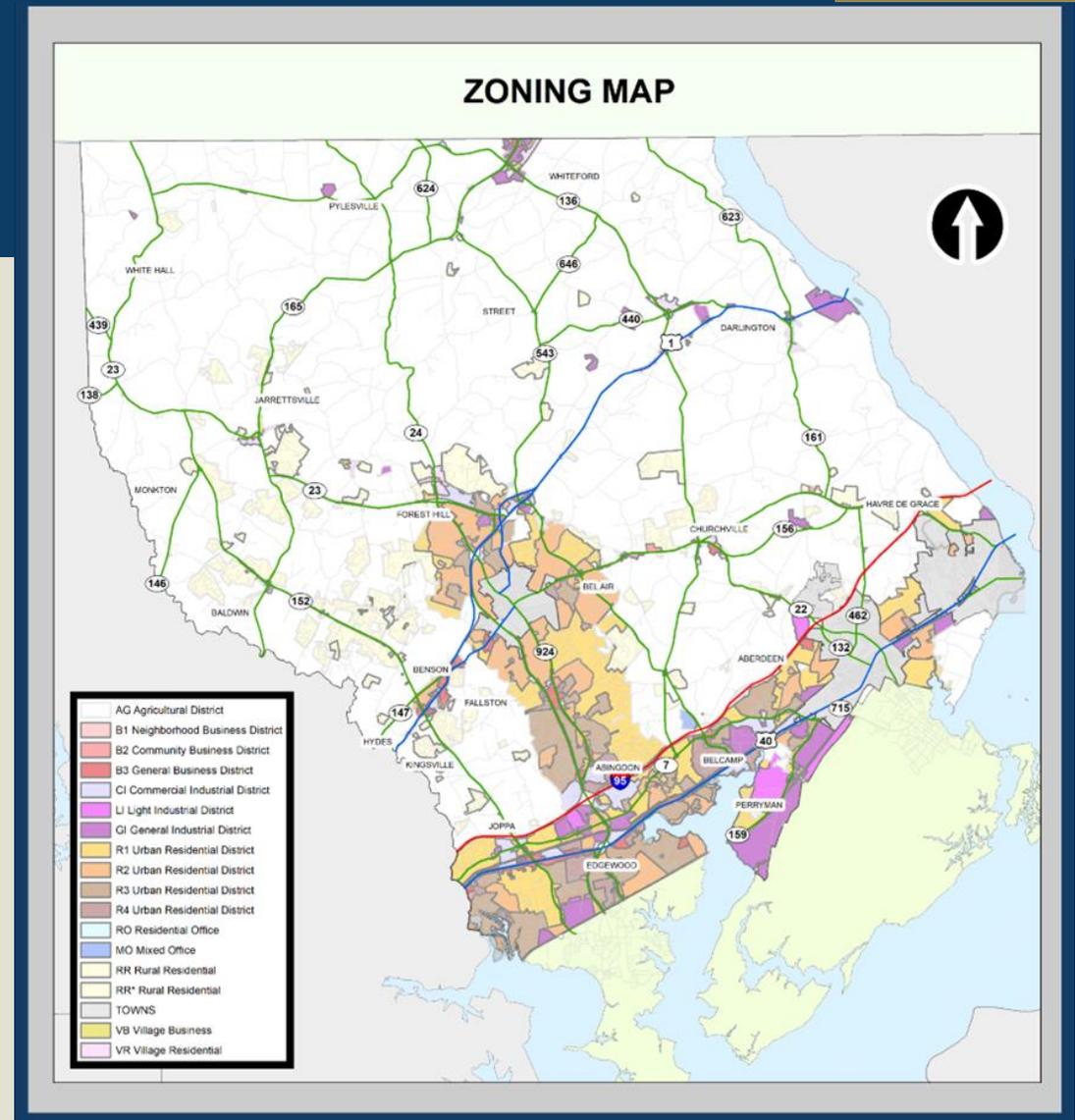




# LAND INVENTORY ANALYSIS PRESENTATION





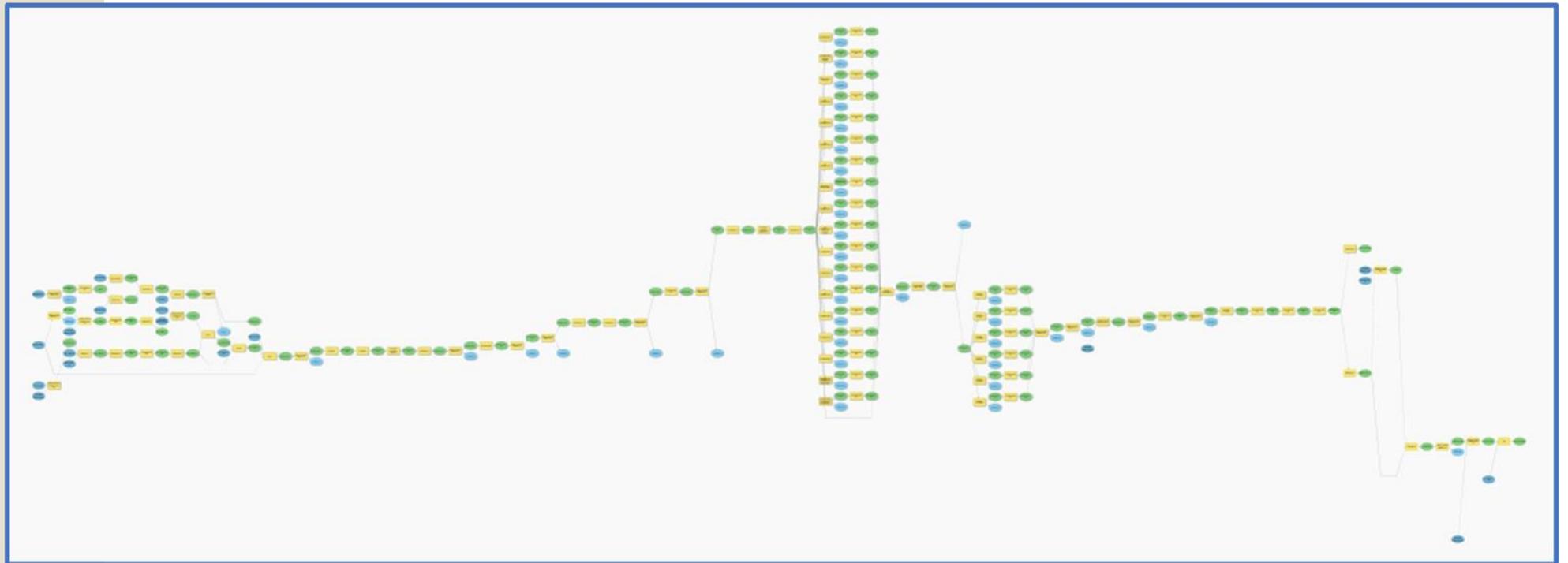
# LAND INVENTORY MODELS

- We created models using Model Builder in ArcGIS Pro to perform both the Residential and Commercial/Industrial land inventories.
- The land inventories include both vacant and underutilized land.



# RESIDENTIAL INVENTORY MODEL

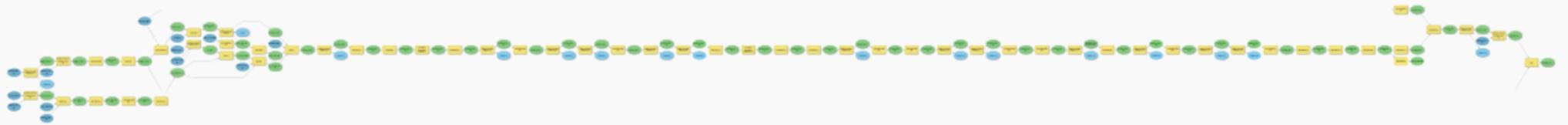
The Residential Inventory Model contains 164 variables and 105 processes.





# COMMERCIAL/INDUSTRIAL INVENTORY MODEL

- The Commercial/Industrial Inventory Model contains 88 variables and 58 processes.





# RESIDENTIAL INVENTORY MODEL

## MODEL STEPS

### SUMMARY

The following steps are performed on Harford County's cadastral (parcel) layer, with the three municipalities (City of Aberdeen, City of Havre de Grace, and the Town of Bel Air), and Aberdeen Proving Ground excluded.



# RESIDENTIAL INVENTORY MODEL

## EXCLUSIONS:

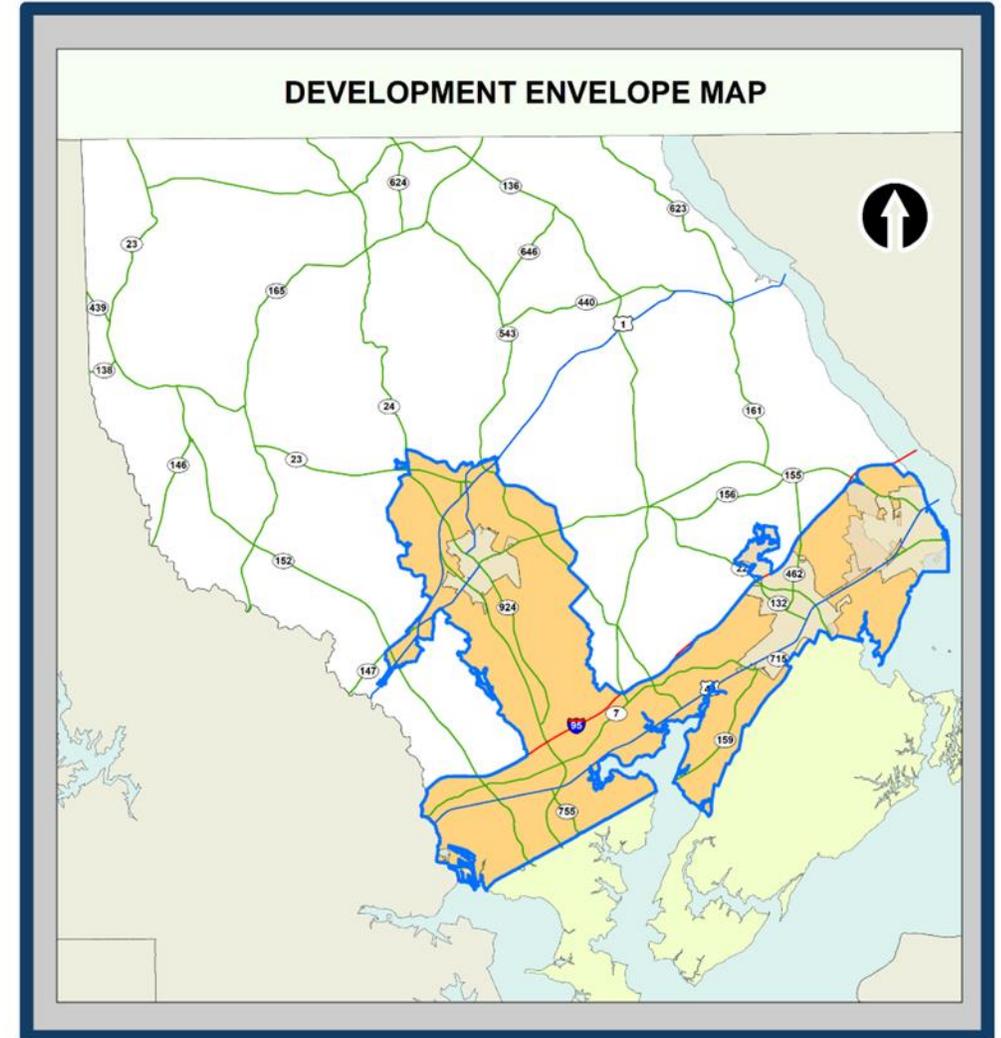
- Government-owned
- Public Utility Parcels (BGE, Exelon, etc.)
- Parcels in Land Preservation
- Open Space
- Cemeteries



# RESIDENTIAL INVENTORY MODEL

## DEVELOPMENT ENVELOPE

The models intersect parcels with the Development Envelope and tag each record as either inside or outside; if a parcel is split by the Envelope, then two records will appear in the output.





# RESIDENTIAL INVENTORY MODEL

## ZONING

- The models intersect the Parcel layer with the Zoning layer so that if a parcel is split zoned, there is a unique record for each zoning type. Zoning types analyzed include:
- **Residential Land Inventory :**
  - R1, R2, R3, & R4 (Urban Residential Districts)
  - RR and RR\* (Rural Residential)
  - VR (Village Residential)
- **Commercial/Industrial Land Inventory:**

• B1 (Neighborhood Business District)	LI (Light Industrial District)
• B2 (Community Business District)	GI (General Industrial District)
• B3 (General Business District)	RO (Residential Office)
• CI (Commercial Industrial District)	VB (Village Business)

Agricultural Zoned land is analyzed separately on a parcel-by-parcel basis. Mixed Office zoning is not analyzed because it is being built out.



# RESIDENTIAL INVENTORY MODEL

## ENVIRONMENTAL CONSTRAINTS

The models delete all portions of a parcel that have environmental constraints, which include:

- 150' buffer of major streams
- 75' buffer of smaller streams
- 50' buffer of 100-year floodplain
- Slopes of >25% that are >40,000 sf in size
- 75' buffer of national wetland inventory wetlands
- 100' buffer of wetlands of special state concern
- Resource Conservation Area designation  
in the Critical Area
- 100' buffer of the Critical Area





# RESIDENTIAL INVENTORY MODEL

## RESIDENTIAL FORMULAS:

For the Residential Land Inventory, a UNITS REMAINING field is added and calculated using the following criteria:

ZONING	TYPE	LOT SIZE	UNITS REMAINING FORMULA/VALUE
RR & RR*	UNIMPROVED	< 60,000 SF	0
		>= 60,000 SF AND < 4 ACRES	1
		>= 4 ACRES	ACREAGE/2
	IMPROVED	< 4 ACRES	0
		>= 4 ACRES	(ACREAGE/2) - 1
VR	UNIMPROVED	< 10,000 SF	0
WHITEFORD (SEWER)		>= 10,000 SF	SF/10,000
	IMPROVED	< 20,000 SF	0
		>= 20,000 SF	(SF/10,000) - 1
VR (NOT ON SEWER)	UNIMPROVED	< 1 ACRE	0
		>= 1 ACRE	ACREAGE
	IMPROVED	< 2 ACRES	0
		>= 2 ACRES	(ACREAGE) - 1
RO	UNIMPROVED	< 5,000 SF	0
		>= 5,000 SF	((ACREAGE x 8)/2))
	IMPROVED	< 5 ACRES	0
		>= 5 ACRES	((ACREAGE x 8) - 1)/2))

60,000 SF =  
Residential: Conventional  
Min. Lot Area  
Lots recorded on/after 2/8/77  
**1 UNIT PER 2 ACRES**

10,000 SF =  
Residential: Conventional  
Min. Lot Area  
Single Family Detached  
**1 UNIT PER 10,000 SF**

1 ACRE  
COMAR Regulations  
**1 UNIT PER ACRE**

5,000 SF  
Residential: Conventional  
Min. Lot Area  
Garden Apt.  
**8 UNITS PER ACRE**  
50% of RO is Residential

ZONING	TYPE	LOT SIZE	UNITS REMAINING FORMULA/VALUE
R1	UNIMPROVED	< 20,000 SF	0
		>= 20,000 SF	ACREAGE x 1.9*
	IMPROVED	< 2 ACRES	0
		>= 2 ACRES AND < 5 ACRES	1
		>= 5 ACRES	(ACREAGE x 1.9) - 1
R2	UNIMPROVED	< 10,000 SF	0
		>= 10,000 SF	ACREAGE x 4*
	IMPROVED	< 2 ACRES	0
		>= 2 ACRES AND < 5 ACRES	1
		>= 5 ACRES	(ACREAGE x 4) - 1
R3	UNIMPROVED	< 7,500 SF	0
		>= 7,500 SF	ACREAGE X 6
	IMPROVED	< 2 ACRES	0
		>= 2 ACRES AND < 5 ACRES	1
		>= 5 ACRES	(ACREAGE x 6) - 1
R4	UNIMPROVED	< 4,500 SF	0
		>= 4,500 SF	ACREAGE x 9*
	IMPROVED	< 2 ACRES	0
		>= 2 ACRES AND < 5 ACRES	1
		>= 5 ACRES	(ACREAGE x 9) - 1

20,000 SF =  
Residential: Conventional  
Min. Lot Area  
SF Detached  
**1.9 UNITS PER ACRE**

10,000 SF =  
Residential: Conventional  
Min. Lot Area  
SF Detached  
**4 UNITS PER ACRE**

7,500 SF =  
Residential: Conventional  
Min. Lot Area  
SF Detached  
**6 UNITS PER ACRE**

4,500 SF =  
Residential: Conventional  
Min. Lot Area Per Dwelling/Fam. Unit  
Patio/Court/Atrium  
**9 UNITS PER ACRE**

ROUND NUMBERS DOWN  
\*CODE VALUES <1 AS 1



# RESIDENTIAL INVENTORY MODEL

## APARTMENTS/MOBILE HOME PARKS

- A shapefile of apartments and mobile home parks that includes the number of units on each parcel is joined to the parcel layer, and the number of apartments and mobile home parks is subtracted from the UNITS REMAINING.
- Round down because there can't be partial units.



# COMMERCIAL/ INDUSTRIAL INVENTORY MODEL

## COMMERCIAL/INDUSTRIAL FORMULAS

For the Commercial/Industrial Land Inventory, BUILDING SQUARE FOOTAGE POTENTIAL and BUILDABLE PARCEL ACREAGE fields are added and calculated using the following criteria:

INVENTORY	BUILDING SF POTENTIAL FORMULA	BUILDABLE PARCEL ACREAGE FORMULA	ZONING CRITERIA
COMMERCIAL	$(\text{Acreage} * 10,000) - \text{STRUCTURAL SF}$	$\text{Acreage} - (\text{STRUCTURAL SF}/10,000)$	B1, B2, B3, CI w/NON-INDUSTRIAL LAND USE, RO WITH COMMERCIAL LAND USE, VB
INDUSTRIAL	$(\text{Acreage} * 15,000) - \text{STRUCTURAL SF}$	$\text{Acreage} - (\text{STRUCTURAL SF}/15,000)$	CI w/ INDUSTRIAL LAND USE, GI, LI

MARK AS DEVELOPED:   Parcels with BUILDABLE PARCEL ACREAGE <0.2 and STRUCTURAL SF = 0  
                                  Parcels with BUILDABLE PARCEL ACREAGE <2 and STRUCTURAL SF >0



# RESIDENTIAL INVENTORY MODEL

## RESIDENTIAL RESULTS SUMMARY

RESIDENTIAL INVENTORY				
ZONING	ACREAGE	UNITS REMAINING	UNITS REMAINING ROUNDED DOWN	# OF PARCELS
<b>INSIDE ENVELOPE</b>				
R1	2,211.30	3,303.39	3,177.00	500.00
R2	914.27	2,863.95	2,741.00	344.00
R3	535.49	2,710.24	2,639.00	171.00
R4	90.56	692.28	679.00	31.00
RO	1.39	6.05	4.00	4.00
RR	20.40	6.20	5.00	4.00
VR	3.12	3.12	2.00	2.00
<b>TOTAL</b>	<b>3,776.54</b>	<b>9,585.24</b>	<b>9,247.00</b>	<b>1,056.00</b>
<b>OUTSIDE ENVELOPE</b>				
R1	0.47	1.00	1.00	1.00
R2	14.23	49.63	47.00	8.00
RR	1,132.36	464.00	424.00	162.00
RR*	103.78	44.89	40.00	9.00
VR	256.49	455.29	408.00	115.00
<b>TOTAL</b>	<b>1,507.33</b>	<b>1,014.80</b>	<b>920.00</b>	<b>295.00</b>
<b>COUNTYWIDE TOTAL</b>	<b>5,283.87</b>	<b>10,600.03</b>	<b>10,167.00</b>	<b>1,351.00</b>



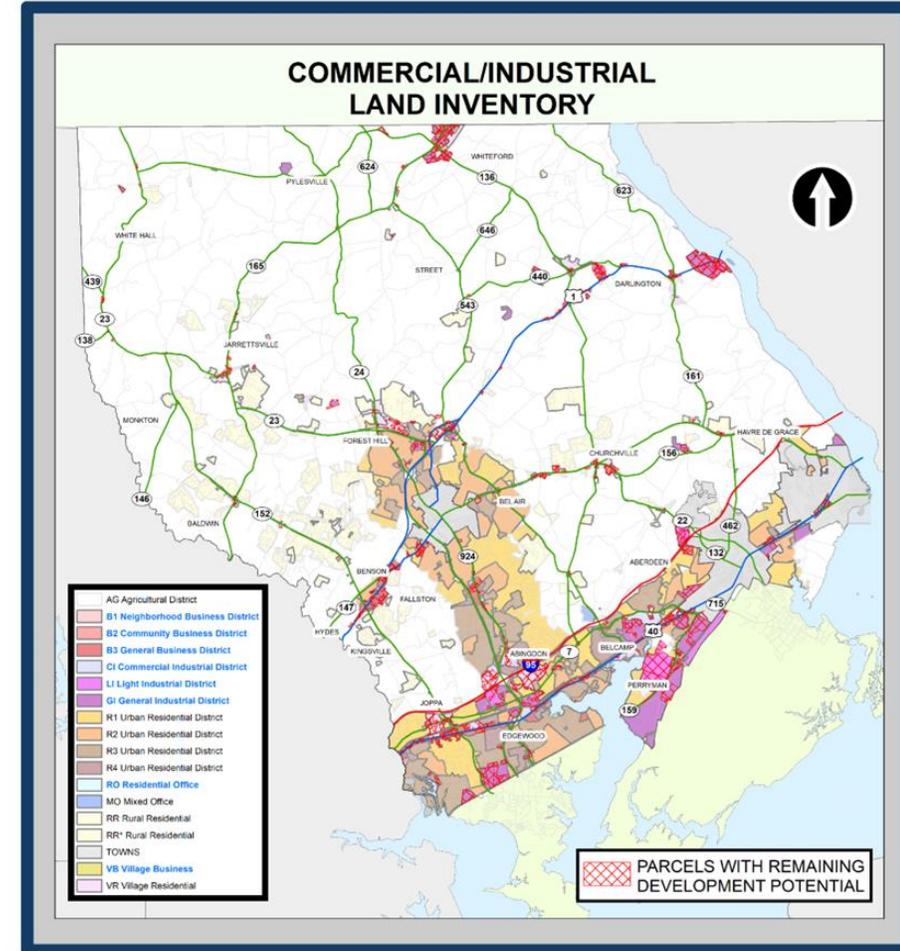
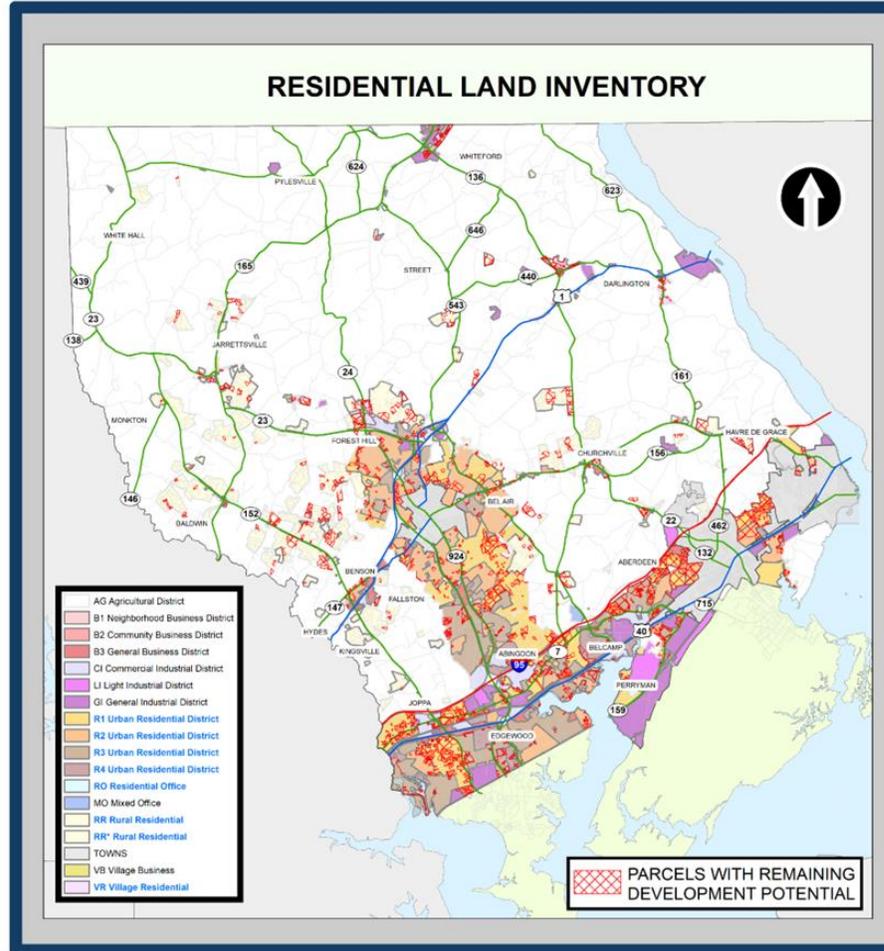
# RESIDENTIAL INVENTORY MODEL

## COMMERCIAL/INDUSTRIAL RESULTS SUMMARY

COMMERCIAL/INDUSTRIAL INVENTORY					
ZONING	ZONING TYPE	ACREAGE	BUILDING SF POTENTIAL	BUILDABLE PARCEL ACREAGE	# OF PARCELS
<b>INSIDE ENVELOPE</b>					
B1	COMMERCIAL	9.34	91,890.85	9.19	13.00
B2	COMMERCIAL	82.84	564,024.79	56.40	39.00
B3	COMMERCIAL	354.95	3,056,830.55	305.68	132.00
CI	COMMERCIAL	610.66	5,304,167.24	530.42	134.00
RO	COMMERCIAL	3.35	29,955.57	3.00	3.00
VB	COMMERCIAL	0.66	6,598.80	0.66	1.00
<b>TOTAL</b>		<b>1,061.81</b>	<b>9,053,467.80</b>	<b>905.35</b>	<b>322.00</b>
CI	INDUSTRIAL	129.66	1,855,220.67	123.68	39.00
GI	INDUSTRIAL	804.04	8,097,774.92	539.85	72.00
LI	INDUSTRIAL	590.80	8,637,840.03	575.86	16.00
<b>TOTAL</b>		<b>1,524.51</b>	<b>18,590,835.62</b>	<b>1,239.39</b>	<b>127.00</b>
<b>COMMERCIAL/INDUSTRIAL TOTAL</b>		<b>2,586.32</b>	<b>27,644,303.42</b>	<b>2,144.74</b>	<b>449.00</b>
<b>OUTSIDE ENVELOPE</b>					
B1	COMMERCIAL	32.79	325,162.40	32.52	11.00
B2	COMMERCIAL	64.47	543,095.73	54.31	18.00
B3	COMMERCIAL	143.21	1,342,205.07	134.22	51.00
CI	COMMERCIAL	26.45	230,599.68	23.06	5.00
VB	COMMERCIAL	70.57	625,385.78	62.54	42.00
<b>TOTAL</b>		<b>337.48</b>	<b>3,066,448.67</b>	<b>306.64</b>	<b>127.00</b>
CI	INDUSTRIAL	13.45	171,132.82	11.41	1.00
GI	INDUSTRIAL	577.93	8,389,709.20	559.31	44.00
LI	INDUSTRIAL	99.55	1,322,468.54	88.16	6.00
<b>TOTAL</b>		<b>690.93</b>	<b>9,883,310.56</b>	<b>658.89</b>	<b>51.00</b>
<b>COMMERCIAL/INDUSTRIAL TOTAL</b>		<b>1,028.41</b>	<b>12,949,759.24</b>	<b>965.53</b>	<b>178.00</b>
<b>COUNTYWIDE TOTALS</b>					
COMMERCIAL		1,399.29	12,119,916.48	1,211.99	449.00
INDUSTRIAL		2,215.43	28,474,146.18	1,898.28	178.00
<b>COMMERCIAL AND INDUSTRIAL</b>		<b>3,614.73</b>	<b>40,594,062.66</b>	<b>3,110.27</b>	<b>627.00</b>



# RESIDENTIAL INVENTORY MODEL





# RESIDENTIAL INVENTORY MODEL

THANK YOU FOR YOUR TIME

ANY QUESTIONS OR COMMENTS?