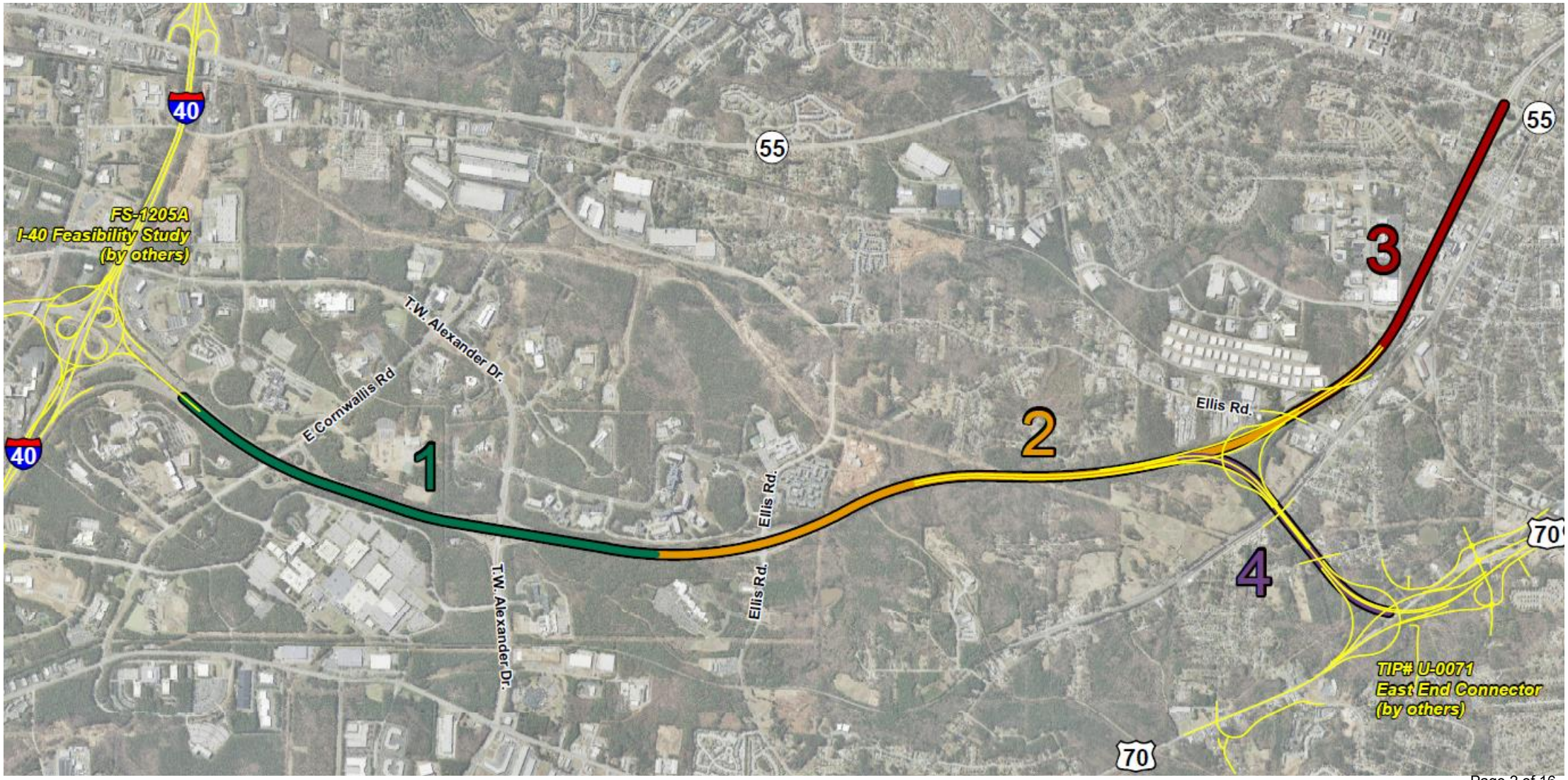
Nothing Compares
NORTH CAROLINA

November 16, 2016

FS-1205C Improvements to NC 147 (Durham Freeway)

Matthew Potter

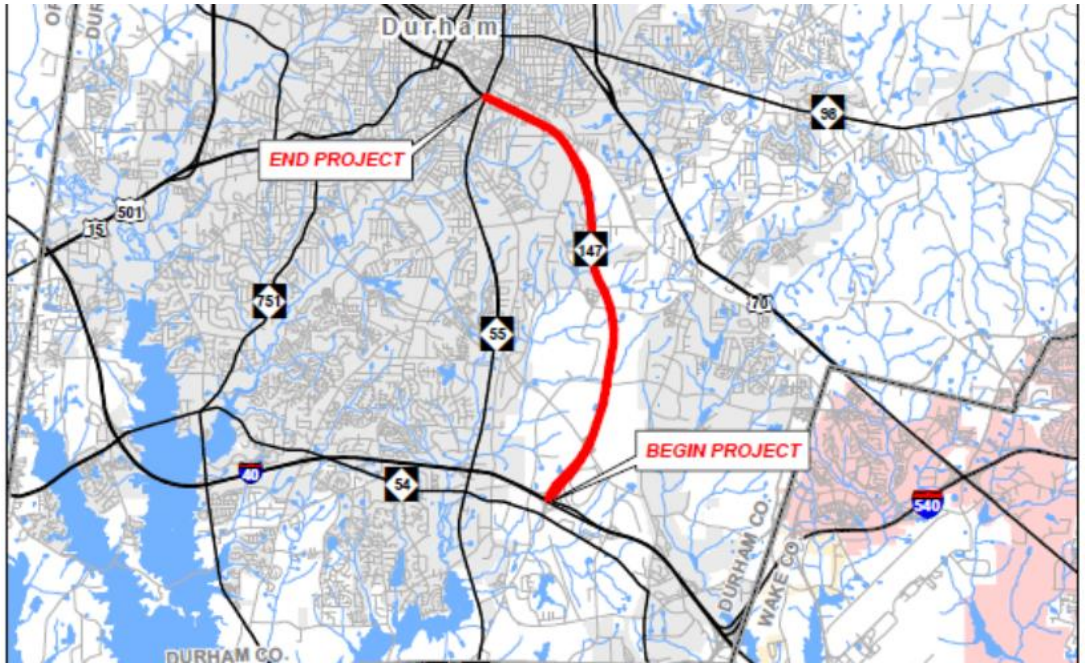
NC 147 & East End Connector



Project Phases

Feasibility Study → Project Planning and Development → Construction

Project Limits / Location



- NC 147 (Durham Freeway) from I-40 to NC 55 (Alston Ave)
- Approximately 7 miles
- Potential Improvements to East End Connector (Managed Lane Alts.)
- Improvements are segmented for funding purposes

Existing Conditions

- Full control of access
- Primarily four-lane divided facility with 60-foot grass median
- Functional Classification = Freeway
- Posted Speed Limit = 65 mph
- AADT between 58,000 and 80,000 vpd

Purpose and Need Discussion

- Current heavy congestion during peak-hour traffic
- Predicted population growth in the vicinity necessitates additional traffic capacity
- Poor levels of service for existing and predicted future no-build conditions
- NC 147 South of East End Connector is Future Interstate 885

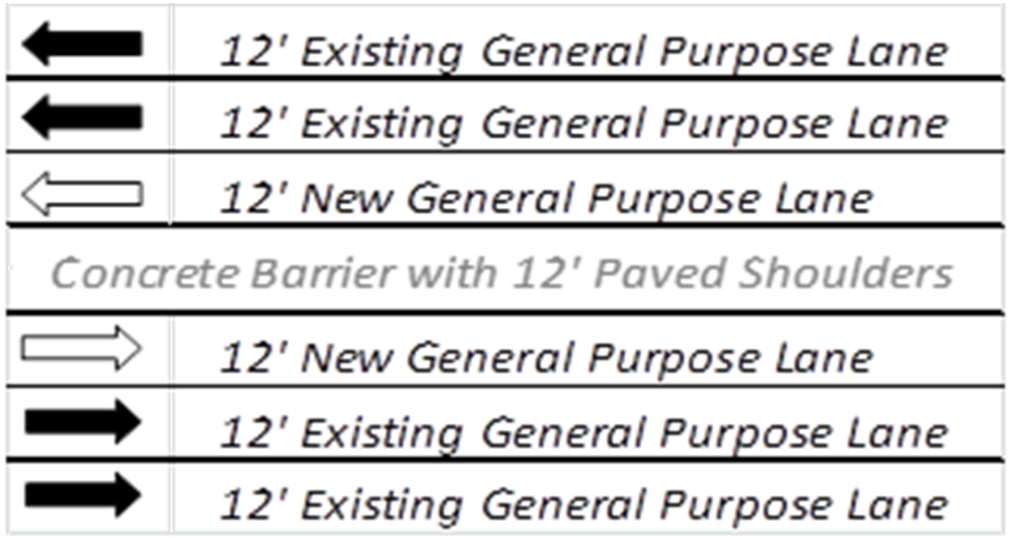
2013 Existing Conditions						
Analysis Type	Level of Service					
	A	B	C	D	E	F
Basic Freeway Segments	0	1	2	7	6	5
Freeway Merges and Diverges	0	1	5	9	4	5
Freeway Weaving Segments	0	0	1	0	3	6
Signalized Intersections	0	6	6	1	0	0
Unsignalized Intersections	0	0	0	1	0	3
Total	**0**	**8**	**14**	**18**	**13**	**19**

Build Alternatives Studied

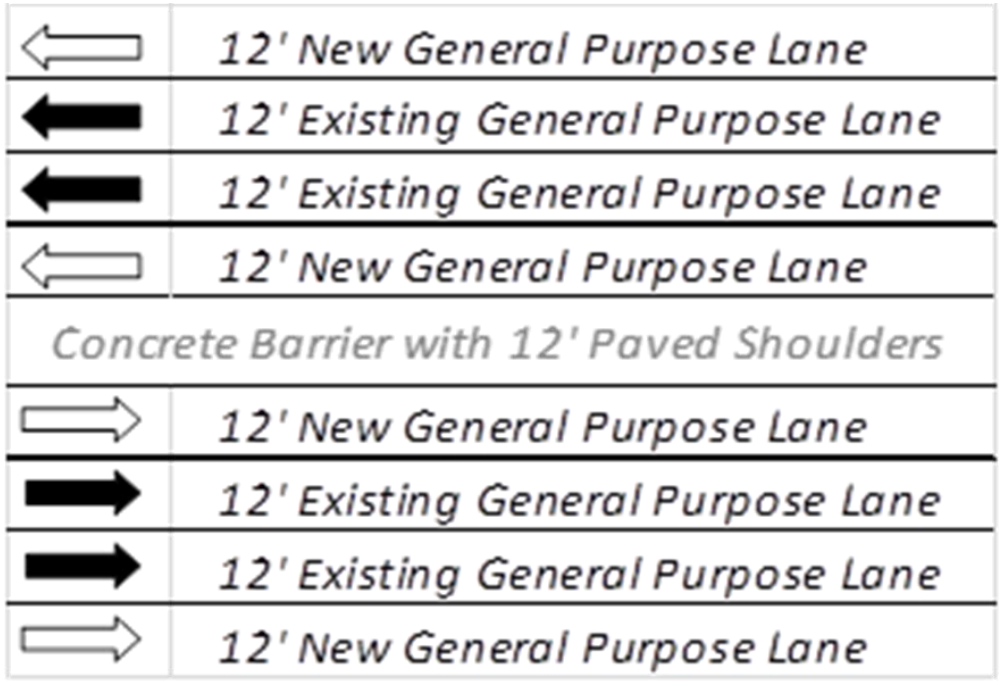
Alternative	Current Typical (No. of Lanes Each Direction)	New Typical (No. of Lanes Each Direction)	Added (Lanes Each Direction)	General Purpose (Added)	Managed Lanes (Added)
1A	2-2	3-3	1	●	○
1B	2-2	4-4	2	●	○
2A	2-2	(2 – 1 I 1 – 2)	1	○	●
2B	2-2	(2 – 2 I 2 – 2)	2	○	●
2C	2-2	(3 – 1 I 1 – 3)	2	○	●
3A	2-2	(2 – 1 I 1 – 2)	1	○	●
3B	2-2	(2 – 2 I 2 – 2)	2	○	●
3C	2-2	(3 – 1 I 1 – 3)	2	○	●
● Yes	○ No	Managed Lane			

General Purpose Alternatives

- **Alt 1A** – 3 general purpose lanes in each direction

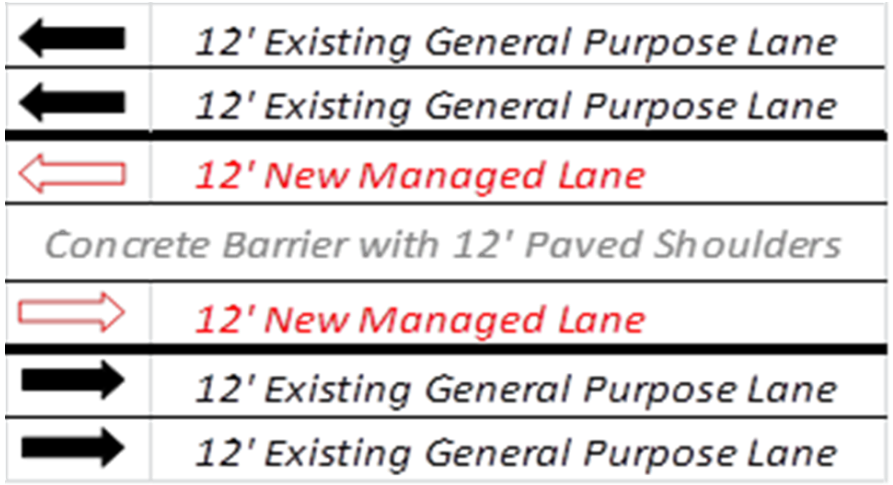


- **Alt 1B** – 4 general purpose lanes in each direction

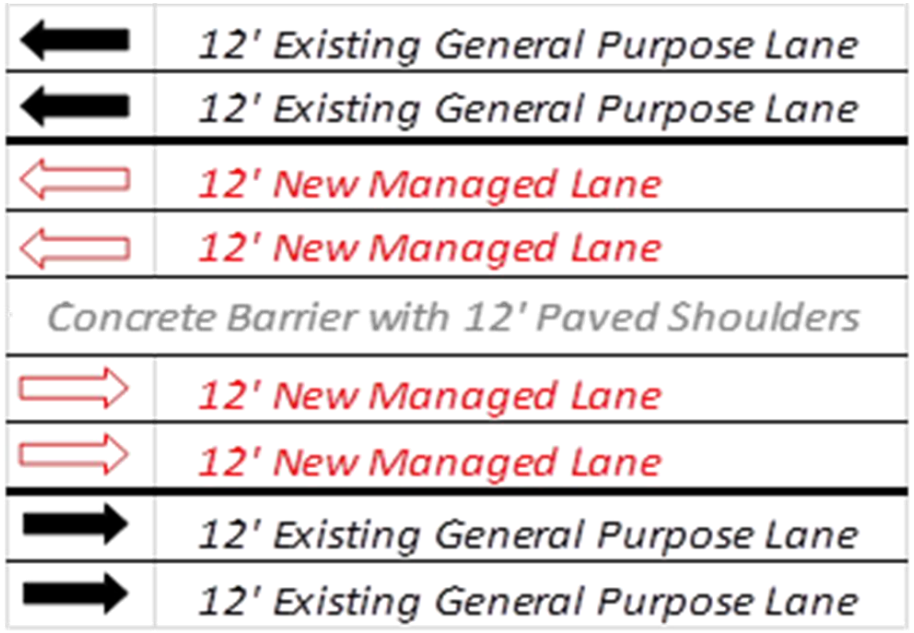


Managed Lane Alternatives

- **Alt 2A and 3A**

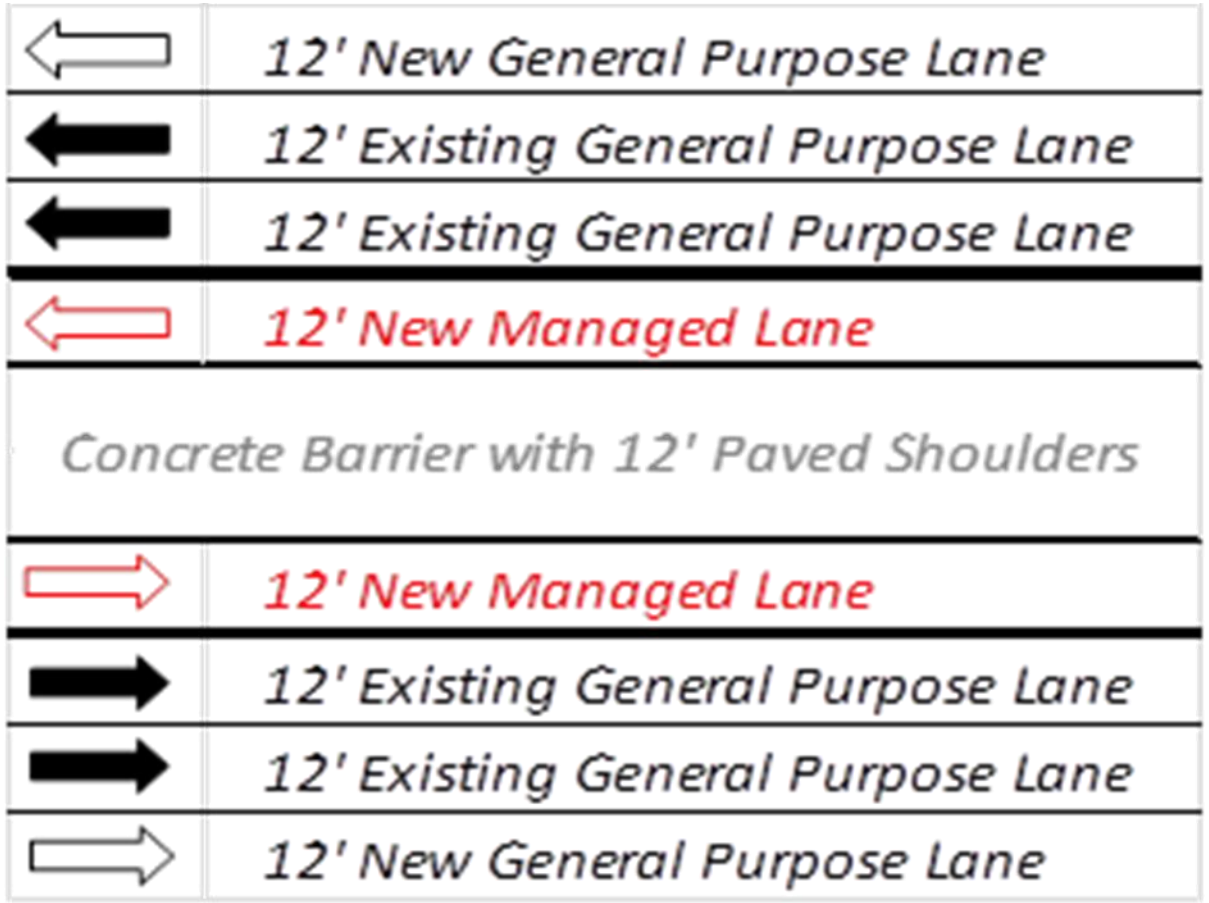


- **Alt 2B and 3B**



Managed & General Purpose Alternative

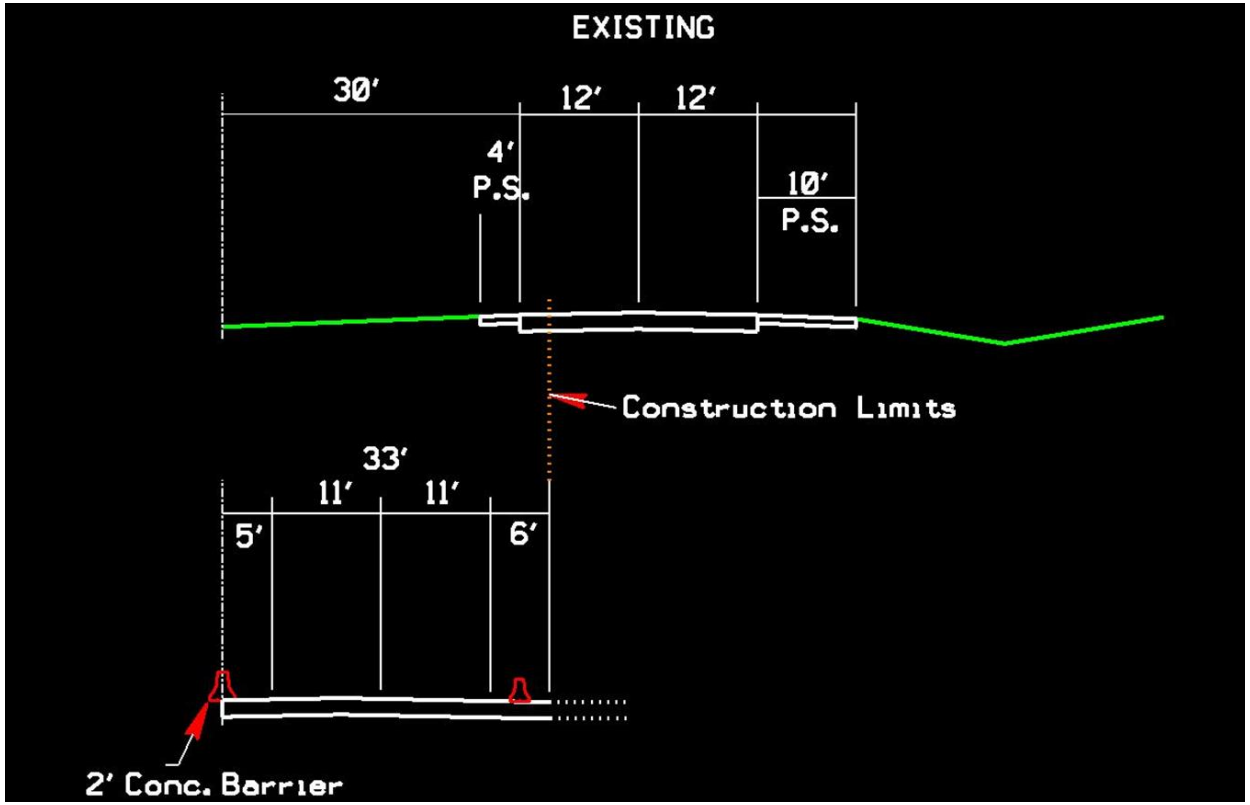
- **Alt 2C and 3C –** 1 new managed lane and 1 new general purpose lane



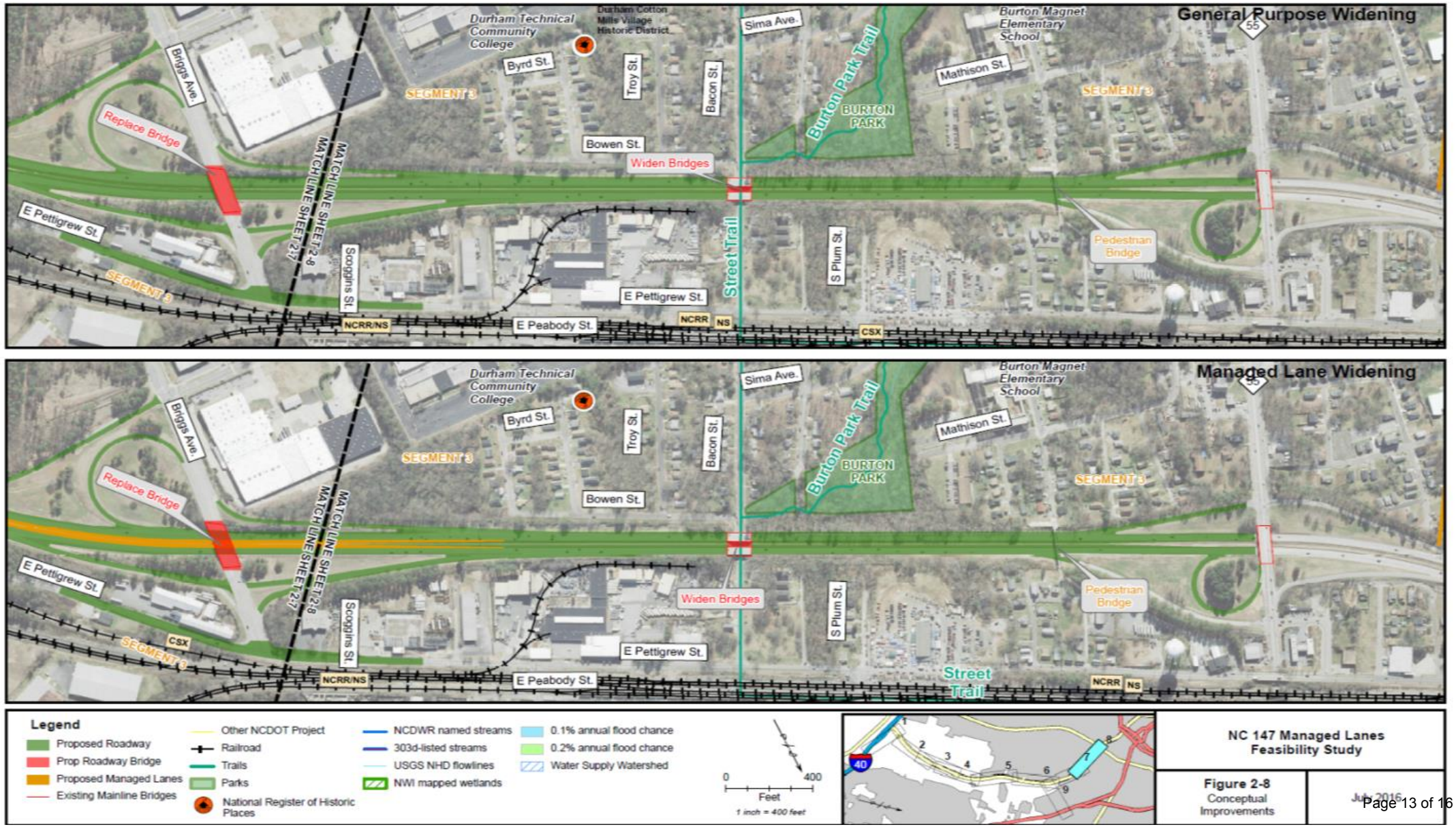
Potential Major Issues

- Construction phasing
- Potential Right of Way impacts on northern end
- Ingress and egress points for managed lanes
- Connection to Interstate 40
- Bottleneck – Highest traffic volume on northern end
- Multiple bridge replacements
- Public involvement
- Auxiliary Lanes

Construction Phasing



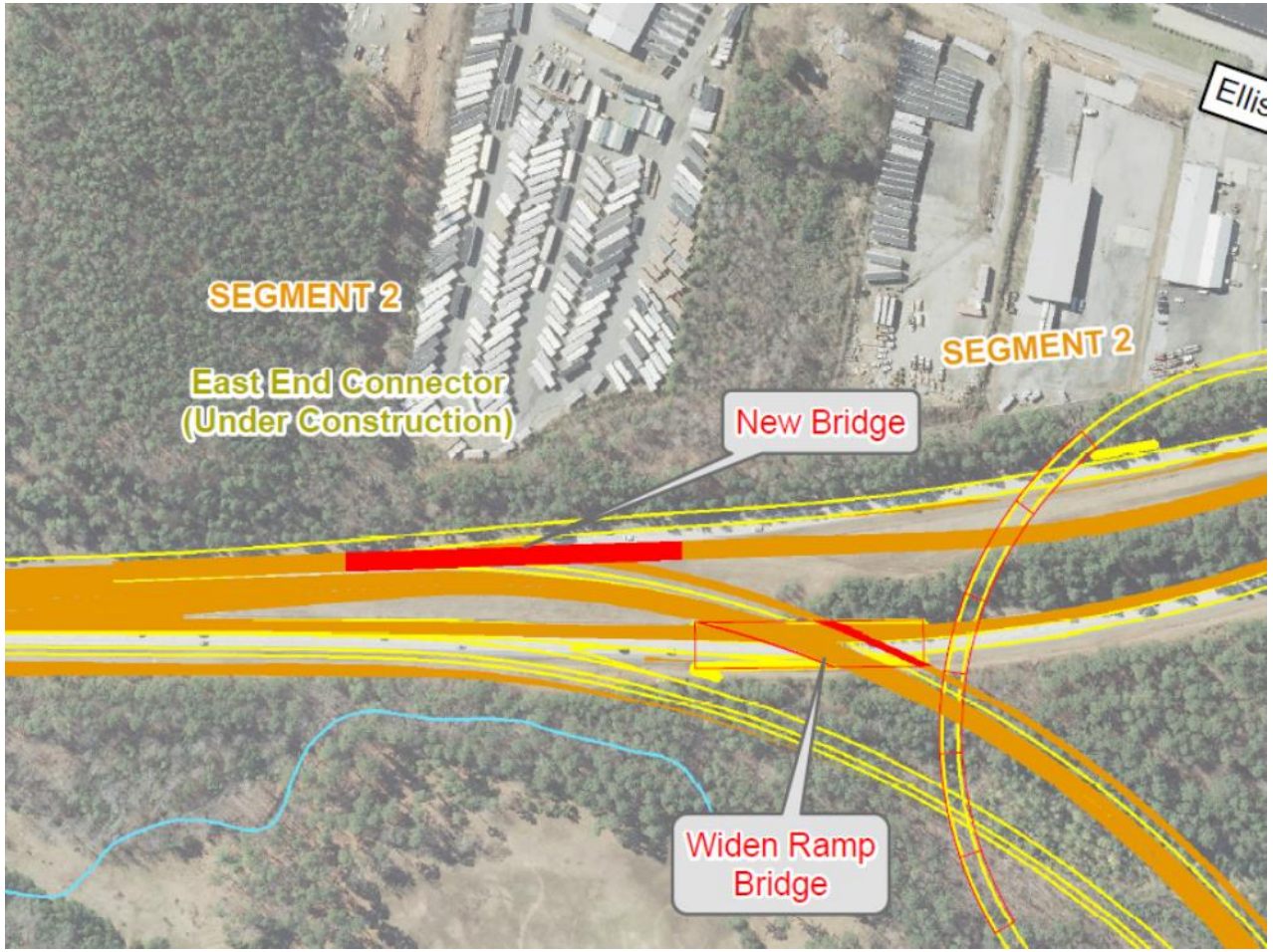
Northern End of the Project



Ingress/Egress Points

T.W. Alexander Drive

East End Connector



Comparison of Alternatives

Alternative	Alternative Type	Total # of Lanes (GP/ML)	Total Construction Cost*	Unacceptable LOS E or F (analysis pts)
1A	General Purpose	6 (6/0)	$112,698,000	35%
1B	General Purpose	8 (8/0)	$112,806,000	18%
2A	Managed Lanes	6 (4/2)	$153,148,000	45%
2B	Managed Lanes	8 (4/4)	$149,248,000	45%
2C	Managed Lanes	8 (3/1)	$149,248,000	-
3A	Managed Lanes	6 (4/2)	$132,548,000	55%
3B	Managed Lanes	8 (4/4)	$126,148,000	55%
3C	Managed Lanes	8 (3/1)	$126,148,000	-

Conclusion and Recommendations

- Alternative 1B, 2C and 3C recommended for further study and development
- Alternative 1B costs are anticipated to be lower than 2C or 3C due to managed lane tie-ins
- Insufficient median to accommodate construction phasing increases cost of all 6-lane Alternatives
- 8-lane alternatives may be phased similar to 6-lane alternatives, but utilizes full depth final pavement instead of temporary pavement