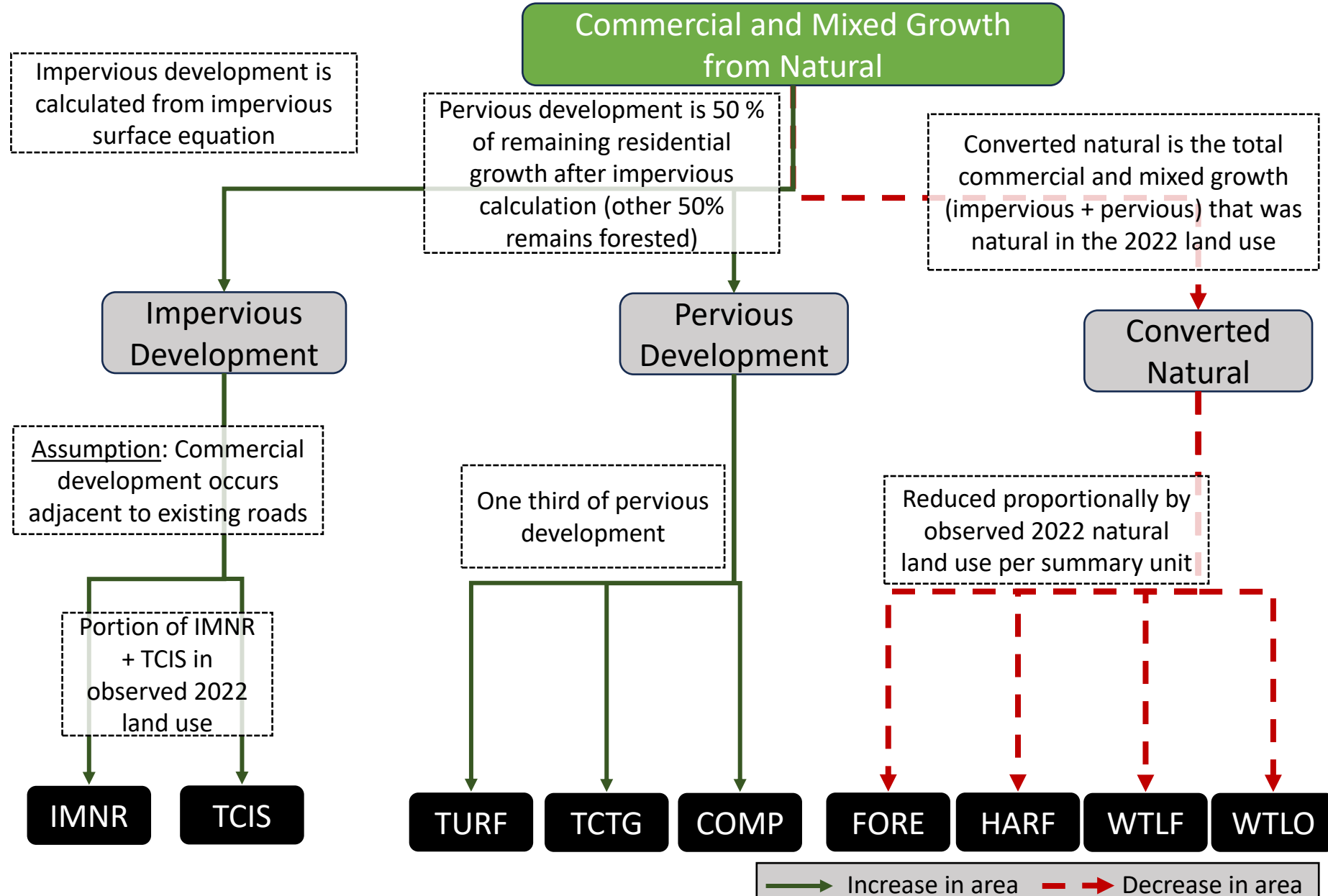
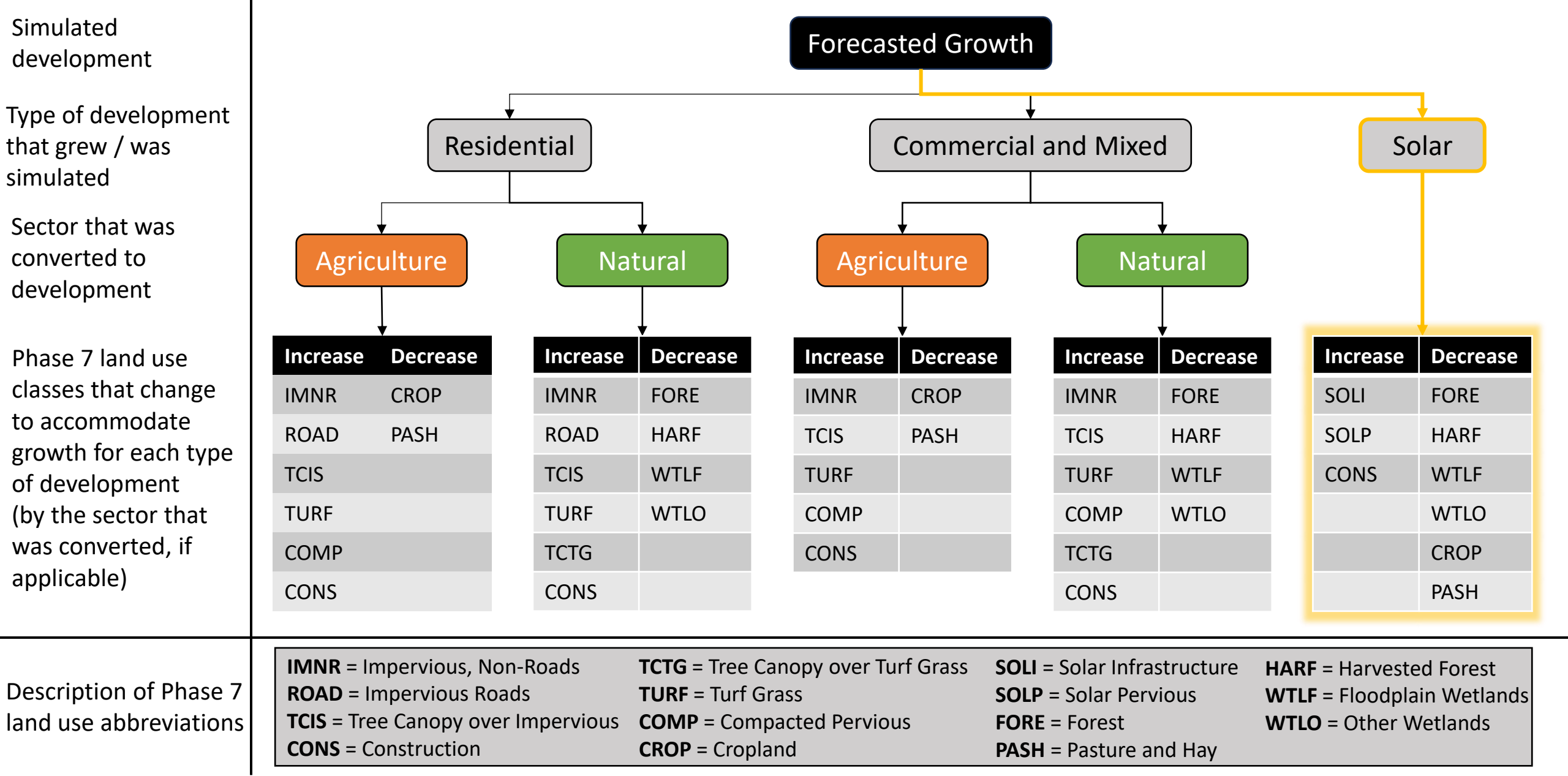


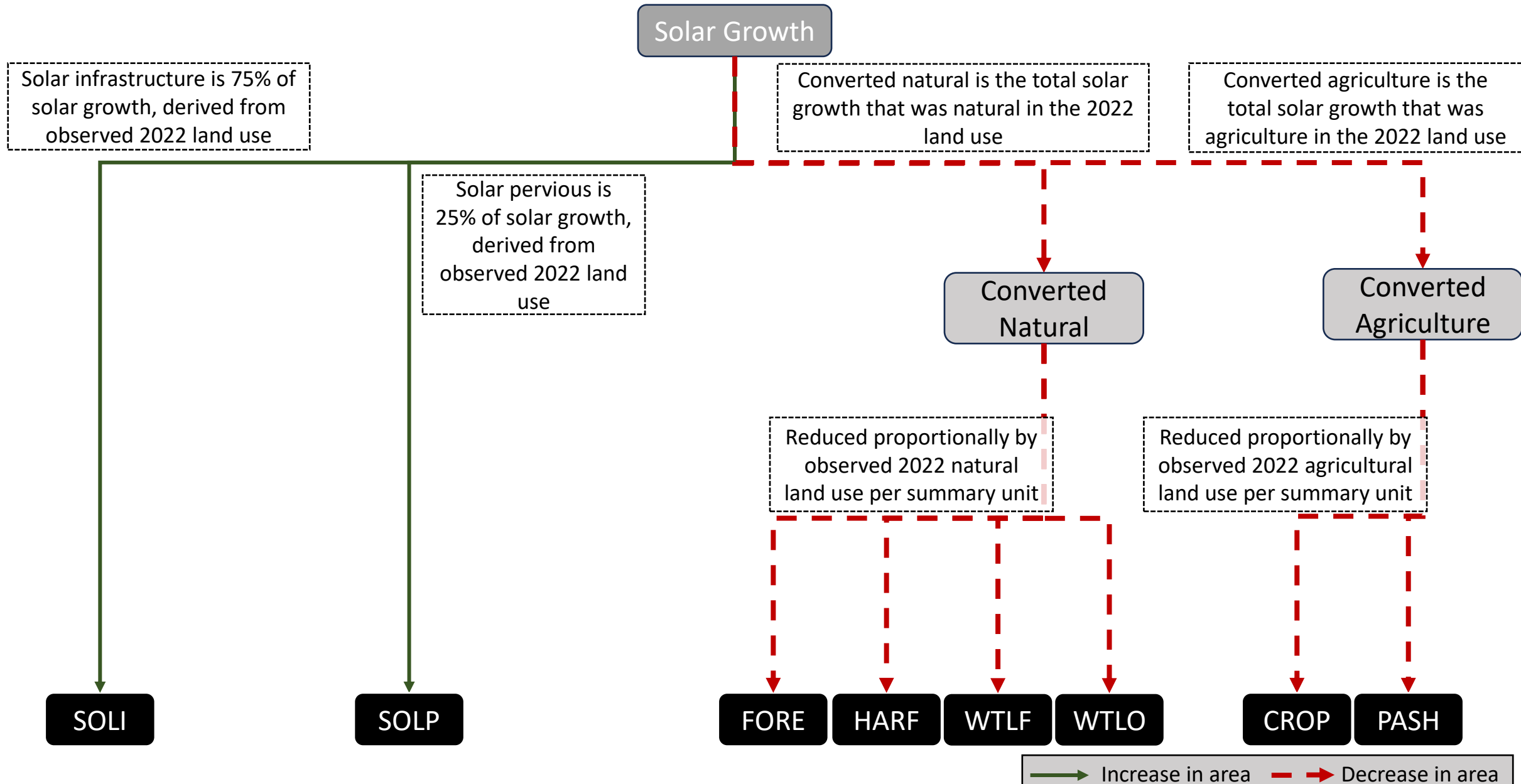
Figure 1: State-specific impervious equations relating commercial lot size and % impervious. Impervious = Impervious non-roads + TC over impervious



Translating Forecasted Greenfield Development to Phase 7 Land Use



Translating Solar Growth to Phase 7 Land Use



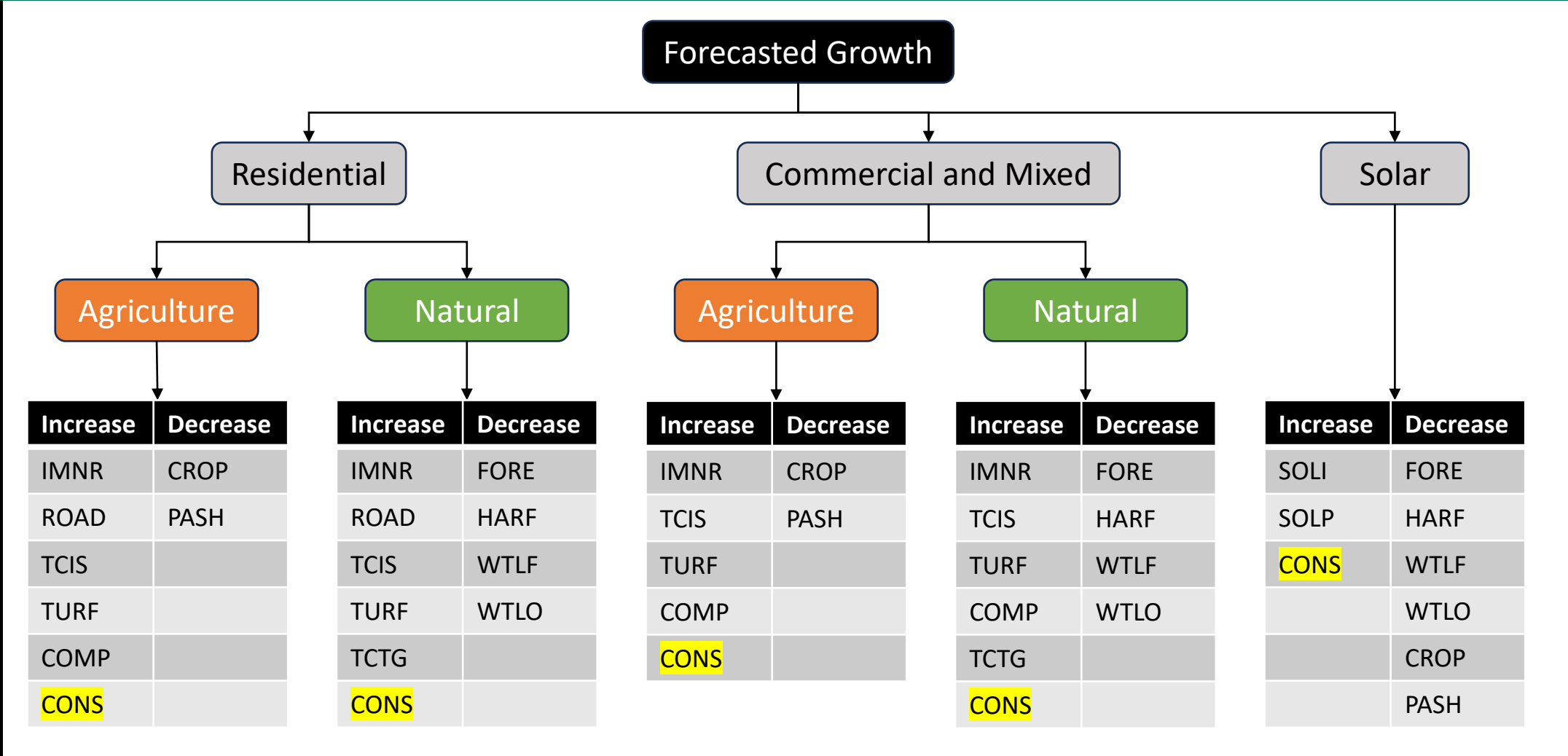
Translating Forecasted Greenfield Development to Phase 7 Land Use

Simulated development

Type of development that grew / was simulated

Sector that was converted to development

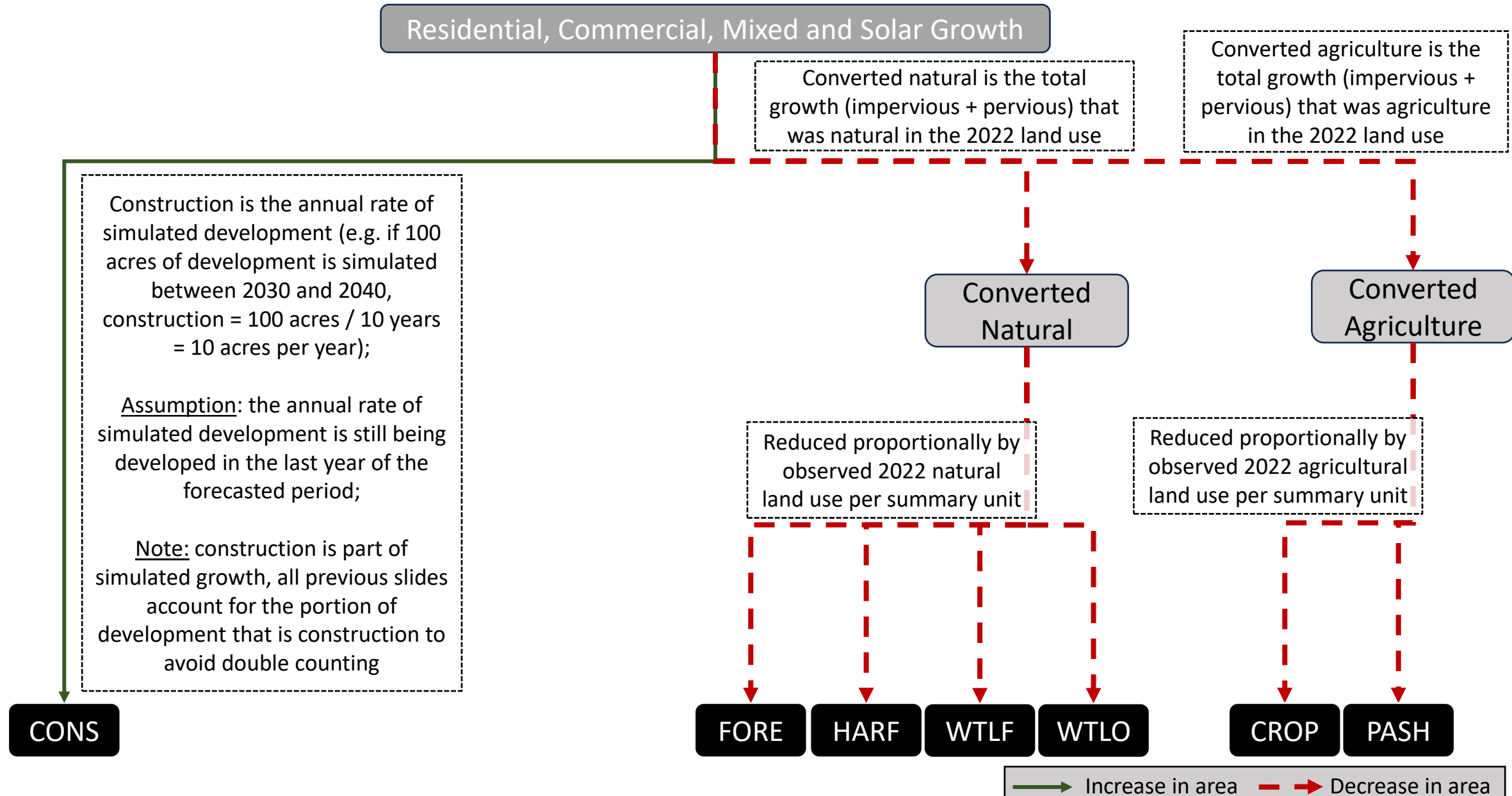
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Translating Residential, Commercial, Mixed and Solar Growth to Construction



Moving Base Year Construction to Developed Land Uses

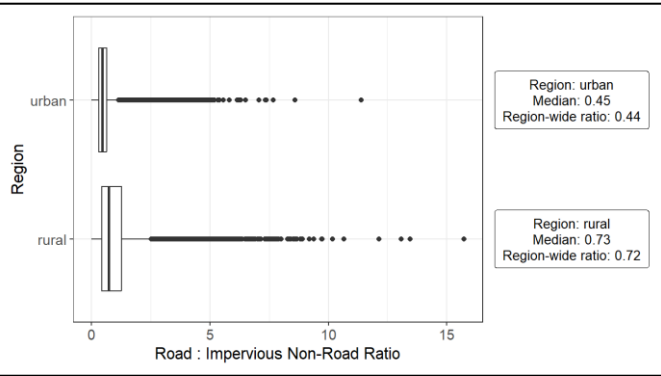
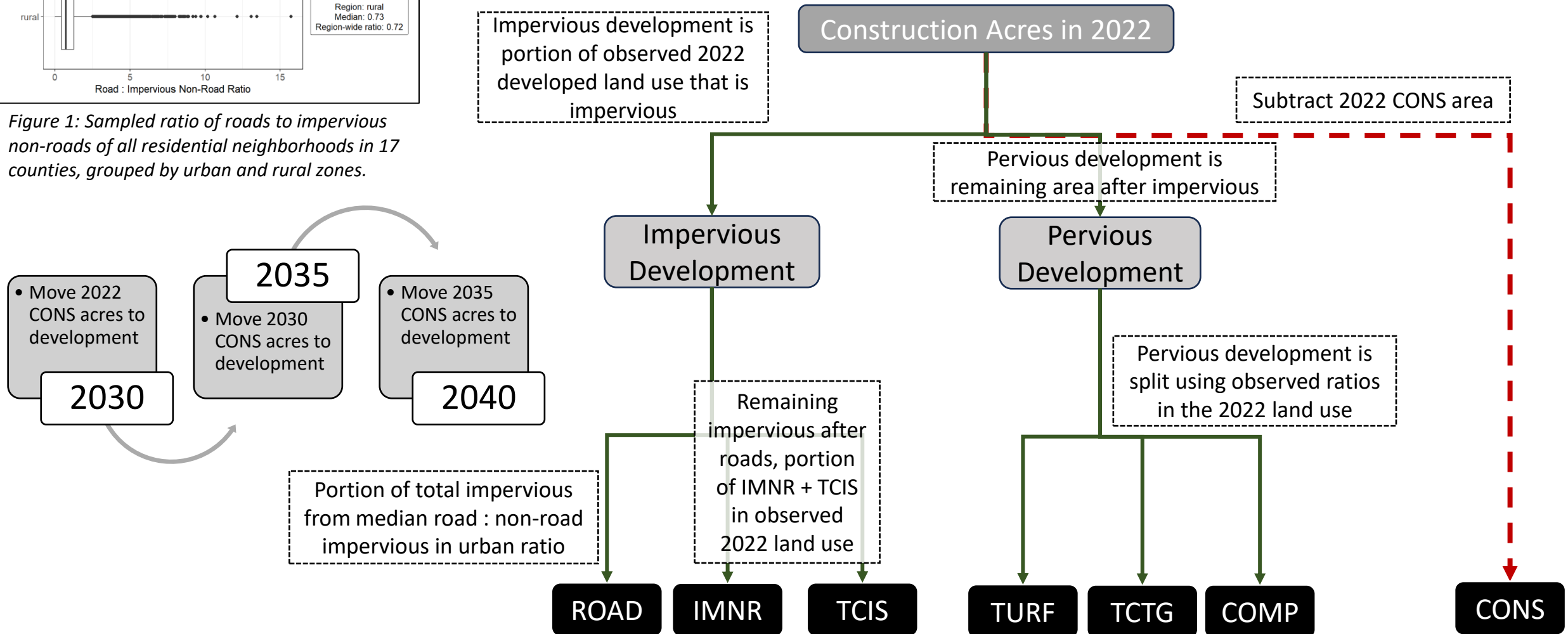


Figure 1: Sampled ratio of roads to impervious non-roads of all residential neighborhoods in 17 counties, grouped by urban and rural zones.

Challenge:

Construction acres in 2022 are assumed to be developed in 2030, therefore no longer being construction. Without knowing what the construction became, we allocate (or move) the construction acres to the developed land uses based on the observed proportions in the 2022 land use and the observed ratio of roads to non-road impervious.

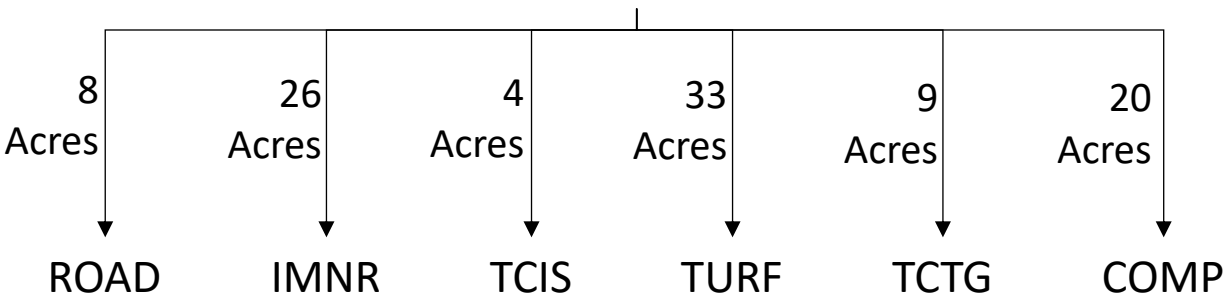


Construction Example

If there is 100 acres of construction in the **base year 2022**

Then all 100 acres are converted to roads, impervious non-roads, tree canopy over impervious, turf grass, tree canopy over turf grass, and compacted pervious as described in the previous slide

100 Acres of CONS



This calculation repeats for each simulated year (2030, 2035, 2040), with the base year updating to the previous simulated year

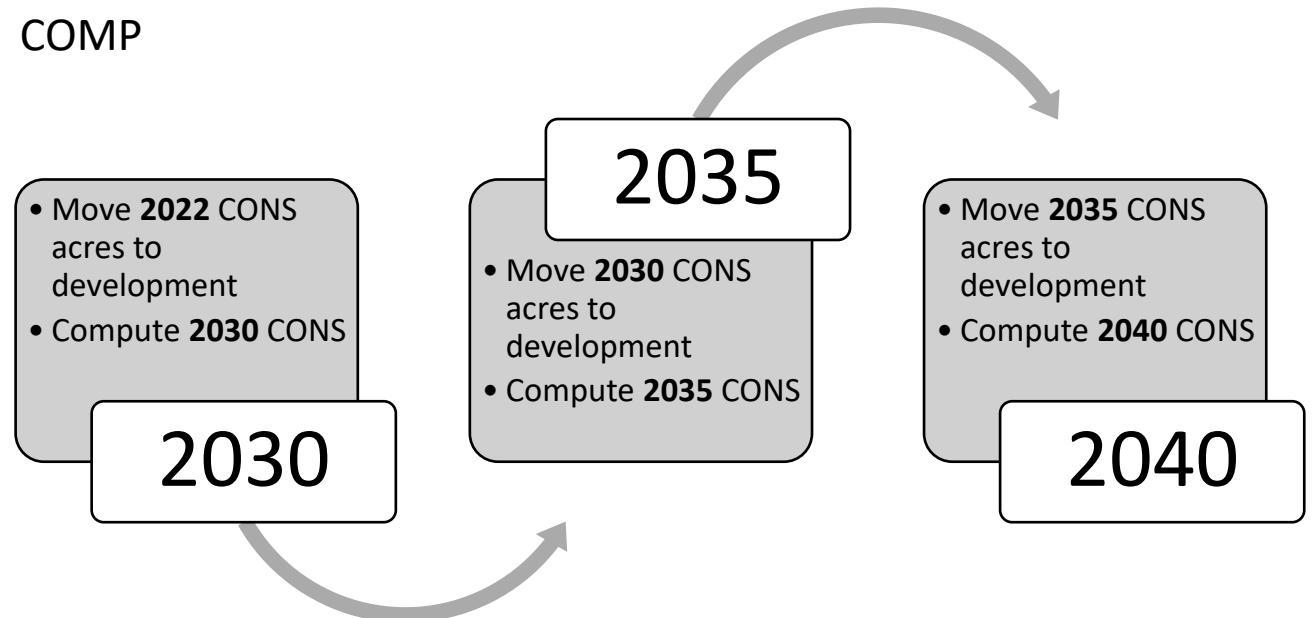
If there is 240 acres of development in **simulated year 2030**

Then the amount of construction in 2030 is the annual rate of development between 2022 and 2030.

240 Acres of development

$(2030 - 2022) = 8 \text{ years}$

= 30 acres per year



Questions?

Contacts

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Jackie Pickford

jpickford@usgs.gov