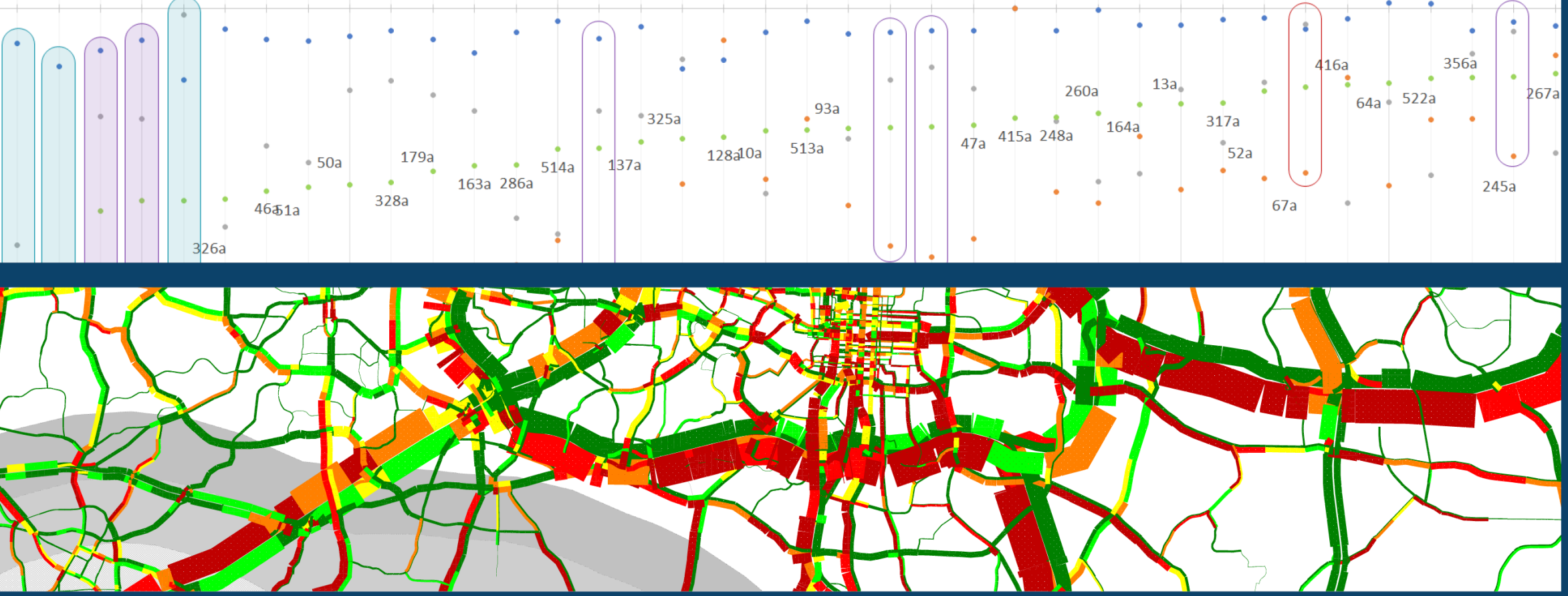


Bonus Allocation Funding Methodology

Technical Analysis and Program Recommendation

Presented by
Alex Rickard
Taruna Tayal

April 25, 2019

CAMPO
NC Capital Area Metropolitan Planning Organization

vhb

STI Law Bonus Allocation (NCDOT Background)

- Bonus Allocation funds are generated by
  - Local funding participation:
    - ½ of local contribution
  - Highway Tolling:
    - ½ value of toll revenue bonds
    - ½ forecasted revenue for 1st 10 years – operation costs
  - $100,000,000 maximum
- Funds must be programmed on projects within the toll County

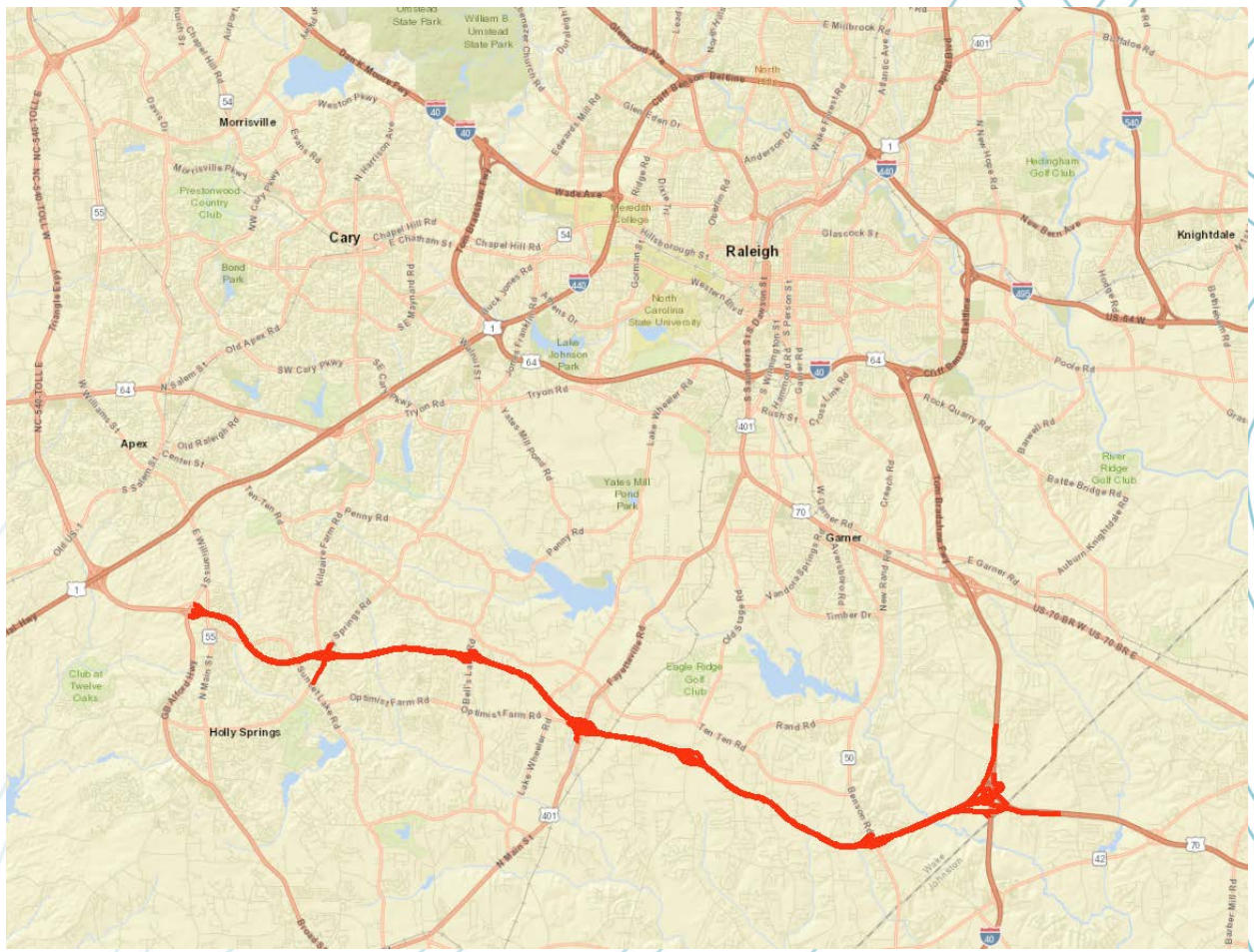
STI Law Bonus Allocation (NCDOT Background)

- Programming Caps
  - Statewide Mobility – no cap
  - Regional Impact – Capped at 10% of the regional allocation
  - Division Needs – Capped at 10% of the division allocation
- Must obligate funds in 5 years
- Use on highway or highway-related projects only

CAMPO Bonus Allocation

- NC 540: R-2721 & R-2828
  - $100,000,000

- STI Bonus Allocation Caps
  - Region C 10% $154,362,600
  - Division 5 10% $50,117,700



CAMPO BA Guiding Principles

- Inclusion in the Metropolitan Transportation Plan (MTP)
- Logical Nexus to Generating Source of Bonus Allocation Funds
- Recognition of Funding Challenges with Strategic Transportation Investment law
- Recognition of Funding Opportunities with Strategic Transportation Investment law

Buffer Screening

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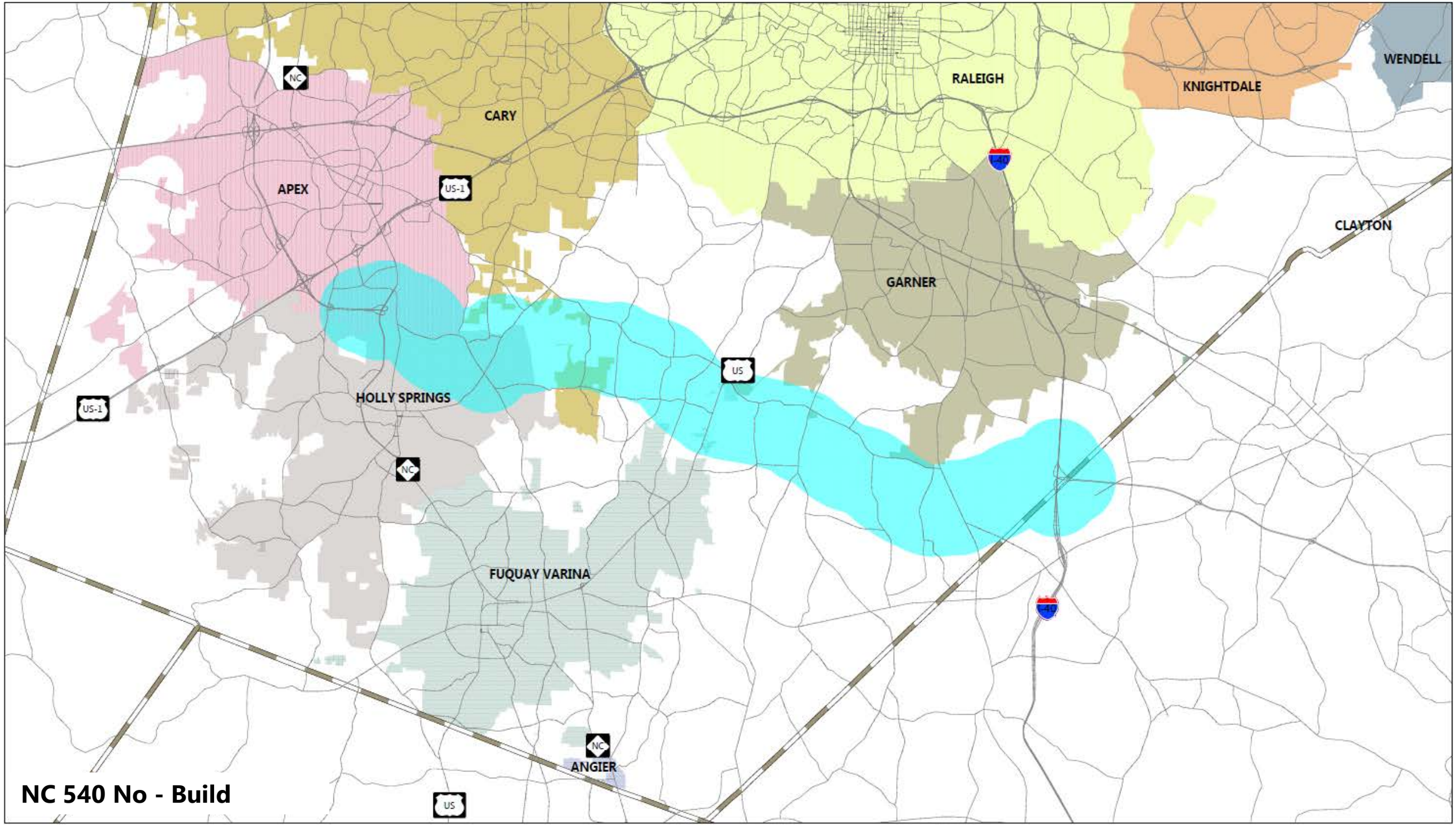
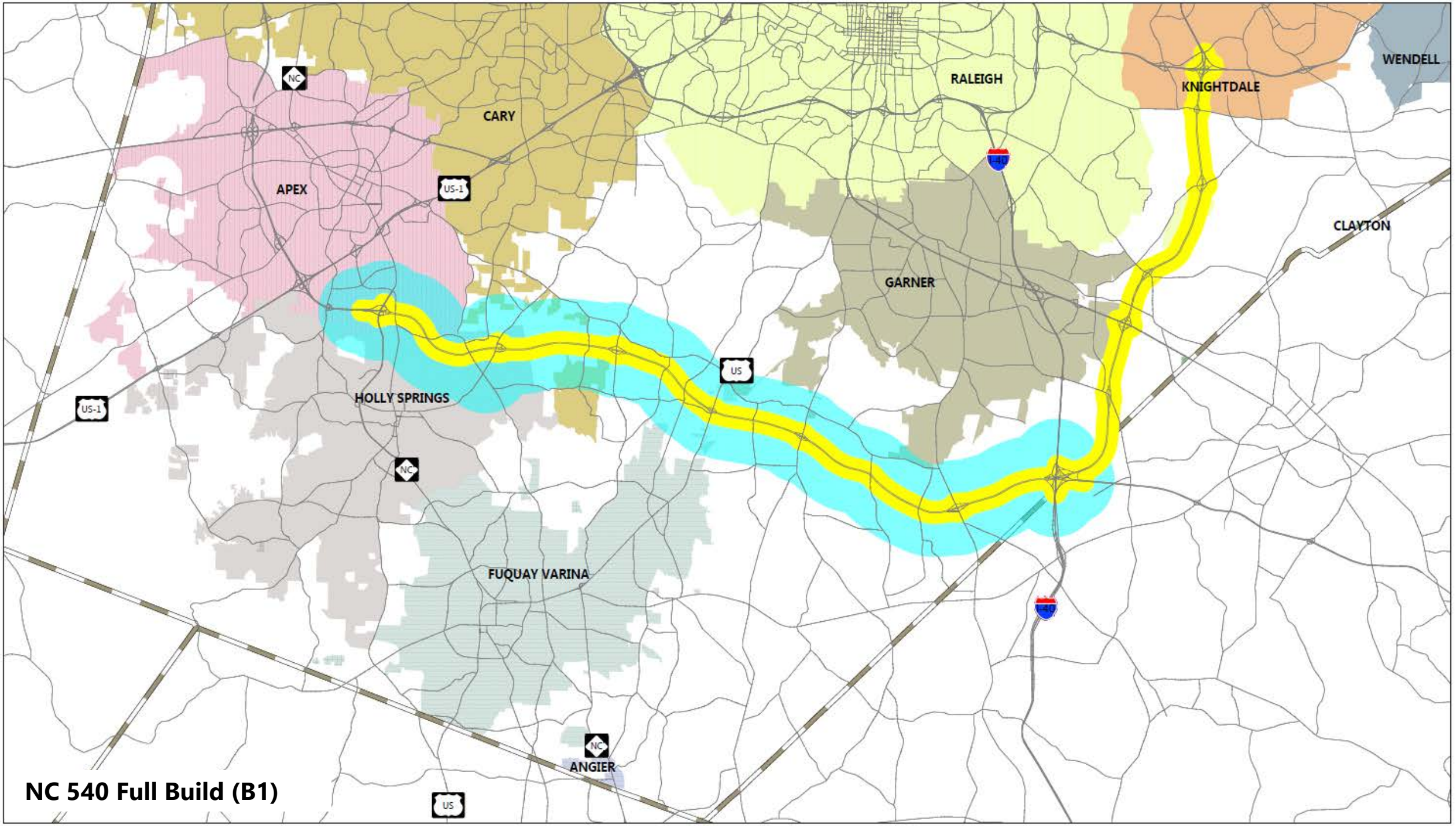
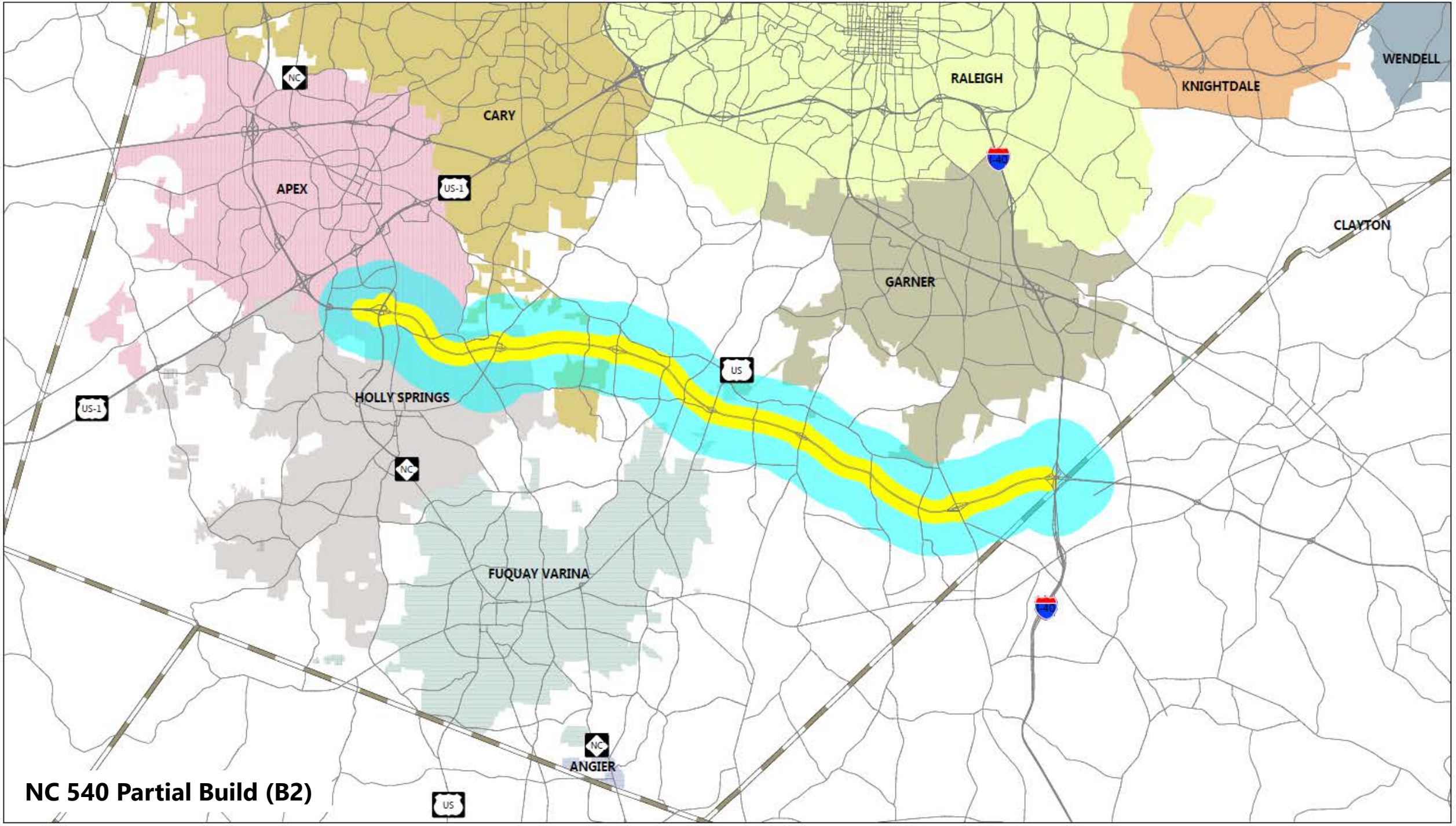


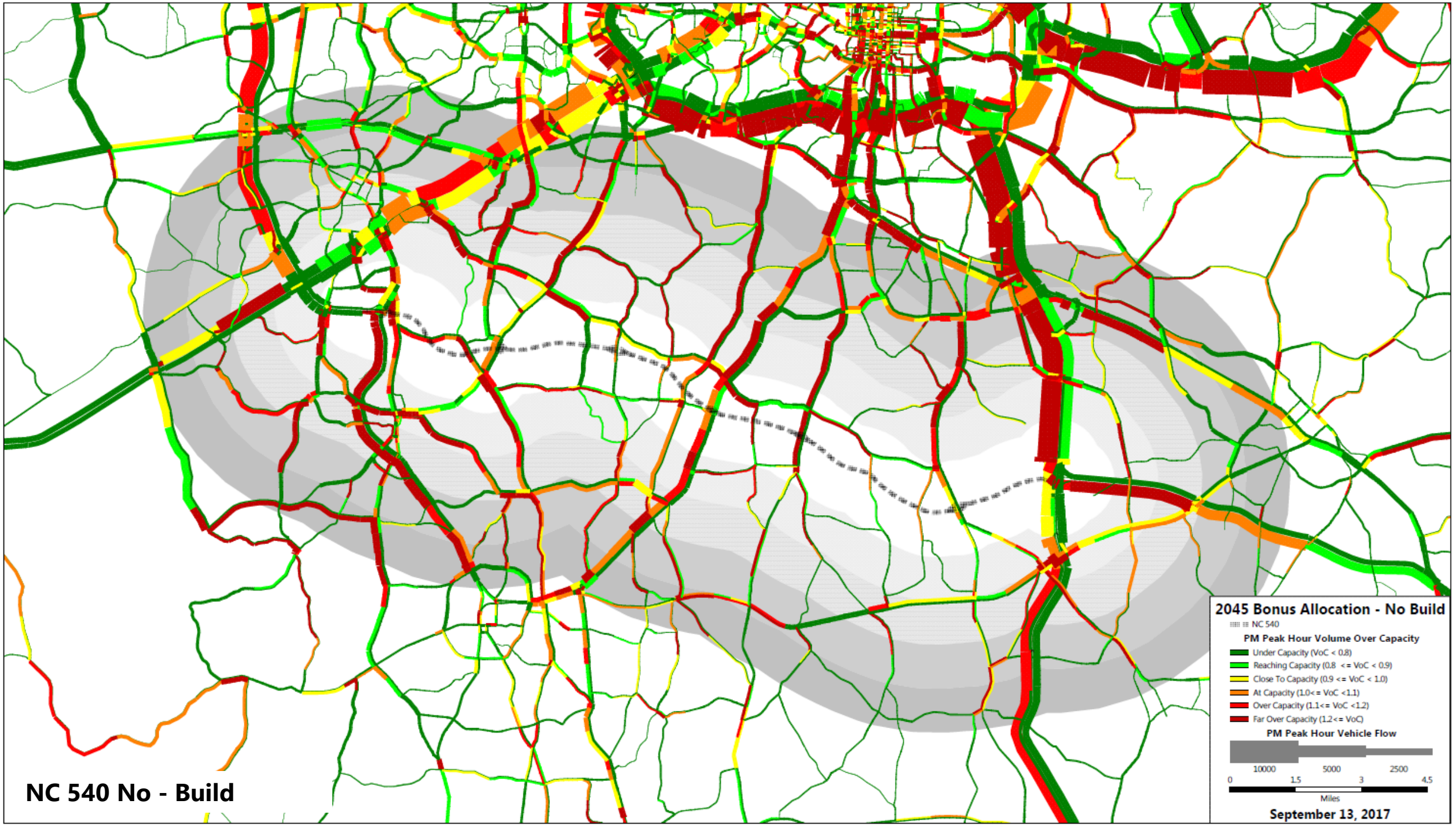
NC 540 No - Build

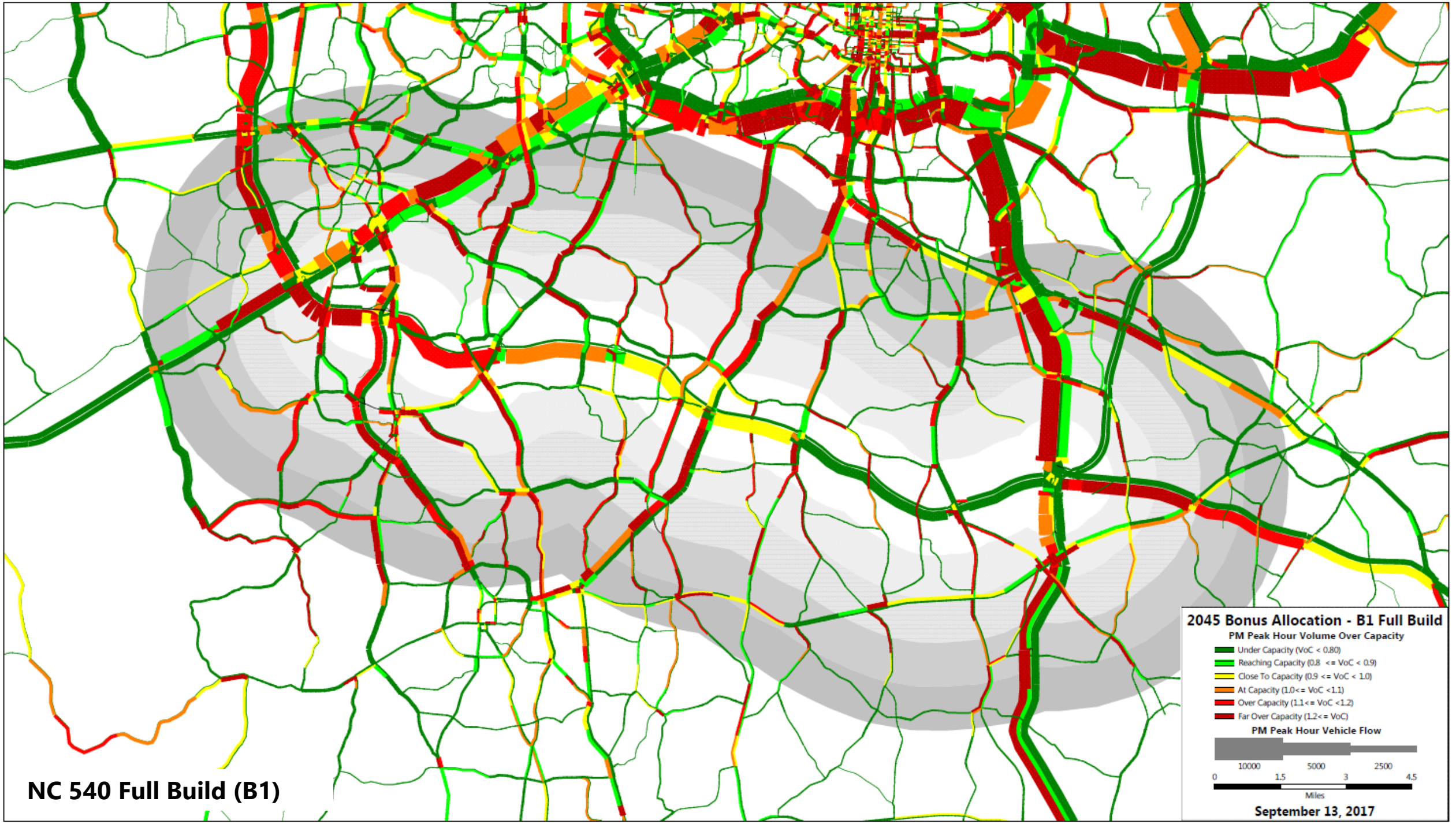


NC 540 Full Build (B1)

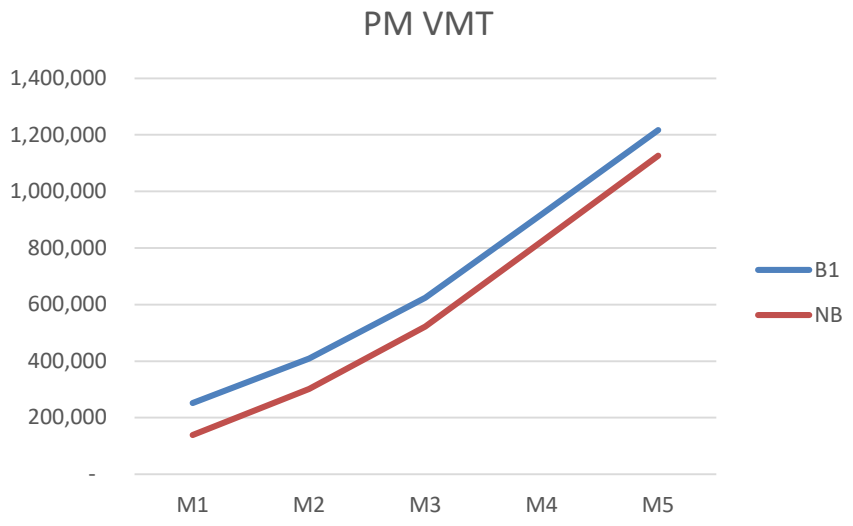


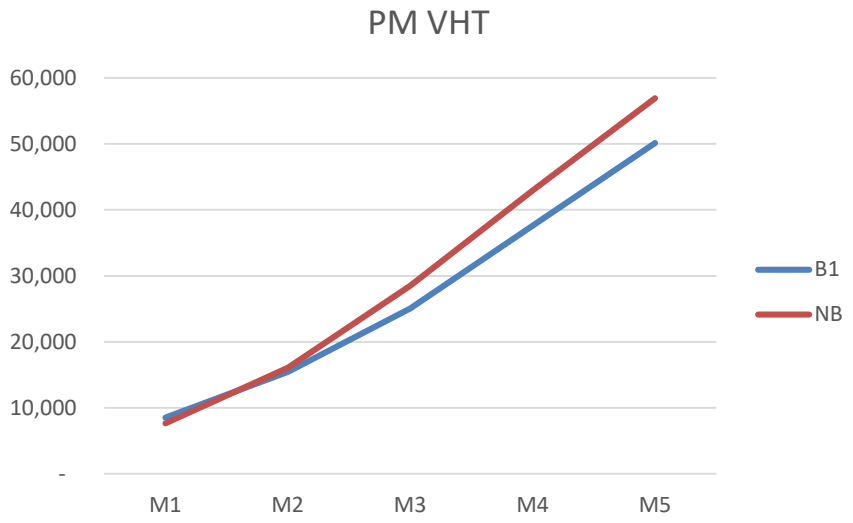
NC 540 Partial Build (B2)

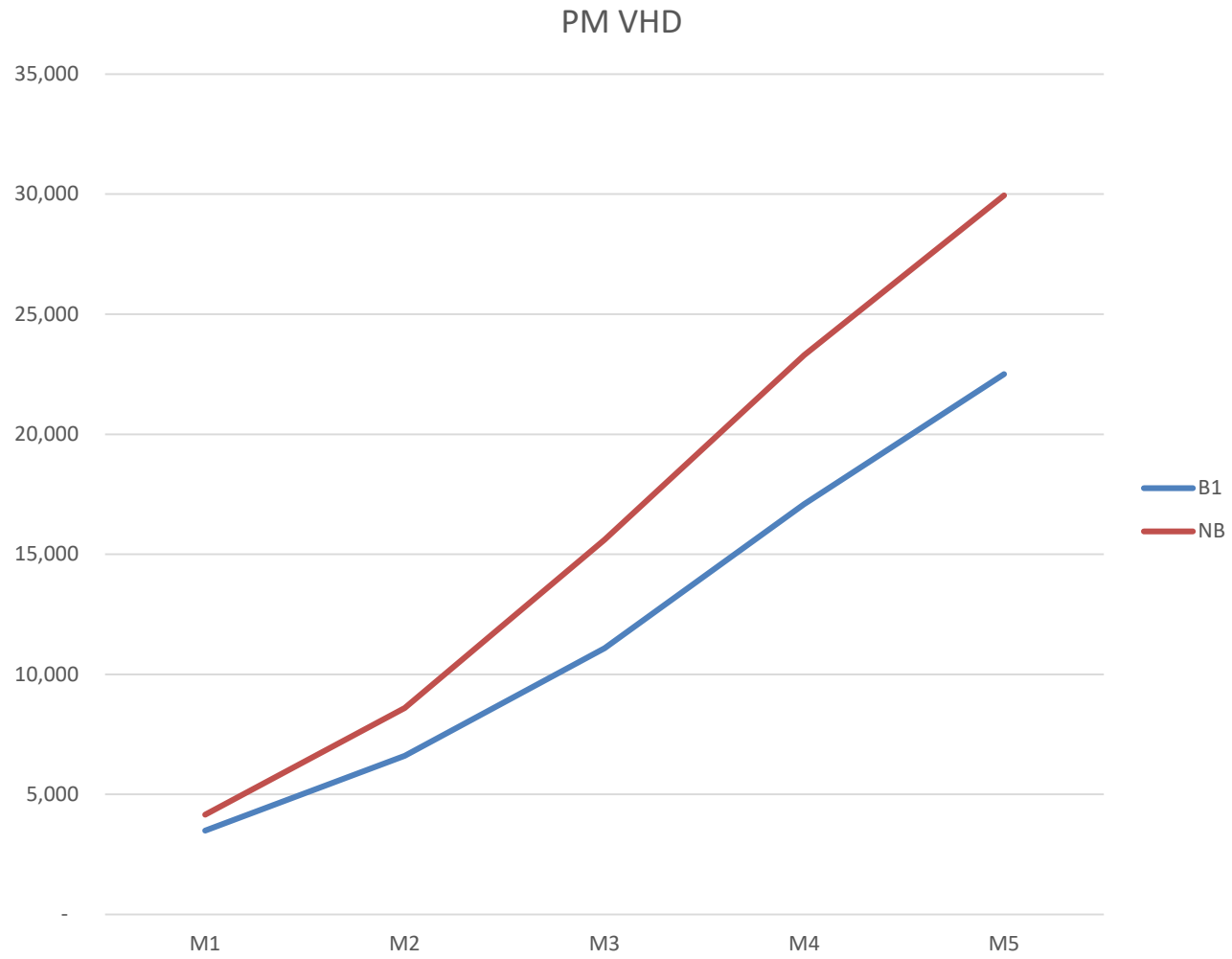

2045 Bonus Allocation - No Build
NC 540
PM Peak Hour Volume Over Capacity
Under Capacity (VoC < 0.8)
Reaching Capacity (0.8 <= VoC < 0.9)
Close To Capacity (0.9 <= VoC < 1.0)
At Capacity (1.0<= VoC <1.1)
Over Capacity (1.1<= VoC <1.2)
Far Over Capacity (1.2<= VoC)
PM Peak Hour Vehicle Flow
10000
5000
2500
0
1.5
3
4.5
Miles
September 13, 2017
NC 540 No - Build


2045 Bonus Allocation - B1 Full Build
PM Peak Hour Volume Over Capacity
Under Capacity (VoC < 0.80)
Reaching Capacity (0.8 <= VoC < 0.9)
Close To Capacity (0.9 <= VoC < 1.0)
At Capacity (1.0<= VoC <1.1)
Over Capacity (1.1<= VoC <1.2)
Far Over Capacity (1.2<= VoC)
PM Peak Hour Vehicle Flow
10000
5000
2500
0
1.5
3
4.5
Miles
September 13, 2017
NC 540 Full Build (B1)

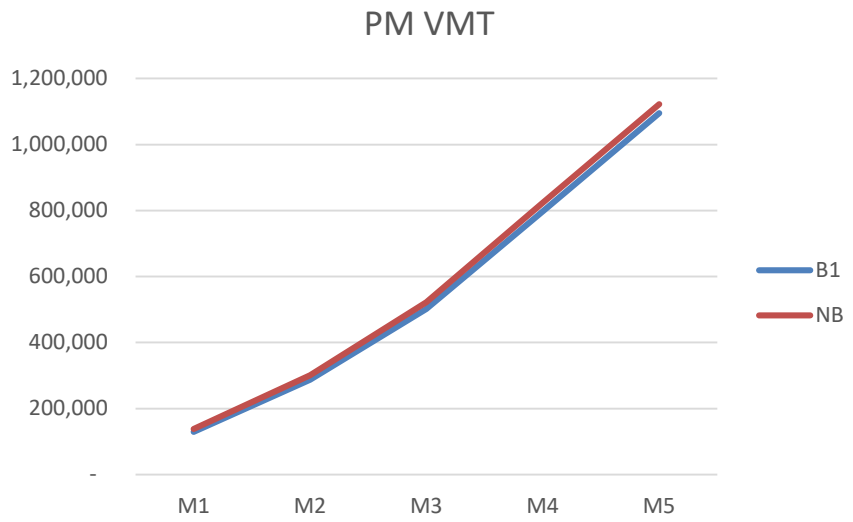
NC 540 Full Build (B1)

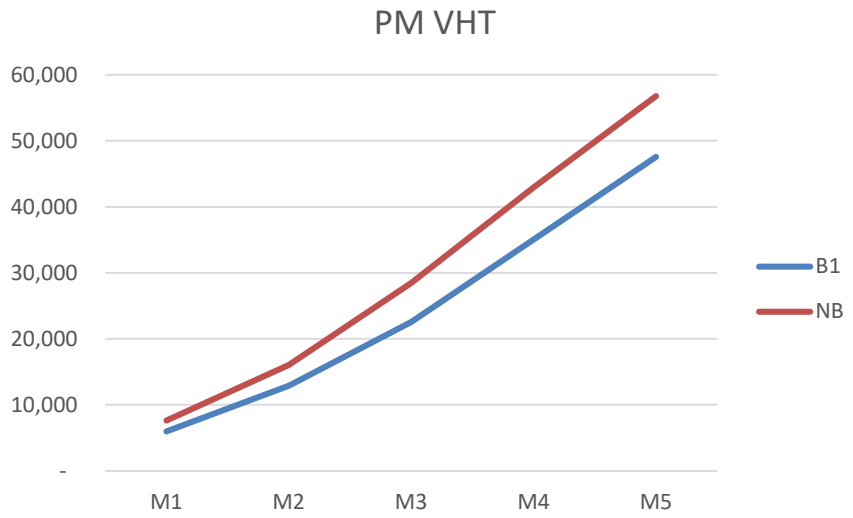


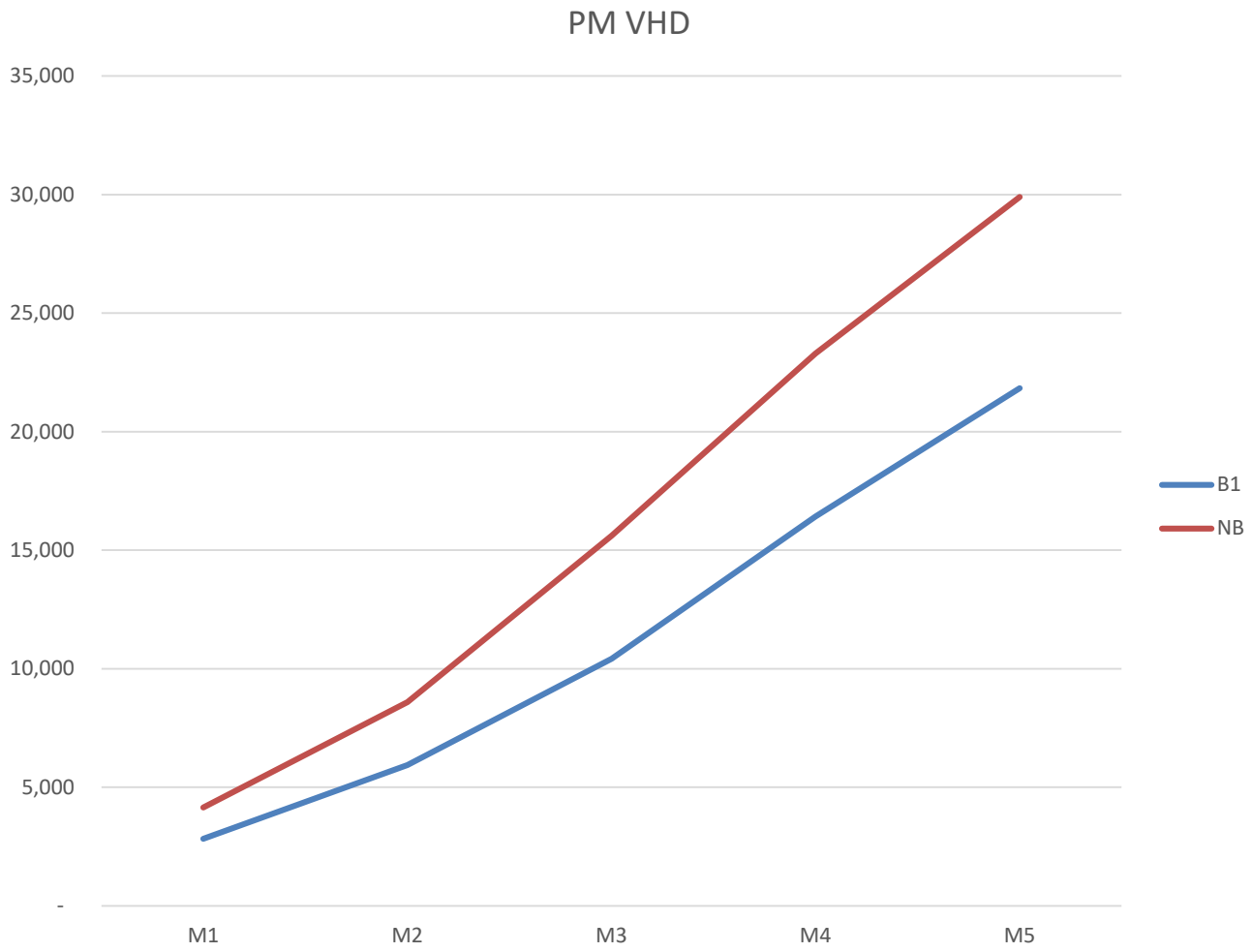




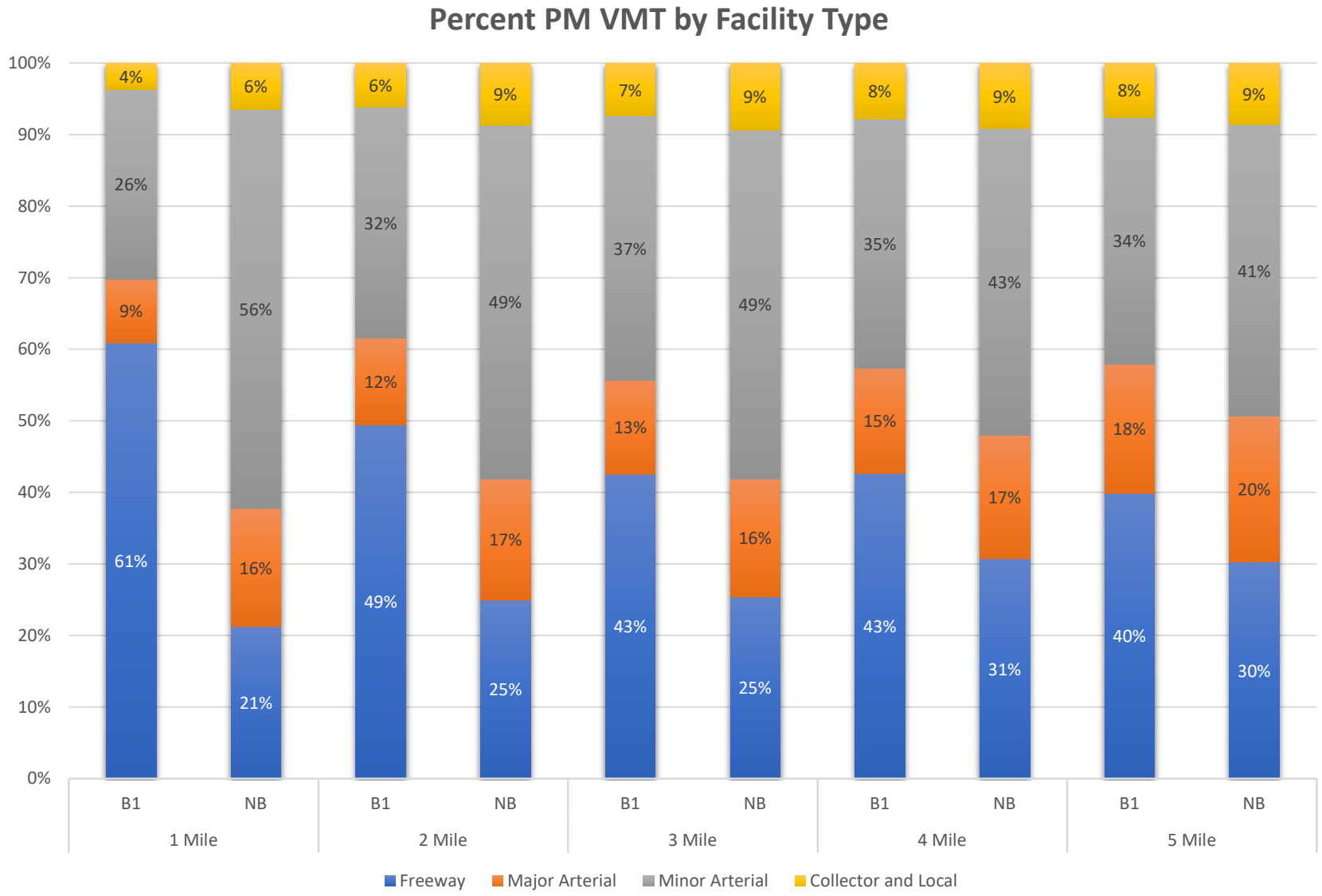
NC 540 Full Build (B1) – Surface Street Comparison



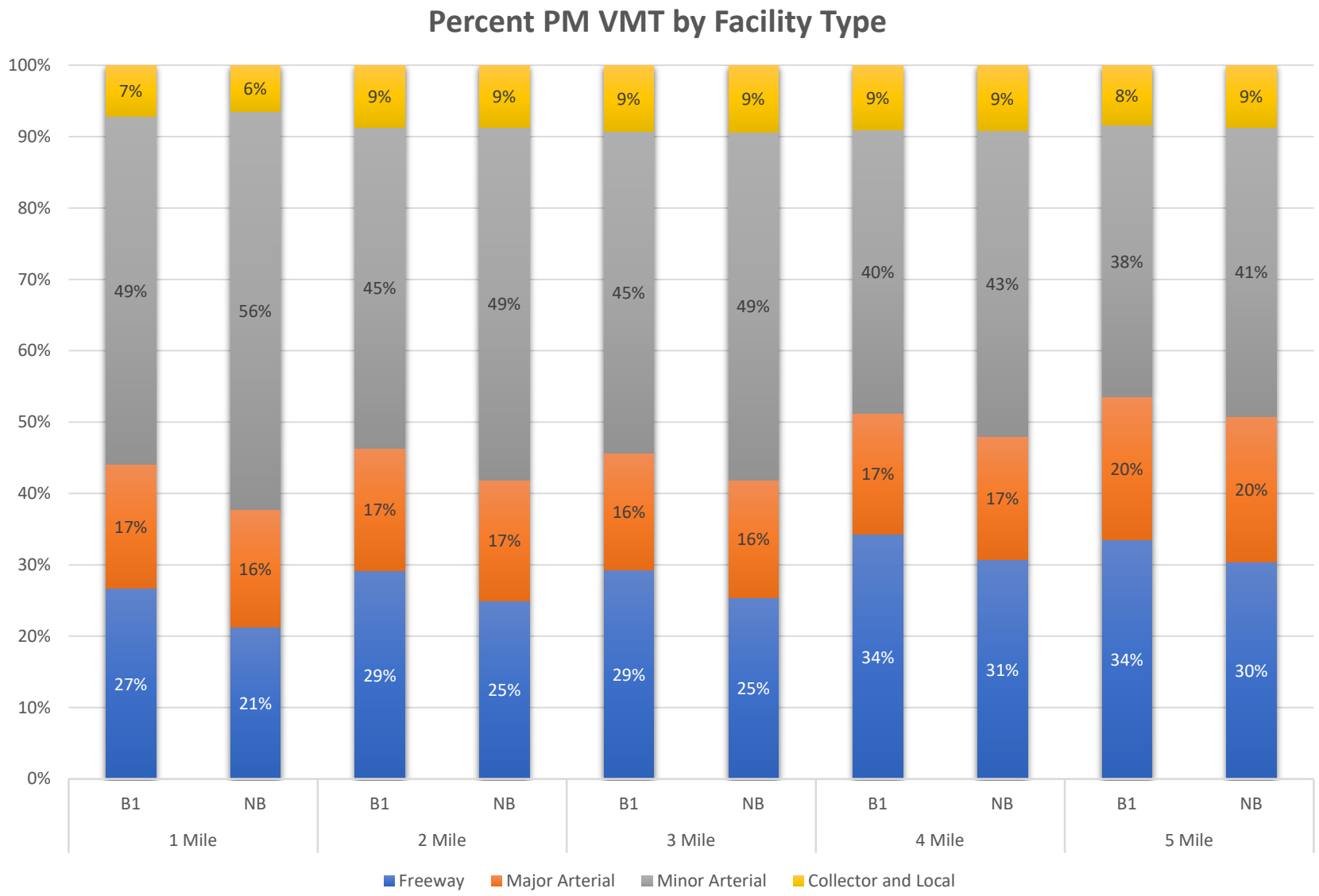




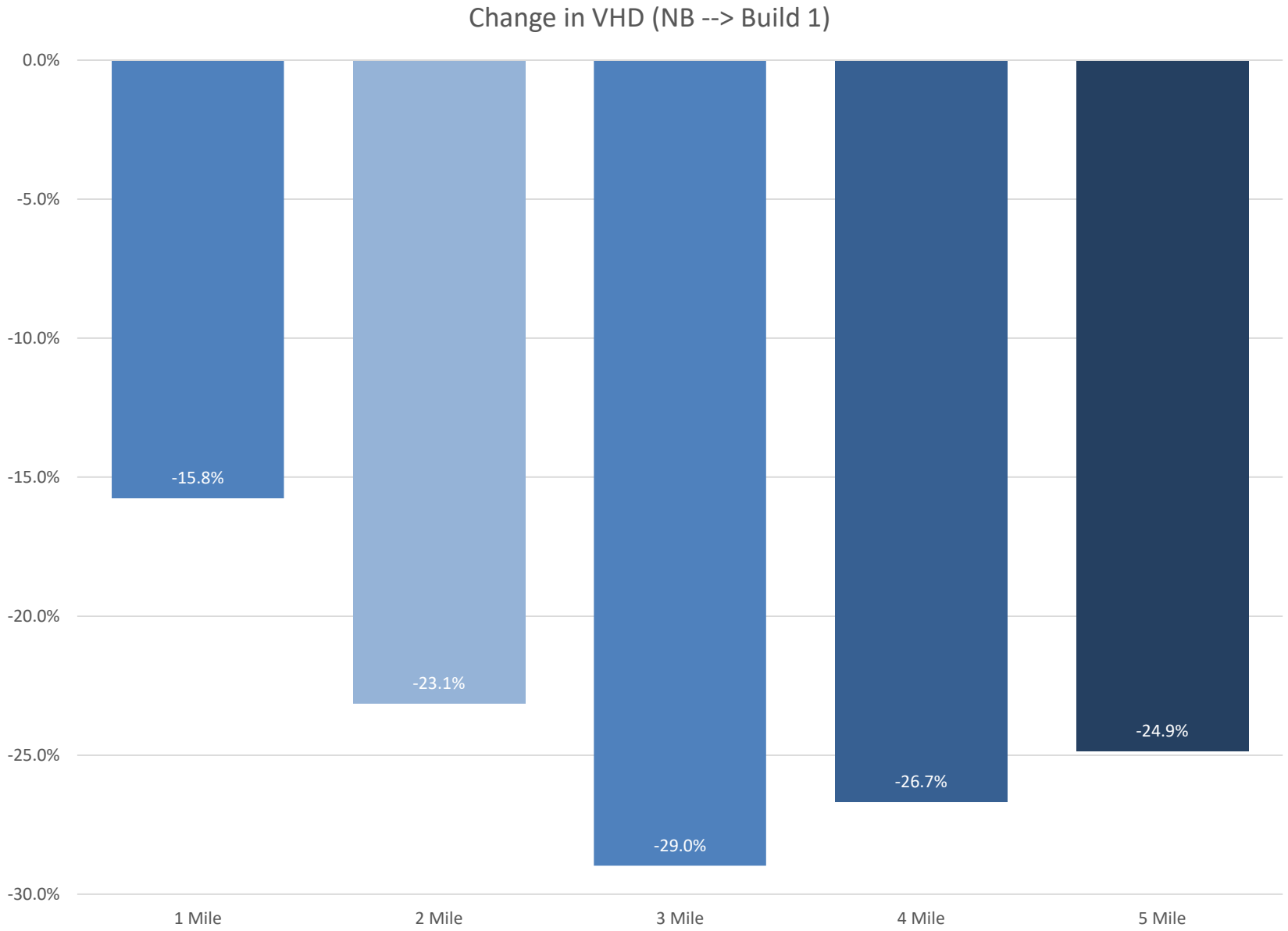
NC 540 Full Build (B1)



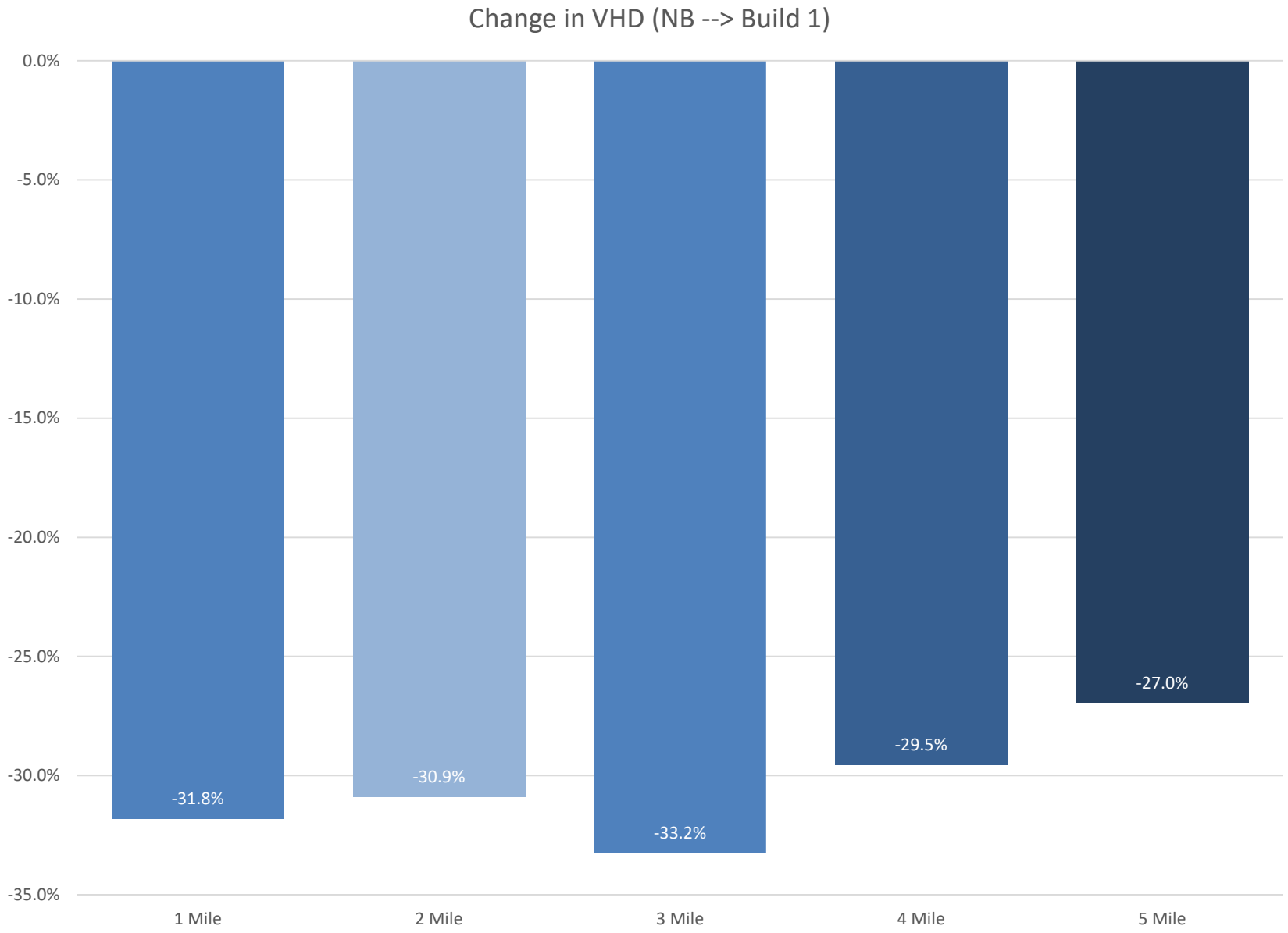
NC 540 Full Build (B1) – Surface Street Comparison



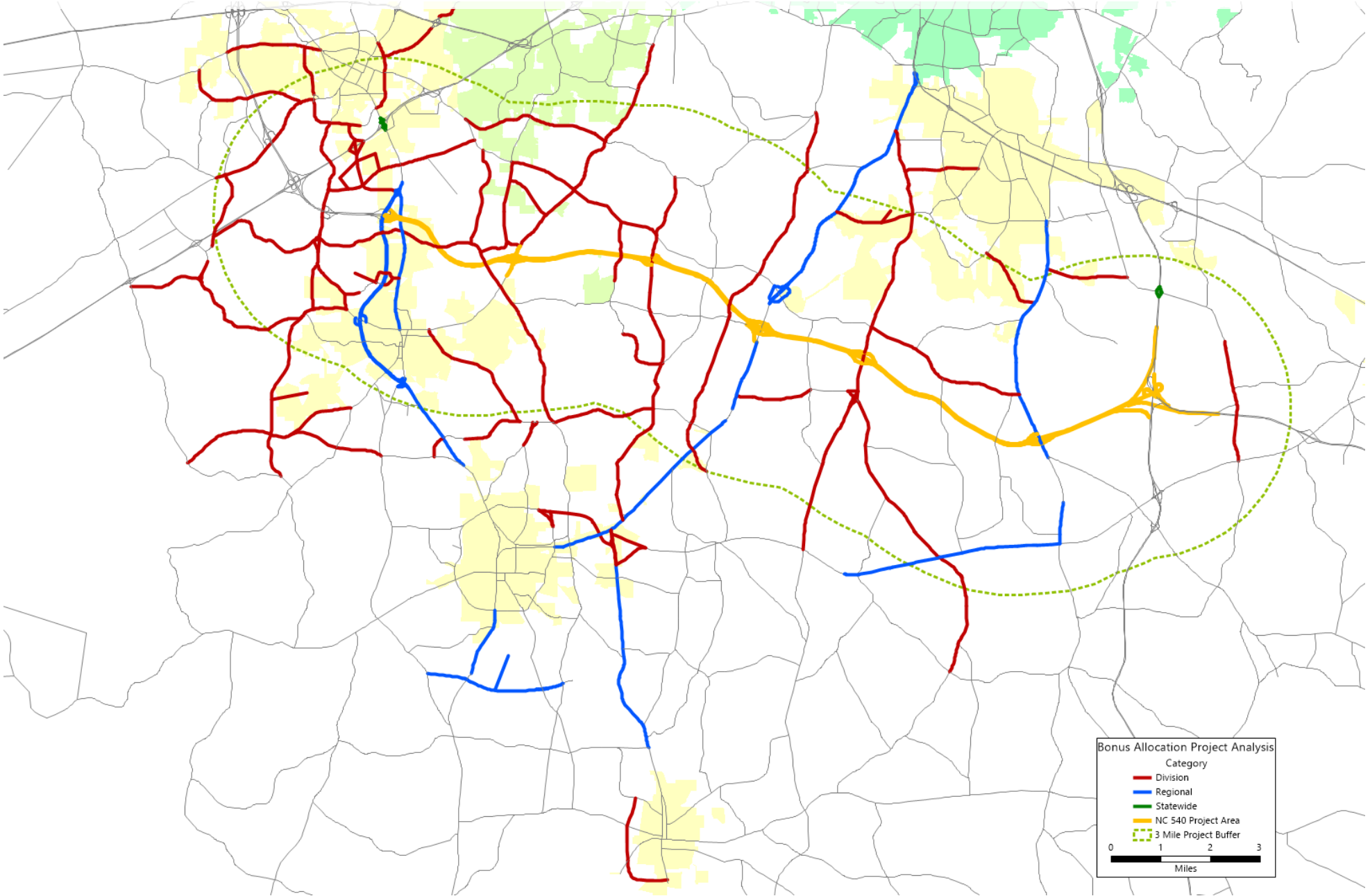
NC 540 Full Build (B1)



NC 540 Full Build (B1) – Surface Street Comparison



Potential Projects for Bonus Allocation Funding



Project Scoring Methodology

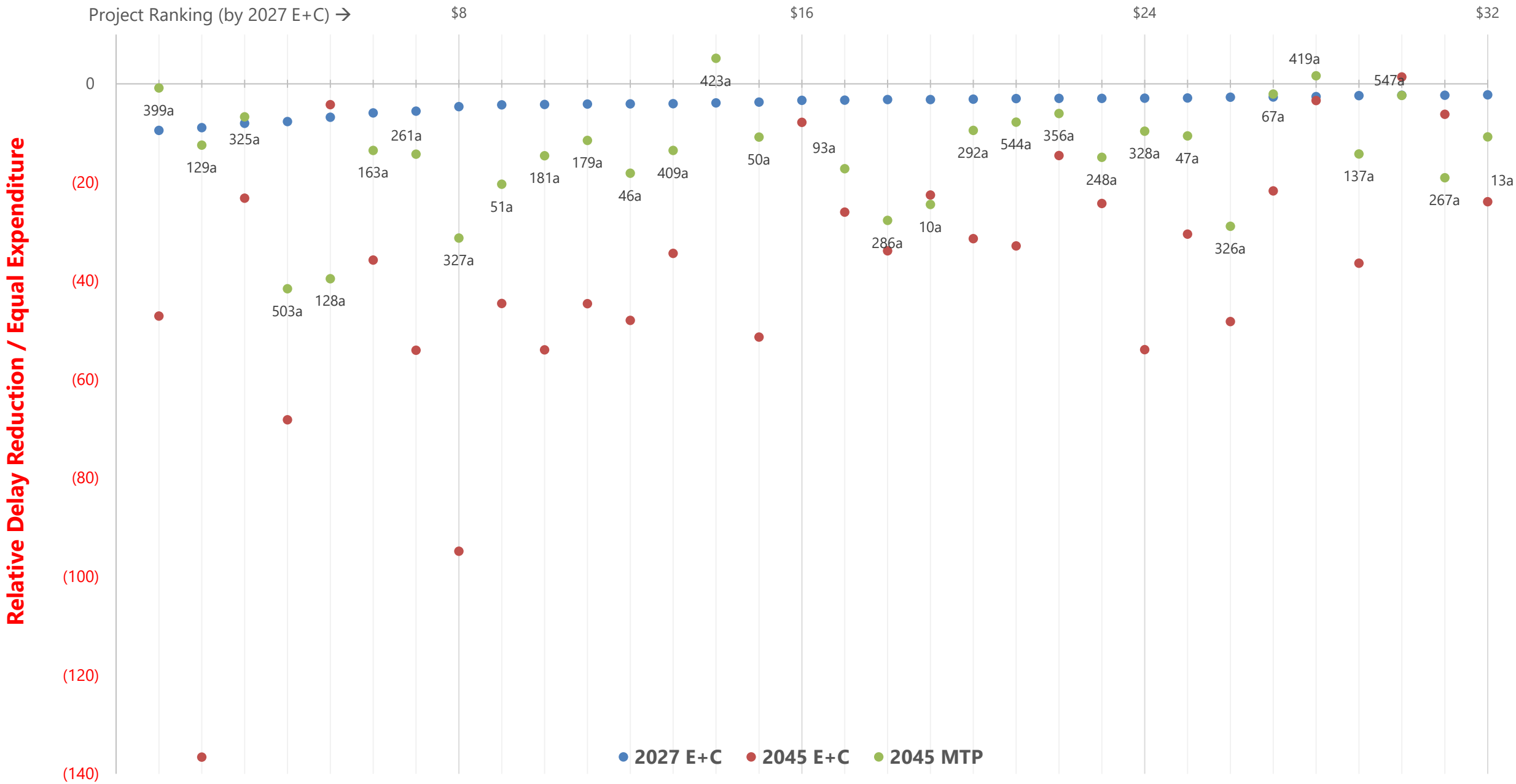
vhb

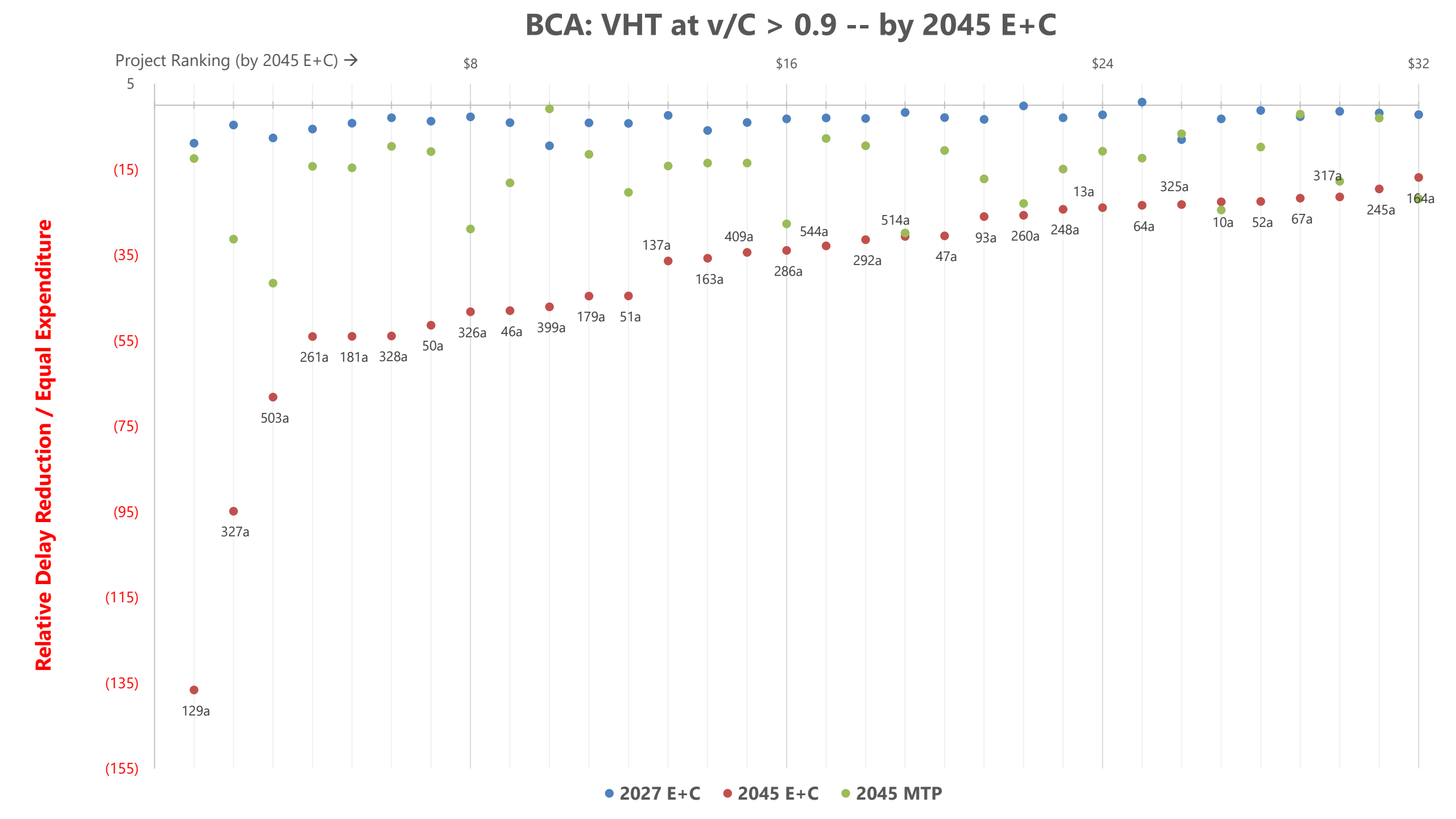
Scenarios

- BCA for VHT on links where v/C >0.90
  - Maximize delay reduction per dollar spent
  - Works best for prioritizing projects within budget constraints

- **2027 E+C**: reduction/project added
  - *Is there an immediate benefit? (highest certainty)*
- **2045 E+C**: reduction/project added
  - *Is there an sustained benefit? (moderate certainty)*
- **2045 MTP**: lost reduction/project removed
  - *Are there dependencies on other projects? (least certainty)*

BCA: VHT at v/C > 0.9 -- by 2027 E+C



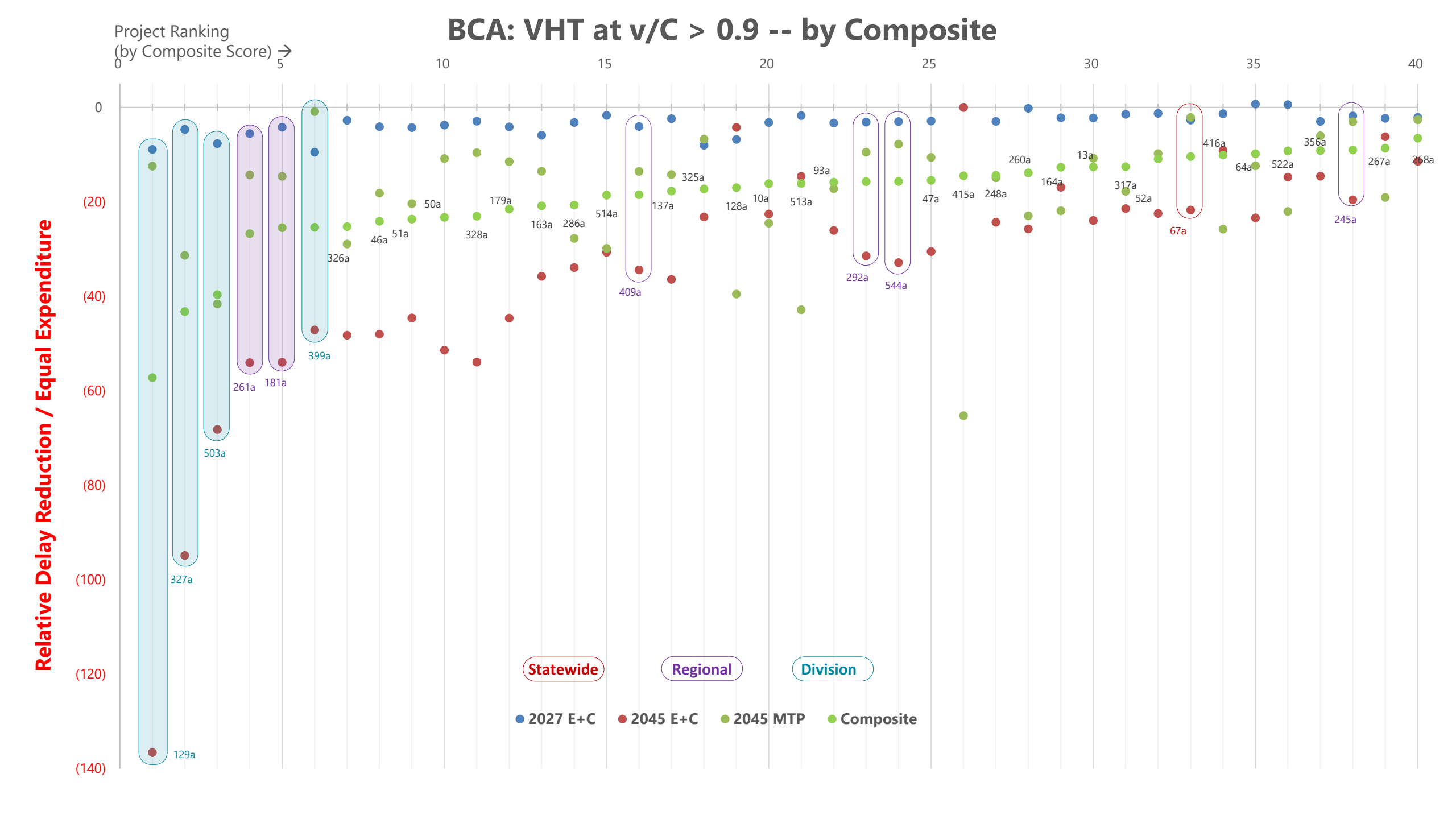

BCA: VHT at v/C > 0.9 -- by 2045 E+C
Project Ranking (by 2045 E+C) →
$8
$16
$24
$32
5
(15)
(35)
(55)
(75)
(95)
(115)
(135)
(155)
Relative Delay Reduction / Equal Expenditure
129a
327a
503a
261a
181a
328a
50a
326a
46a
399a
179a
51a
137a
163a
409a
286a
544a
292a
514a
47a
93a
260a
248a
13a
64a
325a
10a
52a
67a
317a
245a
164a
2027 E+C
2045 E+C
2045 MTP

Analysis

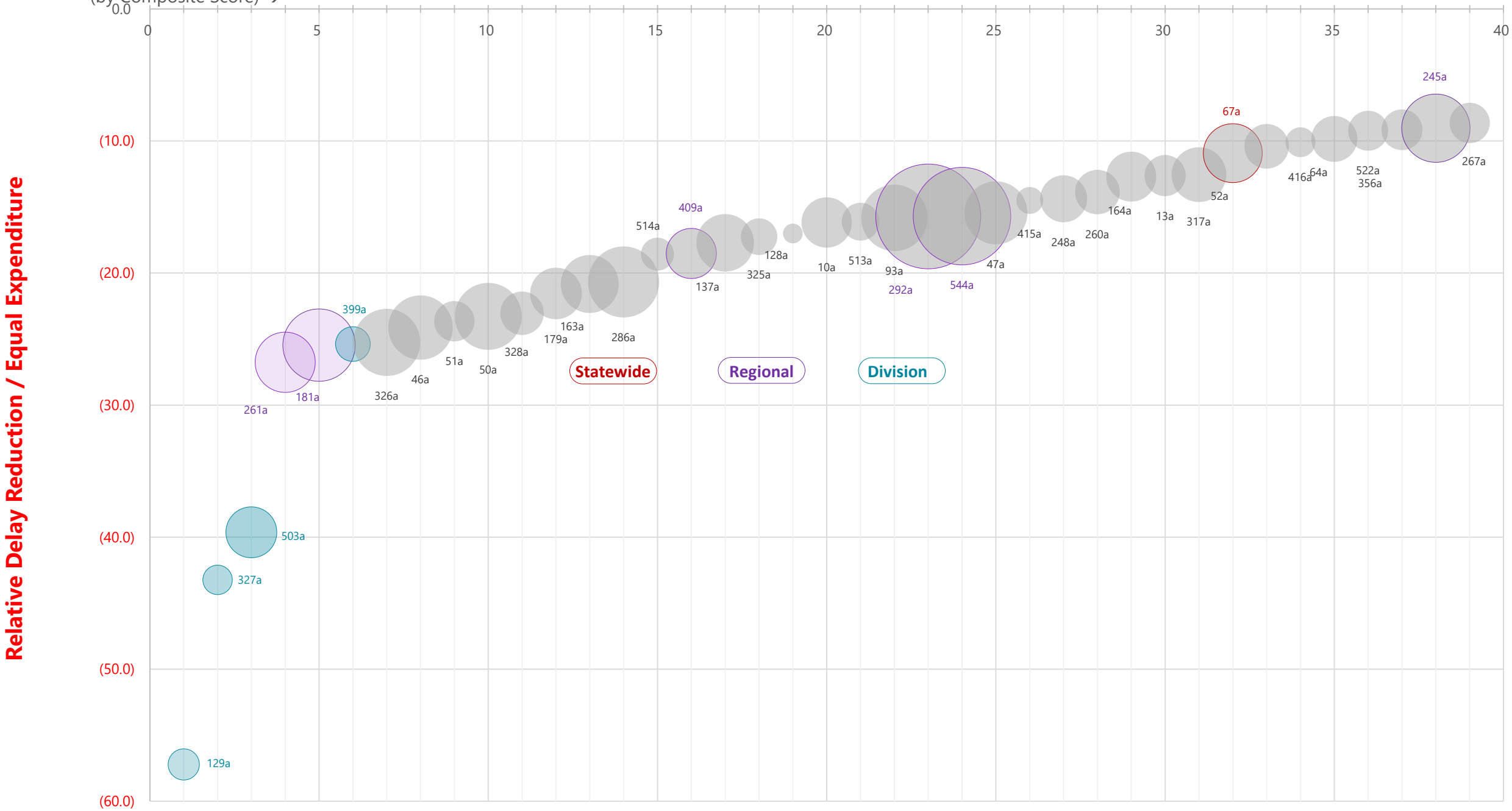
- Composite weighted score
  - *3.00*(2027 E+C reduction in VHT on congested links per $)*
  - *1.00*(2045 E+C reduction in VHT on congested links per $)*
  - *0.67*(2045 MTP reduction in VHT on congested links per $)*

Summed & divided by 3 to scale score

- 2027 E+C
- Discount/eliminate cases where project worsens conditions


BCA: VHT at v/C > 0.9 -- by Composite
Project Ranking
(by Composite Score) →
0
5
10
15
20
25
30
35
40
Relative Delay Reduction / Equal Expenditure
0
(20)
(40)
(60)
(80)
(100)
(120)
(140)
129a
327a
503a
261a
181a
399a
326a
46a
51a
50a
328a
179a
163a
286a
514a
409a
137a
325a
128a
10a
513a
93a
292a
544a
47a
415a
248a
260a
164a
13a
317a
52a
67a
416a
64a
522a
356a
245a
267a
268a
Statewide
Regional
Division
2027 E+C
2045 E+C
2045 MTP
Composite

Project Cost (Area) by Composite Score



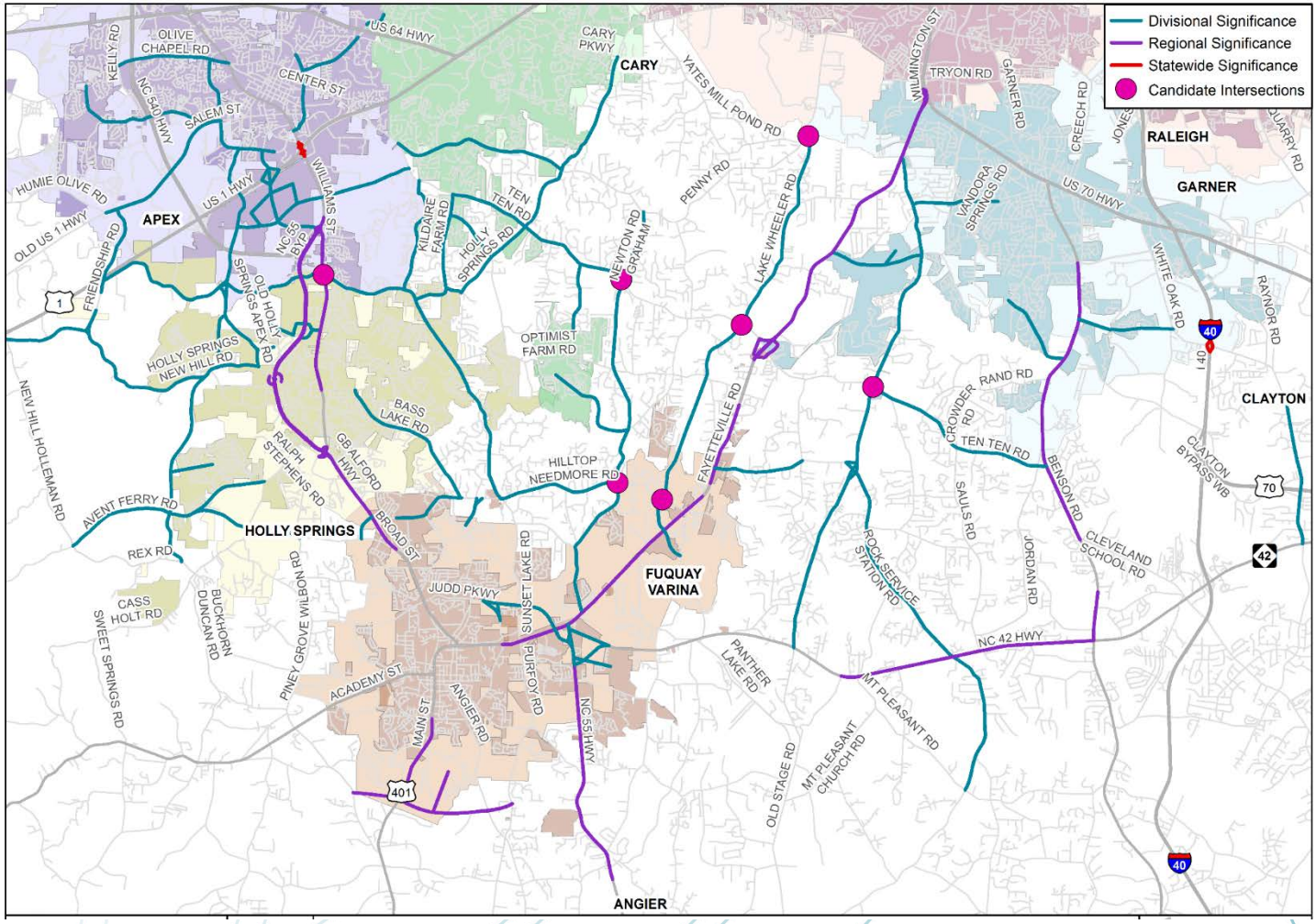
Division and Regional Significance Selected Projects

DIVISION				
Project ID	**Improvement**	**Project Description**	**Cost**	**Project ID**
129a	New Location	Charlotte Avenue	$ 6,856,668	**$ 39,682,993**
327a	Turn Lane	CAMPO Way	$ 6,097,806	
503a	Widening	CRTPO Street	$ 18,224,744	
399a	New Location	Triangle Road	$ 8,503,775	
REGIONAL & STATE				
261a	Widening	NC 2045 (Capital St.)	$ 25,506,804.96	**$ 62,326,502**
181a	Widening	April Way	$ 36,819,697.20	
TOTAL				**$ 102,009,495**

Intersection Projects

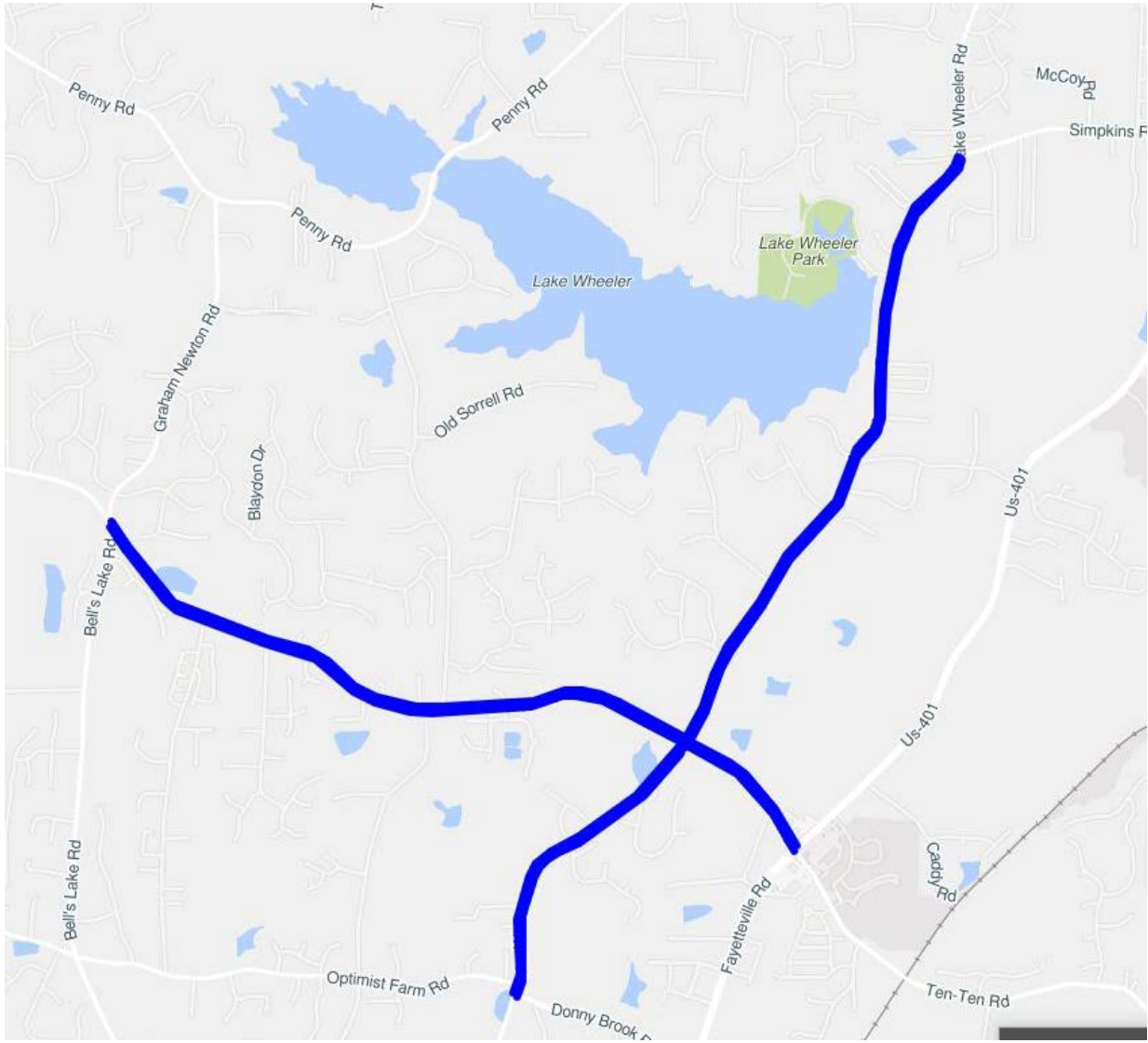
Intersection Projects

- Signalized Intersections
  - 2-lane Roadway intersections,
  - No Turn lanes , or
  - Minimal left turn
- **Base Year Analysis** : difference in delay between
  - No-Build
  - Build by adding
    - Storage lanes
    - Left turn lanes
    - Through Lanes



CAMPO Intersection Analysis

- NCDOT's Signal Retiming Prioritization Tool using Probe Data
  - Signalized or non-signalized intersections
  - Readily available data – HERE travel time data
  - Data & Results are easily understood by decision makers



CAMPO Intersection Analysis

tmc_code	Ave speed (Oct 2018 Wkday)	Speed Limit	AADT (2017)			Travel Time at speed limit (min) to go 1 mile	Travel Time at Ave Spd to go 1 mile	Delay/veh (min)	Delay/day (tot minutes)	Delay/year (mins @260 days)	Delay/year (hours @260 days)
125+14608 Average	38.6	45.0	3,650	SR 1010 at Lake Wheeler	Lake Wheeler NB to SR 1010	1.33	1.55	0.22	806	209,584	3,493
125+14609 Average	40.4	45.0	6,500	SR 1010 at Lake Wheeler	Lake Wheeler NB from SR 1010	1.33	1.48	0.15	980	254,703	4,245
125+14618 Average	29.2	45.0	9,000	SR 1010 at Lake Wheeler	SR 1010 WB to Lake Wheeler	1.33	2.05	0.72	6,485	1,686,138	28,102
125+14619 Average	41.5	45.0	6,000	SR 1010 at Lake Wheeler	SR 1010 WB from Lake Wheeler	1.33	1.44	0.11	666	173,103	2,885
125-14607 Average	42.1	45.0	3,650	SR 1010 at Lake Wheeler	Lake Wheeler SB from SR 1010	1.33	1.43	0.09	338	87,998	1,467
125-14608 Average	39.7	45.0	6,500	SR 1010 at Lake Wheeler	Lake Wheeler SB to SR 1010	1.33	1.51	0.18	1,161	301,869	5,031
125-14617 Average	24.8	45.0	9,000	SR 1010 at Lake Wheeler	SR 1010 EB from Lake Wheeler	1.33	2.42	1.08	9,736	2,531,341	42,189
125-14618 Average	40.5	45.0	6,000	SR 1010 at Lake Wheeler	SR 1010 EB to Lake Wheeler	1.33	1.48	0.15	898	233,504	3,892
	37.1	45.0	50,300	SR 1010 at Lake Wheeler		1.33	1.67	2.71	21,070	5,478,240	91,304
				SR 1010 at Lake Wheeler				162.35	ave seconds delay per vehicle/ day		

CAMPO BA Methodology – Next Steps

- Complete Intersection Analysis
  - NCDOT's Signal Retiming Prioritization Tool using Probe Data
  - TransModeler Analysis
  - Compare BCA & VHT for TRM projects vs Intersections
- Policy Decision to assign percentage of BA funds to intersections
- MPO Ex. Board to approve BA projects in August & approve 2020-2029 TIP

Findings and Recommendation

- TRM Composite Scoring
  - Projects yielding significant immediate and long-term benefits are the most attractive
  - Projects whose benefits decline (or grow minimally) over time may or may not be justified
  - Benefits were typically less than for the 2045 E+C analysis
  - Projects providing minimal immediate and long-term benefits are the least desirable
  - Could be used for analyzing MTP projects
  - Could be used for selecting SPOT candidate projects
- Intersection Analysis
  - Difficulties comparing back to TRM metrics
  - Investment Mix: % Regional, % Division, % Intersections

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