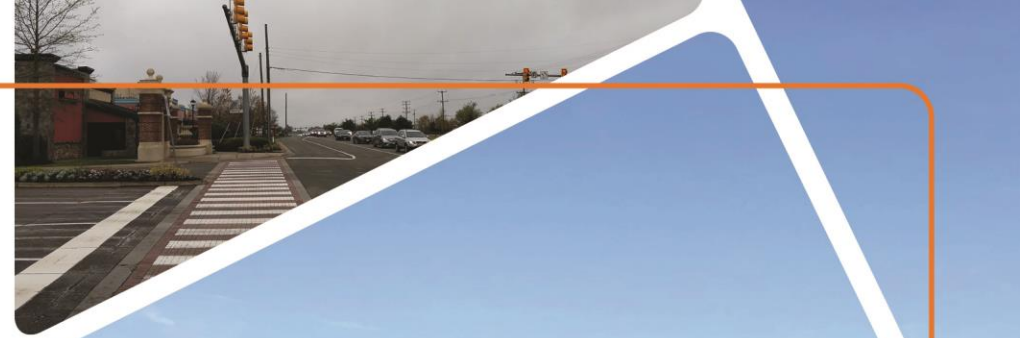


JUNE 13, 2024

# How Many Improvements Does It Take To “Fix” Short Pump?

## Short Pump Area IAR

Terrell Hughes, Henrico County  
Mark Herman, Kimley-Horn





# Introduction to Short Pump



T.J. Maxx  
Wegmans  
Burlington  
CVS Pharmacy  
ALDI

Macy's  
The Cheesecake Factory  
Texas de Brazil  
Chick-fil-A  
Dillard's

Walmart Supercenter  
Panda Express  
McDonald's  
Sonic Drive-In  
World Market  
Best Buy

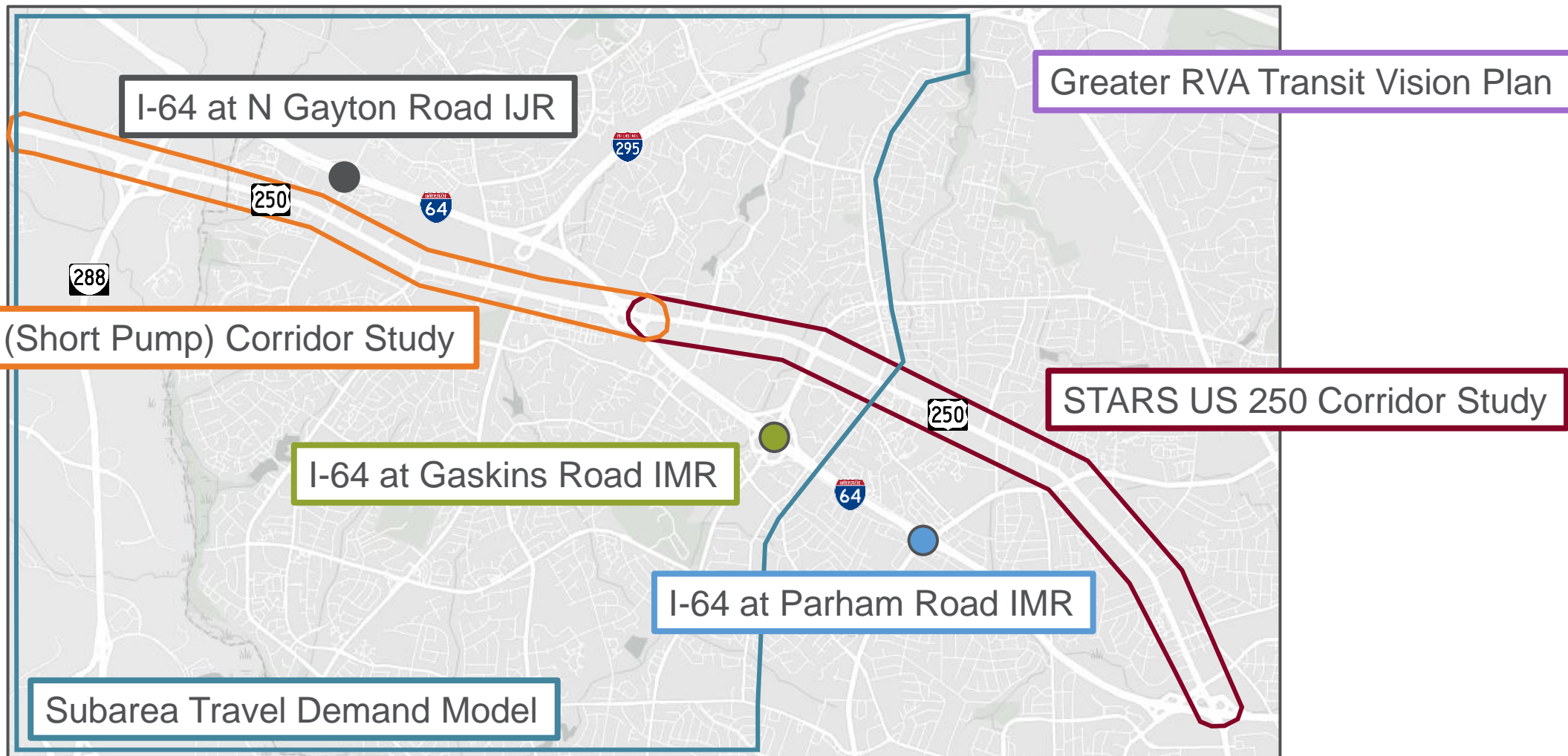
Ethan Allen  
BJ's Restaurants and Brewhouse  
The Honey Baked Ham Company

Ulta Beauty  
Trader Joe's  
Dave & Buster's  
Whole Foods Market  
REI  
Home Goods

**SHORT PUMP** | Henrico County, VA



# Prior Studies Completed



# Project Purpose

Improve safety  
at hot spots

Reduce recurring  
congestion

Address  
capacity-constrained  
roadways

# Safety Problem Statement

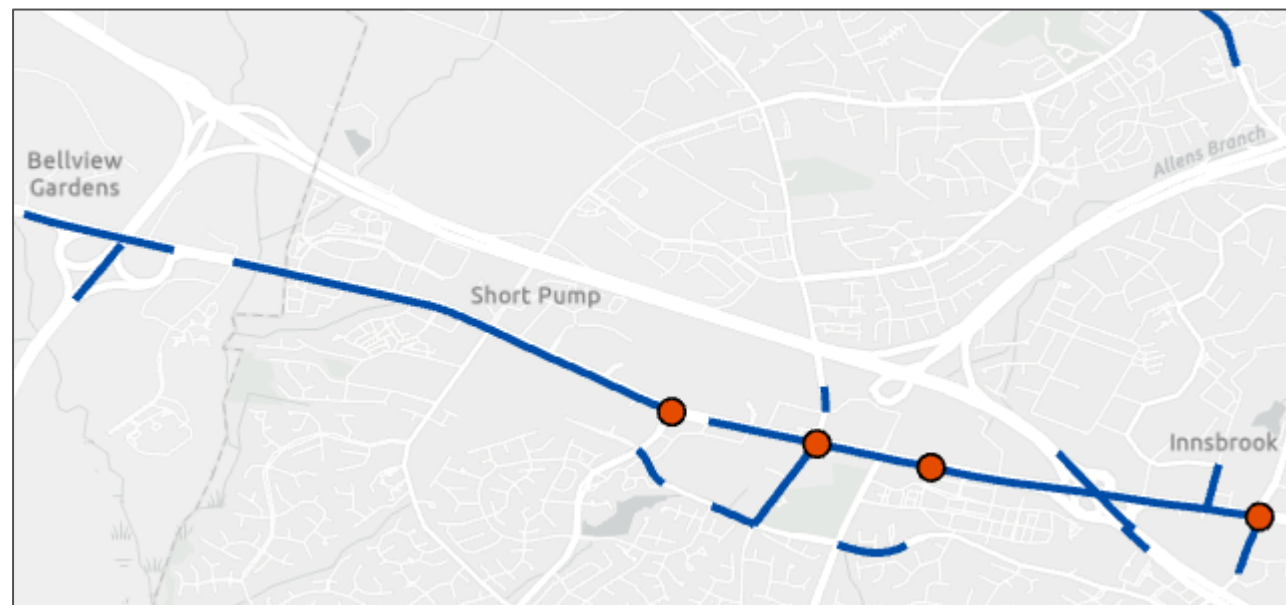
January 17, 2017–  
October 26, 2022

- **1,851 crashes**
  - 7 fatal crashes
  - 492 injury crashes
- **9,514 calls for service**

2016–2020 PSI  
rankings  
(Richmond District)

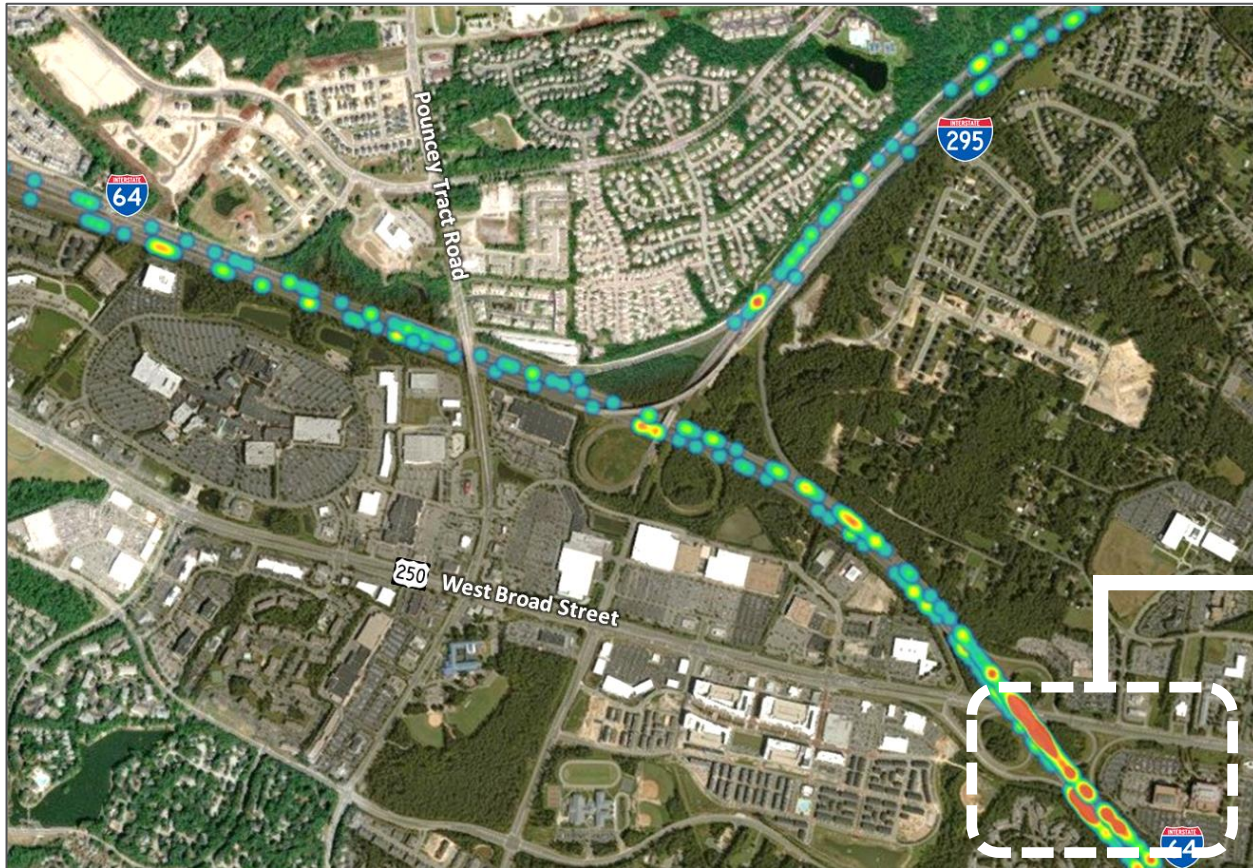
- **1<sup>st</sup>** ranked intersection
- **9<sup>th</sup>** ranked intersection
- **8 segments** totaling 2 miles ranking in **top 10 miles**

2016–2020 PSI Segments and Intersections



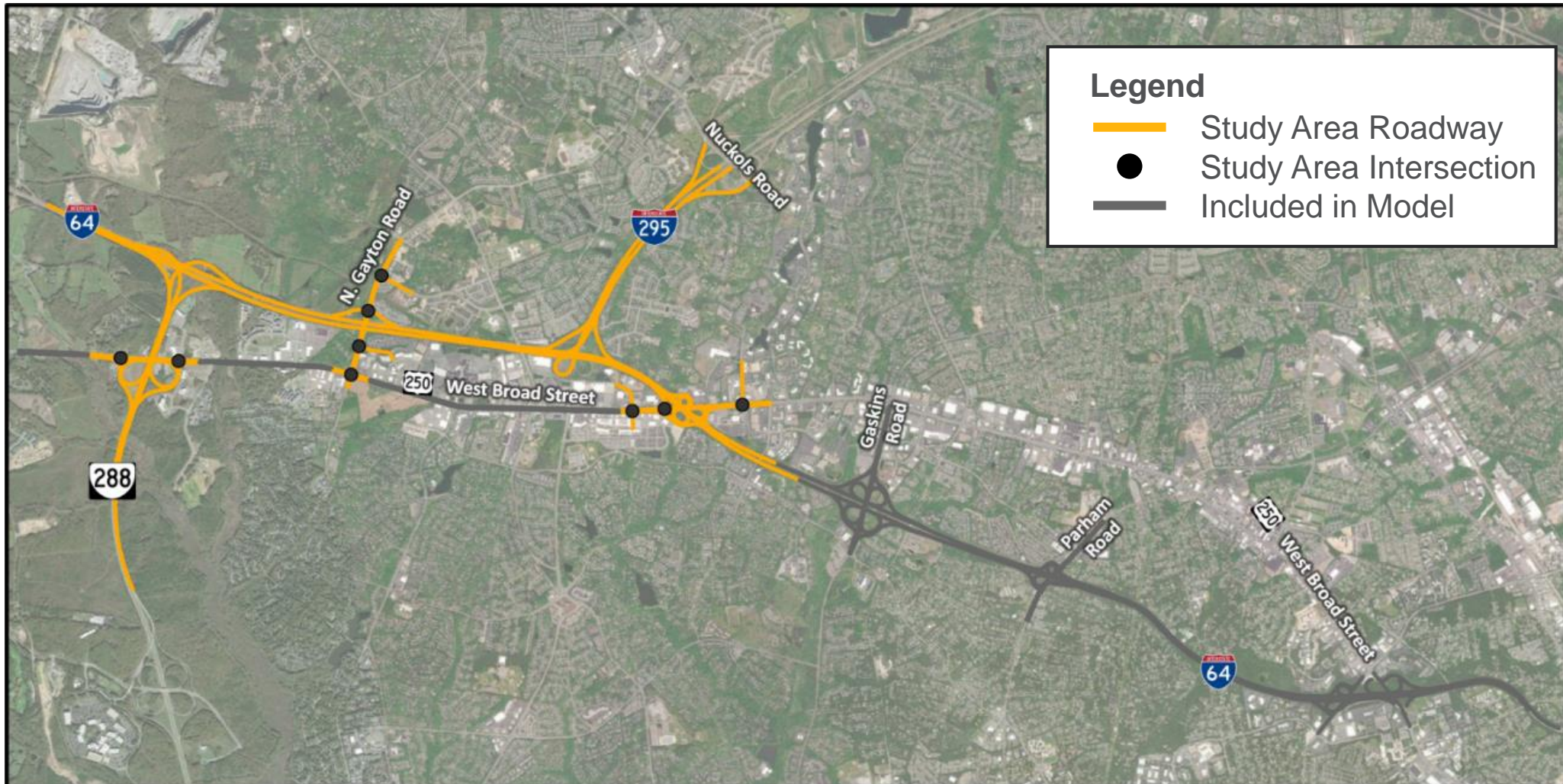


# I-64 Crash Hot Spot

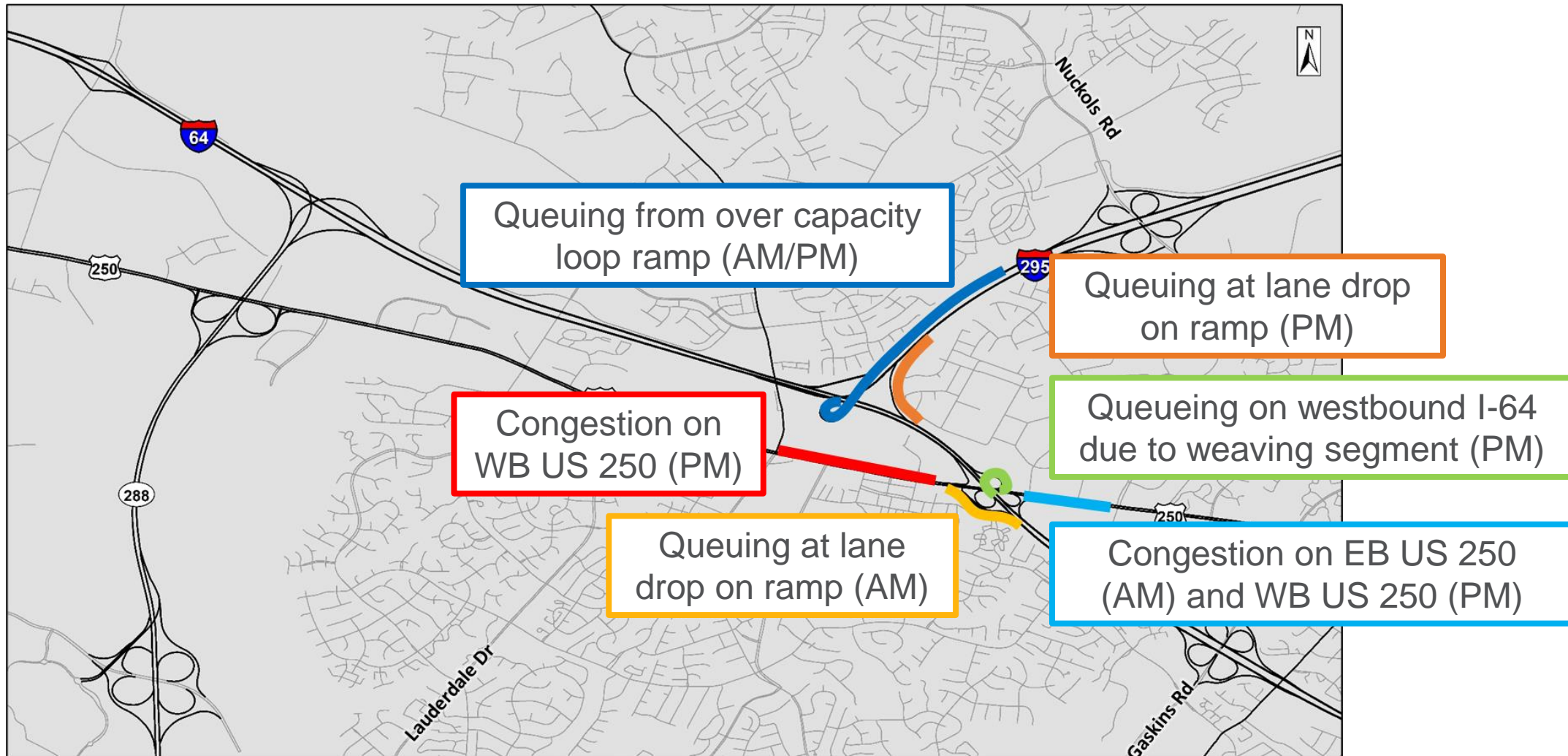




# Study and Modeling Areas

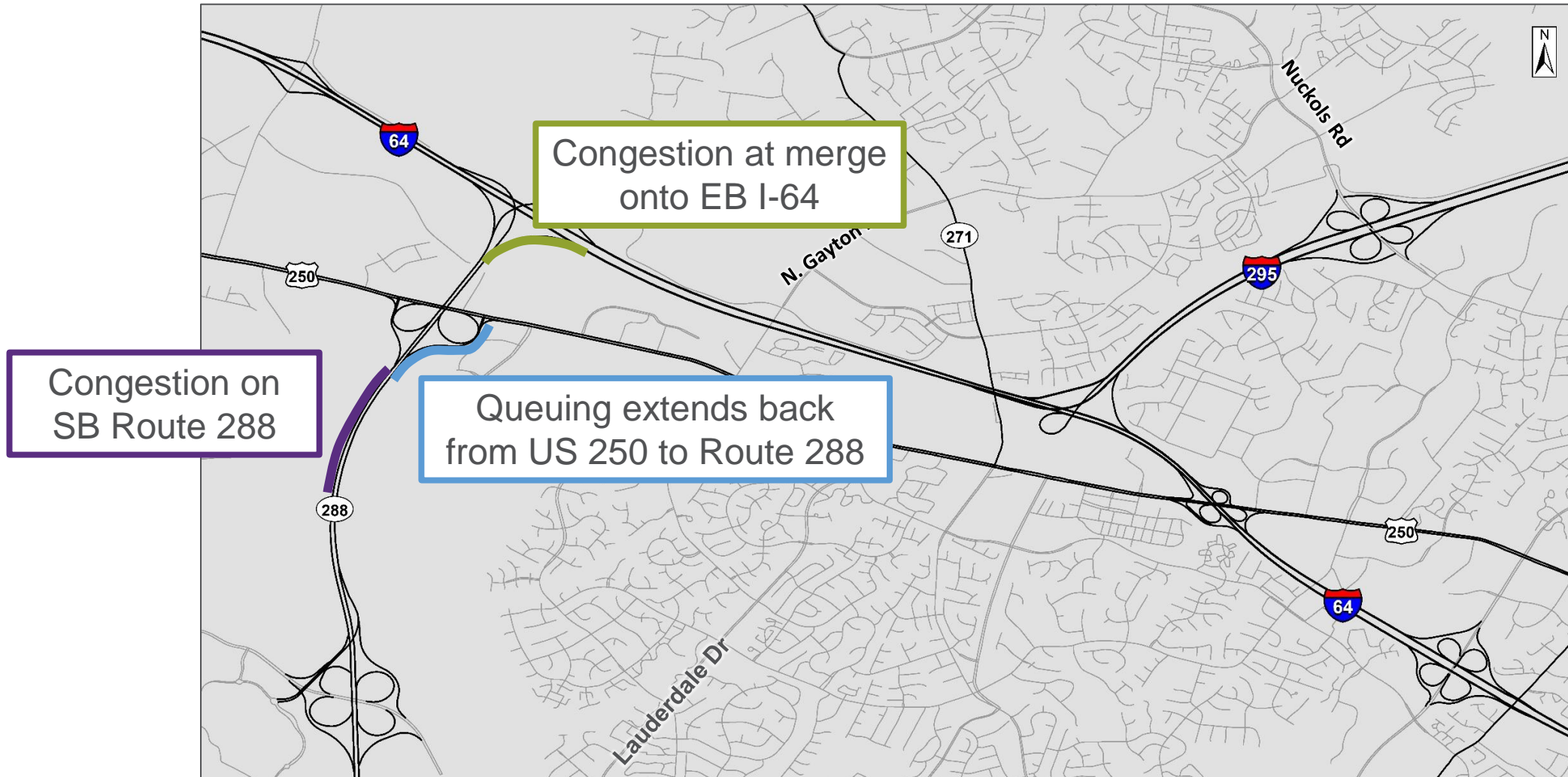


# Key Existing Operational Issues

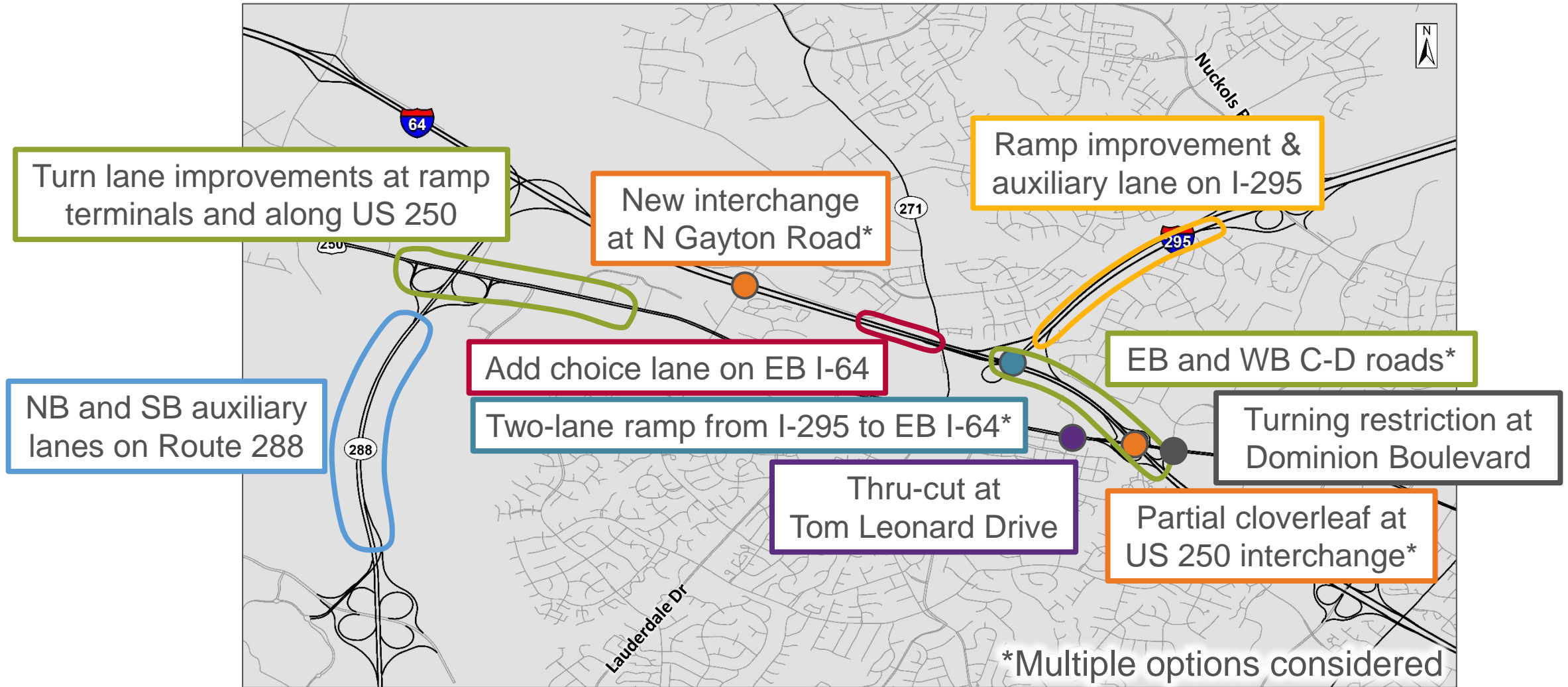




# New Operational Issues – Future Years

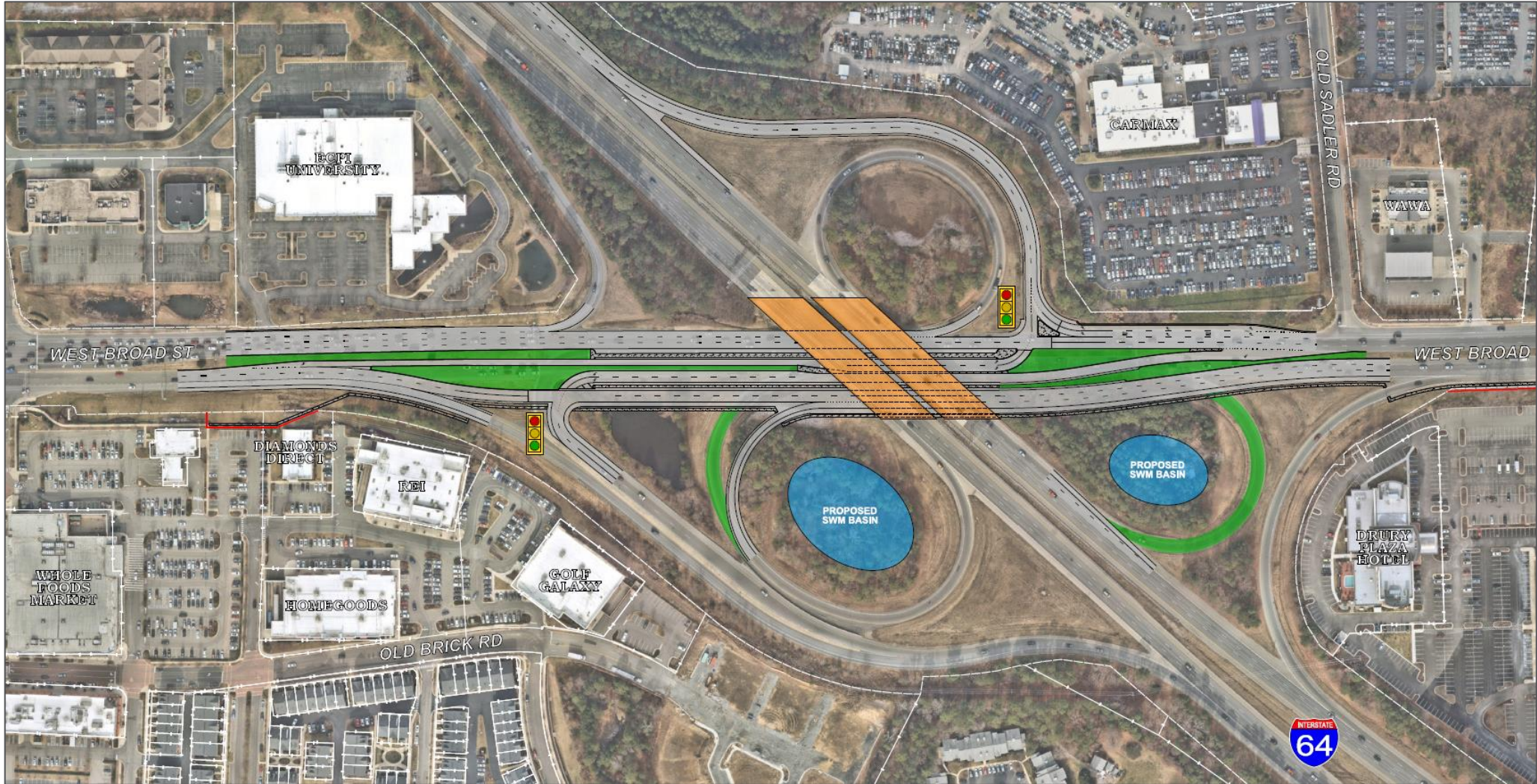


# Concepts Considered



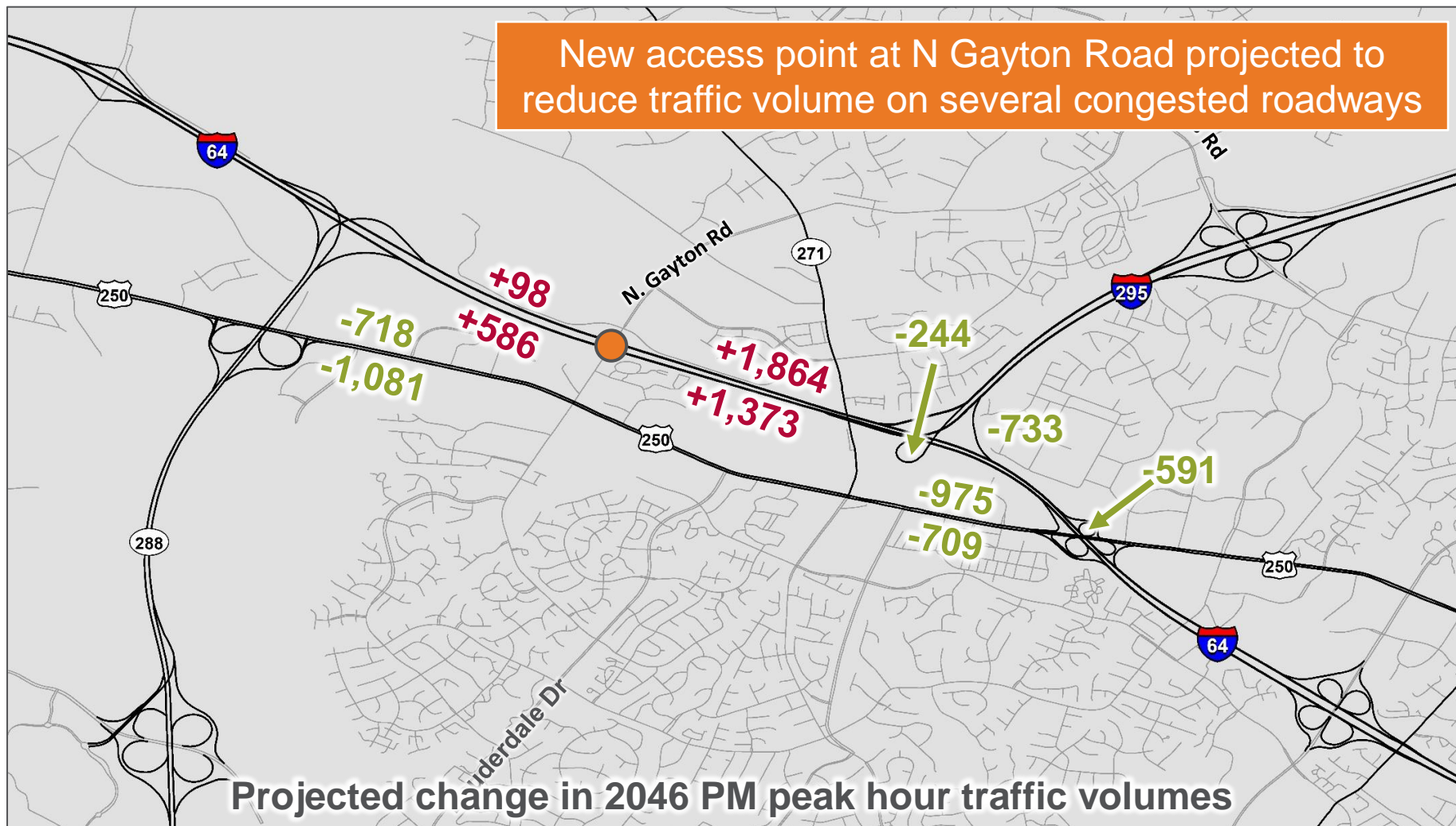


# Proposed Partial Cloverleaf at US 250





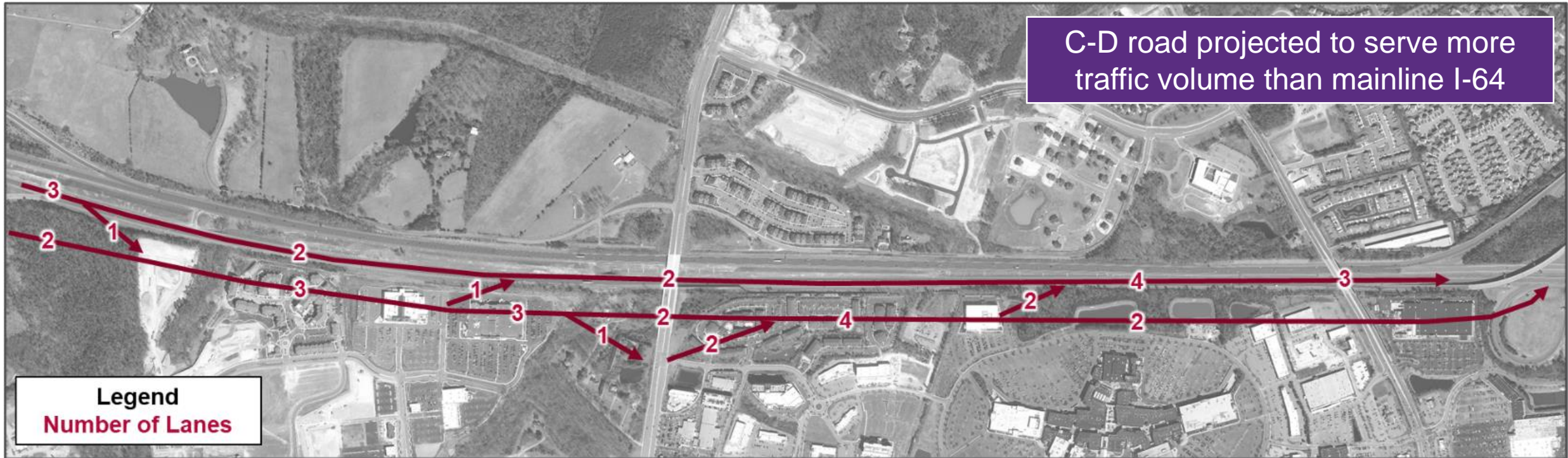
# New Interchange: Changes in Volumes





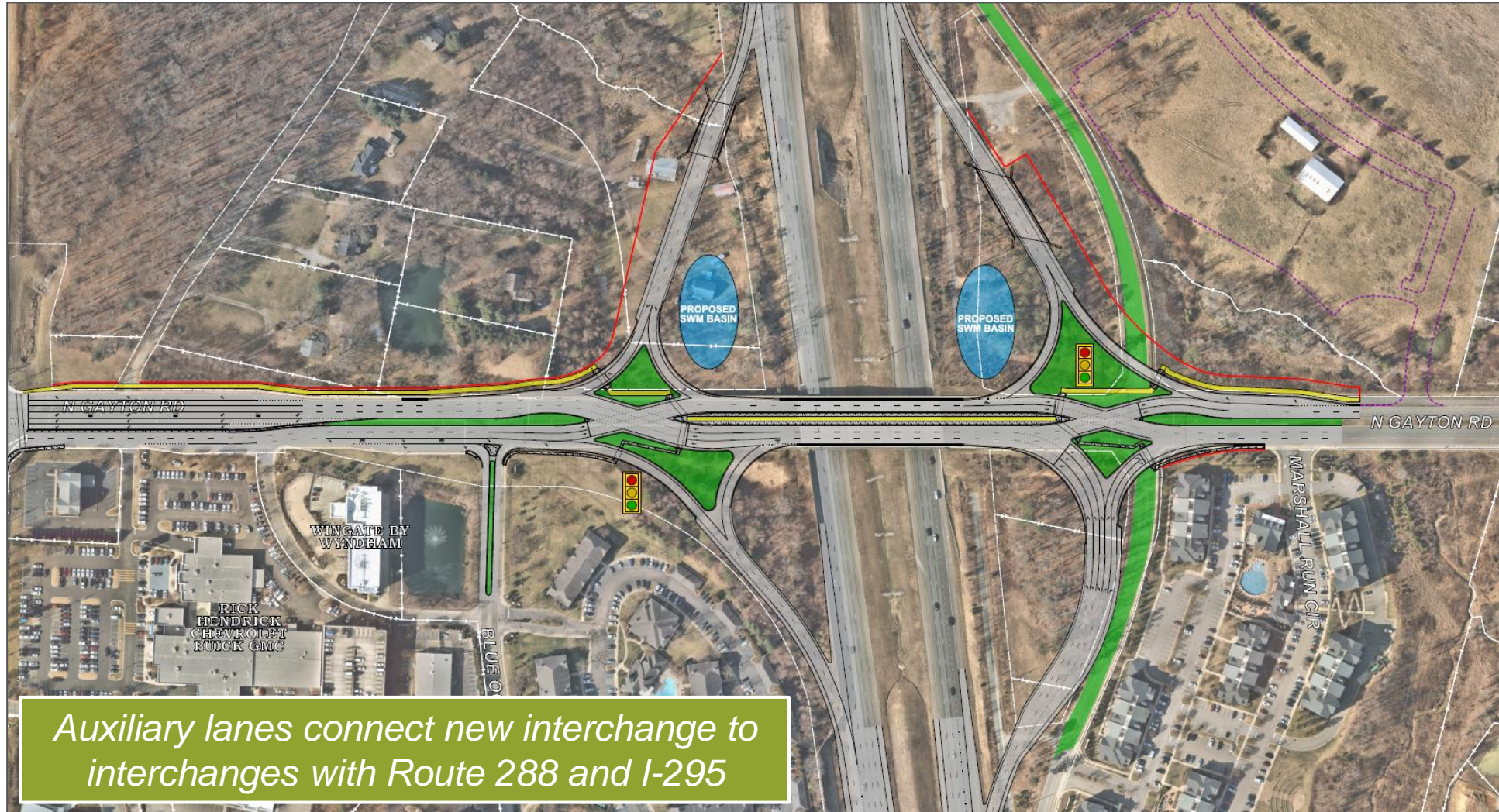
# New Interchange Screening

- Constrained with maintaining existing bridge on N Gayton Road
- Compared full and partial C-D road concepts against auxiliary lanes





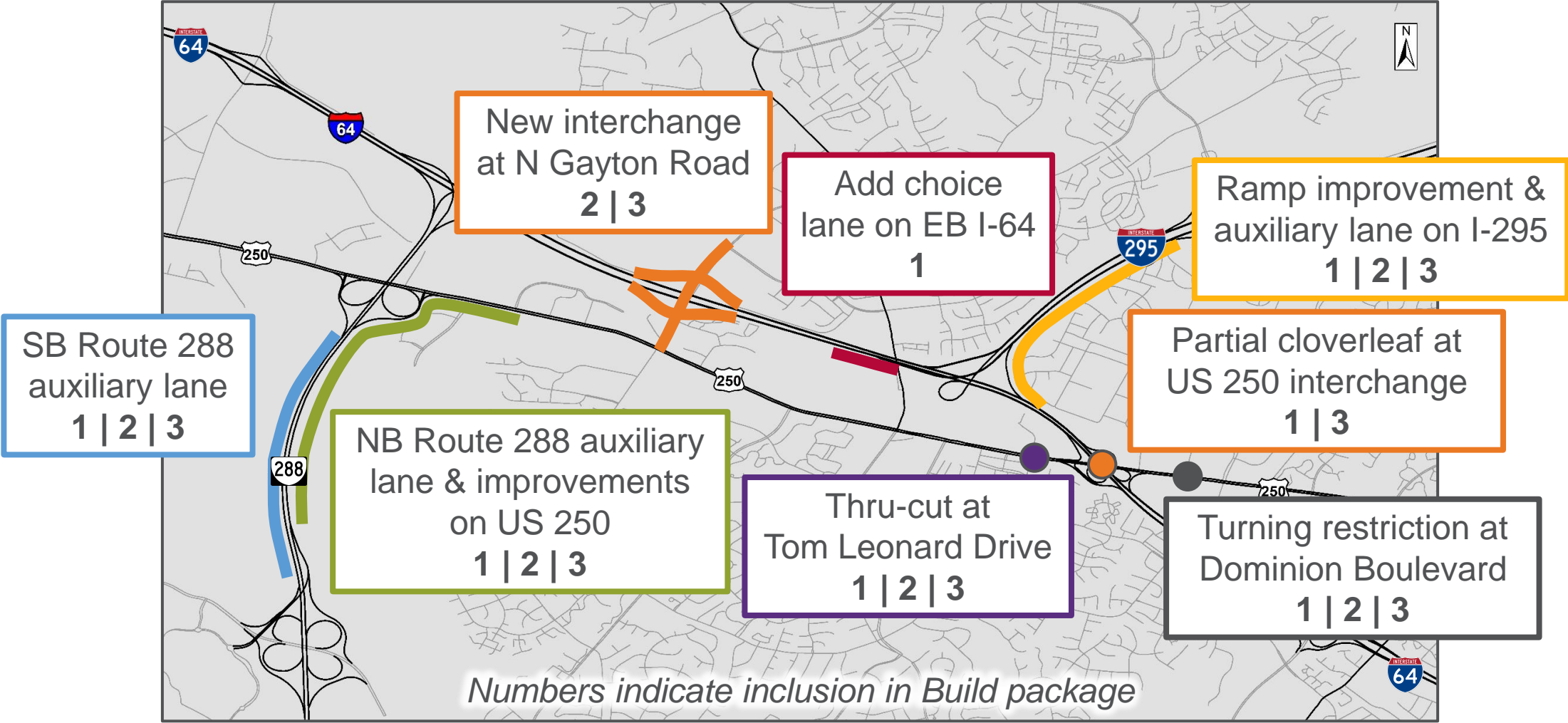
# Proposed DDI at N Gayton Road



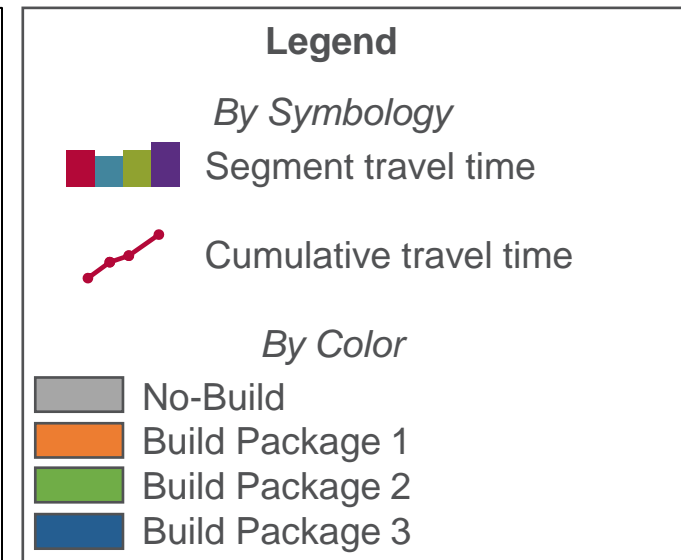
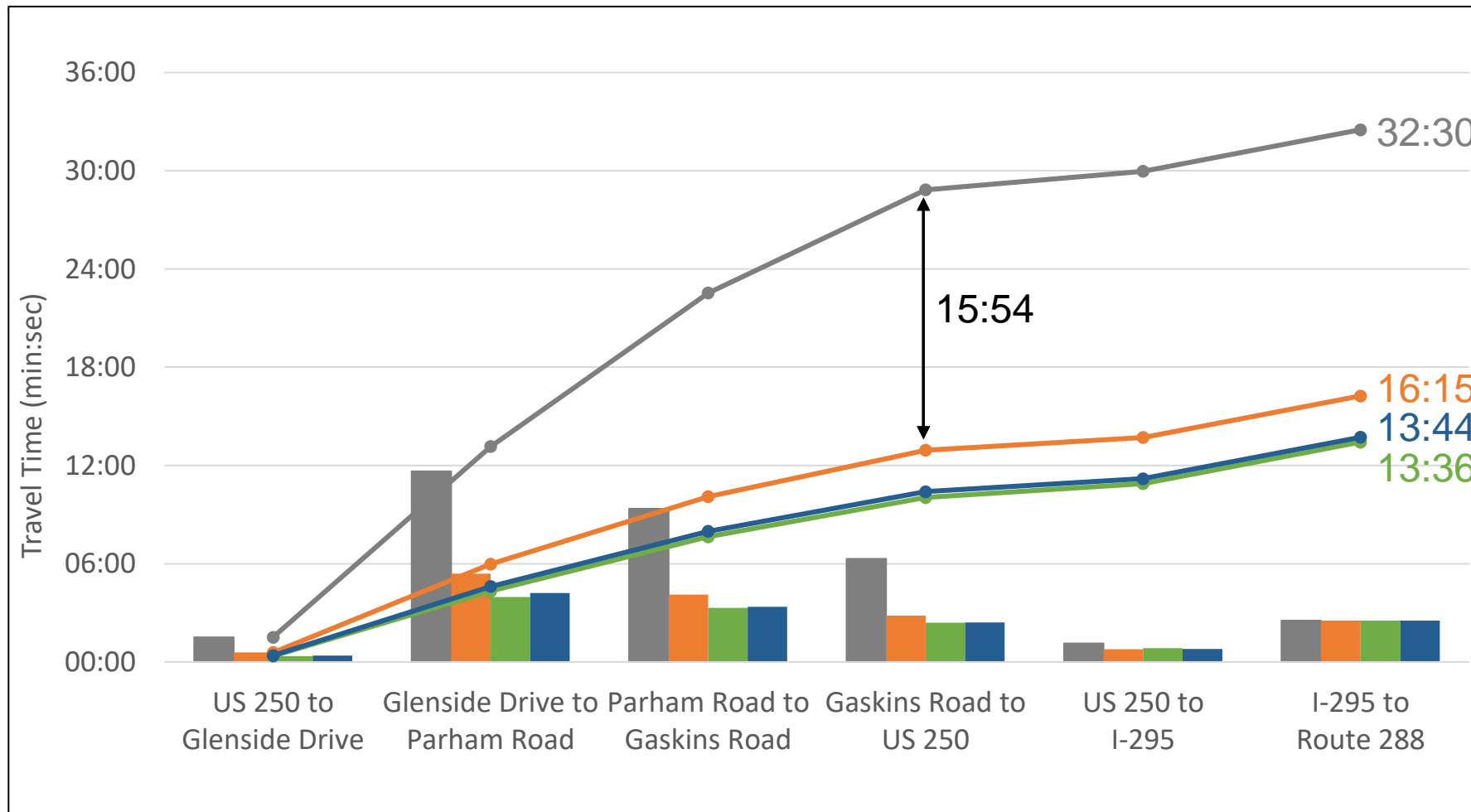
Auxiliary lanes connect new interchange to interchanges with Route 288 and I-295



# Development of 3 Build Packages



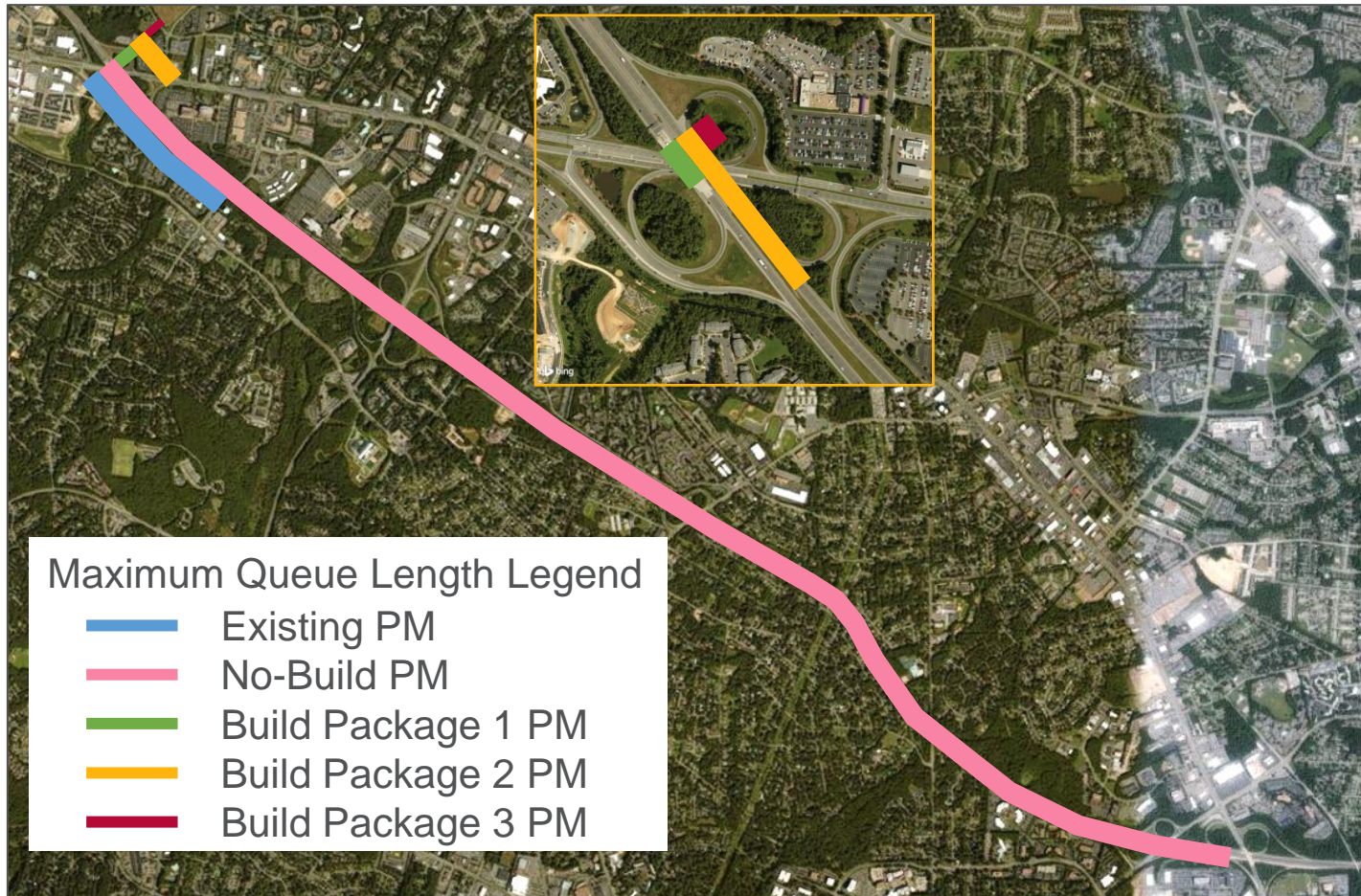
# Projected Benefits of Build Packages: Westbound I-64 – 2046 PM Travel Time



Reduced queuing on westbound I-64 at the US 250 interchange improves upstream travel times in all build packages



# Projected Benefits of Build Packages: Westbound I-64 – 2046 PM Queues



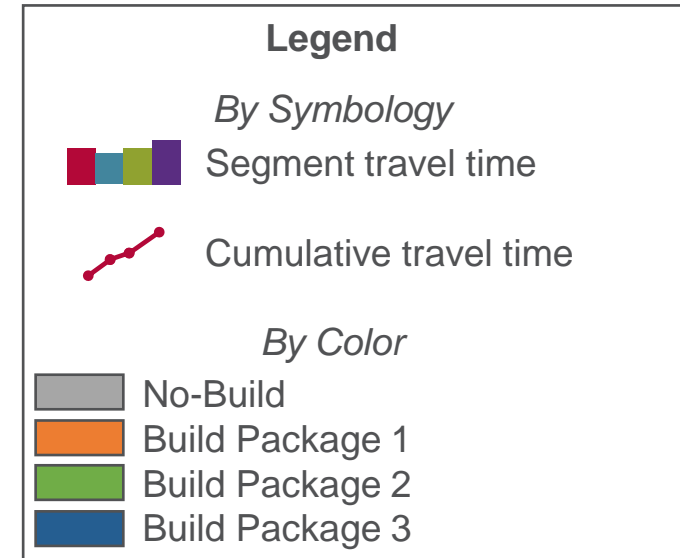
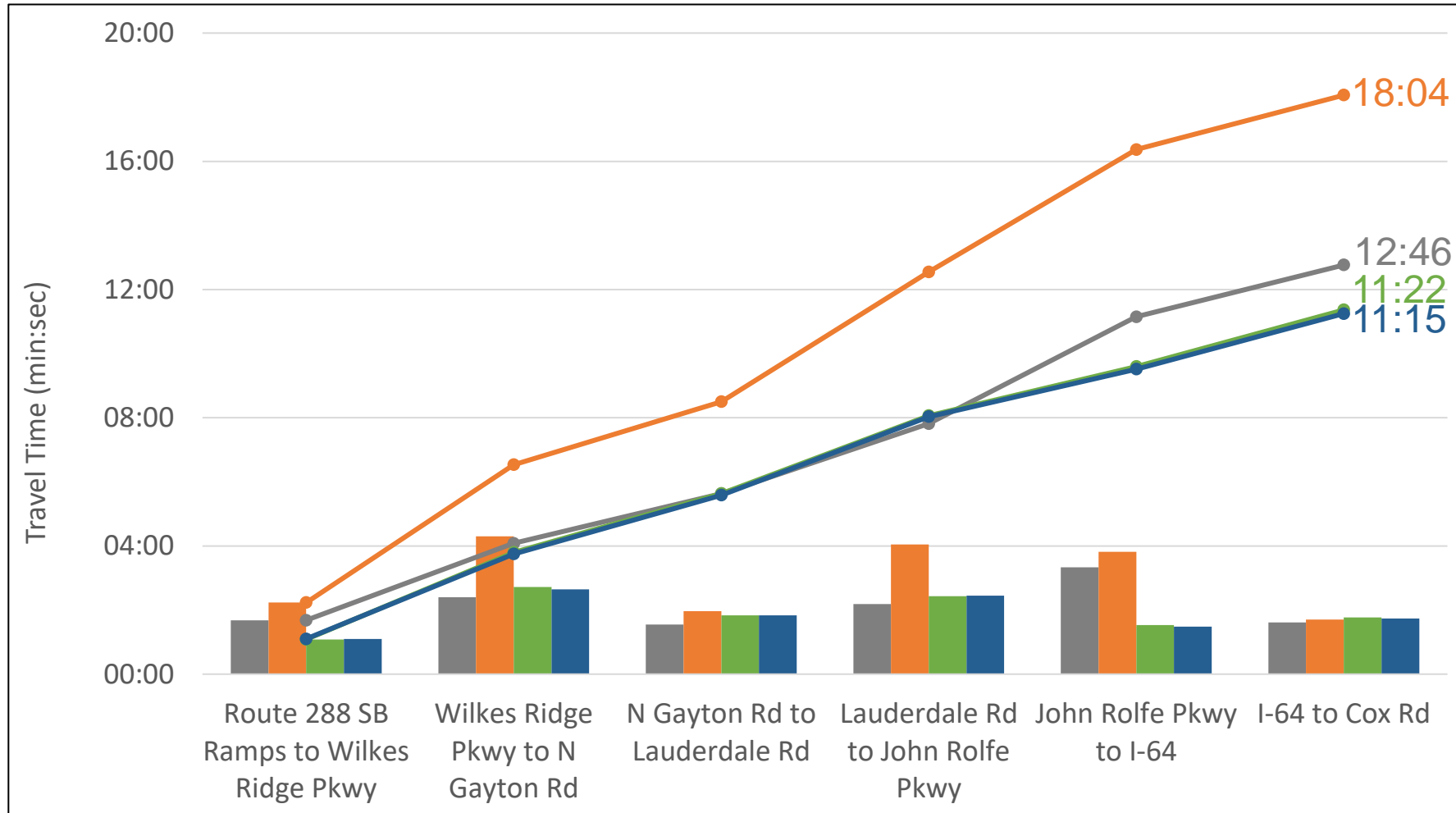
PM Peak Hour

Scenario	Year	Maximum Queue Length (ft)
Existing	2019	3,510
No-Build	2046	27,200
Build Package 1	2046	180
Build Package 2	2046	1,000
Build Package 3	2046	100

Build packages are projected to:

- Limit congestion on westbound US 250 from backing up to interstate
- Remove weave or reduce friction associated with vehicles weaving and changing lanes in advance of weave

# Projected Benefits of Build Packages: Eastbound US 250 – 2046 PM Travel Time



**Releasing the bottleneck at the northbound Route 288 off-ramp terminal causes additional delay and queuing on the arterial due to increased throughput in Build Package 1**



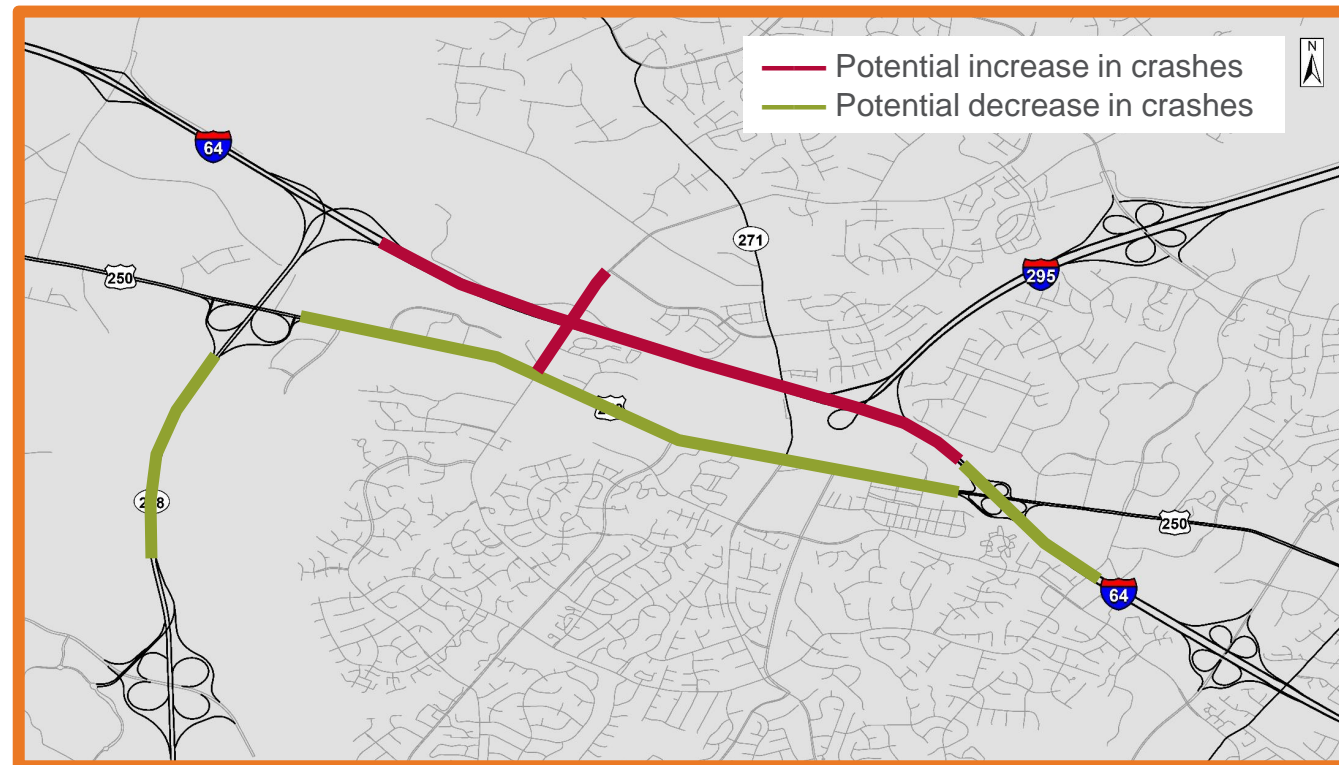
# Safety Analysis: Approach

Evaluate potential **increase in crashes** attributed to:

- New signals
- New ramps
- New auxiliary lanes

Evaluate potential **decrease in crashes** attributed to:

- Reduced volume on existing roadways
- Roadway improvements



# Safety Analysis: Challenges

ISATe does not accurately predict the number of congestion-related crashes at US 250 interchange

- At US 250 interchange: prediction is **78% lower** than crash history
- Other I-64 segments: prediction **within 12%** of crash history

ISATe predicted an increase in crashes at US 250 interchange for all Build packages





# Safety Analysis: Alternative Approach

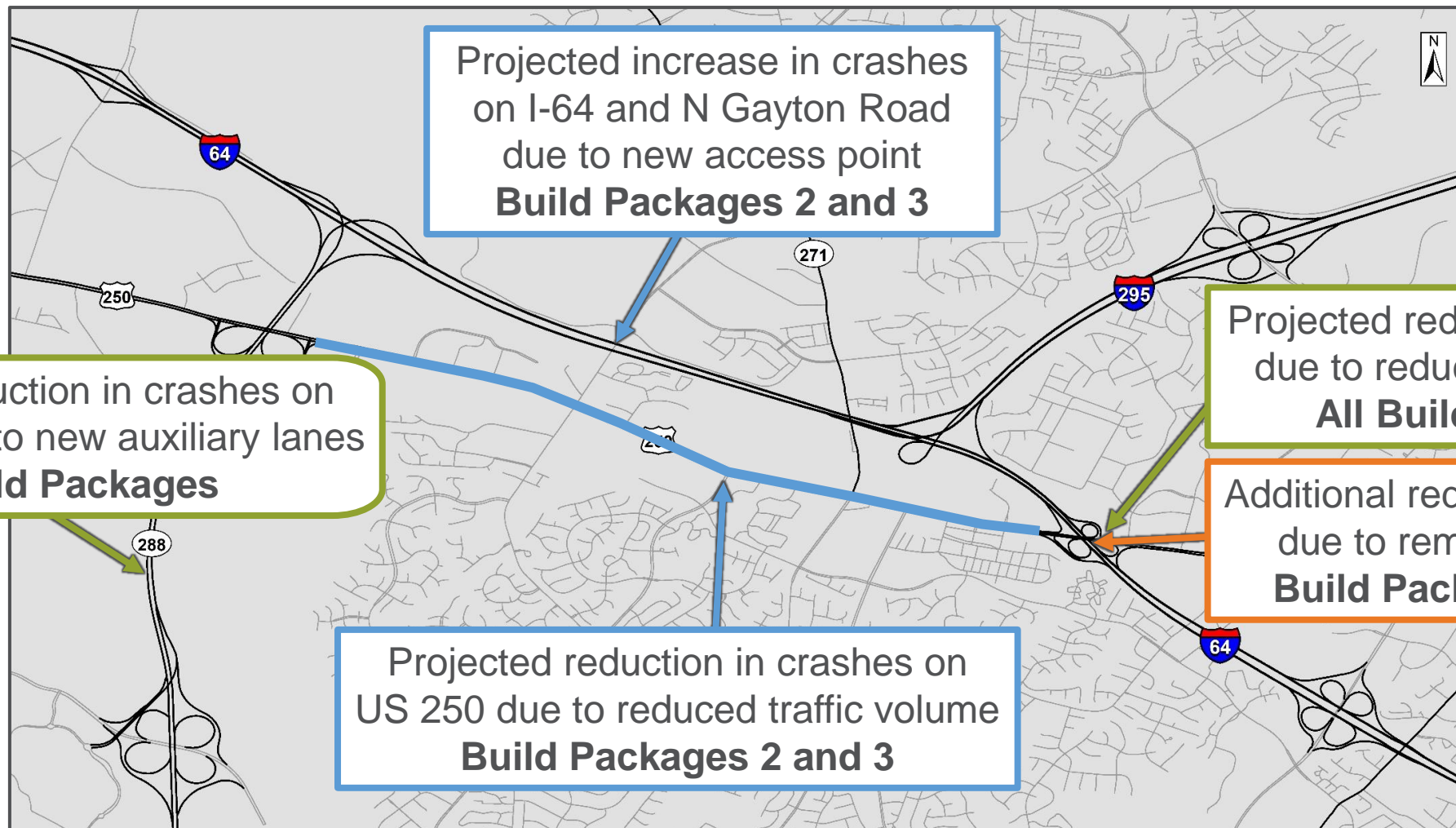
Low- and high-range estimates developed for crash reduction

Custom CMFs applied to existing crash history

Reduction factored to 2046

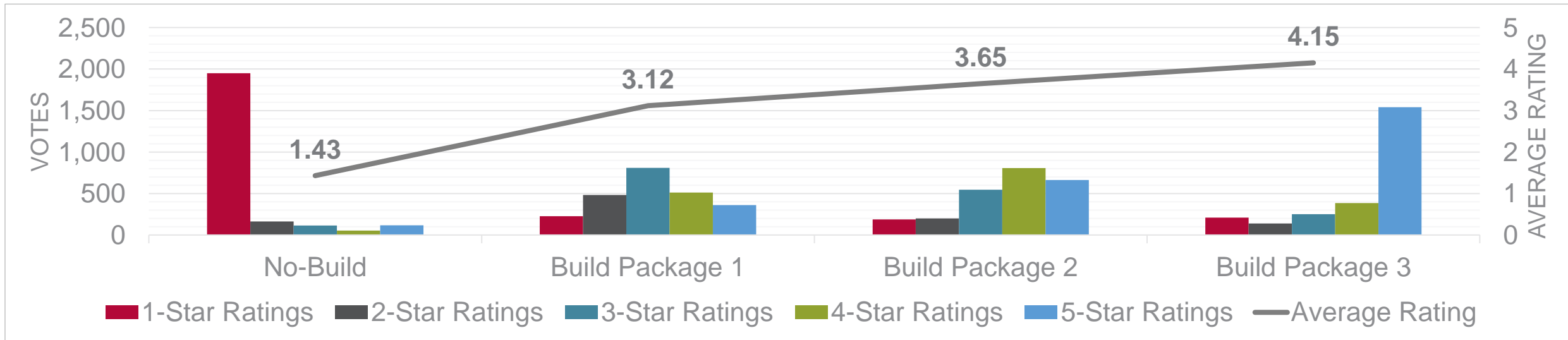
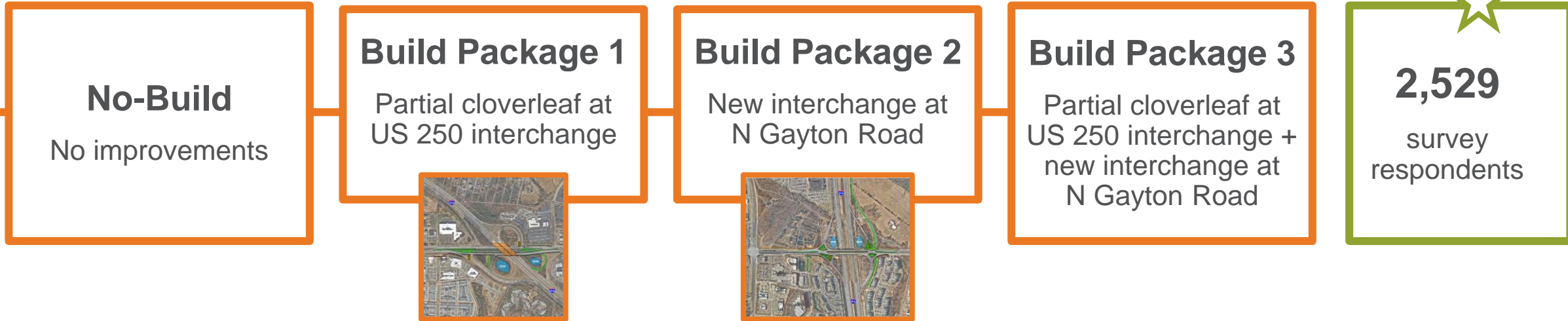
- **Low-range:** custom CMF calculated based on ratio of weaving volumes in each alternative compared to No-Build scenario
- **High-range:** custom CMF calculated based on assumed mitigation of rear end crashes attributed to queue during PM peak and angle or sideswipe crashes attributed to removal of weaving area

# Build Package Safety Comparison

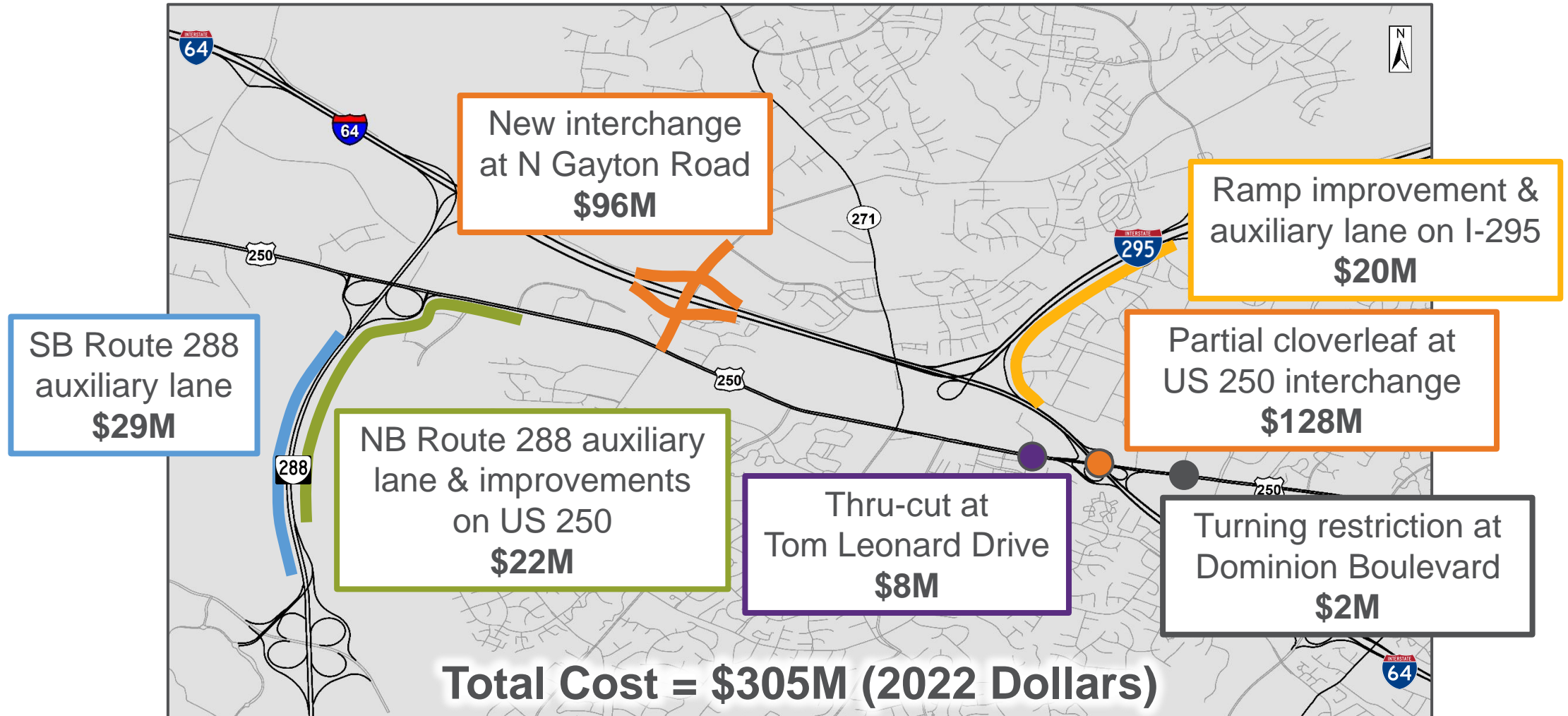




# Public Feedback



# Preferred Alternative: Build Package 3





# Next Steps and Path to Funding

Federal environmental study (NEPA) underway – administered by VDOT

Total cost of improvements:

**\$305M**  
*(2022 dollars)*

Committed funding:

- \$64.5M in Central Virginia Transportation Authority regional funding
- \$60M in local funding
- \$22.8M in already funded SMART SCALE projects

Pending applications:

- Multimodal Project Discretionary Grant
- SMART SCALE



Kimley»»Horn  
Expect More. Experience Better.



# Thank you!

Terrell Hughes

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