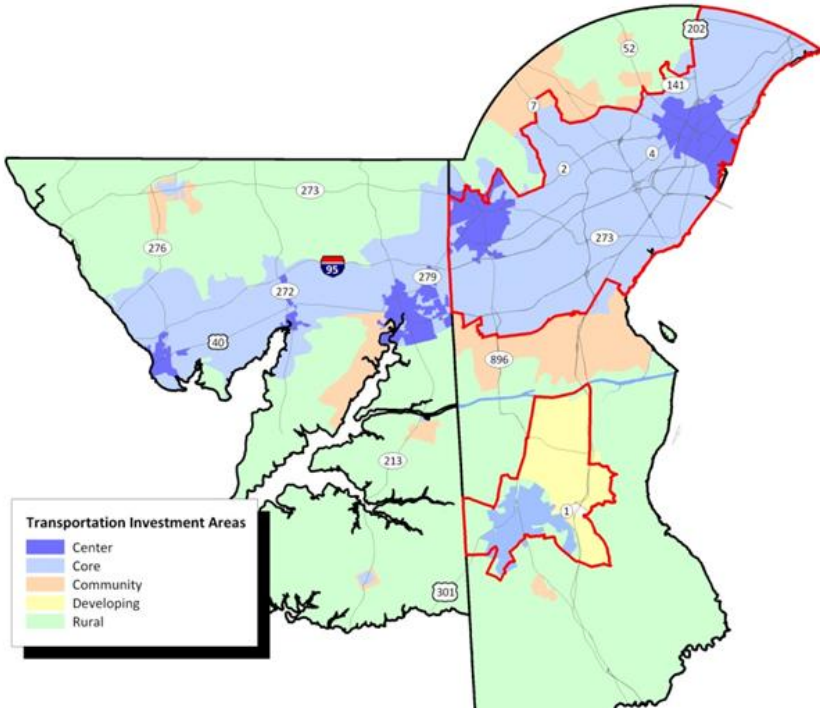
Scenario Model Results 8/25/14
for the 2040 Regional Transportation Plan

Scenario Development and Methodology

As part of the development of the 2040 RTP, WILMAPCO has developed several "what if" future land use & transportation scenarios. These are to be used as a guide to determine which development patterns help reduce impacts on land use and transportation infrastructure. The scenarios were tested using the DelDOT Peninsula model with the following land use and transportation options. Each were evaluated for conditions in the year 2040, the horizon year of the plan.

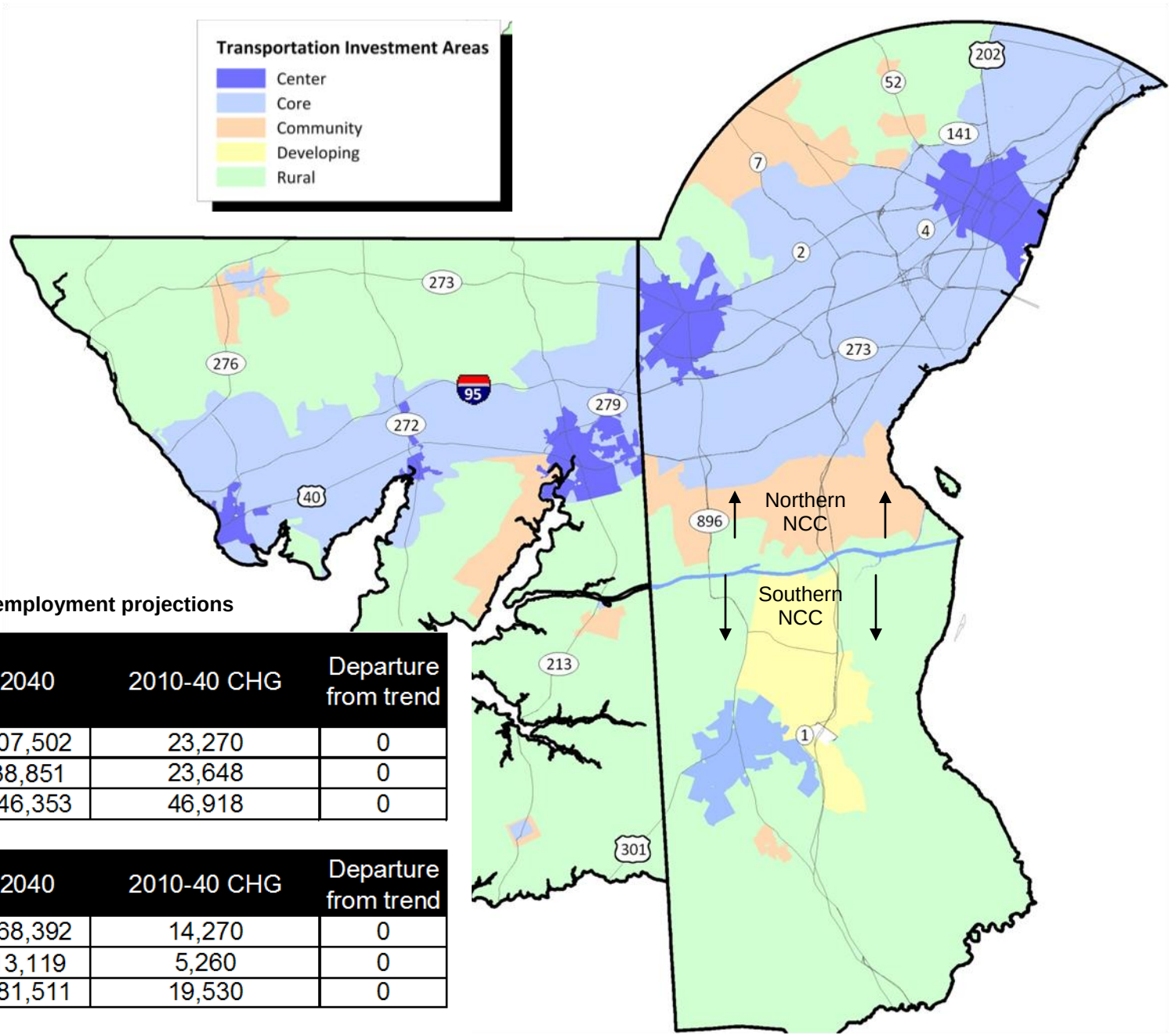
Land Use Scenarios Tested:	**Transportation Options Tested:**
Scenario 1. Current Land Use Projections **Scenario 2. Accelerate Southern Development** **Scenario 3. Centralized Southern Growth** **Scenario 4. Northern Redevelopment** **Scenario 5. Slower Growth**	**- Option #1: RTP Constrained projects** **- Option #2: RTP Constrained projects plus modest transit improvements. To simulate this , transit mode share was increased by 25% based on existing mode share by Census block group. Increase was limited to the areas shown in red on the map below.**

- **Performance Measures**
  Scenarios will be compared based on the following measures:
  - Air Quality Performance (VOC, NOx, PM, CO, CO2, etc.)
  - Average Annual Daily Traffic and Volume/Capacity
  - % of roads at Level of Service (LOS) F in each model year
  - Travel Times by Traffic Analysis Zone (TAZ) for selected origins /destinations
  - Average trip length
  - Vehicle Miles Traveled (VMT)
  - Vehicle Hours Traveled (VHT)
  - Total land consumed
  - Transit usage



Concept Scenario #1– Adopted Trend Projections

- Scenario based on using all current trends and unaltered land use patterns.
- Uses of adopted WILMAPCO demographics by TAZ, which sets the countywide control totals for households at 246,000, population at 607,000 & employment at 281,000 by year
- Assumes no changes to the future land use plan



Changes in future household and employment projections

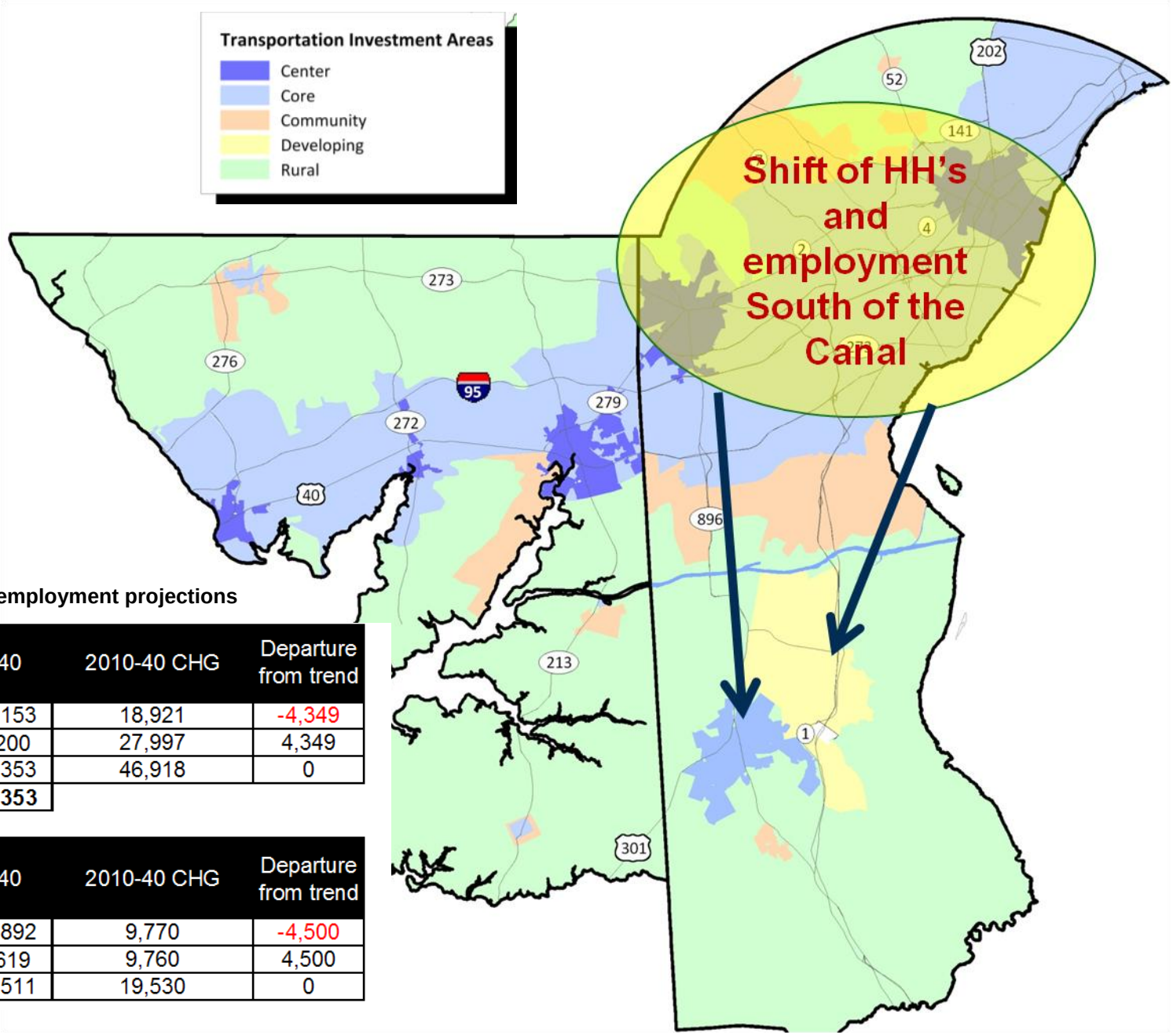
Households	2010	2040	2010-40 CHG	Departure from trend
Northern NCC	184,232	207,502	23,270	0
Southern NCC	**15,203**	38,851	23,648	0
Total	199,435	246,353	46,918	0

Employment	2010	2040	2010-40 CHG	Departure from trend
Northern NCC	254,122	268,392	14,270	0
Southern NCC	7,859	13,119	5,260	0
Total	261,981	281,511	19,530	0

Concept Scenario #2: Accelerated Southern Growth

- Scenario allocates 60% of all expected new household growth (approx. 28,000 HHs) and 50% of all expected new employment growth (approx.9,700 jobs) in New Castle County to south of the canal.

- Assumes no changes to the future land use densities



Changes in future household and employment projections

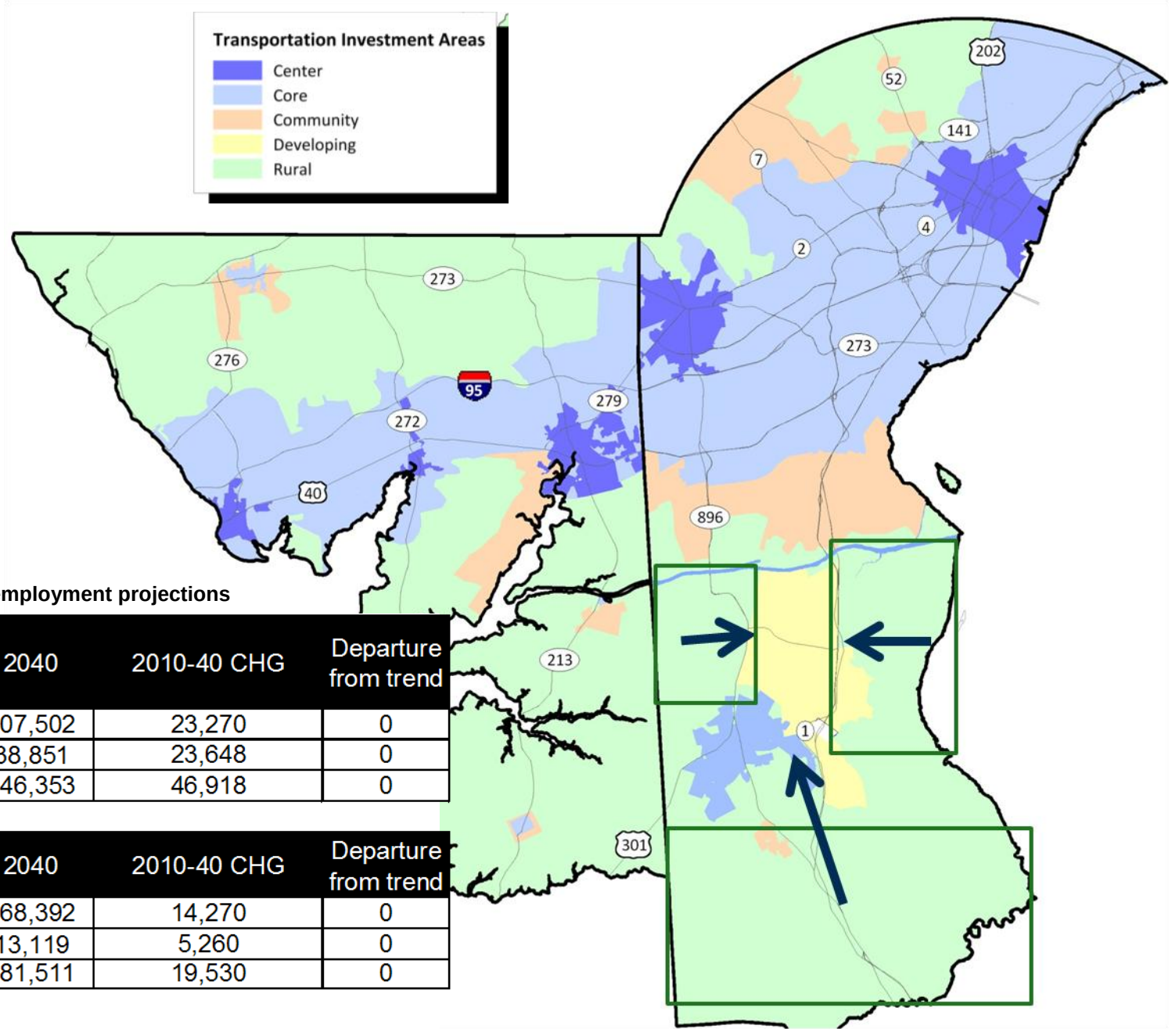
Households	2010	2040	2010-40 CHG	Departure from trend
Northern NCC	184,232	203,153	18,921	-4,349
Southern NCC	**15,203**	43,200	27,997	4,349
Total	199,435	246,353	46,918	0
	199,435	**246,353**		

Employment	2010	2040	2010-40 CHG	Departure from trend
Northern NCC	254,122	263,892	9,770	-4,500
Southern NCC	7,859	17,619	9,760	4,500
Total	261,981	281,511	19,530	0

Concept Scenario #3– Centralized Southern Development

- Scenario is based on the maximizing expected availability of sewer in the central portion of southern New Castle County.
- Allocates 75% (approx 17,000) of all expected HH growth south of the canal will take place in the Developing TIA area and Middletown.
- No employment changes

.



Changes in future household and employment projections

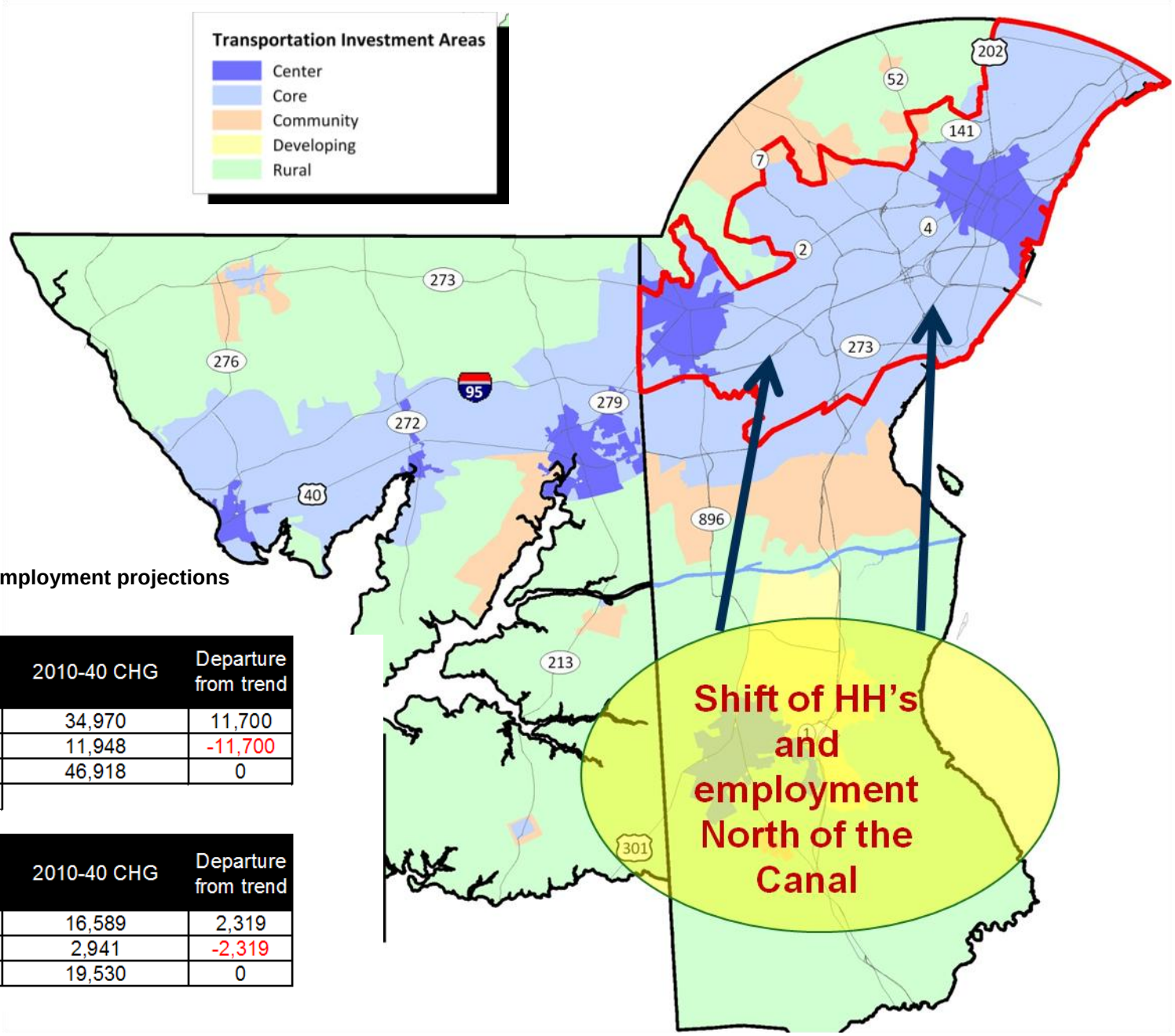
Households	2010	2040	2010-40 CHG	Departure from trend
Northern NCC	184,232	207,502	23,270	0
Southern NCC	**15,203**	38,851	23,648	0
Total	199,435	246,353	46,918	0

Employment	2010	2040	2010-40 CHG	Departure from trend
Northern NCC	254,122	268,392	14,270	0
Southern NCC	7,859	13,119	5,260	0
Total	261,981	281,511	19,530	0

Concept Scenario #4– Northern NCC Redevelopment

- Scenario is based on allocating 75% of all expected new HH growth (approx. 34,000 HHs) and 85% of new employment growth (to the Northern part of the county by 2040.

- Border in red is area which has high vacancy rates (approx. 14,500 units) and was captured in the transit score analysis as an area which currently is suitable for more frequent transit service.



Changes in future household and employment projections

Households	2010	2040	2010-40 CHG	Departure from trend
Northern NCC	184,232	219,202	34,970	11,700
Southern NCC	**15,203**	27,151	11,948	-11,700
Total	199,435	246,353	46,918	0
	199,435	**246,353**		

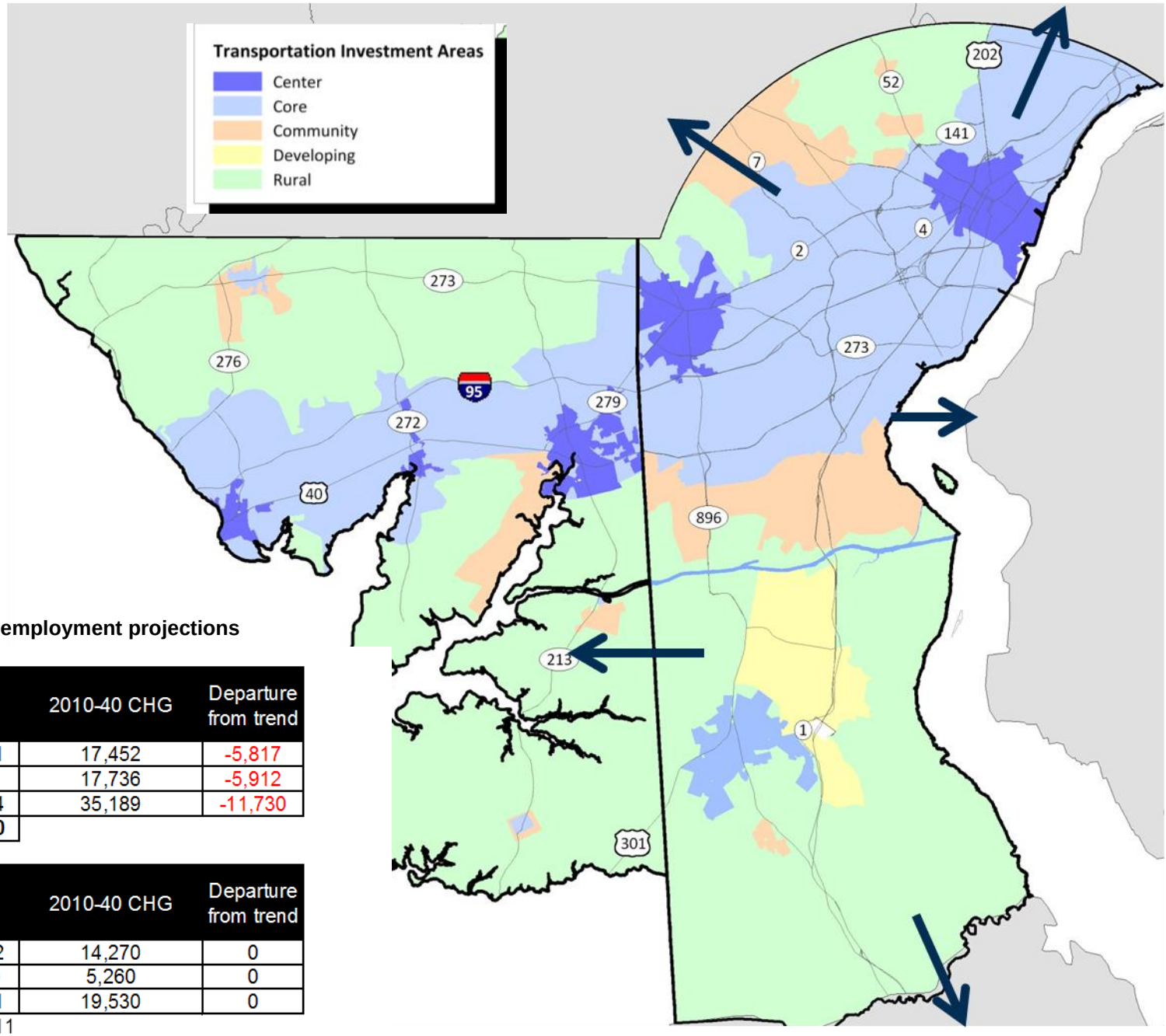
Employment	2010	2040	2010-40 CHG	Departure from trend
Northern NCC	254,122	270,711	16,589	2,319
Southern NCC	7,859	10,800	2,941	-2,319
Total	261,981	281,511	19,530	0
	261981	281511		

Concept Scenario #6– Slower NCC Growth

- Scenario shifts 25% of all expected household growth (approx. 11,000 HHs) out of New Castle County to other nearby counties by year 2040. Development moves to Cecil, Chester, Kent and Sussex

- Decreases NCC household totals from 246,00 to 234,500 by year 2040 . Employment would remain the same (281,000)

- Assumes no changes to the future land use plan.



Changes in future household and employment projections

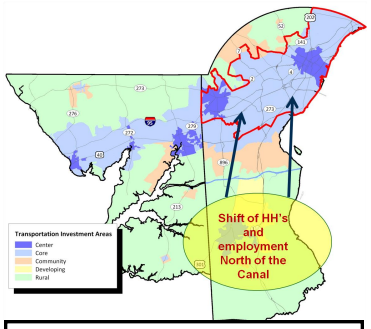
Households	2010	2040	2010-40 CHG	Departure from trend
Northern NCC	179,689	197,141	17,452	-5,817
Southern NCC	**19,746**	37,482	17,736	-5,912
Total	199,435	234,624	35,189	-11,730
	199,435	**234,500**		

Employment	2010	2040	2010-40 CHG	Departure from trend
Northern NCC	254,122	268,392	14,270	0
Southern NCC	7,859	13,119	5,260	0
Total	261,981	281,511	19,530	0
	261981	281511		

Scenario Model Results: Overall Ranking

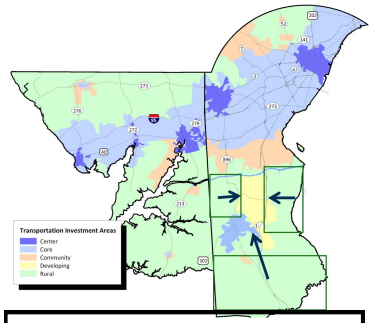
Scenarios were compared using 23 criteria, Shown below are the order in which they performed:

Rank #1
Northern Redevelopment
(Scenario 4)



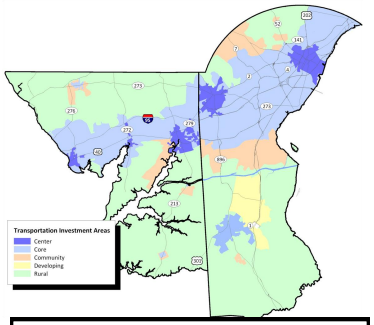
Performed best in 14 criteria

Rank #2
Central SNCC Growth
(Scenario 3)



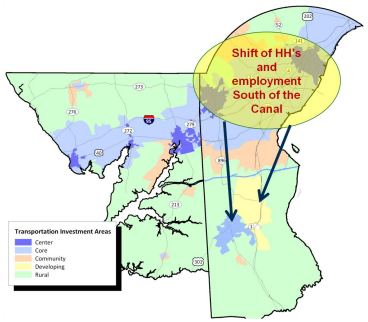
Performed best in 2 criteria

Rank #3
Current Land Use Trend
(Scenario 1)



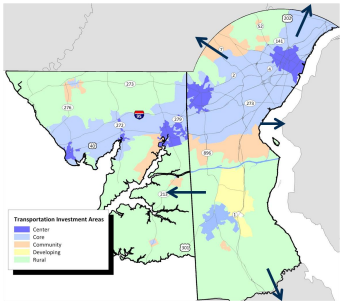
Performed worst in 1 criteria

Rank #4
Accelerated SNCC Growth
(Scenario 2)



Performed worst in 5 criteria

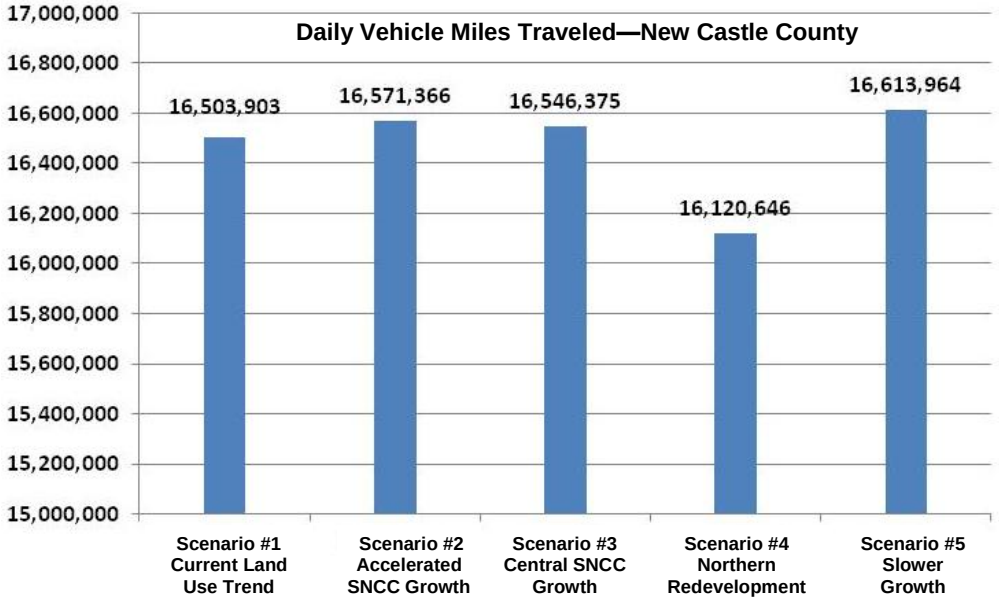
Rank #5
Slower Growth
(Scenario 5)



Performed best in 1 criteria
Performed worst in 11 criteria

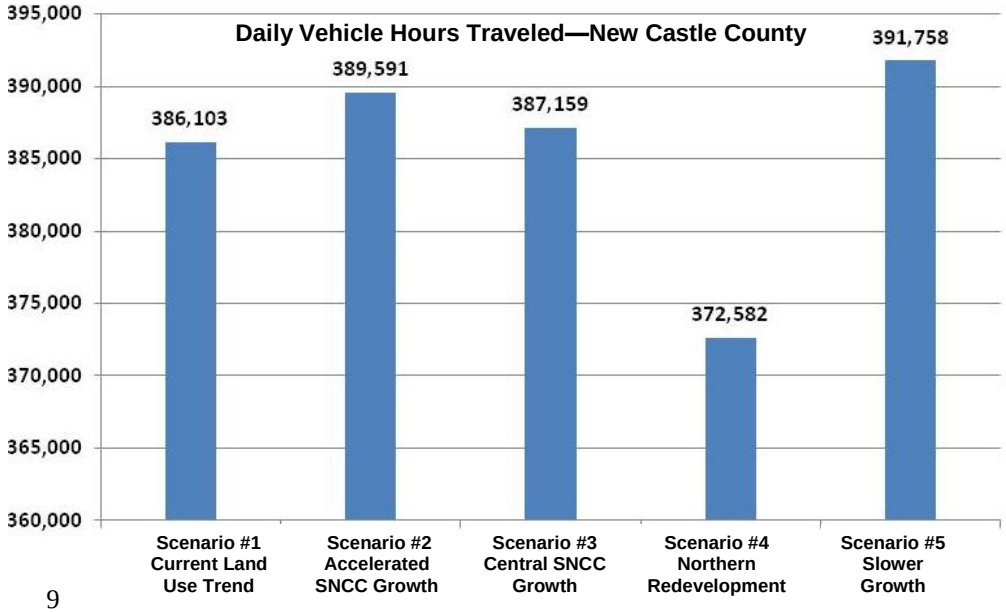
Selected Scenario Analysis Results: VMT and VHT

These graphs compare the regional vehicle miles traveled (VMT) and vehicle hours traveled (VHT) of our transportation and land use scenarios.



Daily Vehicle Miles Traveled Year 2040

- Scenario #4 (Northern redevelopment) does best when comparing VMT reductions with funded RTP projects; approximately 383,000 vehicle miles fewer per day compared to the current trend.
- Scenario #5 (slower growth) performed the worst, adding approximately 110,000 additional VMT per day versus the current trend.



Vehicle Hours Traveled Year 2040

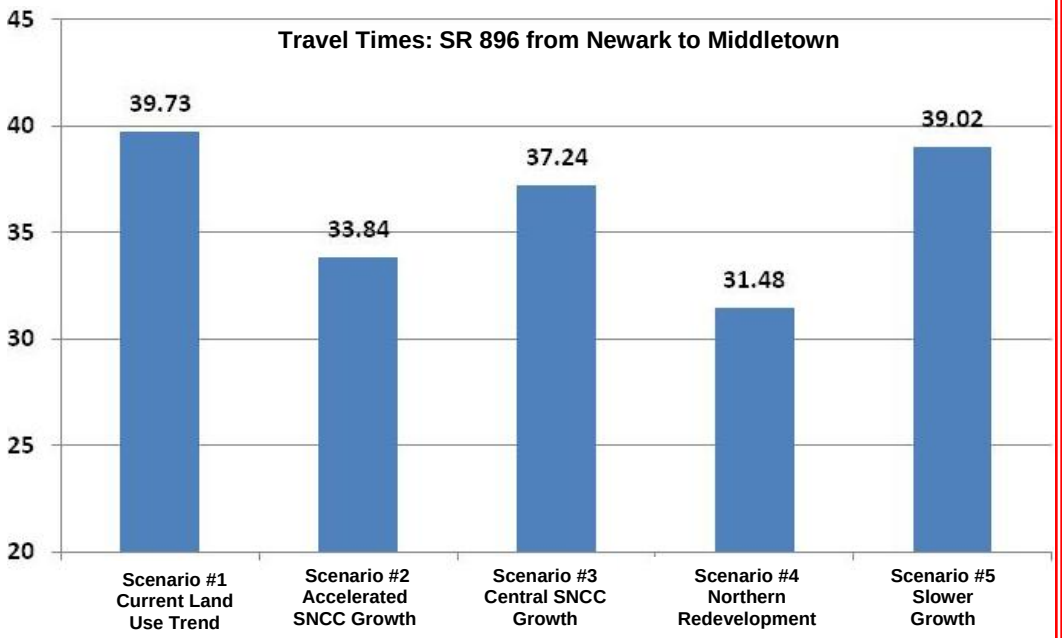
- Scenario #4 (Northern redevelopment) does best when comparing VHT reductions in funded RTP projects; very similar to the reductions in regards to VMT above. It reduced total VHT around 13,500 each day.
- Scenario #5 (slower growth) performed the worst, adding approximately 5,600 additional VHT per day vs. the current land use.

Scenario Model Results Travel Times for Selected Locations

The graphs below showcase travel time comparisons between key locations and/or cities in the region. All figures are shown in minutes.

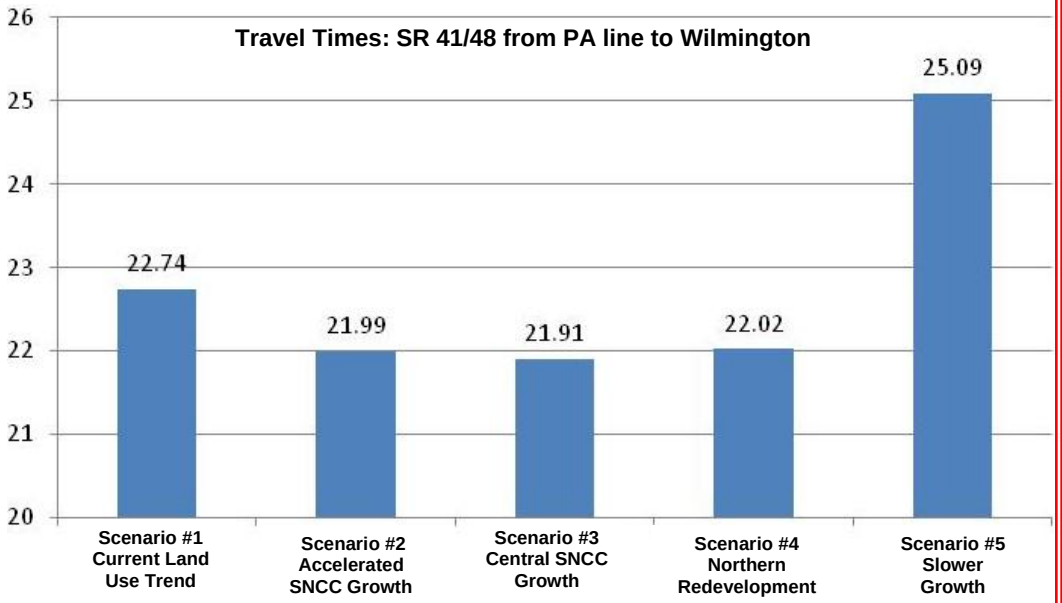
SR 896 (Newark to Middletown)

- Scenario #1 (current land use trend) shows the worst times in traveling from Middletown to Newark in year 2040
- Scenario #4 (Northern redevelopment) outperforms all other scenarios, followed by Scenario #2 (accelerated Southern development)



SR 41/48 (PA Line to Wilmington)

- Scenario #3 (Accelerated SNCC growth) produced the best travel times for this segment;
- Scenario #5 (slower growth) produces a 9% longer travel time vs. Scenario #1 (current land use trend)

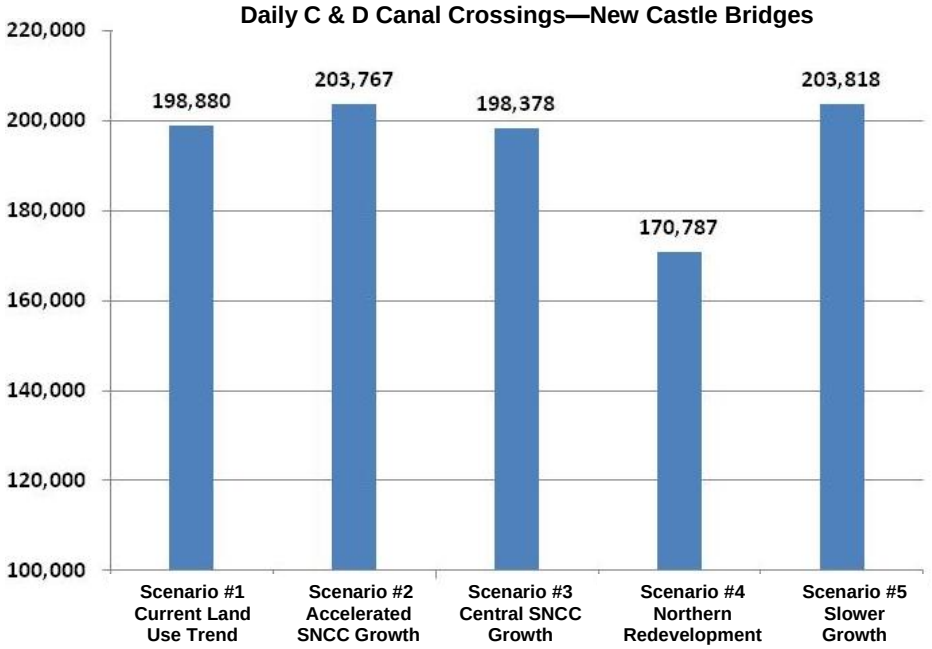


Scenario Model Results: Southern New Castle County Impacts

Measuring the number of C& D Canal crossings and overall VMT in south of the Canal, we can gain a sense of the transportation impacts each scenario will have on Southern New Castle County.

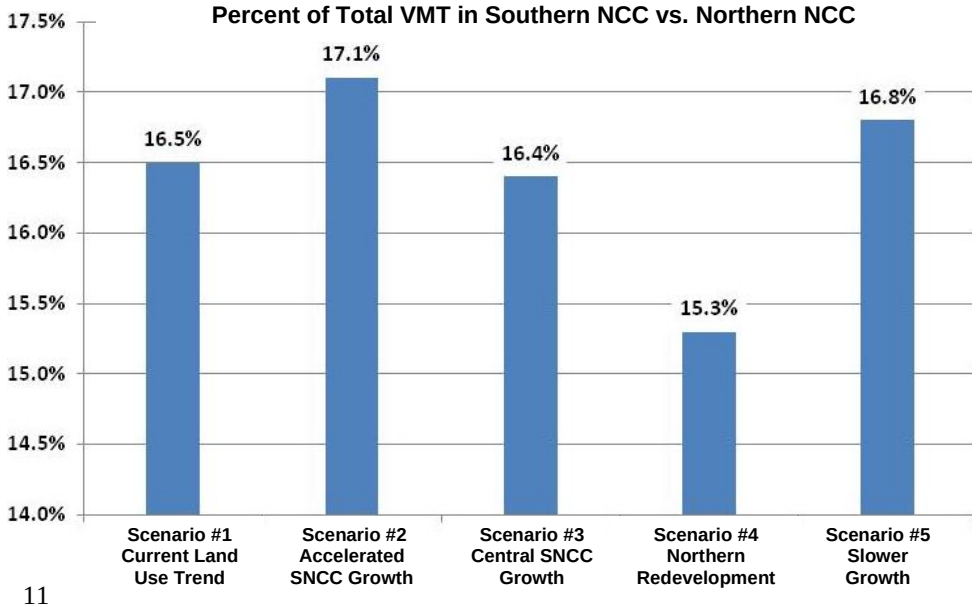
Daily C&D Canal Crossings (Summit, SR 1, Saint Georges and Reedy Point Bridges) Year 2040

- Scenario #5 (slower growth) performs worst followed closely by Scenario #2 (Accelerated Southern Growth), both going over 203,000 crossings per day. Scenario #4 (Northern redevelopment) shows best with 33,000 fewer canal crossings per day.



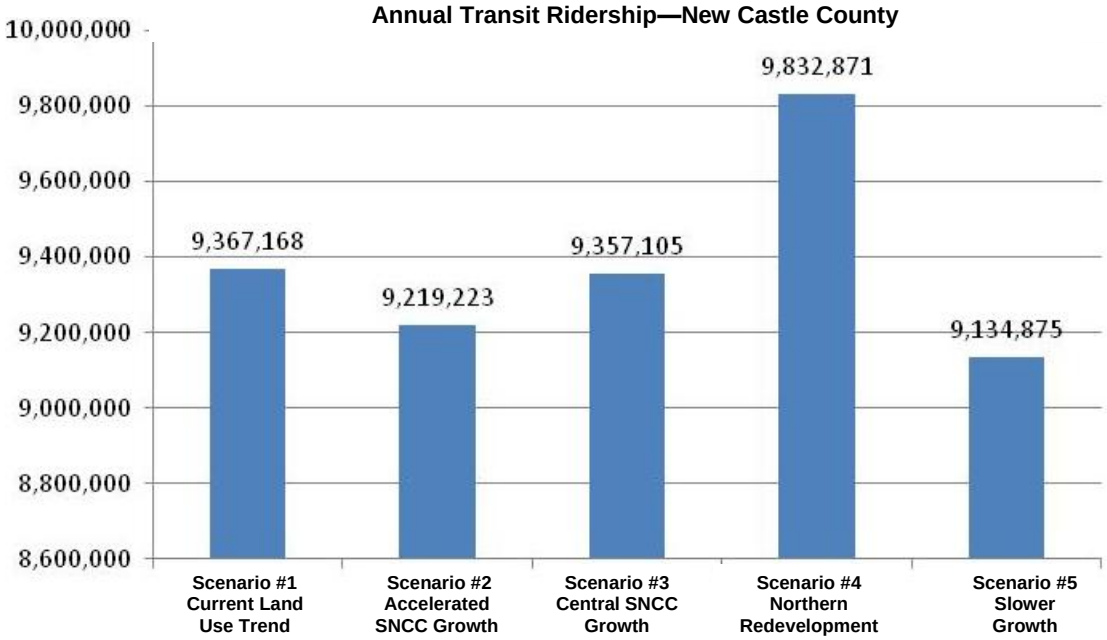
Percent of VMT Below the Canal Year 2040

- Scenario #4 (Northern redevelopment) yields the lowest percentage of VMT south of the Canal when only funded RTP projects are modeled.
- Scenario #2 (accelerated Southern growth) recorded the highest VMT percentage.



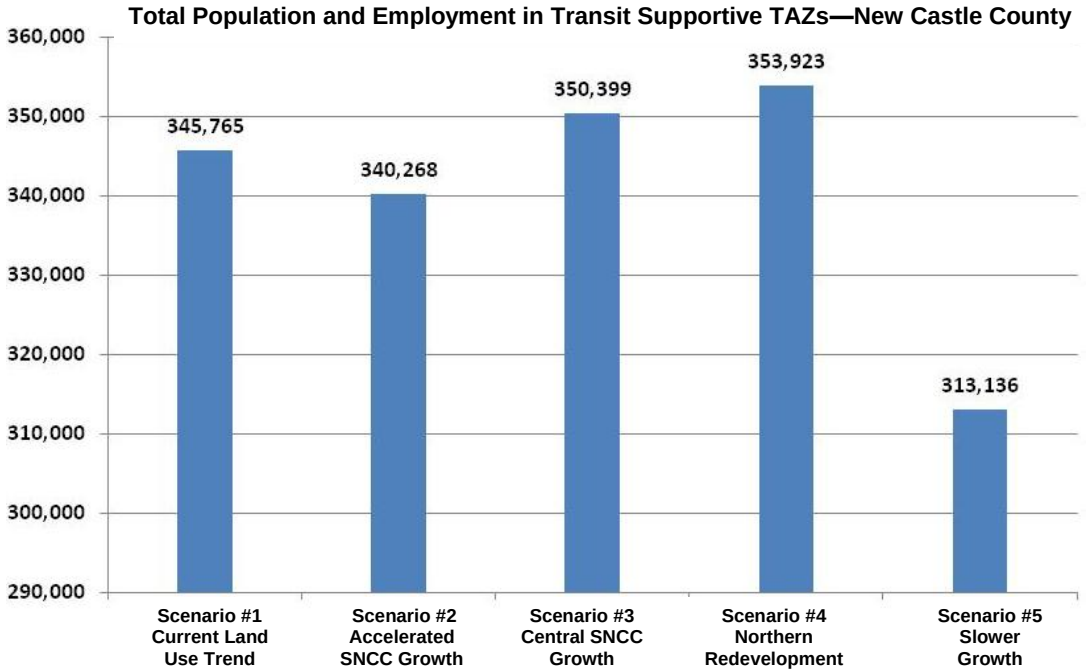
Scenario Model Results: Transit / Transit Supportive Development

- Scenario #4 (Northern redevelopment) performs best, adding roughly 465,000 transit trips annually compared to Scenario #1 (Current Trend).
- Scenario #5 (slower growth) performs worst, followed by Scenario #2 (Accelerated SNCC growth)



Using a threshold of eight people & jobs per acre, each scenario was analyzed to gauge which created the best opportunity for shifting trips to other modes.

- Scenario #5 (Slower Growth) performs worst
- Scenario #4 (Northern Redevelopment) performs best.



Scenario Model Results: Air Quality

- Coming Soon……..

Scenario #1 Current Land Use Trend	Scenario #2 Accelerated SNCC Growth	Scenario #3 Central SNCC Growth	Scenario #4 Northern Redevelopment	Scenario #5 Slower Growth

-

Scenario #1 Current Land Use Trend	Scenario #2 Accelerated SNCC Growth	Scenario #3 Central SNCC Growth	Scenario #4 Northern Redevelopment	Scenario #5 Slower Growth