

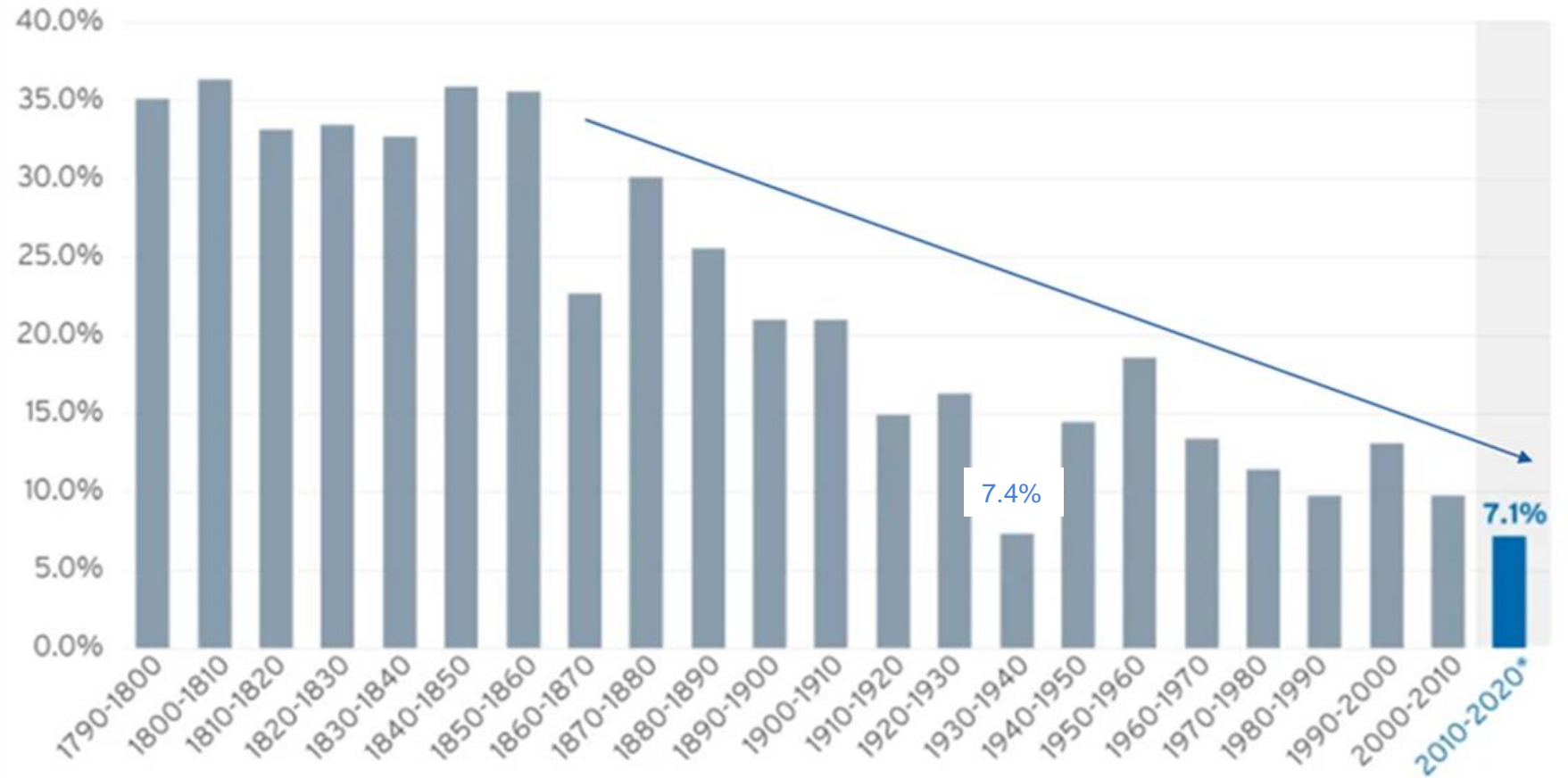
**Delaware APA Monthly
Lunch and
Learning Series:**

**Delaware Population
Projections, traffic
modeling and
demographic trends
February 2022**

National Picture:

2010-2020:
Lowest % Growth
of any Decade

Figure 1: US population growth for decades: Censuses 1790 to 2020 (projected)

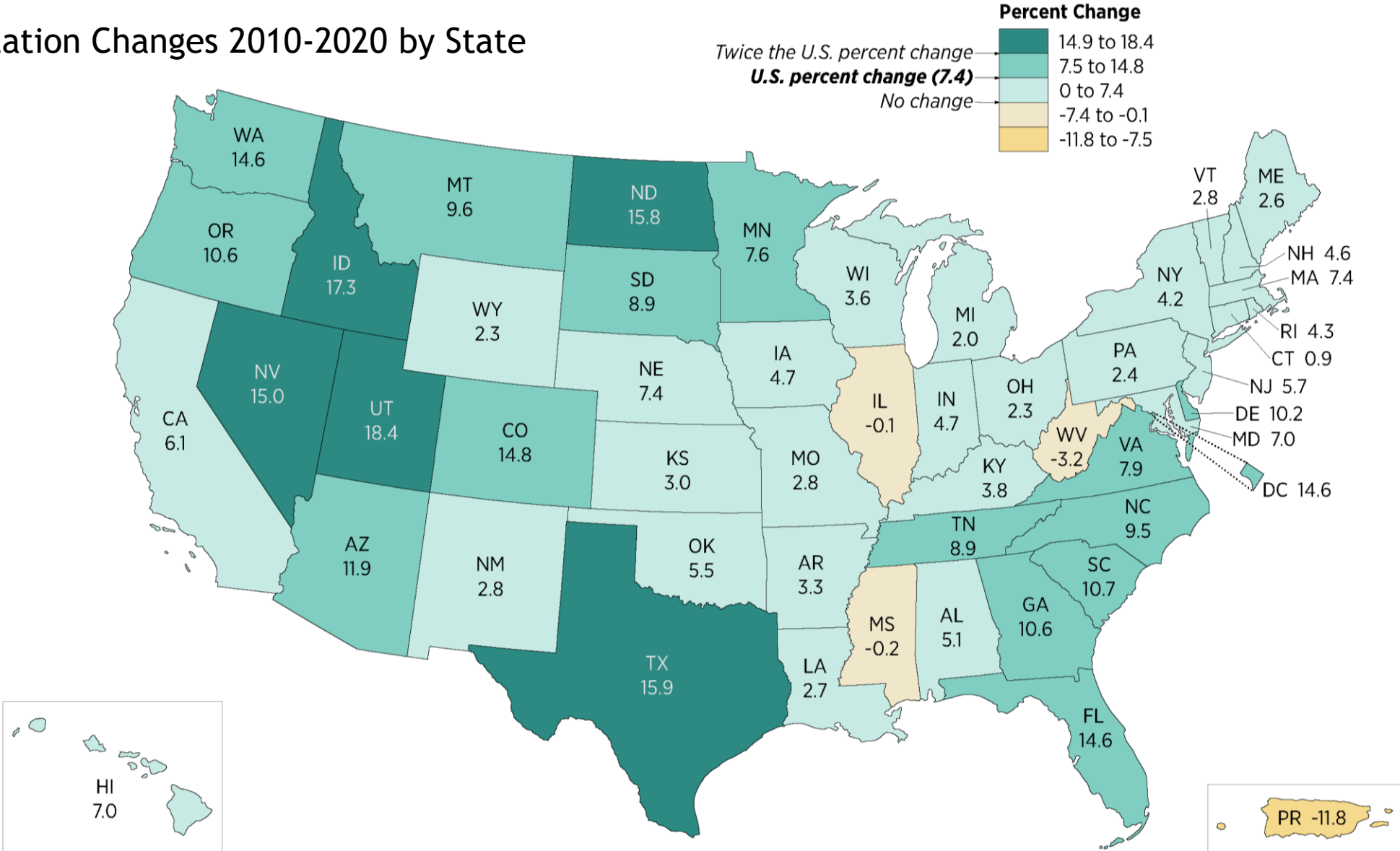


*Projected

Source: William H Frey analysis of U.S. decennial censuses 1790-2010, and author's projection to April 1, 2020.

National Picture:

Population Changes 2010-2020 by State



National Picture:

Important Dates coming in the NEXT decade:

- 2030 - All “baby boomers” will reach 65 (1 in 5 persons)
- 2030 - Net Migration will overtake natural increase as main population driver
- 2034 - 65+ population will be larger than Under 18 Population for first time ever.

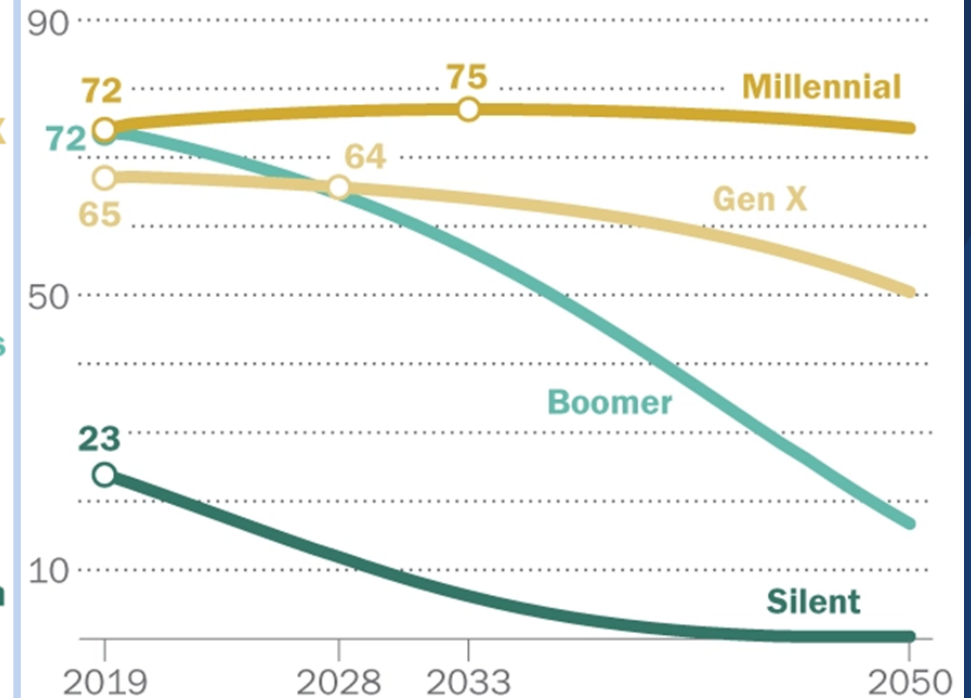
COVID Impact:

- **Baby Bust, not a boom (300K fewer births than expected)**
- **Will extend into 2021, 2022**

Millennials Born: 1981 to 1996 Age in 2019: 23 to 38
Generation X Born: 1965 to 1980 Age in 2019: 39 to 54
Baby Boomers Born: 1946 to 1964 Age in 2019: 55 to 73
Silent Generation Born: 1928 to 1945 Age in 2019: 74 to 91

Projected population by generation

In millions



Source: Pew Research Center tabulations of U.S. Census Bureau population estimates released April 2020 and

Local Picture:

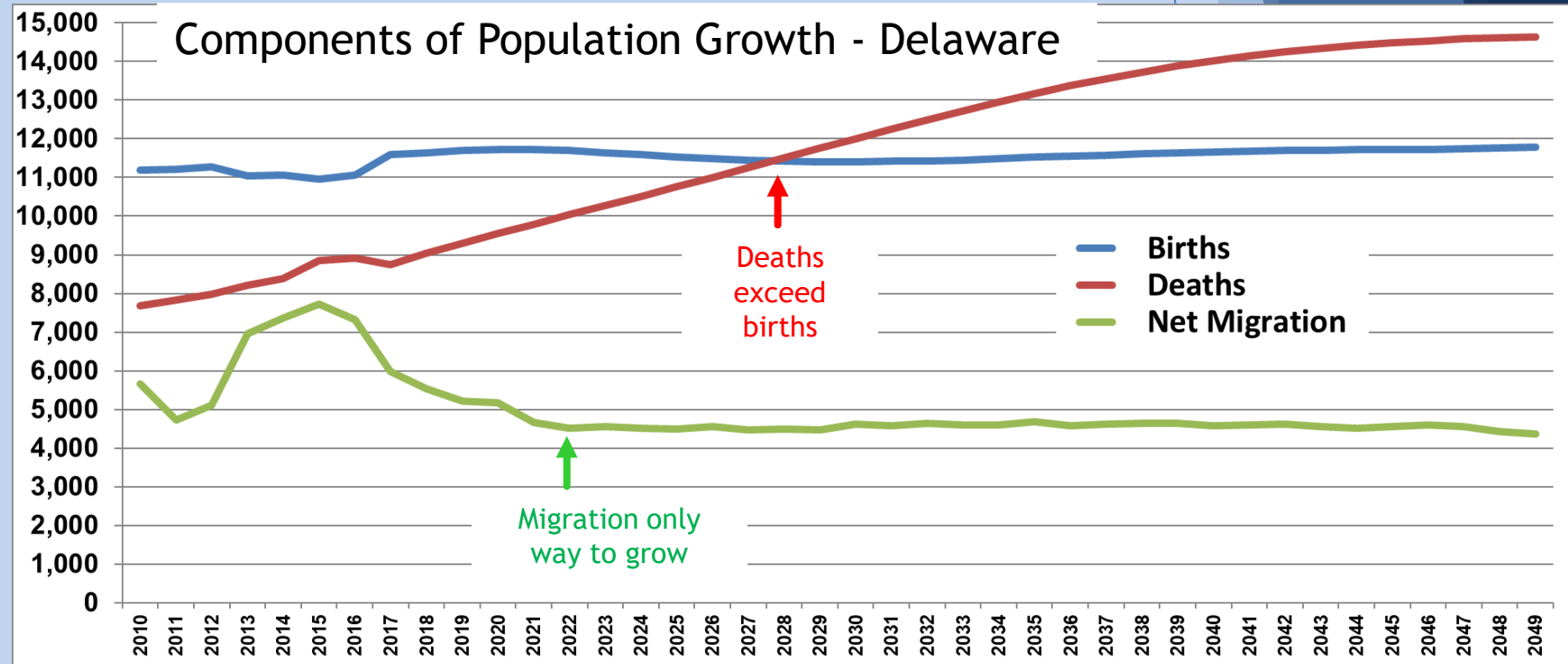
- Delaware not immune to National trends
- Varies widely within DE
- Nat. Increase breakpoint:
NCC: 2031
Kent: 2029
Sussex: 2013
- Several intangibles at play:
 - Tax structure
 - Proximity to major cities
 - Resort areas

Total Population - Delaware 2020-2050

Population	2020	2030	2040	2050	2020-2050 Pop. Change
DE Population	992,035	1,042,869	1,085,592	1,115,712	123,677

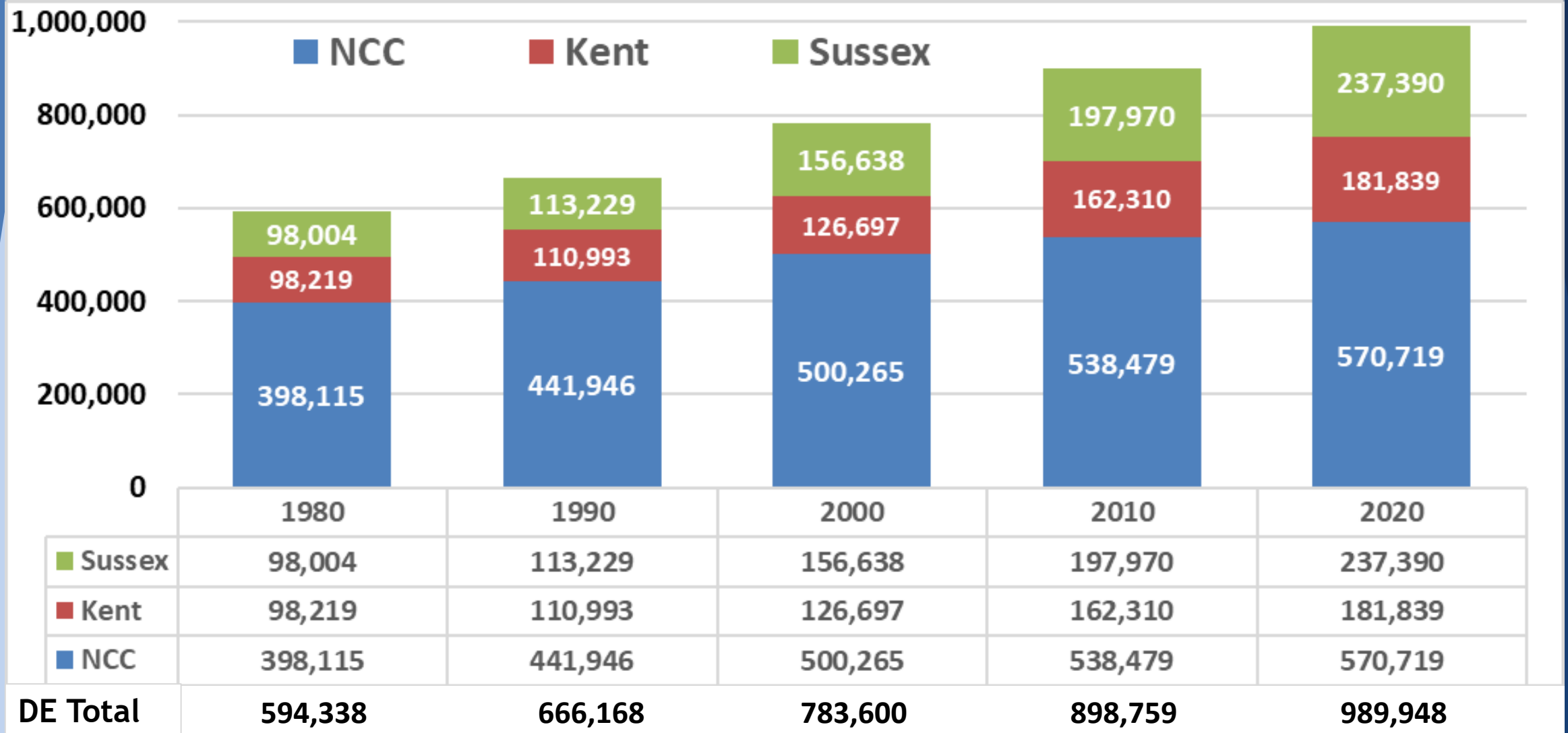
Total Population Growth by Decade

2020 to 2030	2030 to 2040	2040 to 2050
50,834	42,723	30,120



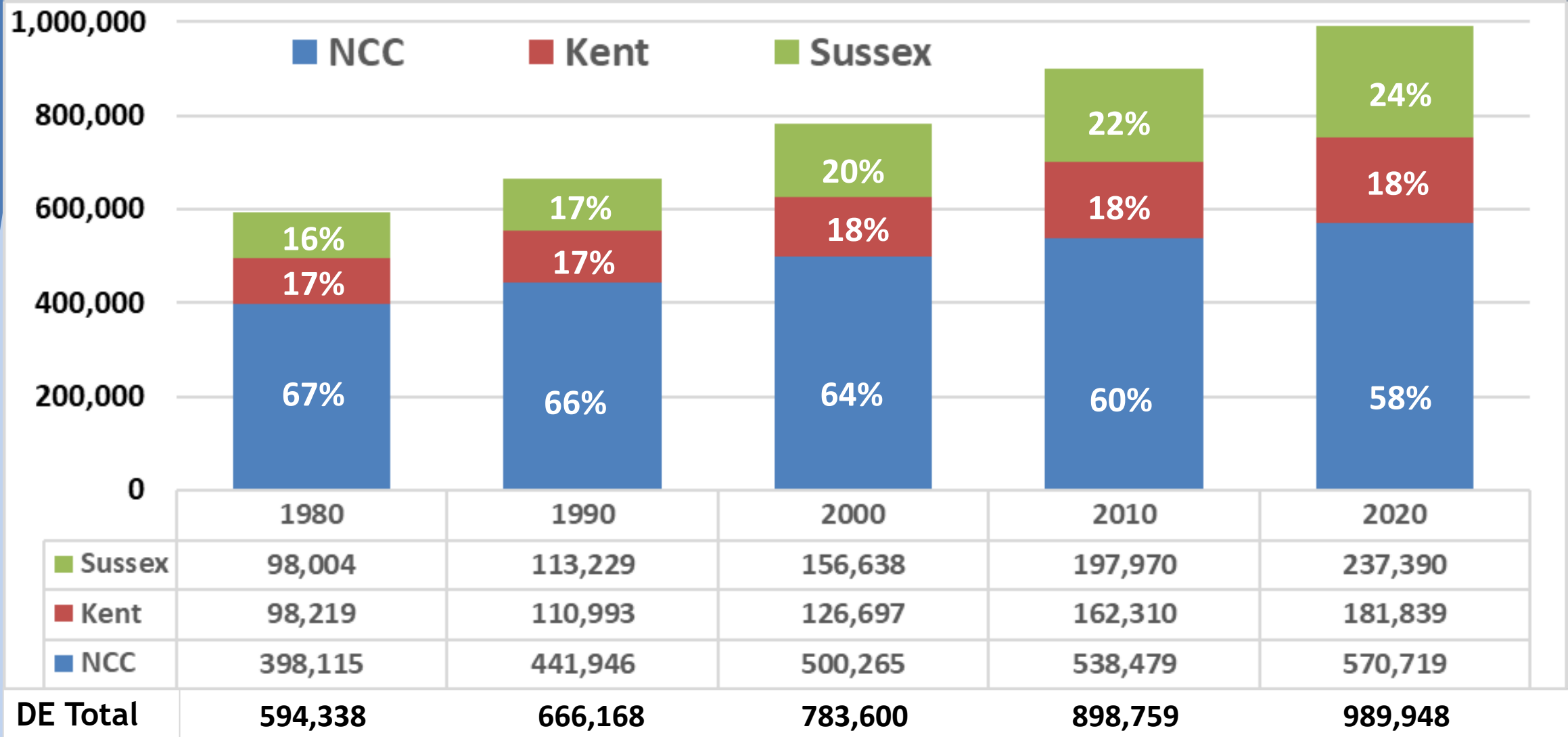
Historical View

Total Population by County: 1980-2020



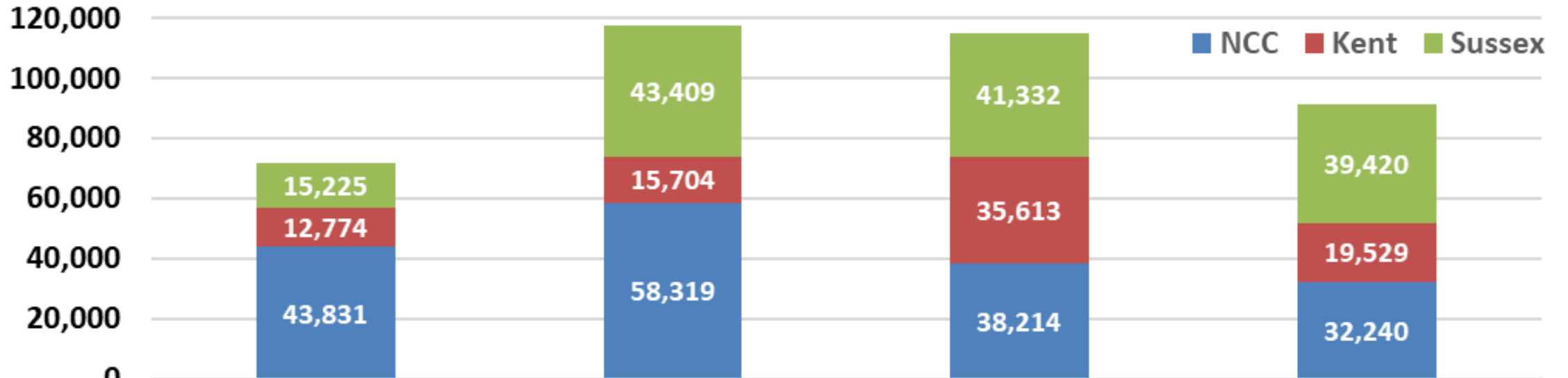
Historical View

% Population by County: 1980-2020



Historical View

Total Population Growth by Decade: 1980-2020



	1980 to 1990	1990 to 2000	2000 to 2010	2010 to 2020
Sussex	15,225	43,409	41,332	39,420
Kent	12,774	15,704	35,613	19,529
Total	43,831	58,319	38,214	32,240

% DE Growth	71,830	117,432	115,159	91,189
	12.1%	17.6%	14.7%	10.1%

% Growth United States	9.8%	13.2%	9.7%	7.4%
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Progression of Demographic Projections “Pyramid”

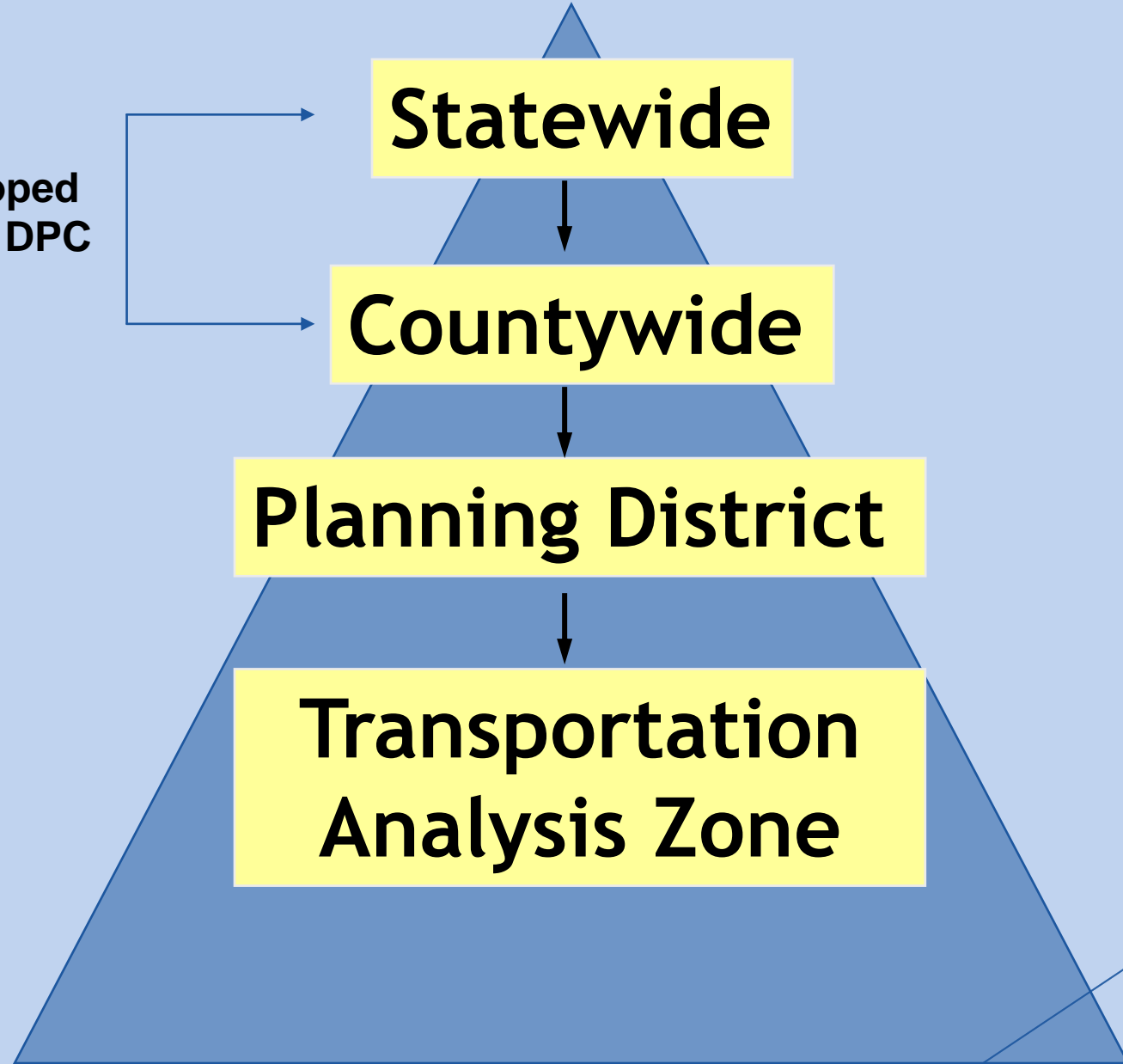
Developed
by the DPC

Statewide

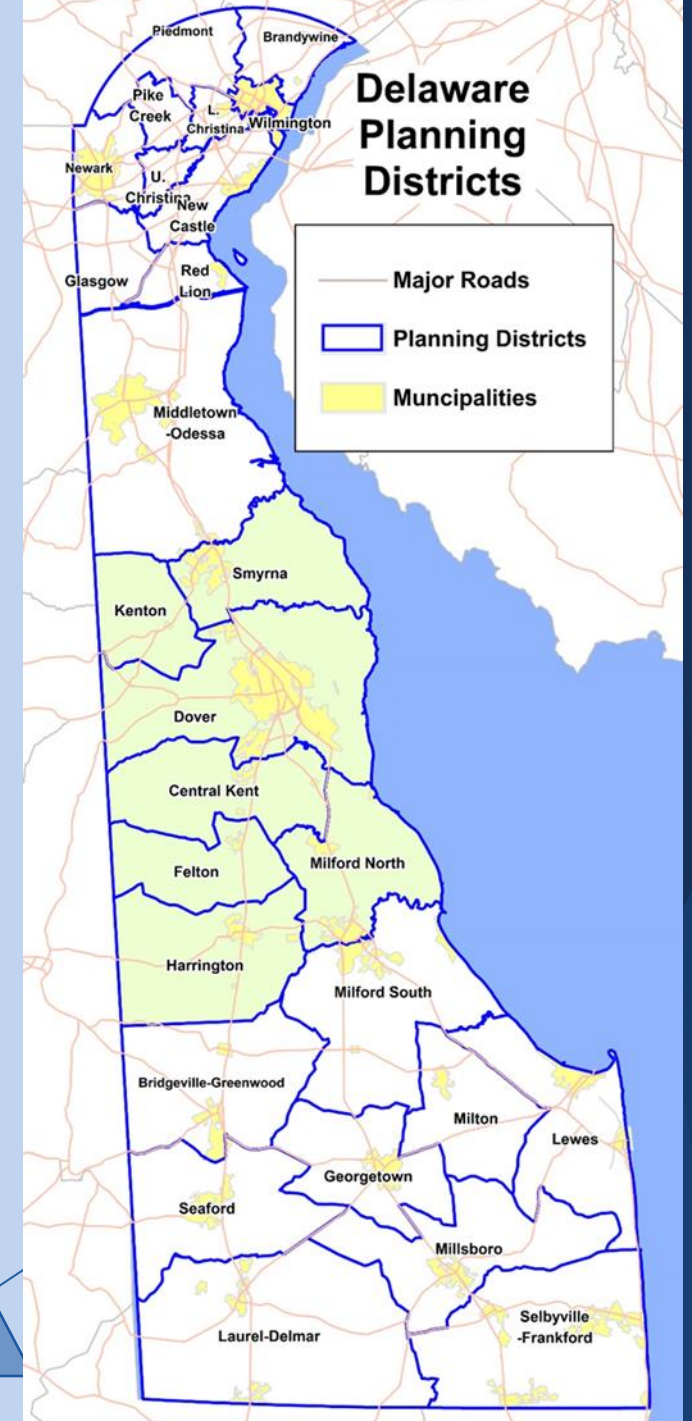
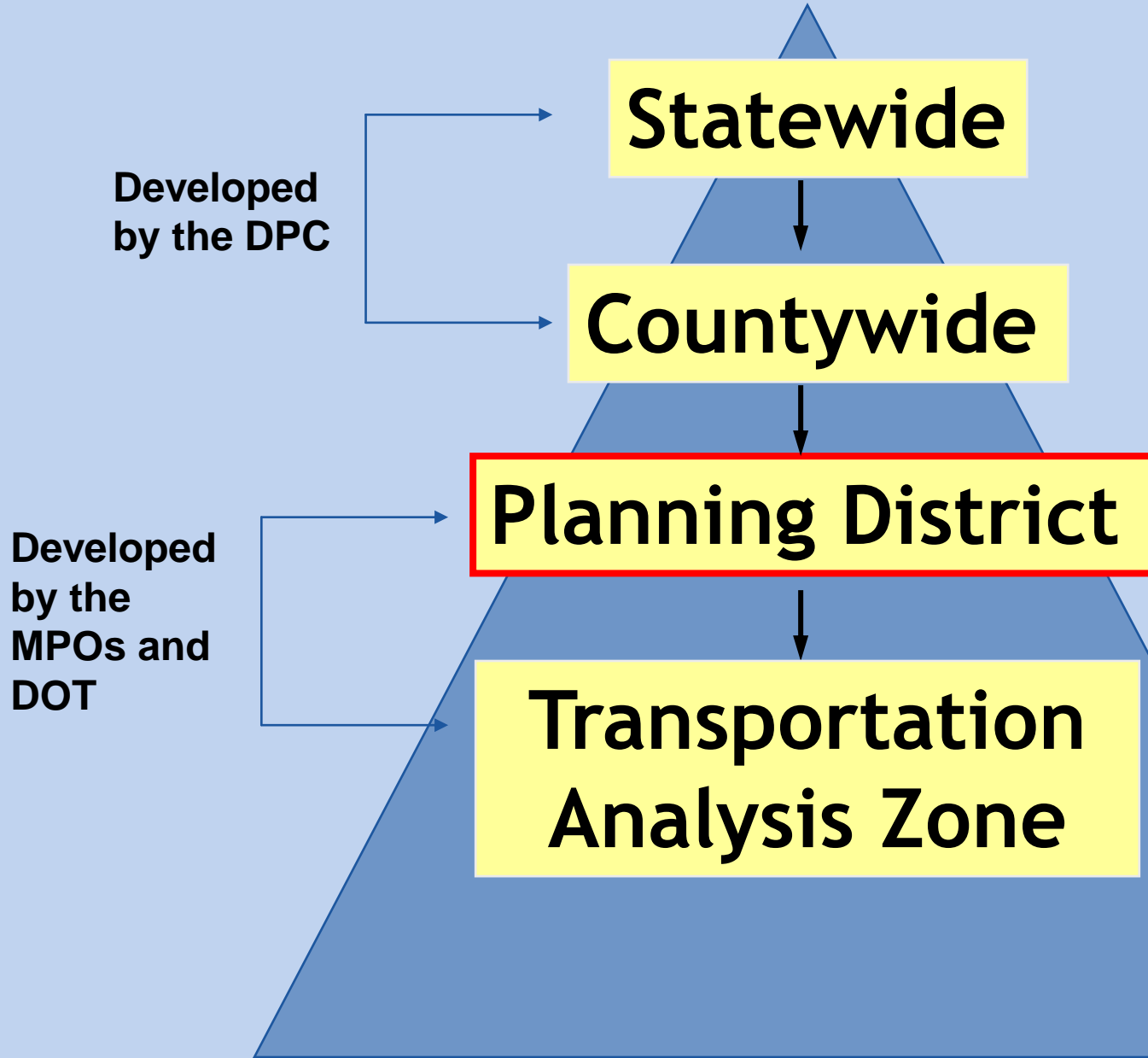
Countywide

Planning District

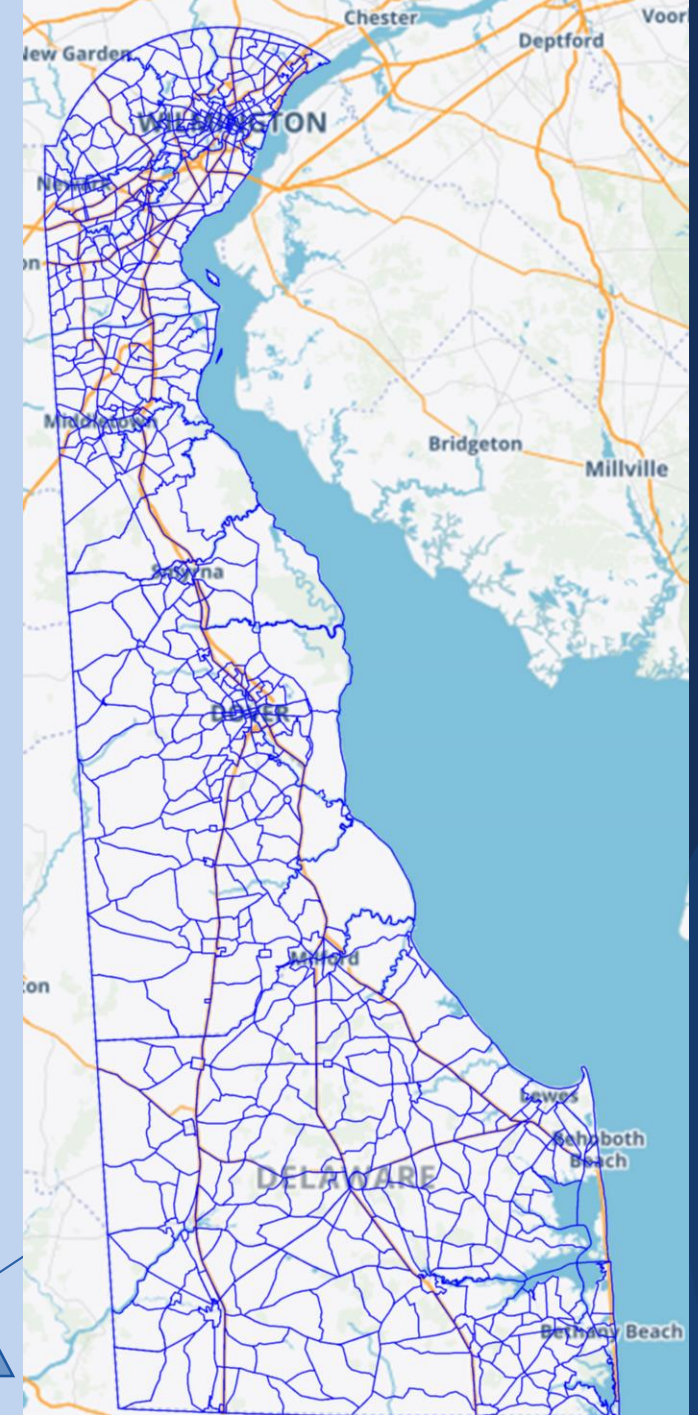
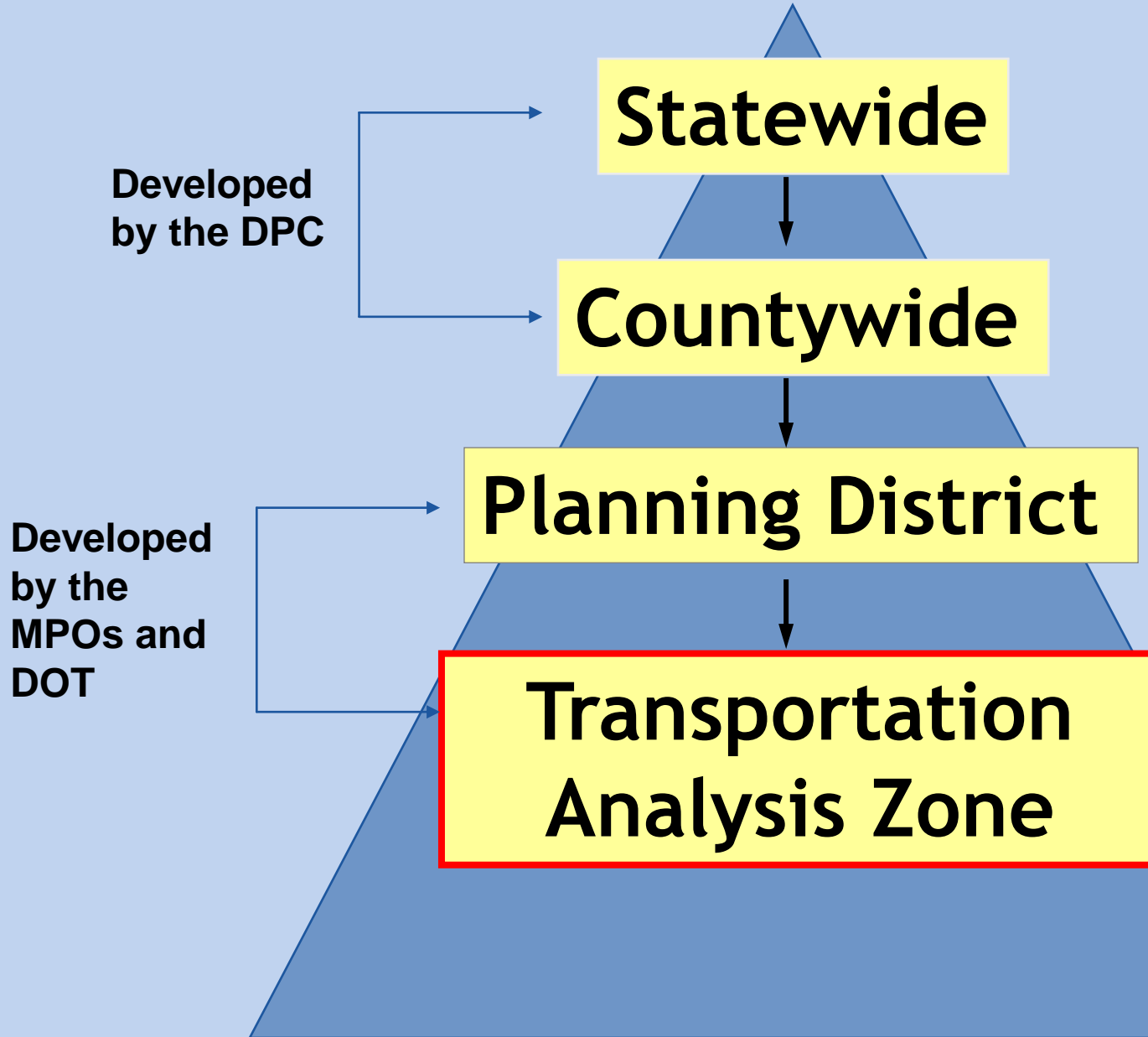
**Transportation
Analysis Zone**



Progression of Demographic Projections “Pyramid”



Progression of Demographic Projections “Pyramid”



Key Pieces of the DPC methodology

High variability make forecasting increasingly difficult!

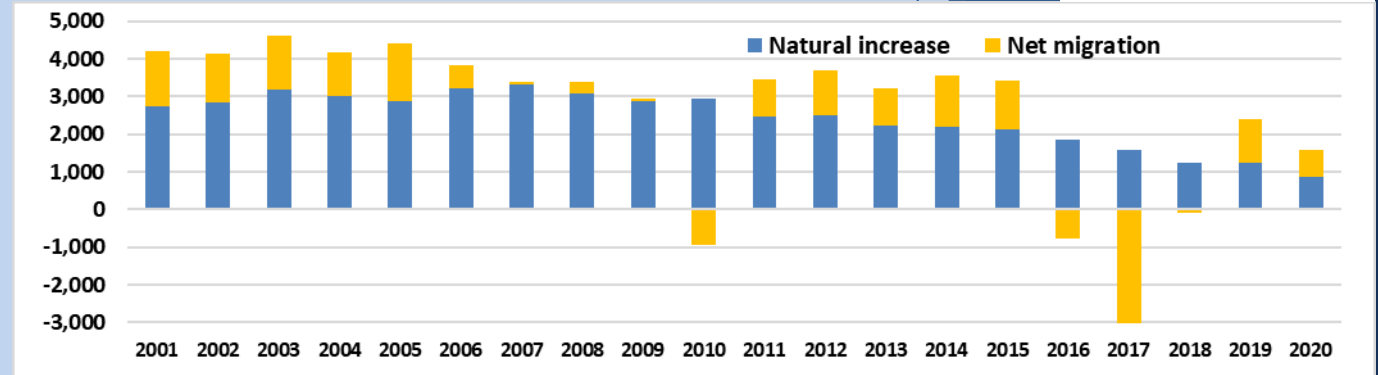
- **Current Population Structure**

- Age/Race/Gender distribution and trends
- Life expectancy/Mortality rates for each single age cohort
- Fertility Rates for each group

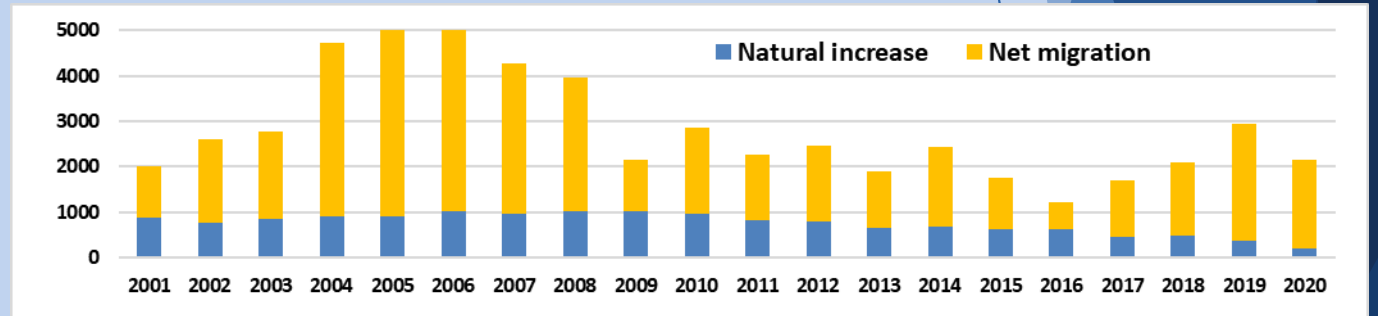
- **Migration/Labor Force**

- Multiple Sources (i.e. BLS, LAUS, etc...)
- Highly economically dependent
- Multiple variables (workforce participation, disabilities, etc.)

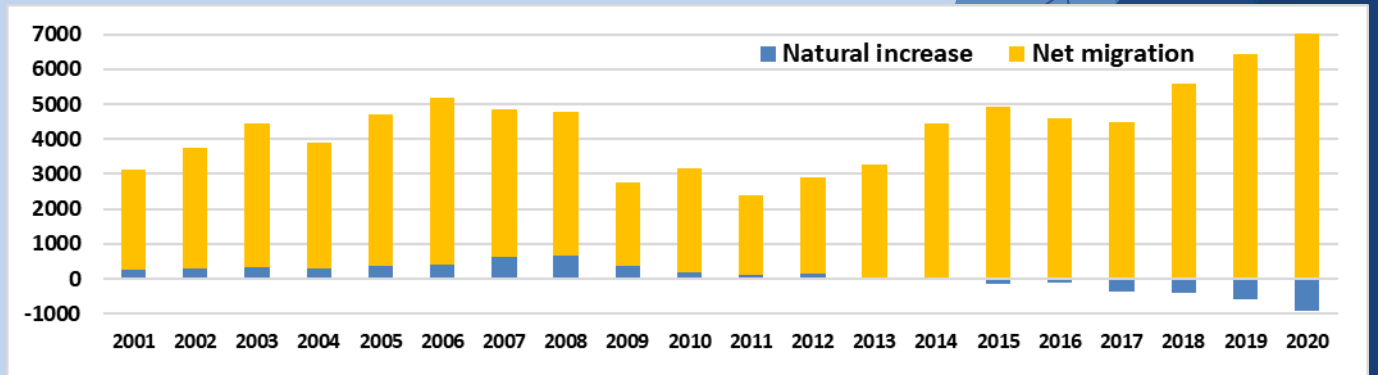
New Castle



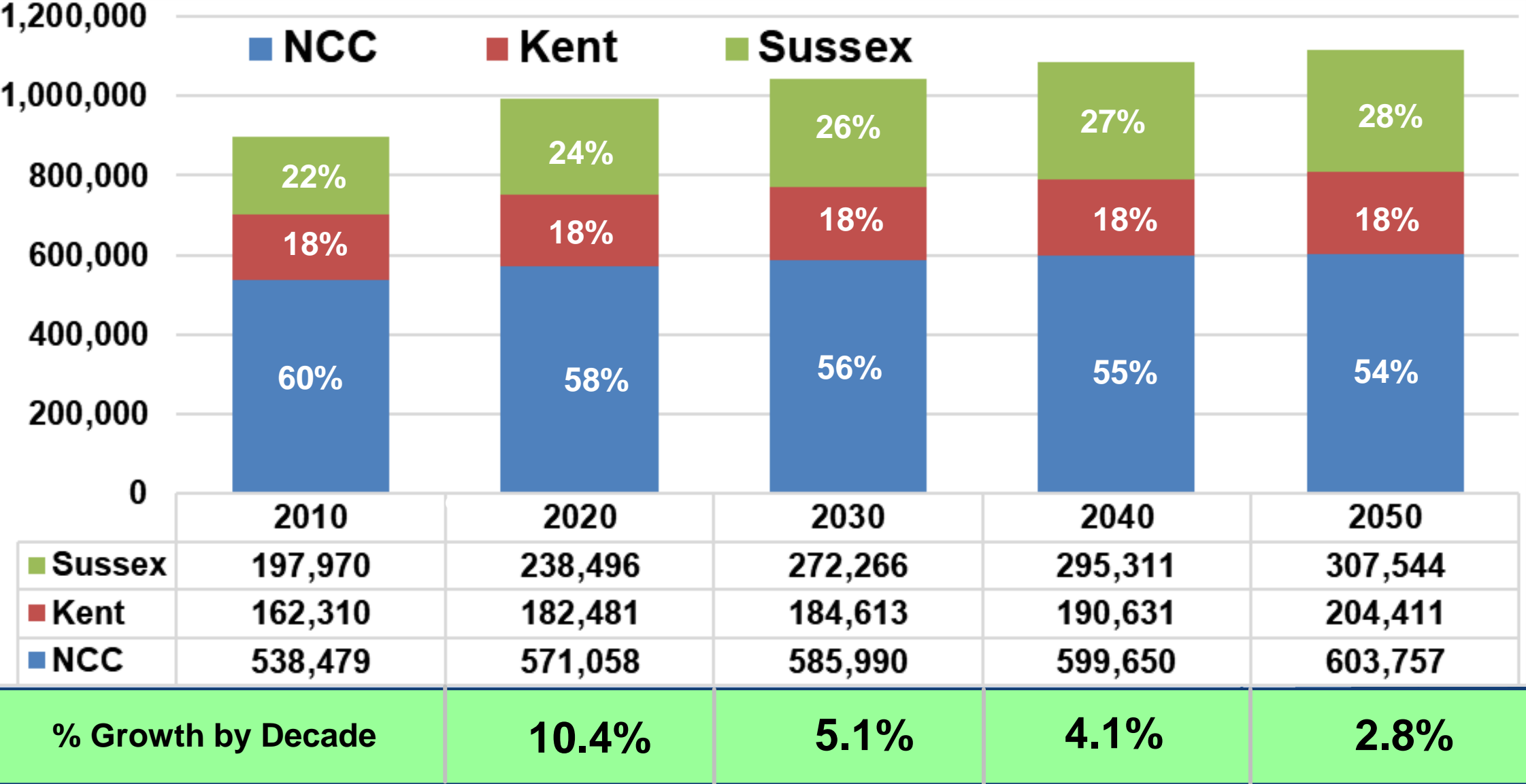
Kent



Sussex



Delaware Population Forecast by County



Population Changes by age: Delaware Counties

New Castle	2020	2050	2020- 2050 Change	2020- 2050 % Change
0 to 4	32,424	29,391	-3,033	-9%
5 to 17	106,211	96,323	-9,888	-9%
18 to 29	119,563	103,912	-15,651	-13%
30 to 64	222,106	234,356	12,250	6%
65+	90,754	139,775	49,021	54%
	571,058	603,757		

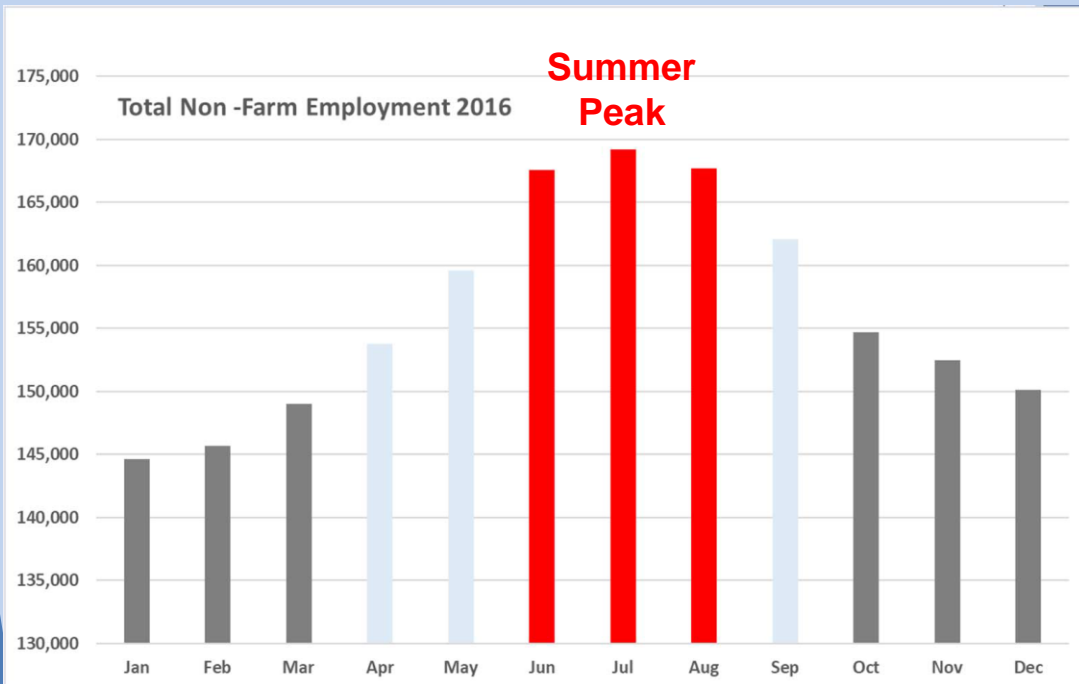
Kent	2020	2050	2020- 2050 Change	2020- 2050 % Change
0 to 4	11,028	11,476	448	4%
5 to 19	36,539	36,300	-239	-1%
20 to 34	38,881	36,784	-2,097	-5%
35 to 64	66,032	79,567	13,535	20%
65+	30,001	40,284	10,283	34%
	182,481	204,411		

Sussex	2020	2050	2020- 2050 Change	2020- 2050 % Change
0 to 4	11,734	14,302	2,568	22%
5 to 19	38,393	45,524	7,131	19%
20 to 34	36,637	44,573	7,936	22%
35 to 64	88,665	110,099	21,434	24%
65+	63,067	93,046	29,979	48%
	238,496	307,544		

Other DPC Products: Seasonal Projections

- Estimates on Summer Population and Employment Totals
- Projections for all municipalities

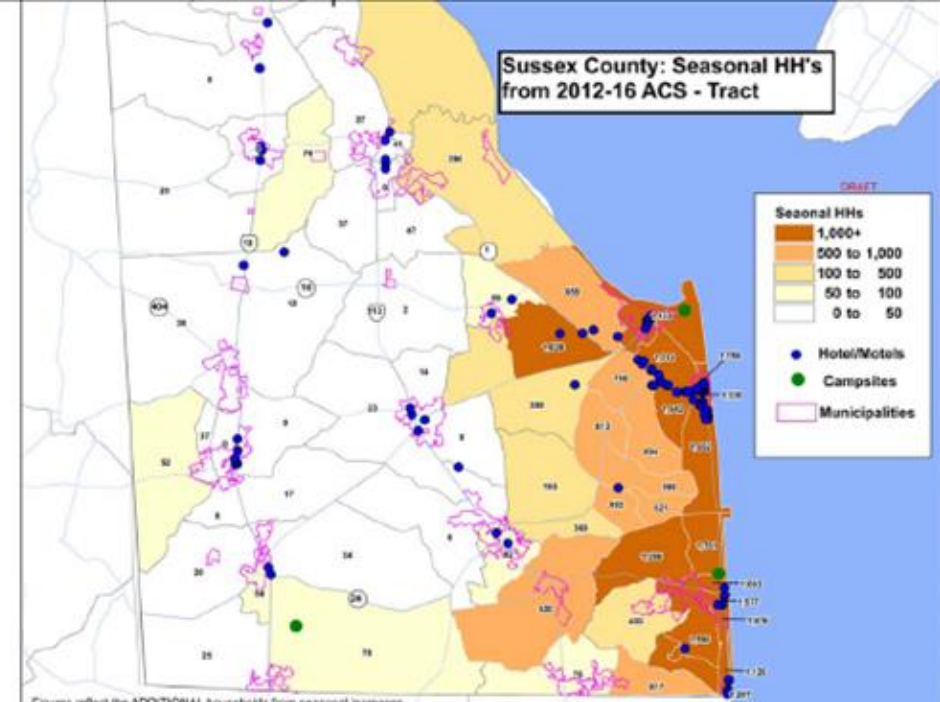
Employment by Month, Salisbury MD/DE BEA



Assigning to TAZs

NEW- CADSR mapped out all motel/hotels and campgrounds

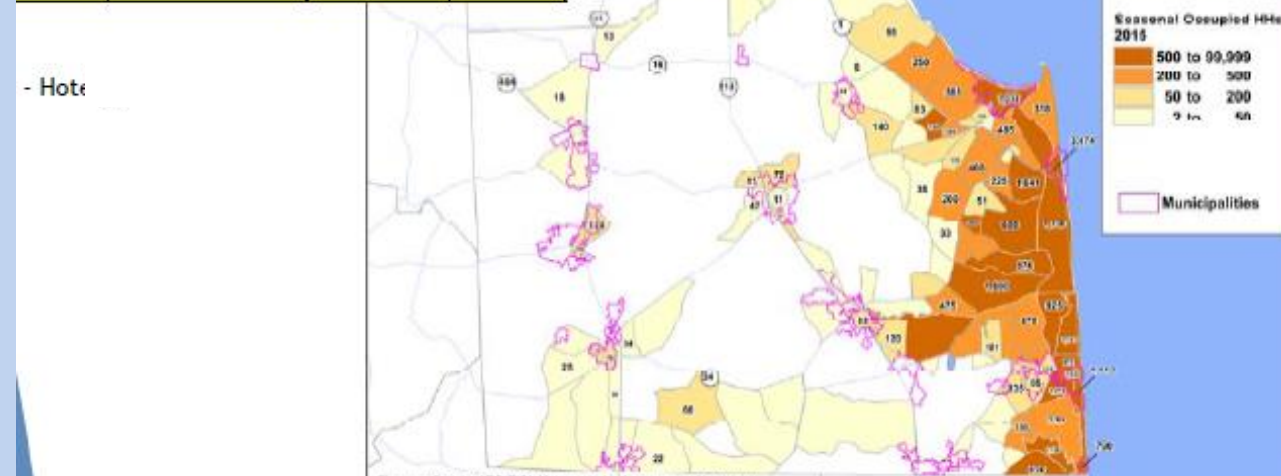
Sussex County
- 4,400 hotel rooms
- 510 camp sites



	Households	2015	2050
Sussex	Annual from DPC	87,287	110,415
Seasonal	Vacants (@80%)	29,224	36,948
	Hotels (@80%)	3,498	3,498
	Campsites (@80%)	408	408
	Total Seasonal	33,130	40,854
Total	Seasonal + Annual	120,417	151,269

Total Seasonal Households - 2015

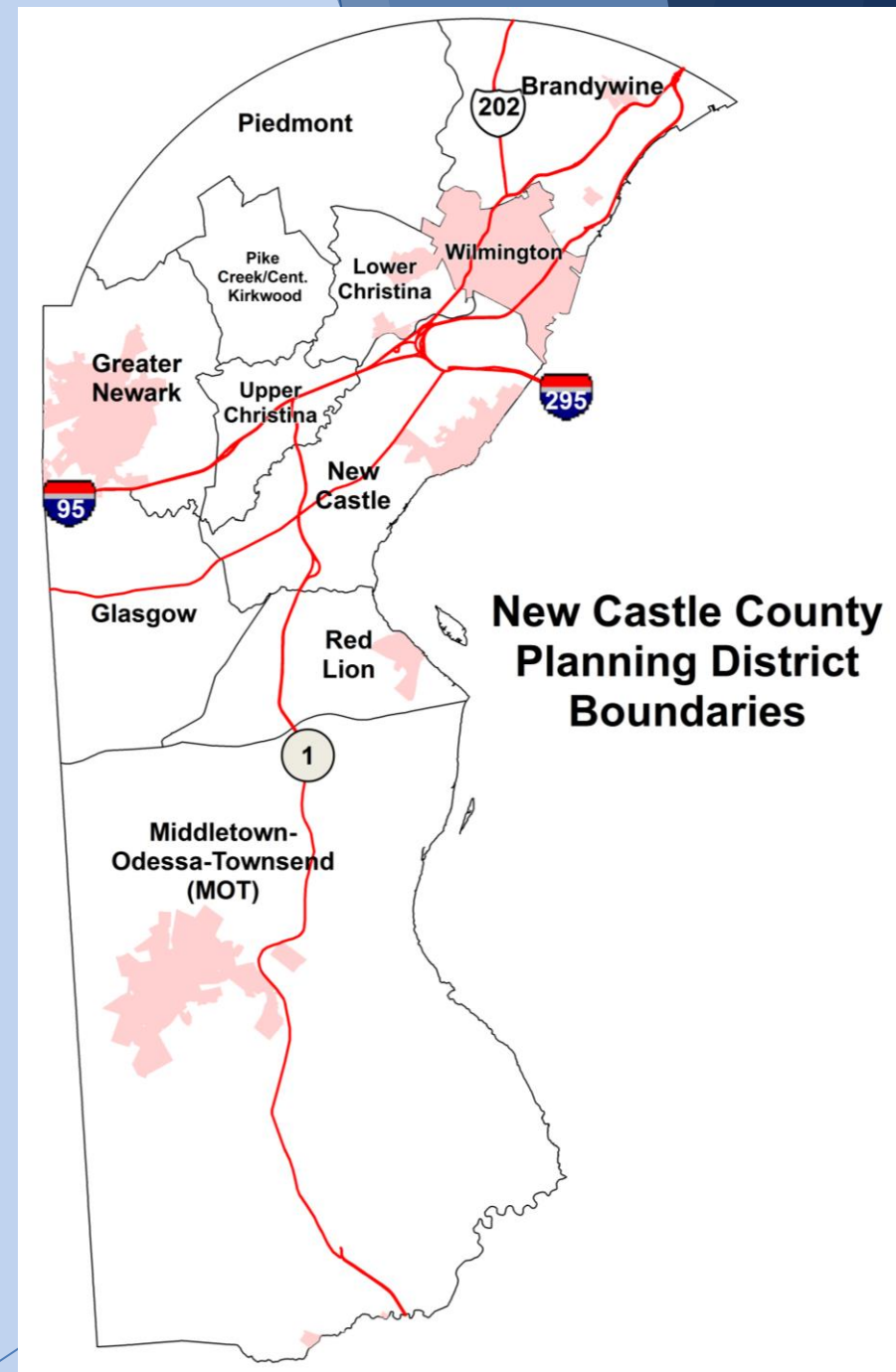
Assumes:
- 80% of vacant units (seasonal)
- 80% Hotel occupancy
- 80% Campsite occupancy



Local Picture:

Several Internal Changes Happening Impacting Housing/Population:

- ▶ Household types changing in parts of the County - Renter vs. Owner
- ▶ Growth in the “non-family household” and single person households
- ▶ Aging population and other choices continue to shape household types, creating a potential housing “bubble”
- ▶ Changes in type of vacancies



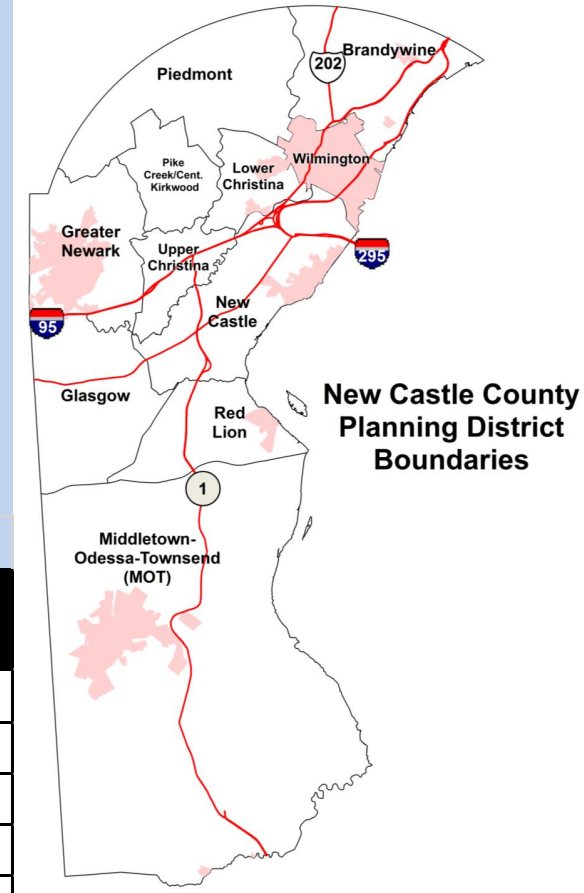
Local Picture:

Under 18 Population

District	2000 Census	ACS 2017	Change 2000-2017
Brandywine	18,074	18,037	-37
Glasgow	9,517	9,465	-52
Greater Newark	13,230	11,172	-2,058
L. Christiana	8,840	8,091	-749
MOT	8,390	15,314	6,924
New Castle	22,634	20,082	-2,552
Piedmont	7,598	5,766	-1,832
Pike Creek	9,656	8,701	-955
Red Lion	1,571	2,232	661
U.Christiana	6,282	5,755	-527
Wilmington	18,687	16,034	-2,653
TOTAL	124,479	120,649	-3,830

65+ Population

New Castle County	2000 Census	ACS 2017	Change 2000-2017
Brandywine	13,554	15,868	2,314
Glasgow	1,398	4,730	3,332
Greater Newark	6,217	9,968	3,751
L. Christiana	5,832	5,106	-726
MOT	2,076	9,043	6,967
New Castle	7,246	11,195	3,949
Piedmont	4,390	7,624	3,234
Pike Creek	6,135	7,120	985
Red Lion	439	1,354	915
U.Christiana	1,500	3,118	1,618
Wilmington	9,177	9,142	-35
TOTAL	57,964	84,268	26,304



While total household growing, Household sizes shrinking

► Changes in Renter vs. Owner Housing

Between 2000 and 2017:

- NCC added a net of 7,233 OWNER-occupied HHs. **Avg. HH size 2.73**
- NCC added a net of 9,661 RENTER-occupied HHs. **Avg. HH Size 2.41**

OWNER-occupied

RENTER-occupied

New Castle County	Owner Occupied HH 2000	Owner Occupied HH ACS 2017	2000 - 2017 Change
Brandywine	23,712	23,015	-697
Glasgow	9,245	11,072	1,827
Greater Newark	14,525	14,647	122
L. Christiana	10,407	9,536	-871
MOT	8,478	17,664	9,186
New Castle	21,292	20,869	-423
Piedmont	9,236	9,397	161
Pike Creek	13,794	12,328	-1,466
Red Lion	1,723	2,942	1,219
U.Christiana	5,770	5,789	19
Wilmington	14,332	12,488	-1,844
Totals	132,514	139,747	7,233

New Castle County	Renter Occupied HH 2000	Renter Occupied HH ACS 2017	2000 - 2017 Change
Brandywine	8,580	8,775	195
Glasgow	2,071	3,494	1,423
Greater Newark	8,626	9,707	1,081
L. Christiana	4,089	4,256	167
MOT	1,071	2,237	1,166
New Castle	9,017	11,049	2,032
Piedmont	1,418	1,762	344
Pike Creek	3,379	4,115	736
Red Lion	183	231	48
U.Christiana	3,702	4,138	436
Wilmington	14,285	16,318	2,033
Totals	56,421	66,082	9,661

While total household growing, Household sizes shrinking

► Growth in the “non-family household”

Between 2000 and 2017:

- NCC added a net of 5,106 Family HHs **Avg. Family HH size 3.26**
- NCC added a net of 11,786 Non-Family HHs. **Avg. Non-Family size 1.29**

A family is a group of two people or more (one of whom is the householder) related by birth, marriage, or adoption and residing together

A nonfamily household consists of a householder living alone (a one-person household) or where the householder shares the home exclusively with people to whom he/she is not related.

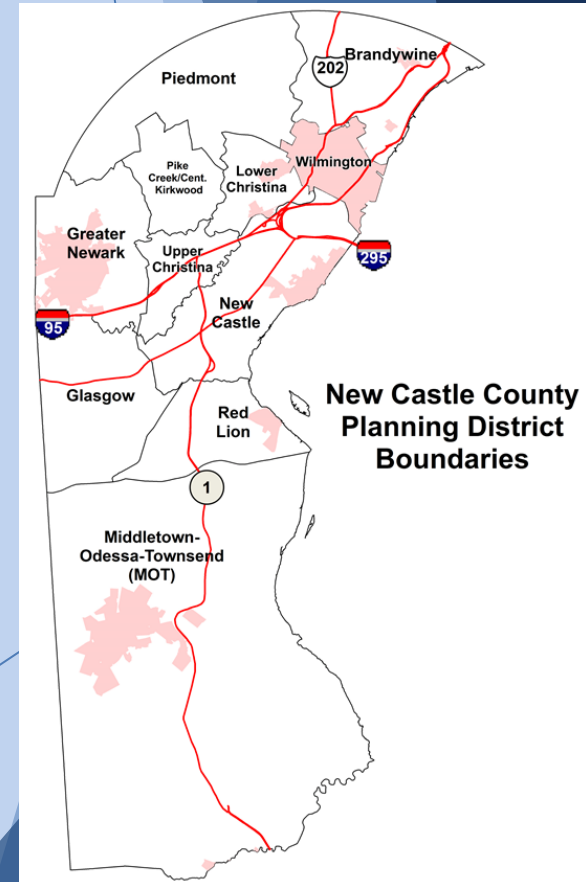
Family HHs

New Castle County	Family HHs Census 2000	Family HHs ACS 2017	Change 2000-2017
Brandywine	21,947	20,390	-1,557
Glasgow	8,680	10,477	1,797
Greater Newark	14,437	13,824	-613
L. Christiana	9,630	8,626	-1,004
MOT	7,825	15,875	8,050
New Castle	21,028	20,642	-386
Piedmont	8,564	8,676	112
Pike Creek	11,401	10,520	-881
Red Lion	1,484	2,348	864
U.Christiana	6,229	6,636	407
Wilmington	15,881	14,198	-1,683
TOTAL	127,106	132,212	5,106

Non-Family HHs

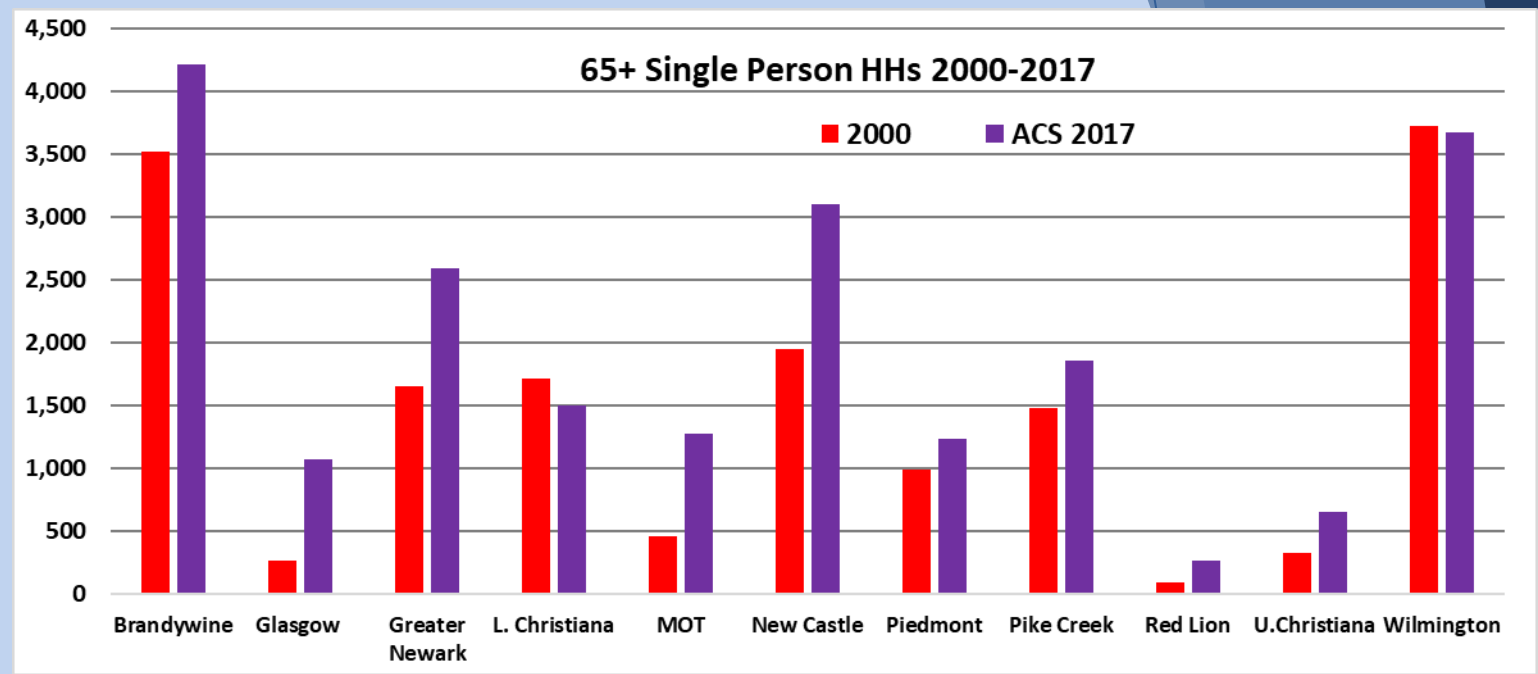
New Castle County	Non Family HHs 2000	Non-Family HHs ACS 2017	Change 2000-2017
Brandywine	10,345	11,400	1,055
Glasgow	2,636	4,089	1,453
Greater Newark	8,714	10,530	1,816
L. Christiana	4,866	5,166	300
MOT	1,724	4,026	2,302
New Castle	9,281	11,276	1,995
Piedmont	2,090	2,481	391
Pike Creek	5,772	5,923	151
Red Lion	422	825	403
U.Christiana	3,243	3,291	48
Wilmington	12,736	14,608	1,872
TOTAL	61,829	73,615	11,786

Since 2000: Non-family HHs households but are 71% of the HH growth type; 26% of new population



65+ Single Person HHs

% of Total Households
 2000: 8.0%
 2016 10.4%



Changes in Age 65+ Single Person HHs: 2000-2017

5 Districts
 have
 15,427
 65+ Single
 person
 HHs (72%)

New Castle County	65 +Single Person HHs Census 2000	65 +Single Person HHs ACS 2017	2000 - 2017 Change
Brandywine	3,516	4,214	698
Glasgow	265	1,067	802
Greater Newark	1,652	2,588	936
L. Christiana	1,715	1,501	-214
MOT	457	1,274	817
New Castle	1,942	3,099	1,157
Piedmont	982	1,235	253
Pike Creek	1,474	1,856	382
Red Lion	90	266	176
U.Christiana	322	653	331
Wilmington	3,723	3,670	-53
TOTAL	16,138	21,423	5,285

Note: 2017 is the midpoint of the 2015-19 5 year avg.

Some Elements “In the Model”:

A “Travel Demand Model” is an Opportunity / Cost Model:
-- Market Based, Data-Driven

Land Use

Where You **Need to Go** . . .
Where You **Want to Go** . . .

Number of Opportunities
“Proximities”

Transportation

How You **Get** There . . .
How You **Want to Get** There ...

Time / Distance
“Accessibilities”

Examples:

Number of:

Stores
Parks
Homes
Jobs

within:

10 minute WALK.
30 minute BIKE.
20 minute BUS of Store. 30
minute DRIVE of Home.

Types of Land Use-Transportation Studies in Delaware (by DeIDOT, MPO's, Other Agencies)

2

Model Applications:

Regional Planning:

- MPO long range plans
- MPO TIP's
- Truck/Freight Planning
- Congestion Management System
- Land Use Scenarios

Statewide Planning:

- Statewide Plan Scenarios
- Delaware STIP
- Evacuation Planning

Studies:

- Toll Revenue
- Bus & Rail Transit
- EIS/MIS
- Corridor & Subarea Studies
- Community Plans
- Traffic Data for Synchro/VISSIM

Model Applications (cont.)

Development Coordination:

- TIS Site Trip Distributions
- Background Traffic Estimates
- "Shift" or Diverted Traffic

Design Year Forecasts:

- Title Box Existing AADT
- Title Box Forecast AADT
- Design Year K, D, % Trucks
- Upstream Population Density

Air Quality:

- SIP Emissions for Air Agency
- Conformity Emissions
- CMAQ Analysis
- AQ Strategic Planning

Transportation Planning Studies – Types of Analyses

*Smaller Study Area
Higher Degree of Detail*

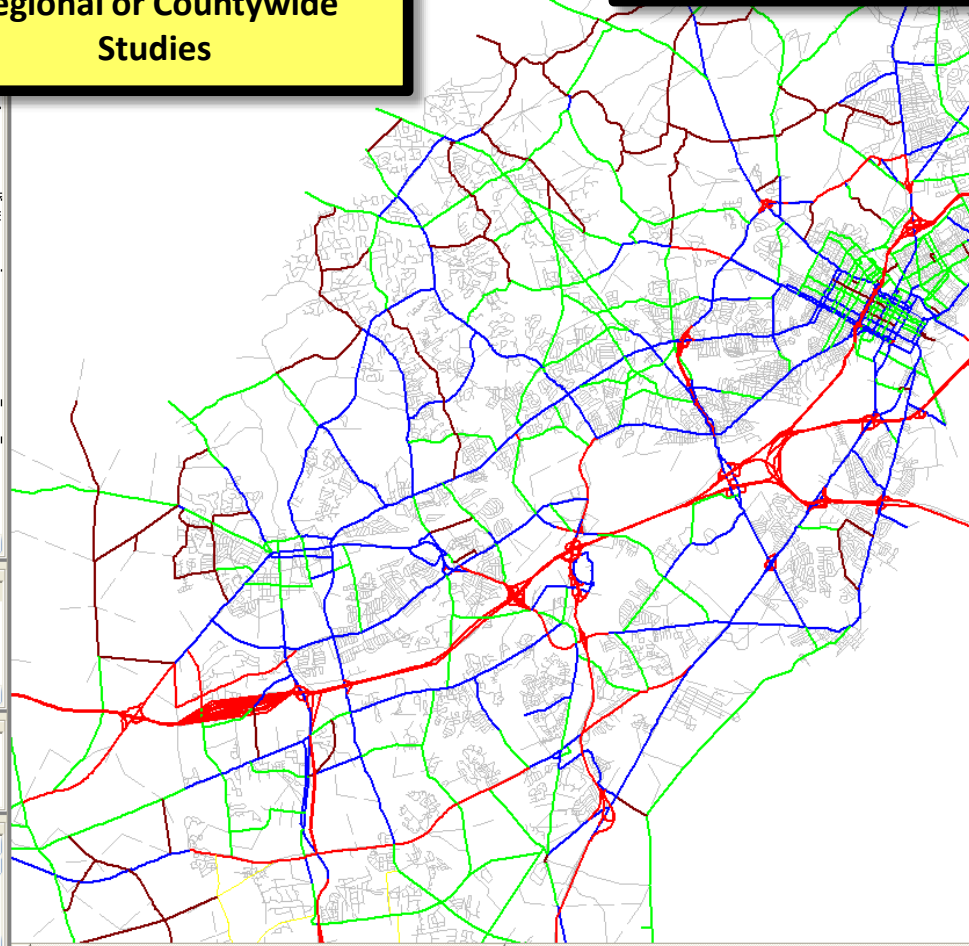
*Larger Study Area
Higher Aggregation*

Typical Study Area:	Parcels/Sites	Corridors/Areas	County/Region		
Examples:	TIS/TID	Corridor Studies EIS, MIS, NEPA/PEL Land Use/Transp. Study	MPO Long Range Plan		
Typical Projects:	Intersections Bypass Lanes Shoulder Upgrades		Widenings		New Roads
DeIDOT Travel Demand Model Level (TAZ Type)	Level 3 Parcels	Level 2 Census Blocks	Level 1 MPO TAZ		

**Model Application Example:
Systems Planning
Outputs**

**Volume = Cars, Trucks, Buses, etc.
Speeds = Cars, Trucks
Travel Times, Cars, Trucks**

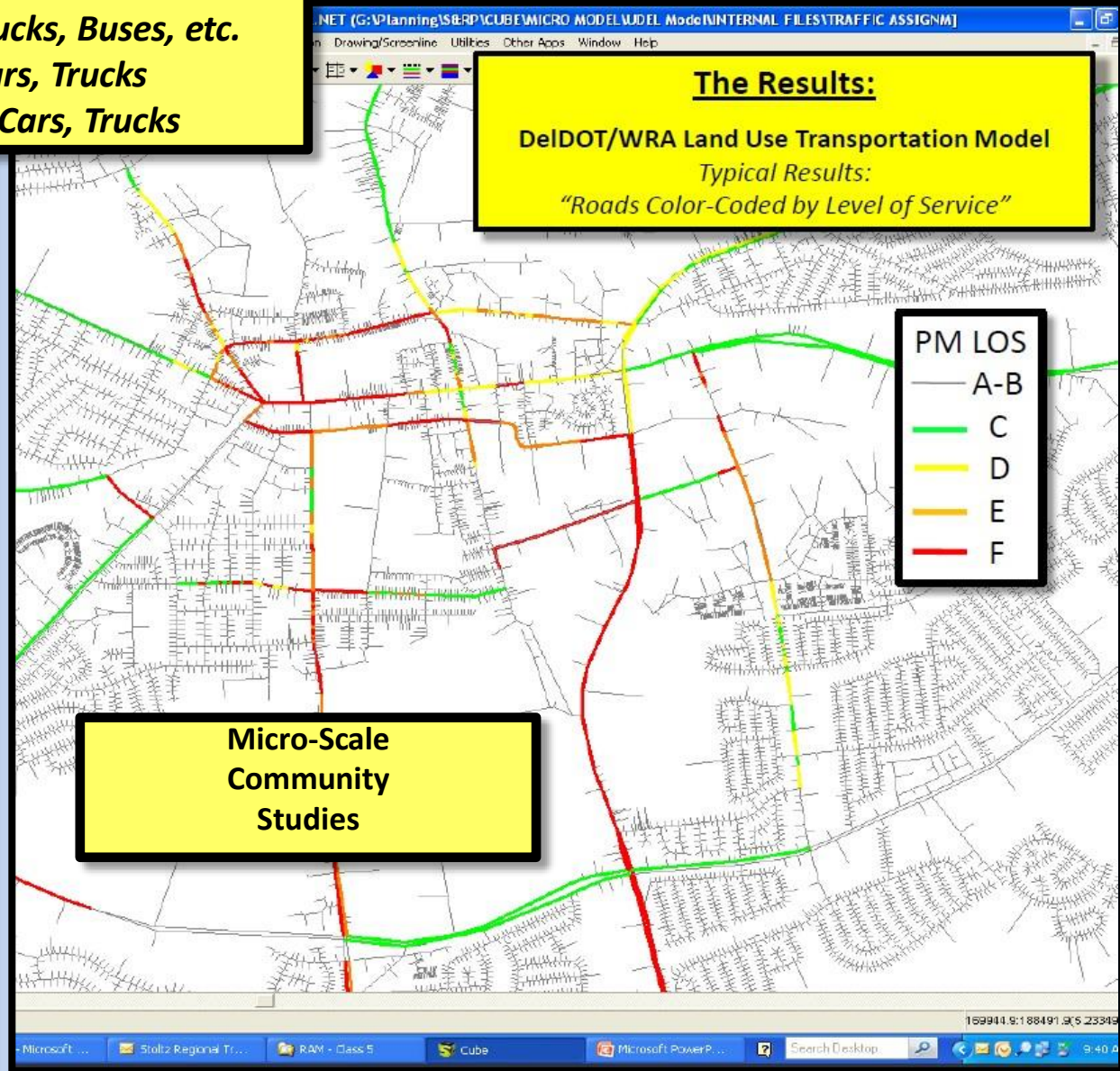
**Large-Scale
Regional or Countywide
Studies**



The Results:

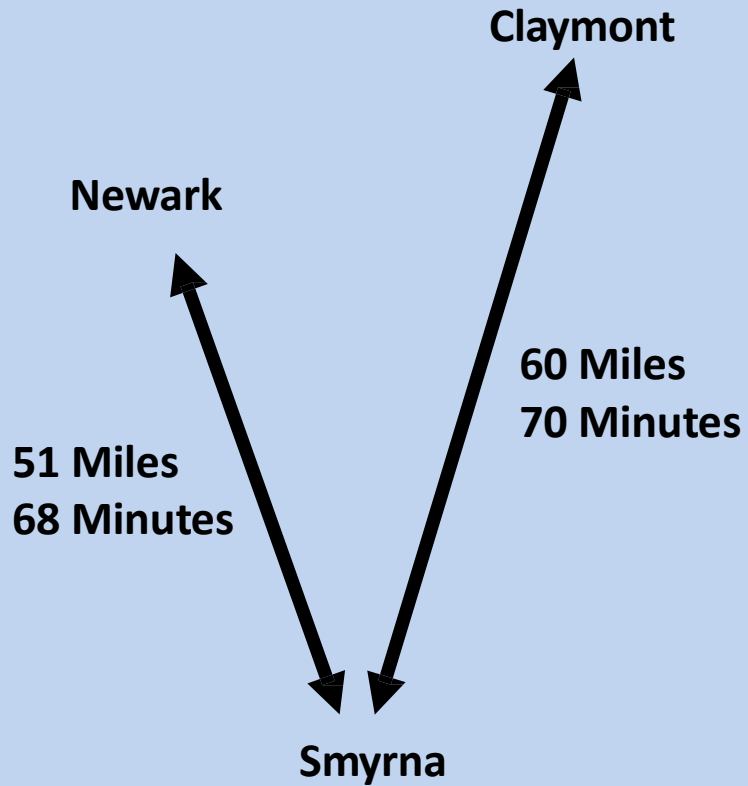
**DelDOT/WRA Land Use Transportation Model
Typical Results:
"Roads Color-Coded by Level of Service"**

**Micro-Scale
Community
Studies**

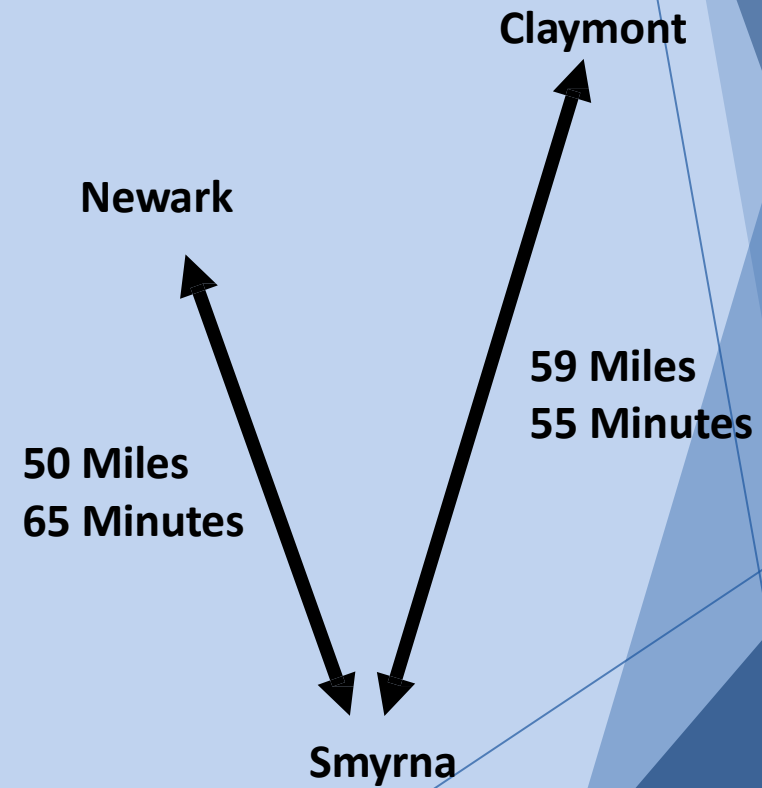


Evaluation of "Land Use Proximities" via Accessibility Scenarios

Recall: Land Uses (Number of Population, Housing, Employment) are "Opportunities"
Proximities are Functions of Transportation Accessibilities

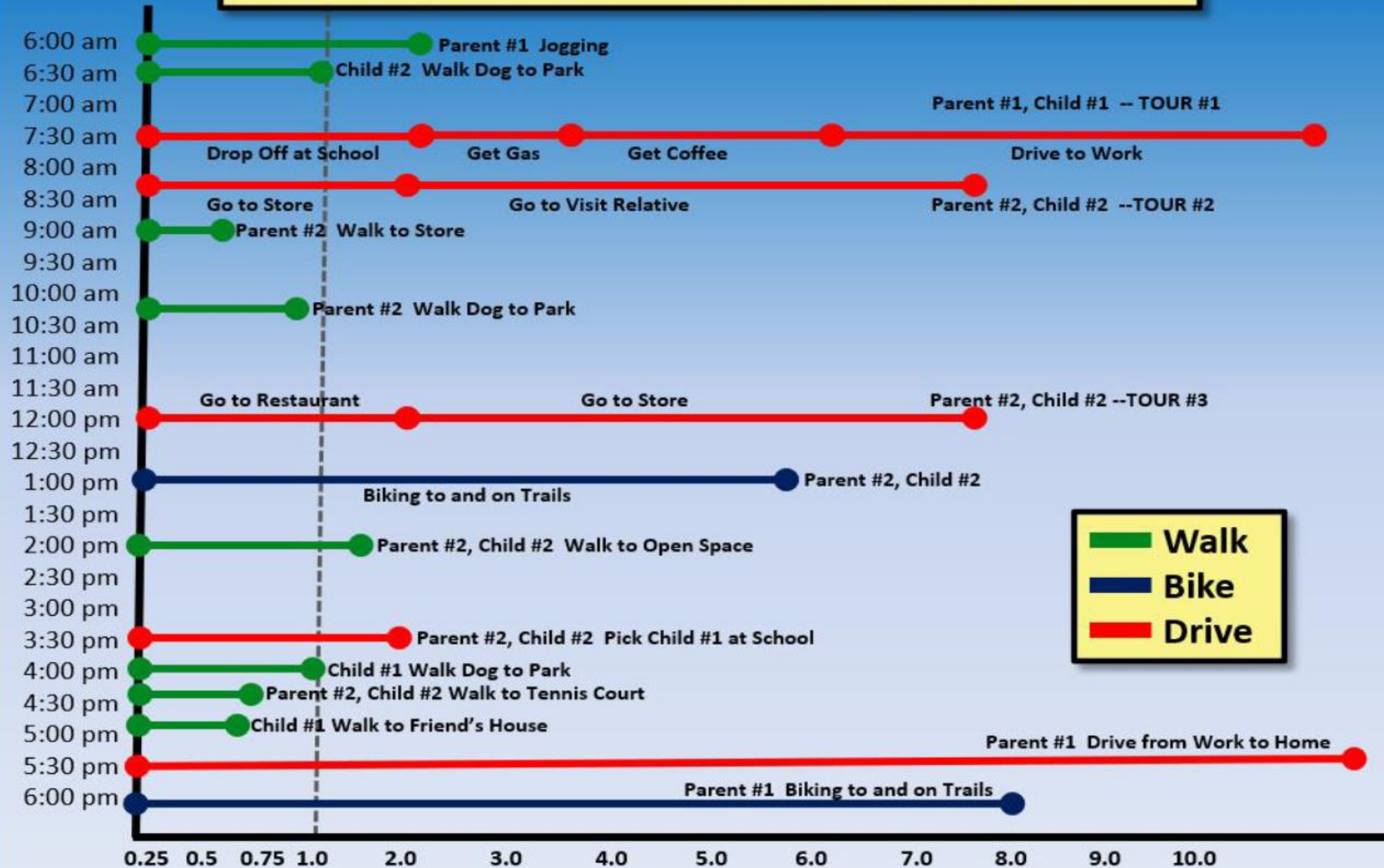


"Before SR 1"



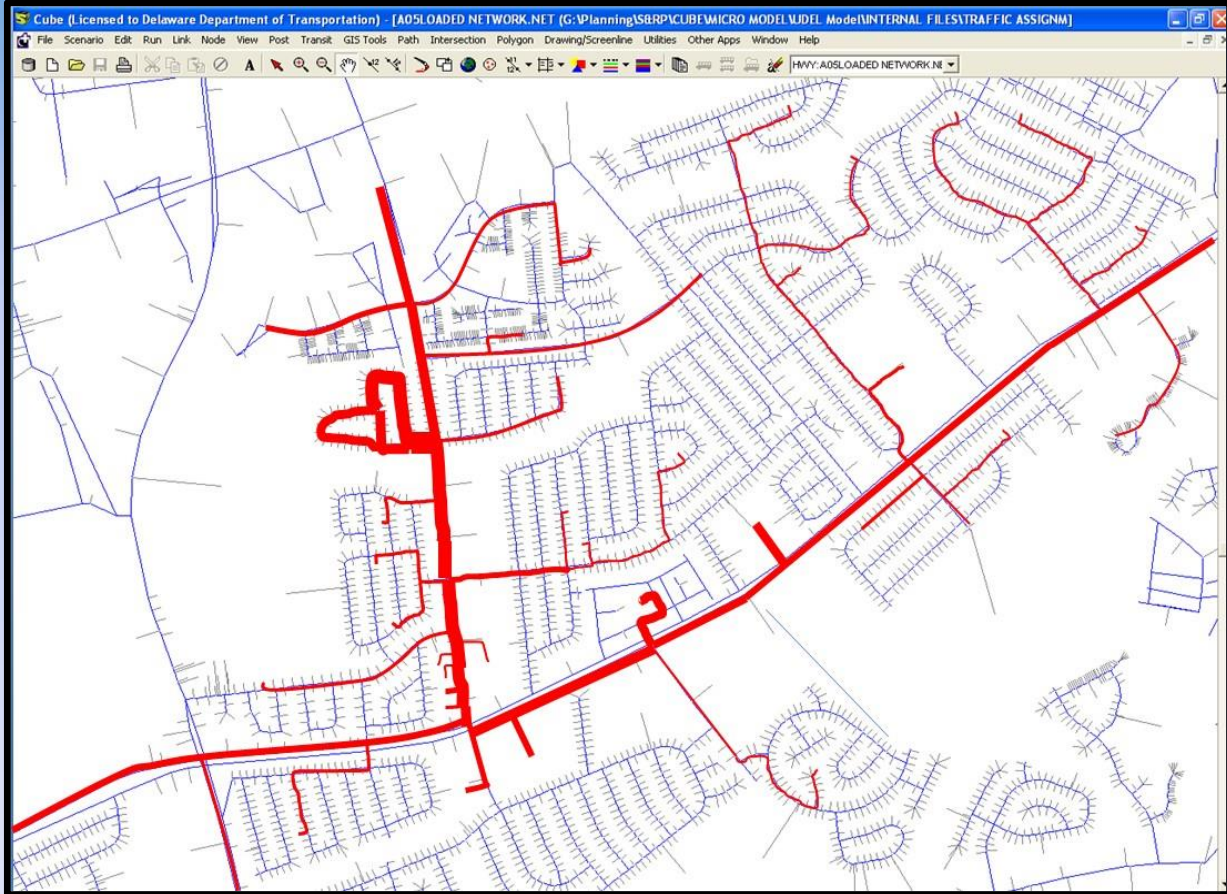
"After SR 1"

Typical Activity / Travel Patterns by Time of Day, Household Member, Trip Purpose, Trip Distance

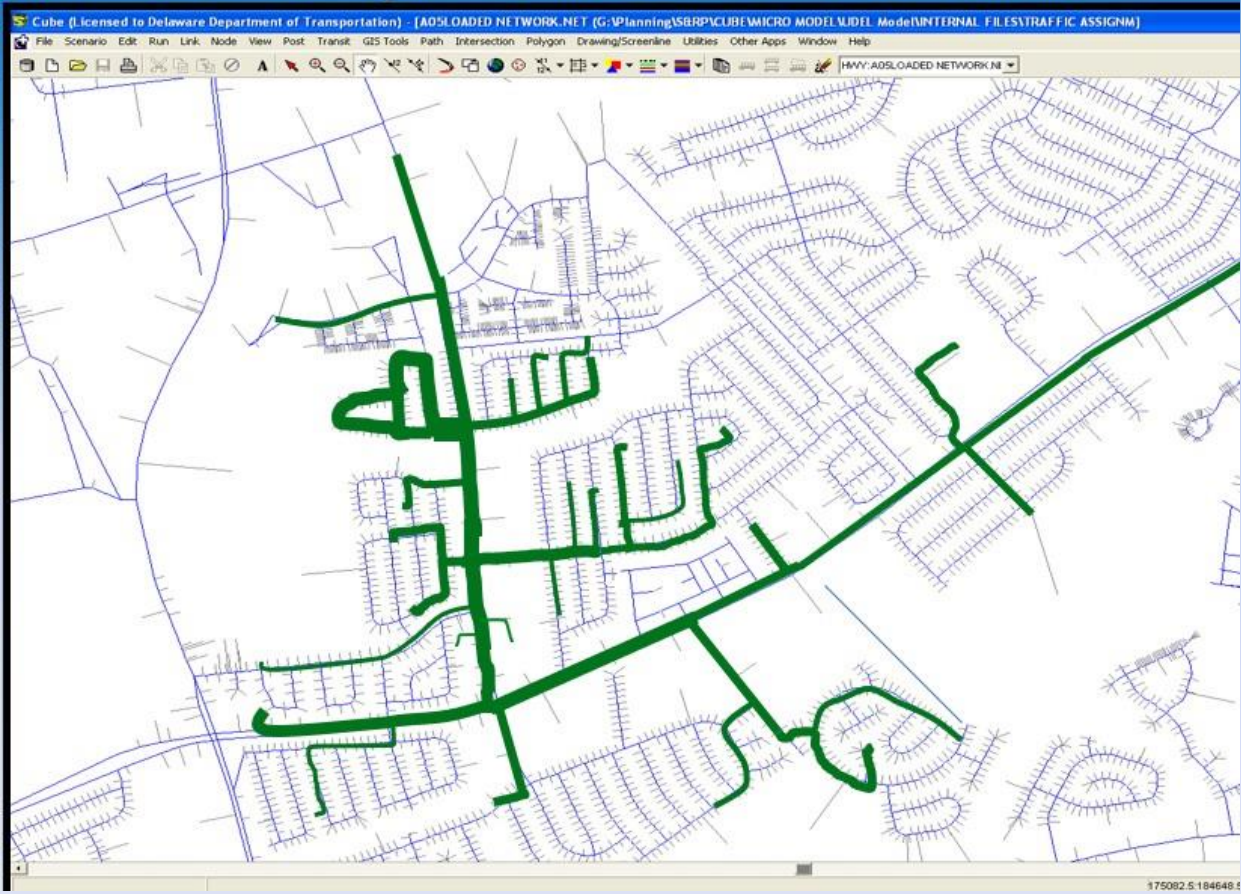


Example: Paths & Routes for Neighborhood

AUTO Volumes (AADT)



BIKE Volumes (AADT)



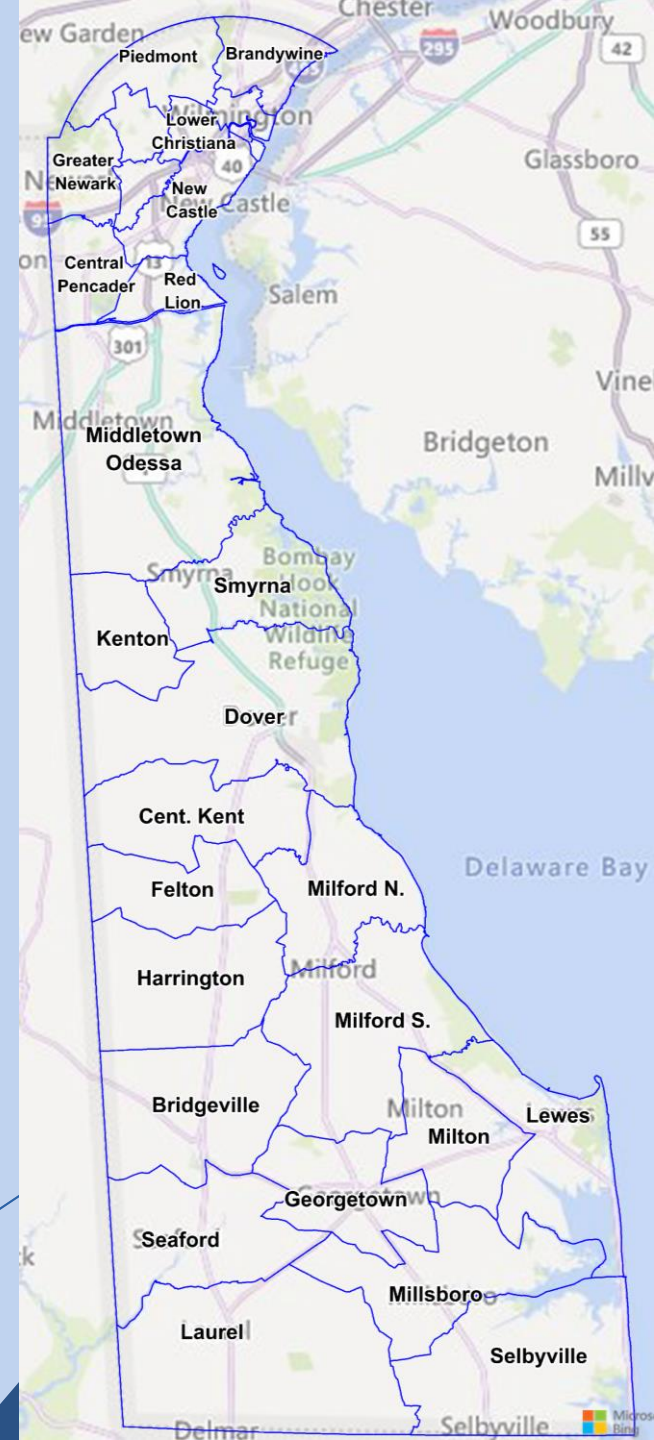
Under 18 Population Changes by Planning District: 2000-2020

				2010 to 2020 Changes		2000 to 2020 Changes	
	2000	2010	2020	Change	% Change	Change	% Change
New Castle							
Brandywine	18,055	16,296	15,942	-354	-2%	-2,113	-12%
Glasgow	9,553	10,376	9,434	-942	-9%	-119	-1%
Lower Christiana	8,820	8,503	8,178	-325	-4%	-642	-7%
Middletown-Odessa	8,366	14,582	17,041	2,459	17%	8,675	104%
Greater Newark	13,152	12,169	11,180	-989	-8%	-1,972	-15%
New Castle	22,618	21,669	20,139	-1,530	-7%	-2,479	-11%
Piedmont	7,577	6,920	5,922	-998	-14%	-1,655	-22%
Pike Creek	9,637	8,968	8,361	-607	-7%	-1,276	-13%
Red Lion	1,540	2,276	2,154	-122	-5%	614	40%
Upper Christiana	6,260	6,057	6,091	34	1%	-169	-3%
Wilmington	18,666	17,263	16,401	-862	-5%	-2,265	-12%
NCC Total	124,244	125,079	120,843	-4,236	-3%	-3,401	-3%

				2010 to 2020 Changes		2000 to 2020 Changes	
	2000	2010	2020	Change	% Change	Change	% Change
Under 18 Population							
Kent County							
Central Kent	5,540	6,884	7,158	274	4%	1,618	29%
Dover	17,519	18,286	18,542	256	1%	1,023	6%
Felton	1,490	1,664	1,663	-1	-0.1%	173	12%
Harrington	2,947	3,100	2,839	-261	-8%	-108	-4%
Kenton	1,545	1,615	1,704	89	6%	159	10%
Milford North	2,315	2,456	2,725	269	11%	410	18%
Smyrna	3,143	6,374	7,415	1,041	16%	4,272	136%
Kent Total	34,499	40,379	42,046	1,667	4%	7,547	22%

				2010 to 2020 Changes		2000 to 2020 Changes	
	2000	2010	2020	Change	% Change	Change	% Change
Sussex							
Bridgeville-Greenwood	2,598	2,969	3,088	119	4%	490	19%
Georgetown	2,665	3,621	4,004	383	11%	1,339	50%
Laurel-Delmar	5,317	5,854	6,219	365	6%	902	17%
Lewes	3,436	3,974	4,442	468	12%	1,006	29%
Milford South	4,472	5,176	5,383	207	4%	911	20%
Millsboro	3,883	4,836	5,922	1,086	22%	2,039	53%
Milton	2,401	2,900	3,396	496	17%	995	41%
Seaford	6,083	6,230	6,132	-98	-2%	49	1%
Selbyville-Frankford	4,364	4,747	4,930	183	4%	566	13%
Sussex Total	35,219	40,307	43,516	3,209	8%	8,297	24%

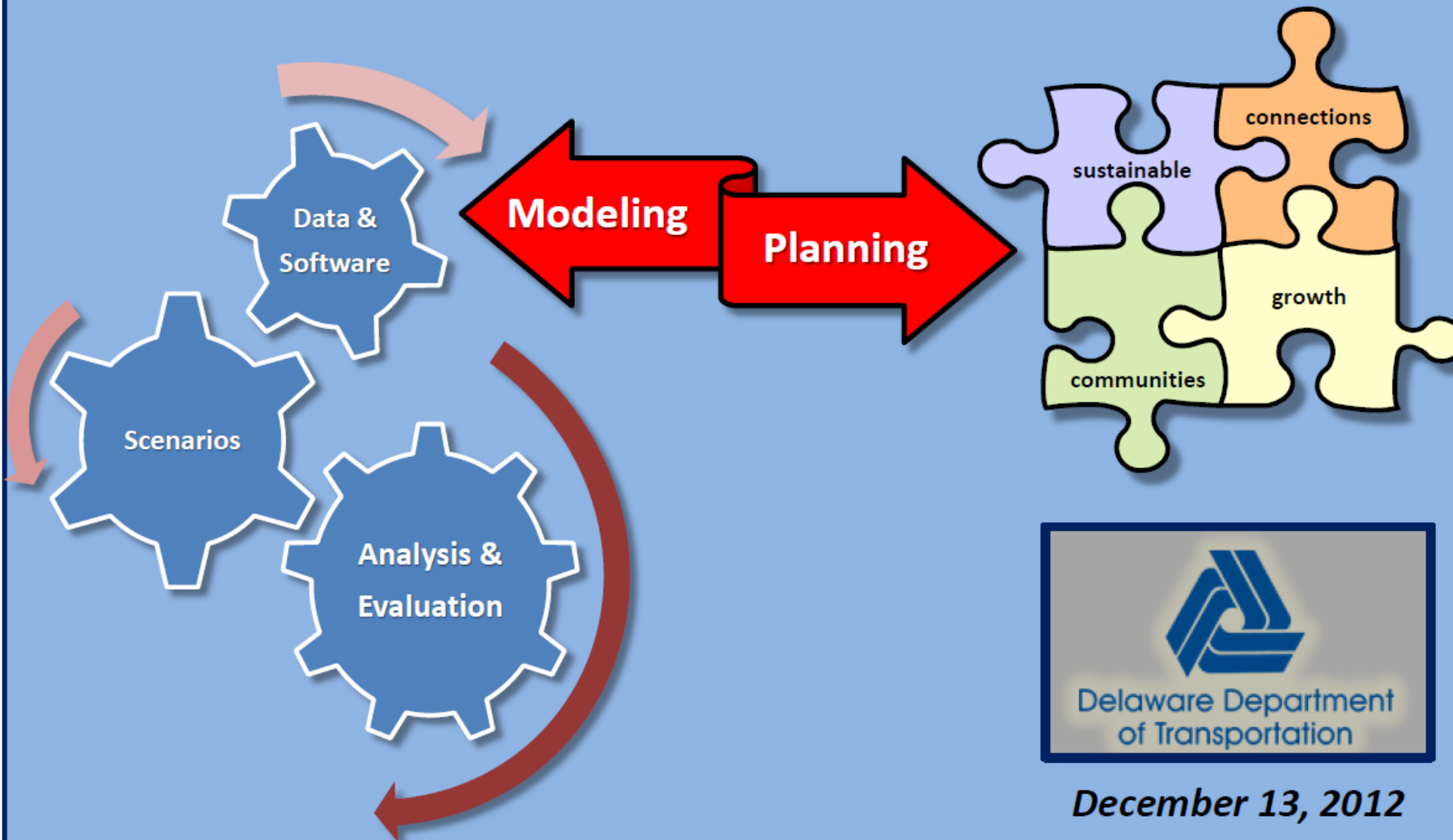
Statewide	193,962	205,765	206,405	640	0.3%	12,443	6%
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Source: 2020 Census PL data

Delaware Department of Transportation Division of Planning

Background on Travel Demand Modeling



MODEL FUNCTIONS **Required Use** **Common Use for Delaware DOT** **Other”**

1

Model Maintenance:

- Update Network & Land Use Files
- Update Traffic Count Files
- Update Core Model Equations

2

Model Applications:

Regional Planning:

- MPO long range plans
- MPO TIP's
- Truck/Freight Planning
- Congestion Management System
- Land Use Scenarios

Statewide Planning:

- Statewide Plan Scenarios
- Delaware STIP
- Evacuation Planning

Studies:

- Toll Revenue
- Bus & Rail Transit
- EIS/MIS
- Corridor & Subarea Studies
- Community Plans
- Traffic Data for Synchro/VISSIM

Model Applications (cont.)

Development Coordination:

- TIS Site Trip Distributions
- Background Traffic Estimates
- “Shift” or Diverted Traffic

Design Year Forecasts:

- Title Box Existing AADT
- Title Box Forecast AADT
- Design Year K, D, % Trucks
- Upstream Population Density

Air Quality:

- SIP Emissions for Air Agency
- Conformity Emissions
- CMAQ Analysis
- AQ Strategic Planning

3

Model Development:

- Model Improvements
- Expand Core Model
- Expand Feature Models
- New Reporting & Summaries
- GIS Integration

MODEL "TOOLBOX" Required Use Common Use "Other"

Model Type:	Typical Application	Traffic Zone Level	Tax-Parcel Level
Level 1 CORE MODEL	MPO Long Range Plans MPO TIP's STIP (Sussex County)		
	Level 2 FEATURE MODEL	Air Quality Conformity EZPass Toll & Mode Choice "Build/No-Build" Evacuation Model Seasonal Tourist Model Junction Model TIS Model Select Link Detailed Modeling	MPO/DelDOT Conformity Analyses Transit Studies Toll Diversion & Revenue MOT Plans Diversion Studies Evacuation Analysis Event Related O-D Summer Resort Traffic for Sussex Intersections in Regional Model ITE Trip Rates for TIS TIS Site Trip Distributions Land Use / Transportation Studies
Level 3 DEVELOPMENT	Tax Parcels Model 3-D Simulation (SSTI) Statewide Microsimulation		

- Completed
- Under Development
- Potential

Level 1

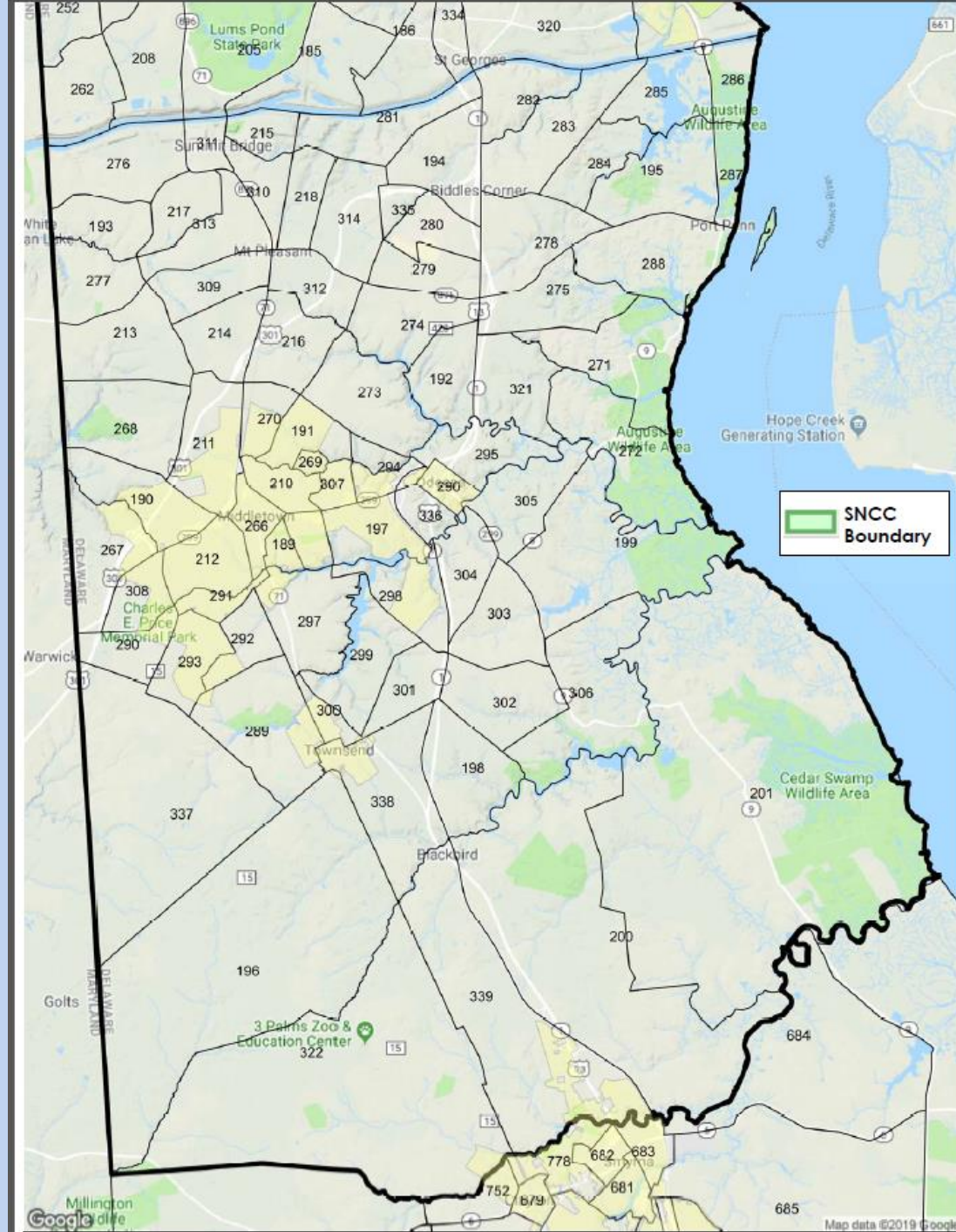
Level 1 model runs (TAZ):

Benefits:

- Quickest run time
- Quickest set-up
- Quickest calibration
- Whole state can be run at L1 resolution (2136 zones)

Potential problems:

- Resolution not high enough to include all roadways in question
- Centroid connections may need adjustments
- Traffic assignment perhaps questionable due to lack of other higher resolution roadways in study area



Level 1 inputs

TAZ_field	Definition	Source/Notes	Purpose	Sample data
WRK_HH_15	Avg. Workers per HH Year 2015	from 2012-16 American Community Survey (ACS)		1.14
TOT_WRK_15	Total Workers year 2015			
INC_15	median HH income	from 2012-16 American Community Survey (ACS)		47,054
VEH_HH_15	Avg. Vehicles per HH year 2015	from 2012-16 American Community Survey (ACS)		1.74
TOT_VEH_15	Total Vehicles			
HH_2015	Occupied HHs 2015	WILMAPCO Data/Demo Subcommittee		1,050
POP_2015	Total Population 2015	WILMAPCO Data/Demo Subcommittee		3,057
EMP_2010	Total Employment 2010	WILMAPCO, Dover/Kent MPO		2,098
EMP_2015	Total Employment 2015	WILMAPCO Data/Demo Subcommittee		2,303
NATRES_15	Natural Resources & Mining	11, 21 NAICS Supersectors	These fields break down the total employment into jobs by type. Each of these have their own trip generation rates, with Retail & Leisure/Hospitality being higher generators	0
CONS_15	Construction	22 NAICS Supersector		64
MANU_15	Manufacturing	31-33 NAICS Supersectors		118
WHL_RET_15	Wholesale & Retail Trade	42,44-45 NAICS Supersectors		382
TRN_UTL_15	Transportation & Utilities	22,48-49 NAICS Supersectors		100
INFO_15	Information	51 NAICS Supersector		16
FINANCE_15	Finance, Insurance and Real Estate	52-53 NAICS Supersectors		547
PRO_BUS_15	Professional and Business Services	54-56 NAICS Supersectors		273
ED_HEALT_15	Health and Education	61-62 NAICS Supersectors		325
LE_HOSP_15	Leisure & Hospitality	71-72 NAICS Supersectors		354
OT_SVCS_15	Other Services	81 NAICS Supersector		55
PUBADM_15	Public Administration	91-93 NAICS Supersectors		69
GQ_POP_10	Group Quarter population	from 2012-16 American Community Survey (ACS)	Population in prisons removed from total population. They do not generate trips.	157
GQ_TYP_10	Group Quarter Type (prison, senior, student, etc...)	from 2012-16 American Community Survey (ACS)		
Over65pct_15	% of population over 65	from 2012-16 American Community Survey (ACS)	Helps in allocating household trip generation rates as 65+ have different travel patterns	14%
Zero_HH_pct15	% of zero car households	from 2012-16 American Community Survey (ACS)		5%
SOV_15	% of single occupant vehicles from JTW data	from 2012-16 American Community Survey (ACS)	Used to assign trips by mode. Data is only for Journey to Work trips (JTW)	68%
Pool_15	% of carpoolers from JTW data	from 2012-16 American Community Survey (ACS)		5%
Trans_15	% of public transit vehicles from JTW data	from 2012-16 American Community Survey (ACS)		7%
WLK_BK_15	% of walkers/bikers from JTW data	from 2012-16 American Community Survey (ACS)		18%
Home_15	% of home workers from JTW data	from 2012-16 American Community Survey (ACS)		3%

Level 2

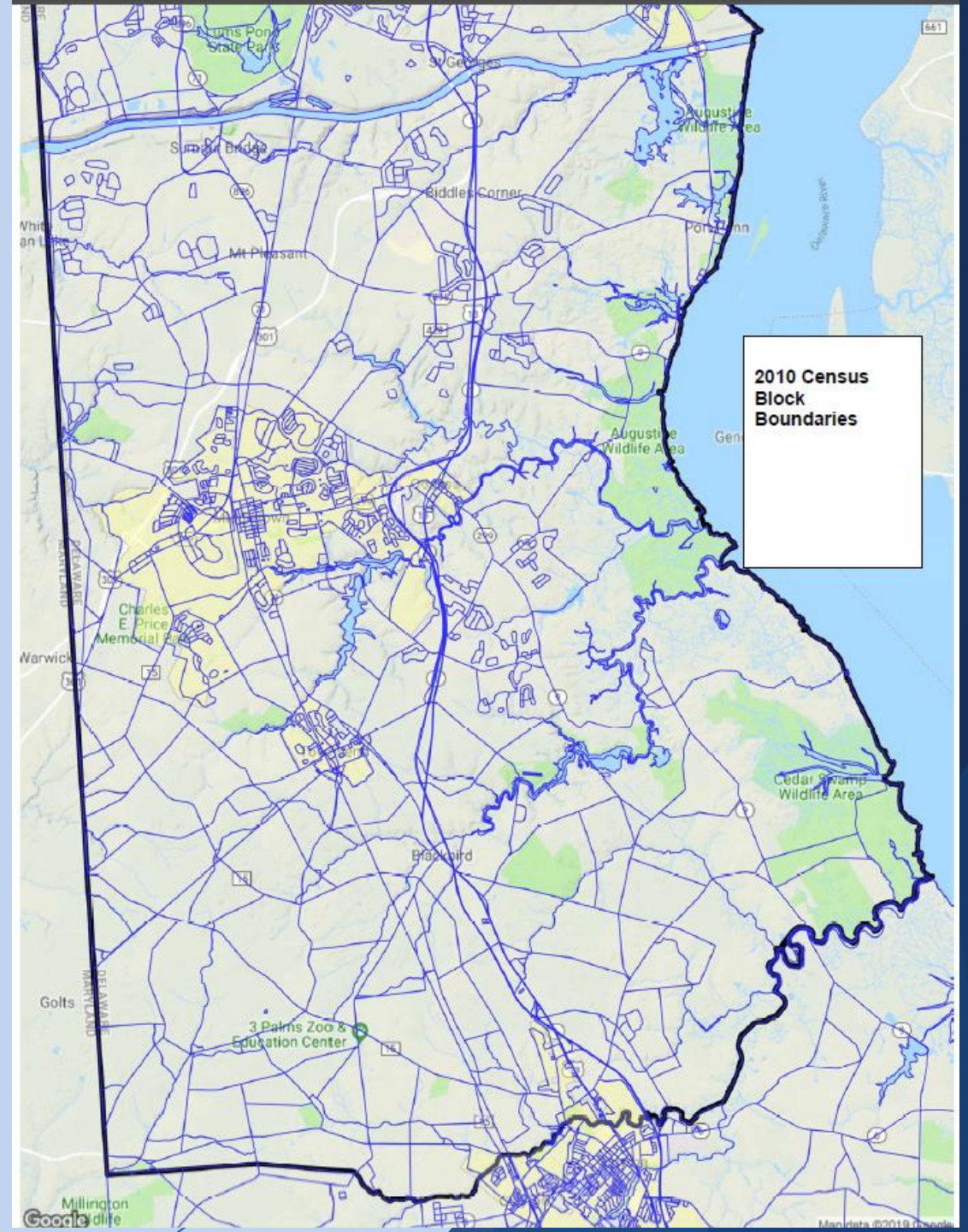
Level 2 model runs (Census Block):

Benefits:

- Comparable run time to L1
- Network resolution is essentially L3
- Whole state able to be run at L2 resolution (24000 zones)

Potential Problems:

- Extended time in set-up via GIS tool
- Extended time in calibration
- Extended time in network check (inclusion of new projects, etc)



Level 3

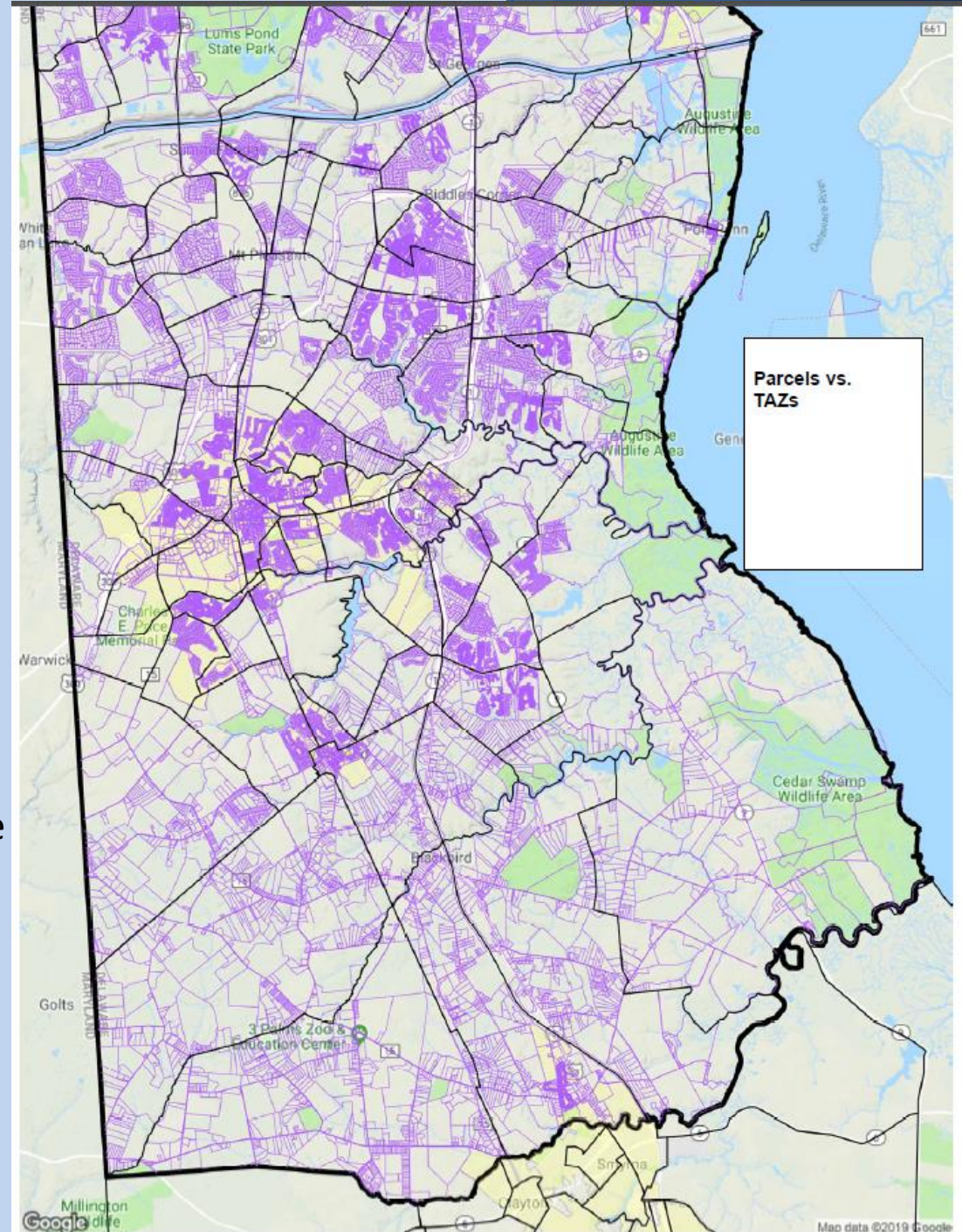
Level 3 model runs (Tax Parcel):

Benefits:

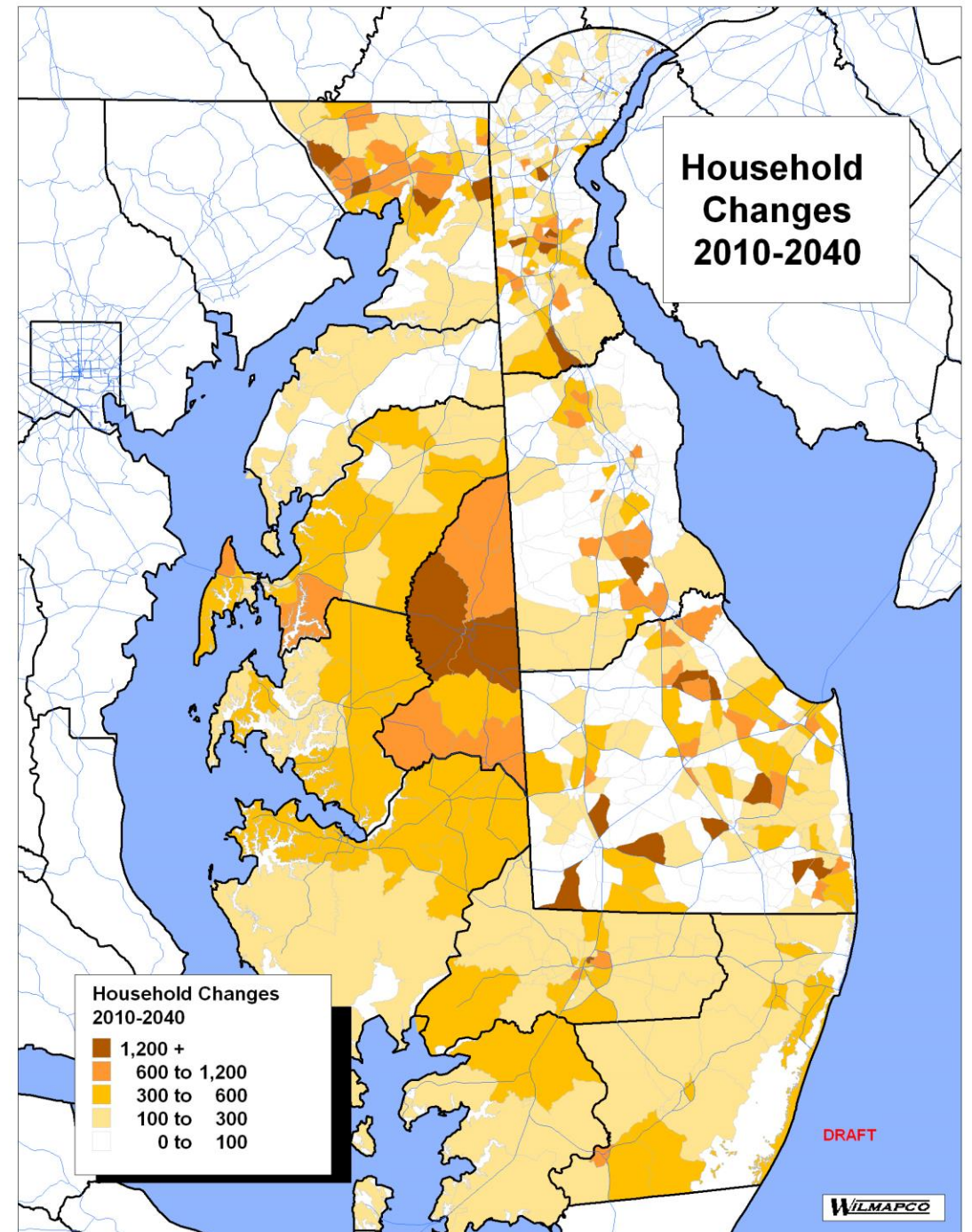
- Centroid loading is per parcel
- Very accurate loading for use with turning movements, bike/ped, etc. after calibration
- All projects at the microscopic level can be analyzed

Potential Problems:

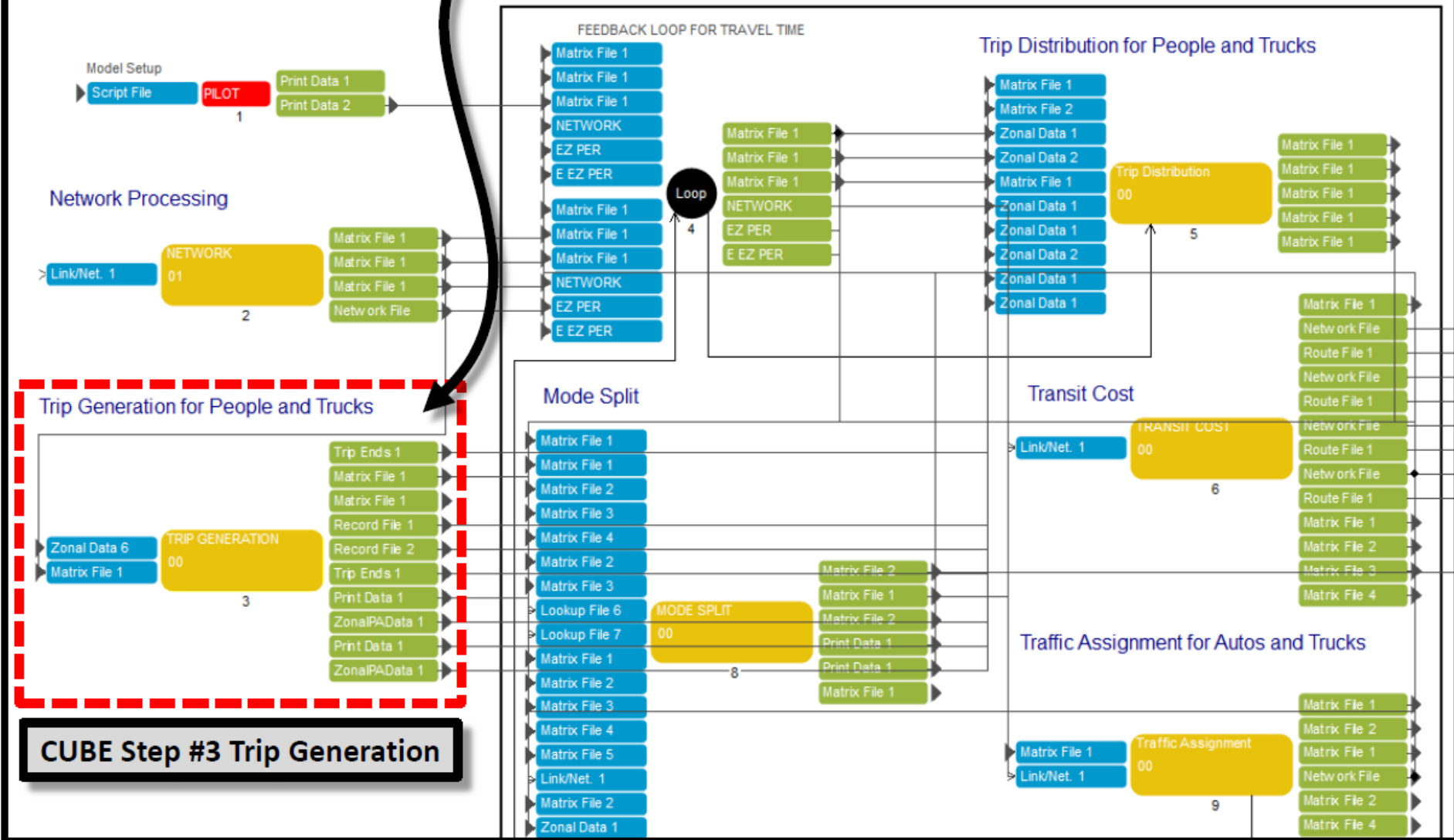
- All L2 problems
- Whole state cannot run at L3 resolution
- Network building and uses need to be reduced in order to save run-time



- Reviewed Annually
- Constant eye on land use activity
- Rely on county land use agencies
- TREND analysis. Scenarios part of RTP process if needed
- Use most recent employment type trends



Use of Census/ACS Data CUBE Model "Main Page"



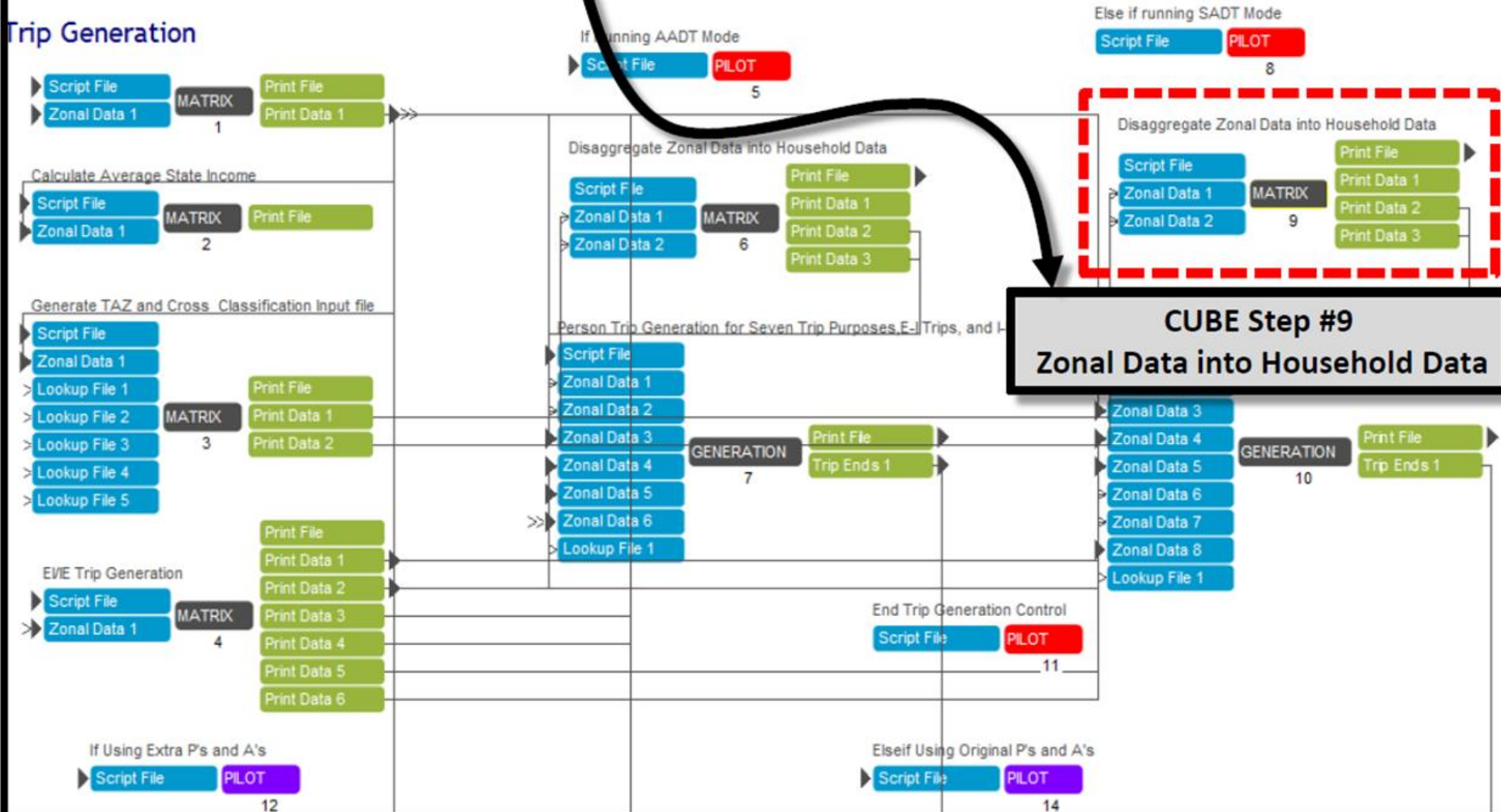
CUBE Step #3 Trip Generation

Use of Census/ACS Data CUBE Model "Trip Generation Page"



DELVOT Peninsula Model

Trip Generation



CUBE Step #9
Zonal Data into Household Data

Use of Census/ACS Data Zonal Data into Household Data

Data Items List:

- ; Persons per Household*
- ; Vehicles per Household*
- ; Workers per Household*
- ; Income quartile factors*

*; Calculate two-way cross classification tables for
trip generation rates, by seven trip purposes:*

(workers per household by persons per household)

(persons per household by vehicles per household)

(