

**R-4045 / BR-0012**

**CP 2 Alternatives**

# Background

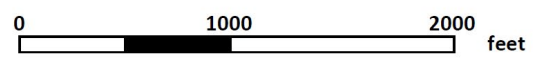
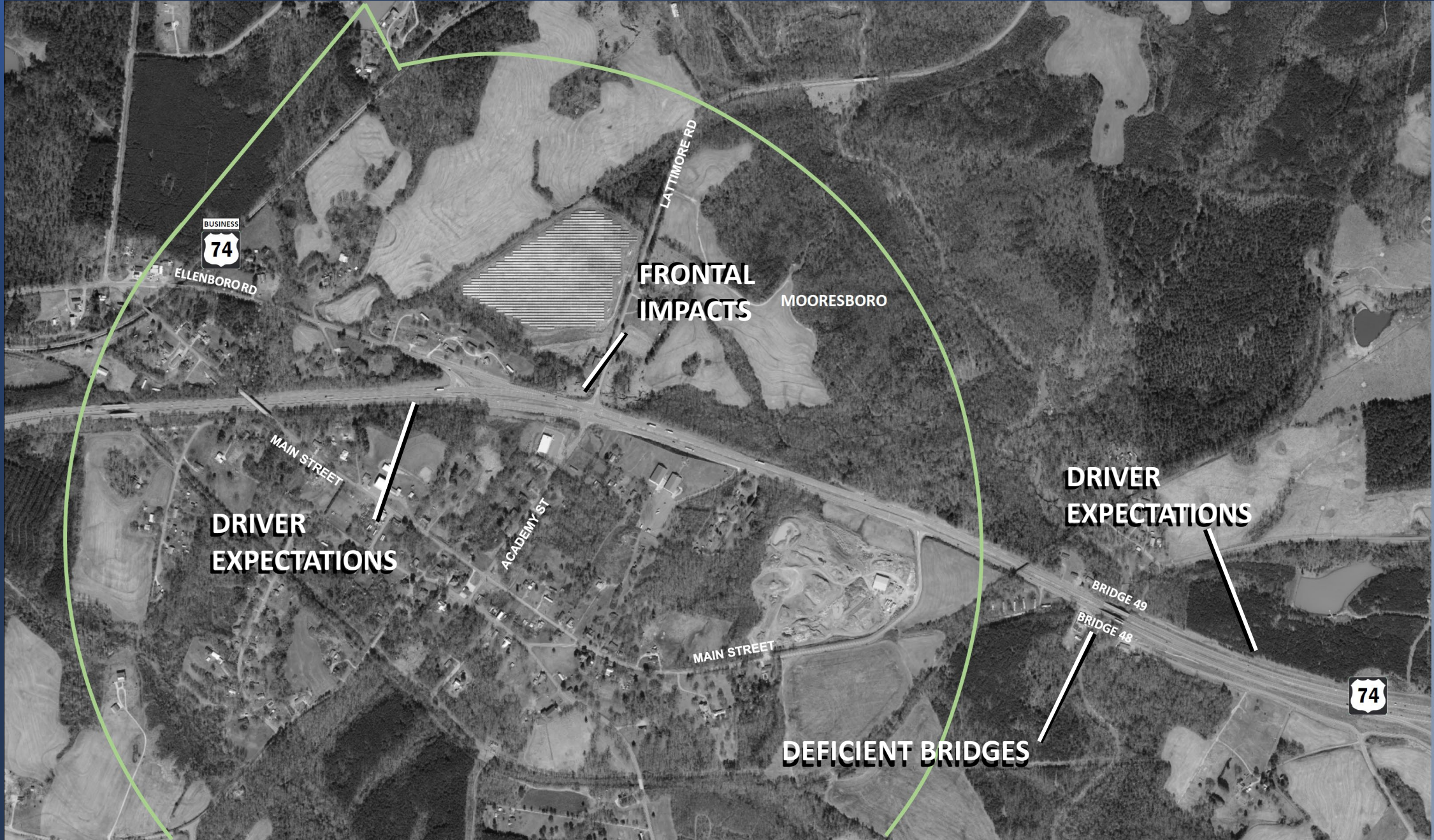
When we originally met with the Core Merger Team in March 2021, we were pursuing the project independent of the Merger Process with the direction from the Core Team to consider a full range of alternatives and come back at LEDPA. In the following slides I'll briefly walk you through the process that led to the alternatives we studied.

Afterward, we'll come back to the beginning to see if you agree with the reasoning and/or have any modifications.

# Begin with Purpose & Need

**Consideration of Alternatives begins with addressing the Purpose of the project which is:**

US 74 is currently a 4-lane freeway with a grass median and varying control of access (primarily fully access-controlled). NCDOT and FHWA have functionally classified this portion of US 74 as a Freeway, and NCDOT and their federal/state/regional stakeholders designated it a Strategic Transportation Corridor (Corridor U) for North Carolina. Based upon the NCDOT review of needs in the project vicinity (see memo dated June 2021 and provided to the Merger Team in March 2022), the subject 1.2-mile portion of US 74 does not meet the aforementioned functional classification and is noncompliant with current roadway design requirements. The subject portion of US 74 also does not satisfy the highway network's established long-term vision, and lacks continuity that negatively affect driver expectations and safety. Additionally, NCDOT identified the existing US 74 at-grade intersection at SR 1168 (Academy Street/Lattimore Road) in the 2021 Highway Safety Improvement Program (HSIP) because of the historical pattern of frontal impact crashes, and the relative severity of personal injuries involved in those crashes. **The purpose of the R-4045 project is to provide a consistent facility to meet drivers' expectations for the US 74 corridor (from Kings Mountain to Columbus, NC) by upgrading this portion of US 74 to meet NCDOT freeway standards.**



R-4045 and BR-0012  
US 74 Controlled Access and Replacement of Bridges 48 and 49

BASE MAP



# Ideas to Address Needs

## Frontal Impact Accidents at Lattimore/US 74

- Traffic Signal
- Reduced Conflict Intersection (Superstreet)
- Interchange
- Control of Access – creates continuity with US 74 Corridor and Eliminates driveways and can reduce or eliminate intersections to reduce conflict points
- Rehabilitate Bridges 48 and 49
- Replace Bridges 48 and 49

# Addressing the Bridges

## Replacement or Rehabilitation?

Rehabilitation and replacement are the two ideas considered to address the deficient bridge 48 and 49. Rehabilitation would not be able to address all structural deficiencies and would not address geometric deficiencies. Replacement of the bridges would address the geometric as well as structural deficiencies.

# Addressing the Bridges

## Maintenance of Traffic

For the bridges, shifting the alignment permanently would not be a preferable for the freeway which rules out a permanent structure(s) on new alignment.

A temporary onsite detour built either to the north or the south are identical in terms of stream impacts and topography but differ in terms of human environment impacts.

The onsite detour to the south would take the business on the southwest quadrant along with at least one mobile home. A temporary onsite detour to the north would avoid in direct impact to the structures in that quadrant and leaving the decision of impact to the mobile home to EJ considerations and Service Road Studies.

# Converting Ideas to Range of Preliminary Alternatives for Screening

The bridge replacements and controlled access would be applied to any alternative considered so that leaves three unique ideas to apply at Lattimore and US 74:

- Traffic Signal
- Reduced Conflict Intersection (Superstreet)
- Interchange



## Screening Preliminary Alternatives

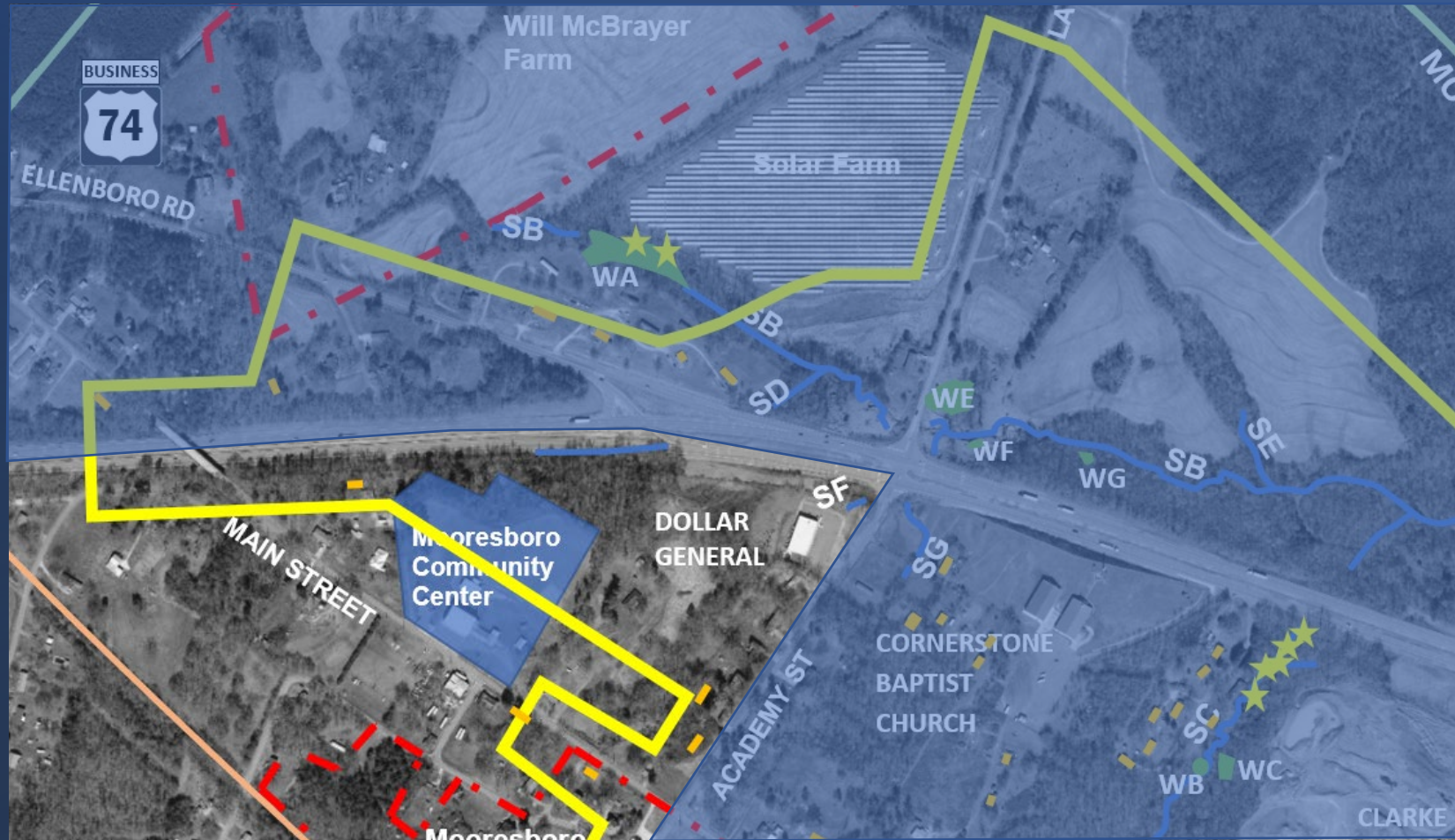
The Traffic Signal and Reduced Conflict Intersection alternatives are not consistent with meeting drivers' expectations because they would still require a shift from interchange only access everywhere else from Kings Mountain to Columbus to at grade intersection through this 1.2-mile segment. In addition, Freeway standards require an interchange.

An interchange is the type of alternative proposed to go forward for detailed study.

## Interchange Alternatives Considered

There are multiple interchange types whose footprint ranges from very large like a turbine to very small like a diamond. For this project, traffic volumes do not exceed what a diamond interchange with possible loop combinations can adequately handle and would result in the smallest footprint. Let's look at the constraints while considering interchange configuration.

# Southwest Quadrant Constraints



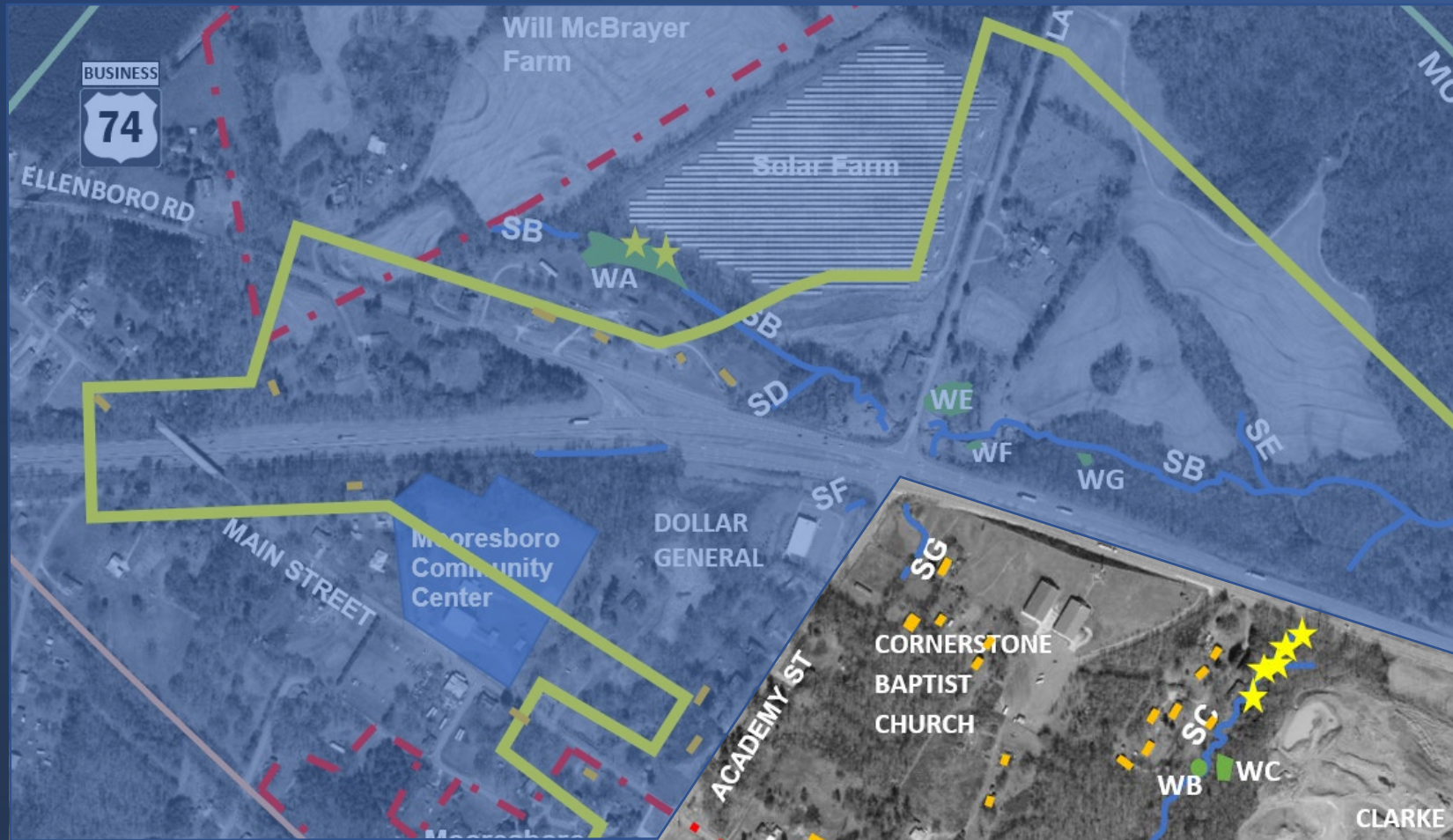
## Southwest Quadrant Constraints

### Southwest Quadrant

The southwest quadrant of the existing intersection of Academy/Lattimore with US 74, has streams and a Dollar General business that are unavoidable with any ramp scenario. A loop in this quadrant would impact the Mooresboro Community Center (4(f)) and still impact Stream D. A ramp minimizes overall impacts in this quadrant.



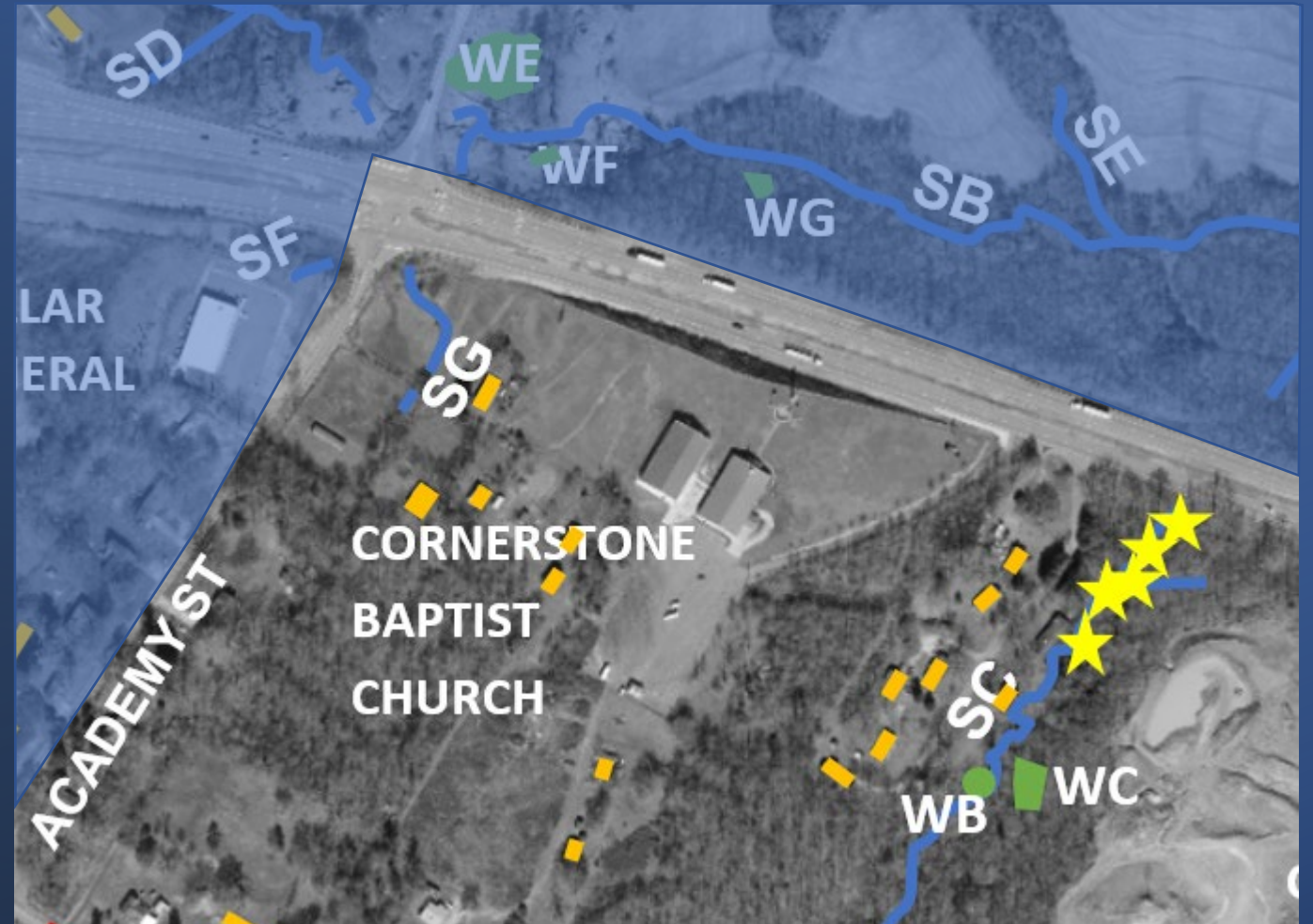
# Southeast Quadrant Constraints



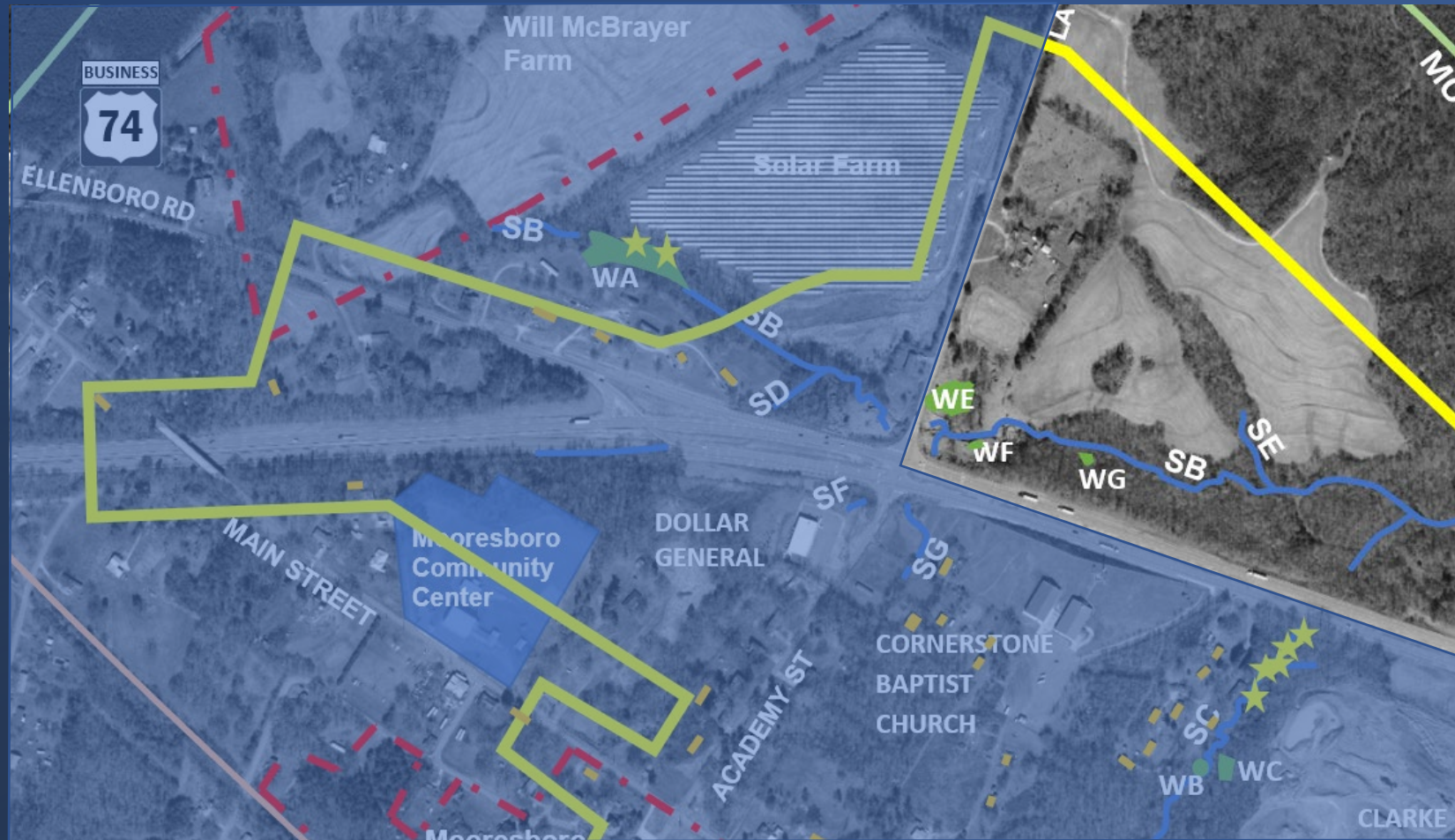
## Southeast Quadrant Constraints

### Southeast Quadrant

The southeast quadrant of the existing intersection of Academy/Lattimore with US 74, has stream SG, an EJ home and a church. The stream and home are likely unavoidable with any ramp scenario. A loop in this quadrant would impact the Cornerstone Baptist Church. A ramp once again minimizes the impacts.



# Northeast Quadrant Constraints



## Northeast Quadrant Constraints

### Northeast Quadrant

The northeast quadrant of the existing intersection of Academy/Lattimore with US 74, has streams SB, SG, and SE along with wetlands WE, WF and WG (as a side note, the total wetlands in the study area add of to 0.8 acres. The stream would be unavoidable by any ramp or loop although a thoughtful alignment can minimize the impact.





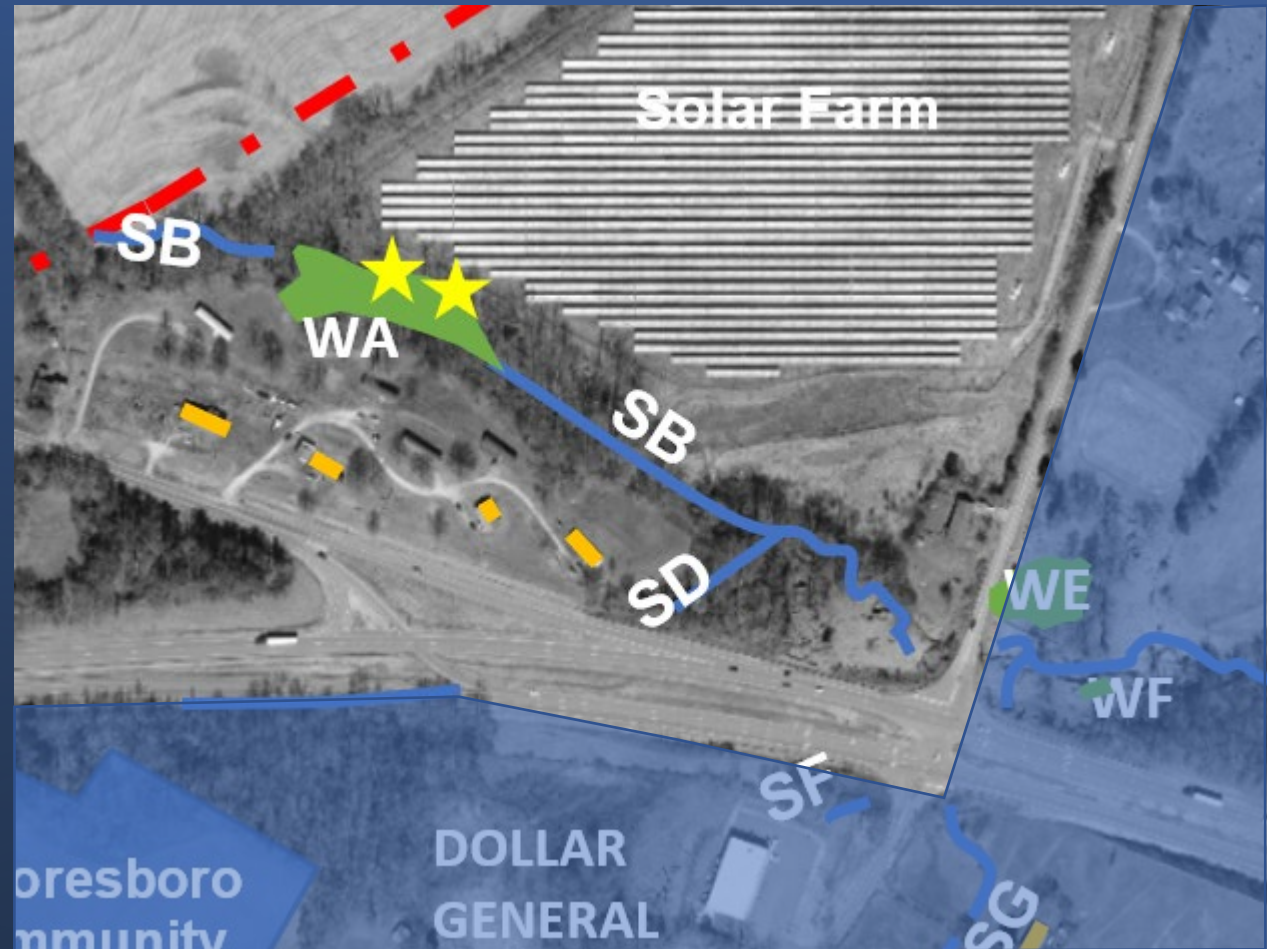
# Northwest Quadrant Constraints



## Northwest Quadrant Constraints

### Northwest Quadrant

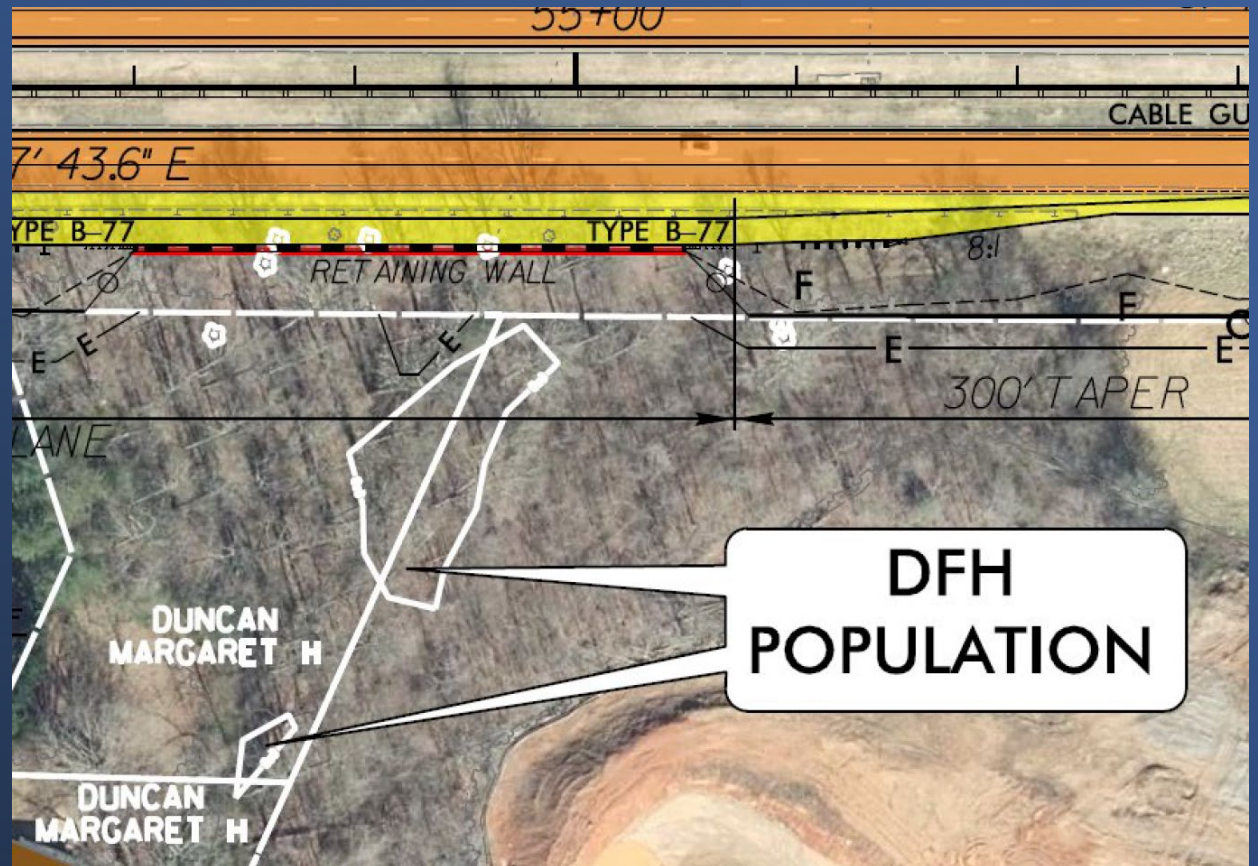
The northwest quadrant of the existing intersection of Academy/Lattimore with US 74, has streams SB, and SD along with wetlands WA. There is also a solar farm. The stream would be unavoidable by any ramp or loop although a thoughtful alignment could minimize the impact.





## Dwarf Flowered Heartleaf

One of the Dwarf flowered heartleaf populations in the NW quadrant of US 74/Lattimore is outside the study area and will not be affected by any design considered. The other location is along stream SC just south of US 74 and just east of Duncan Drive. Although no lanes would be added to US 74, improvements to the median and shoulder to meet design standards resulted in an unminimized footprint that would directly impact the DFH population. The Department evaluated a retaining wall at this location which was successful in getting the impact off the population although it is still near to it. The Department will be approaching USFWS with the details of this information in the coming weeks to consult on how to proceed regarding Section 7 of the Endangered Species Act.



## Service Roads - Addressing Controlled Access Impact

Control of Access in the case of an interchange results in closing all driveways and intersections near the interchange. This means that homes and business that currently have direct access to US 74 via driveway or at-grade streets would be cut off from US 74. Normal practice requires a service road study to determine if the value of the property exceeds the cost of a service road to re-establish access. This project must also take into consideration Environmental Justice with the presence of many low-income households.

## Alternatives Evaluated to Date

For the **Southern Half of the Interchange**, the constraints led to a tight diamond configuration that would attempt to avoid the church, the 4(f) park, and as many homes as possible. A roundabout was chosen for the terminus as a proven means of safer traffic operation.

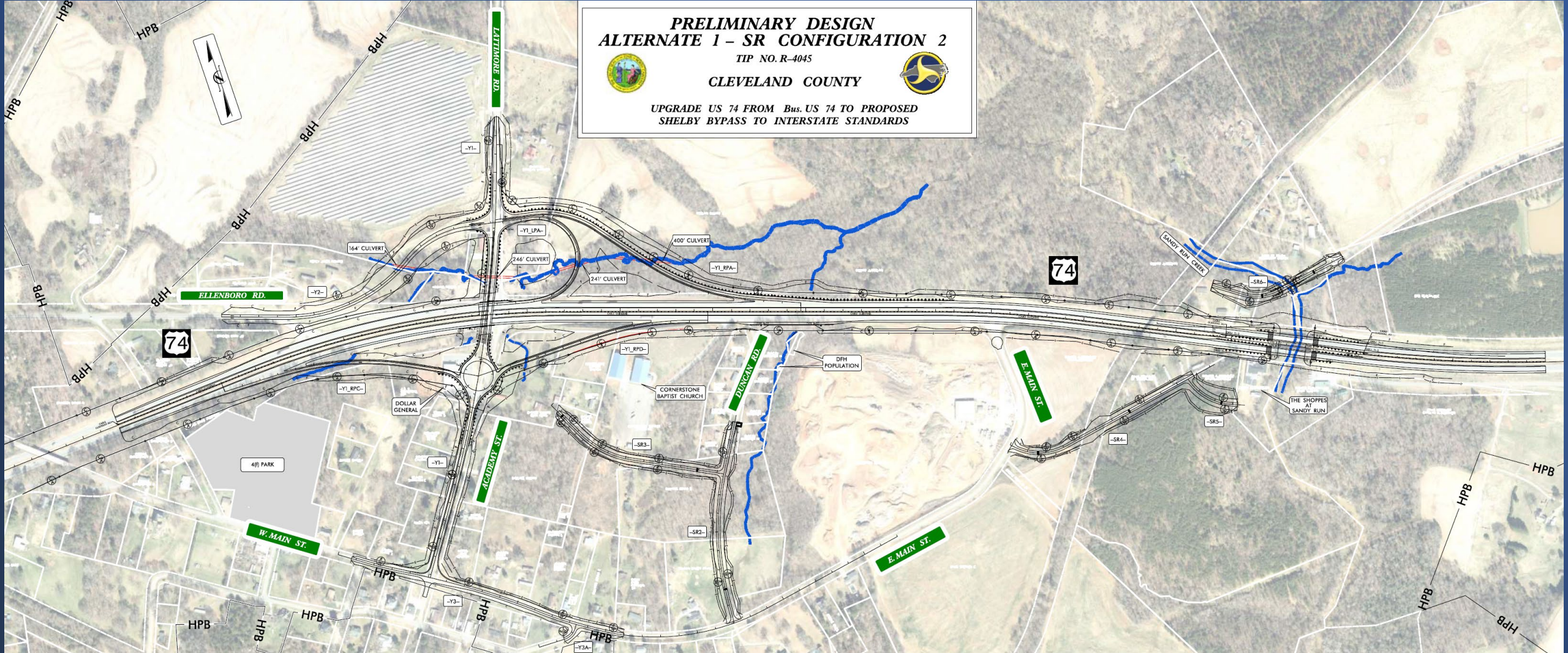
For the **Northern Half of the Interchange**, the presence of a very long Stream SB along with several reaches of other tributaries (SD, SE and SF) a tight diamond would result in the highest stream impacts. With a desire to study minimizing that impact NCDOT chose to study two alternative configurations described on the following two pages.

For the Service Roads, there were somewhat obvious alternatives for locations near Bridges 48 and 49. However, the area around the church and Duncan Road, there were three different configurations considered which had different advantages for resources potentially protected or costs. All three configurations are shown with Alternatives 1 and 2.

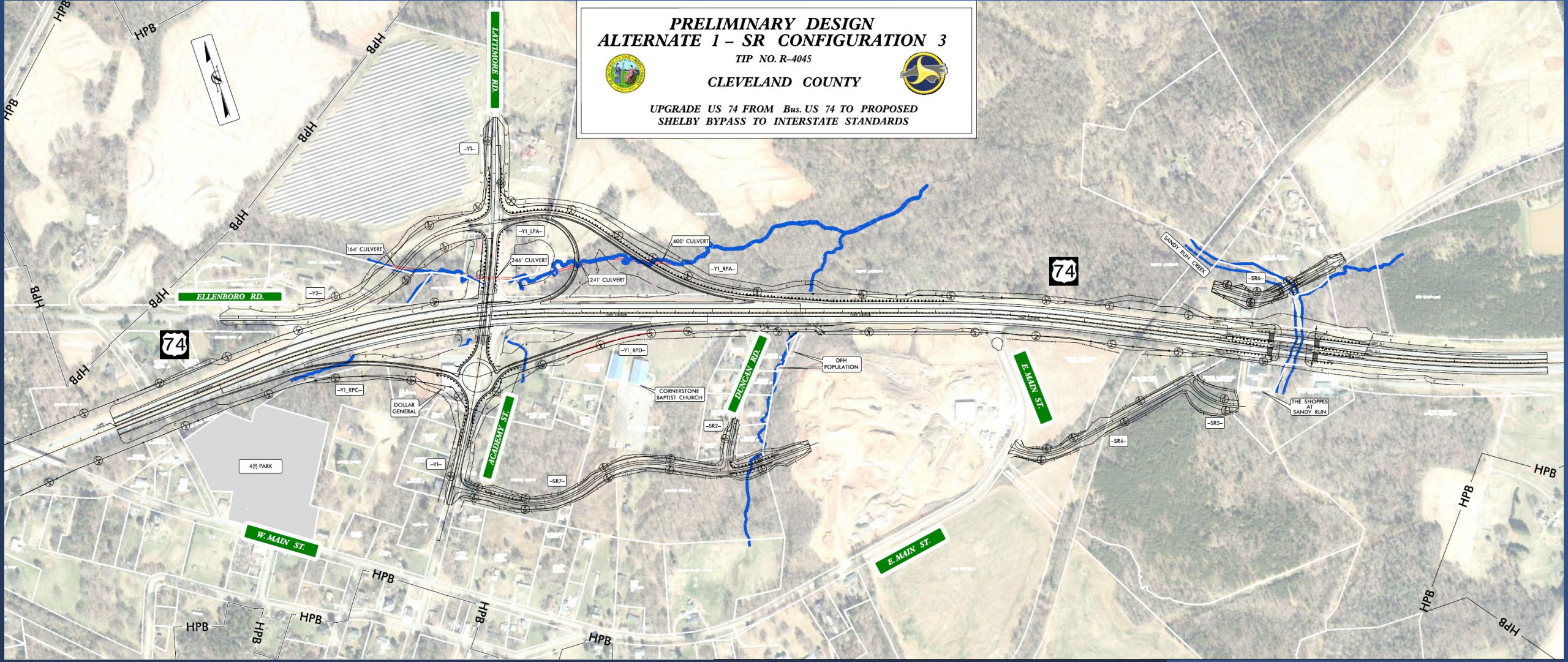


# Alternative 1

## Service Road Configuration 2



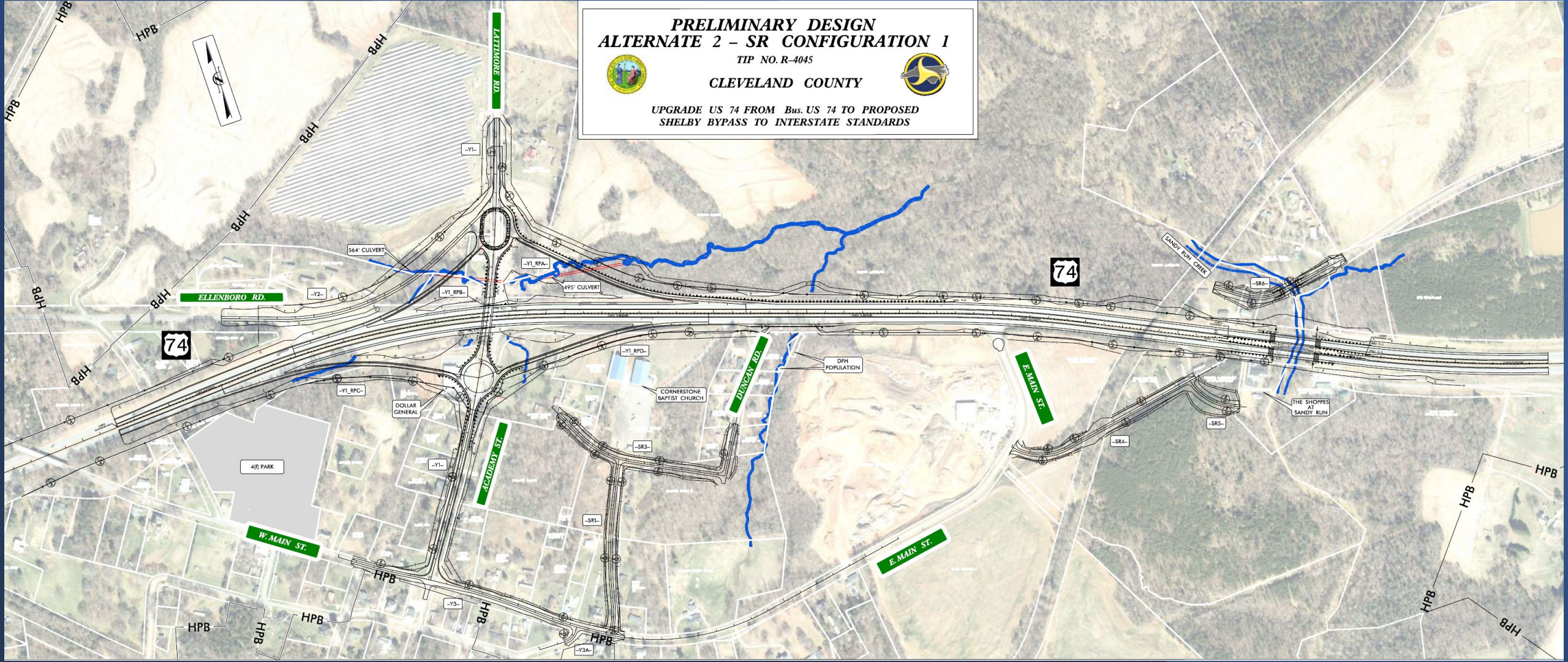
# Alternative 1 Service Road Configuration 3



**PRELIMINARY DESIGN**  
**ALTERNATE 1 - SR CONFIGURATION 3**  
TIP NO. R-4045  
CLEVELAND COUNTY  
UPGRADE US 74 FROM Bus. US 74 TO PROPOSED SHELBY BYPASS TO INTERSTATE STANDARDS

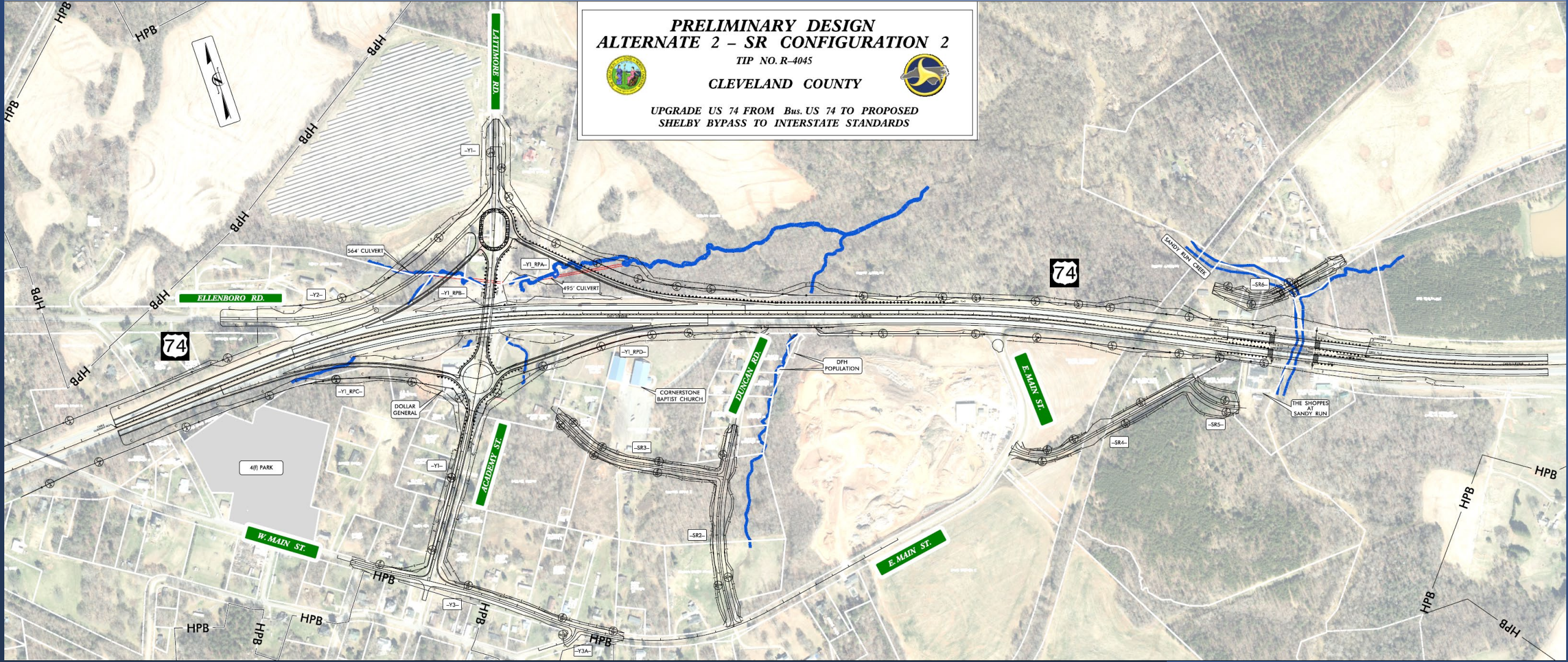


# Alternative 2 Service Road Configuration 1

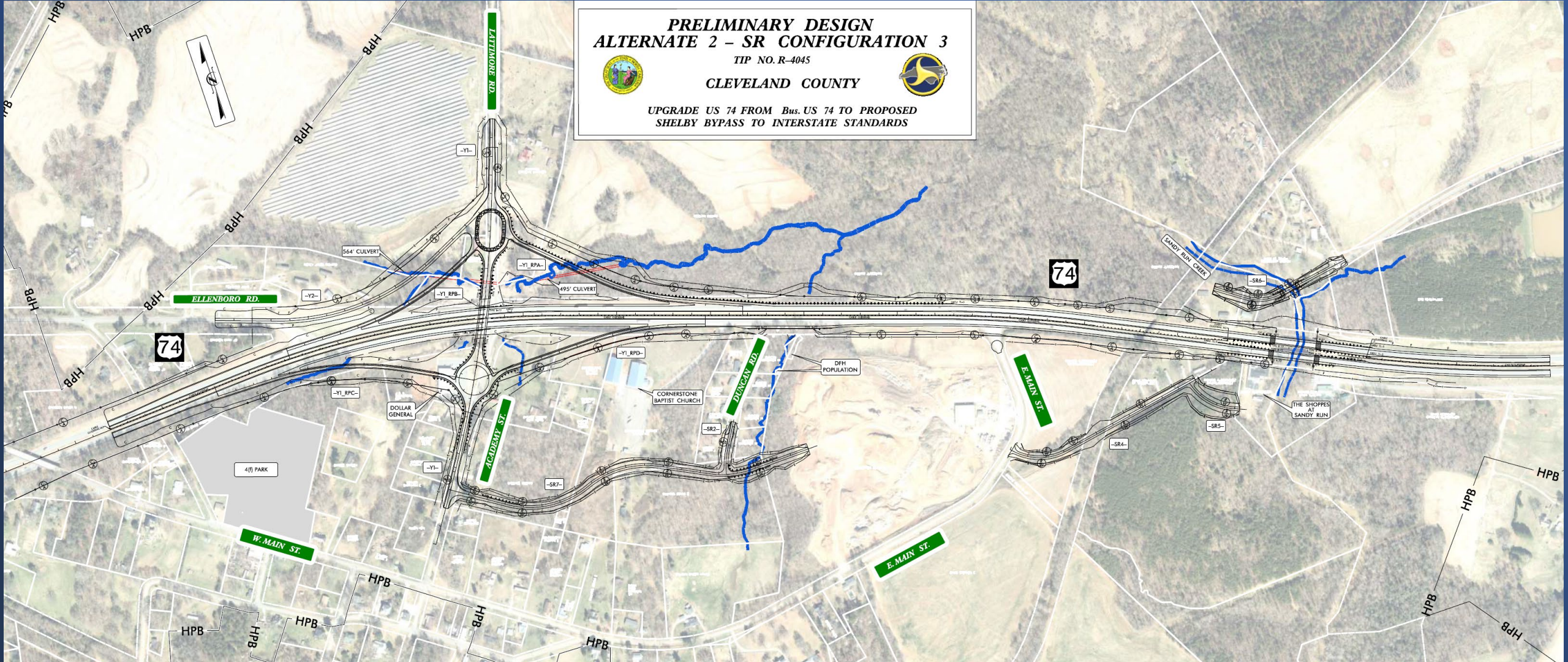


# Alternative 2

## Service Road Configuration 2



# Alternative 2 Service Road Configuration 3



# Discussion

# CP 2 Concurrency Form