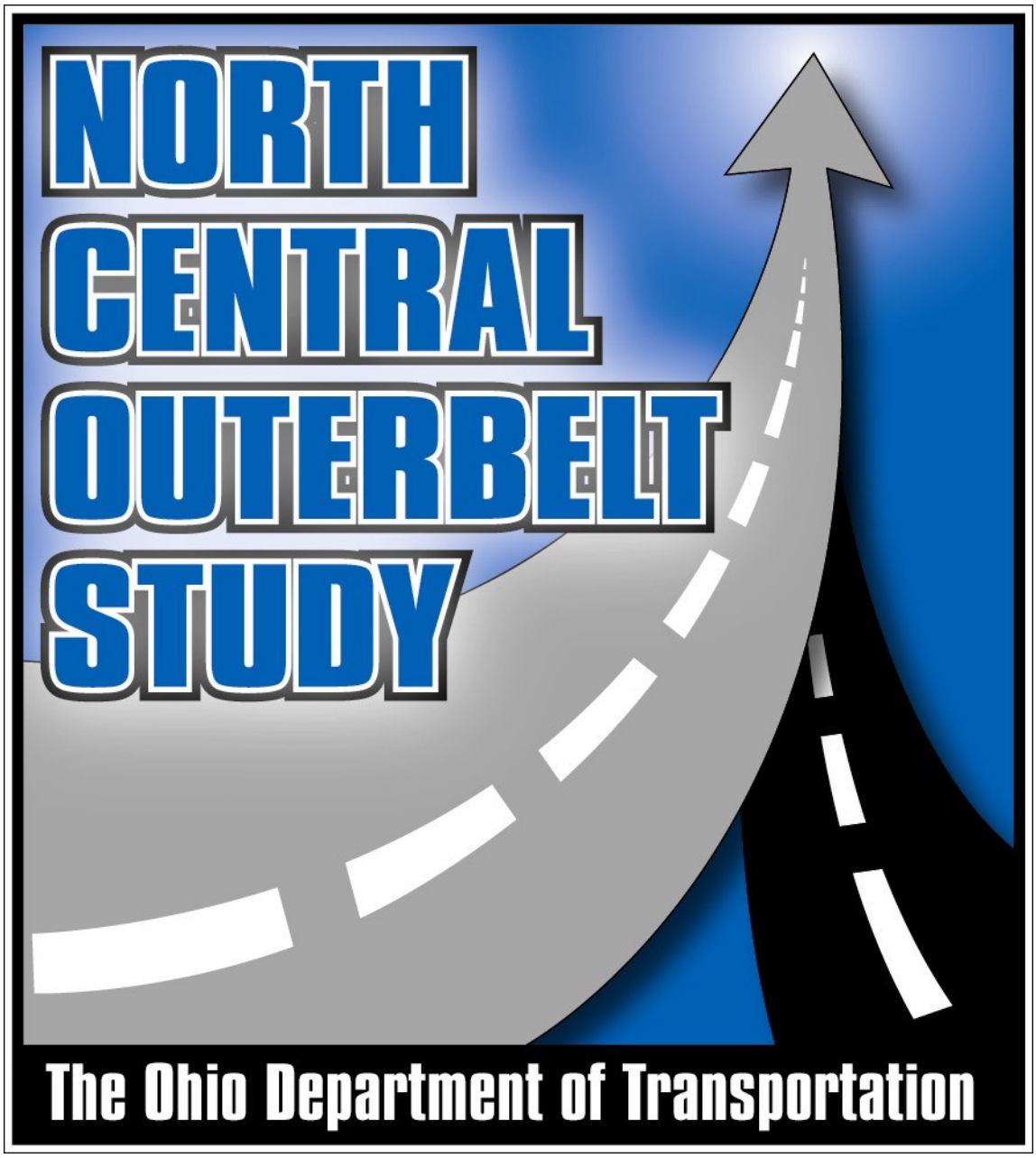

Recommendations

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Chapter 1: Recommendations

For more efficient consideration and analysis of Alternatives, the study area was divided into five different segments or locations. The locations and their respective conceptual alternatives are shown in Table 1, below.

Table 1: North Central Outerbelt Study Conceptual Alternatives

Alternative	Concept Description
SR 315 Interchange	
1	Replace 2 loop ramps with flyover ramps
2	Replace 2 loop ramps with turbine ramps
US 23 Interchange	
1	Replace both exit loop ramps with diamond ramps (keep entering loop ramps)
2	Replace both entrance loop ramps with diamond ramps (keep exit loop ramps)
US 23 North of I-270	
A	Add one lane in each direction of US 23
C	Add one lane in each direction of US 23 & create a NB below grade expressway
D	Add one lane in each direction of US 23 & create a NB above grade expressway
York Temple Drive	
No-build	Leave the existing intersection of US 23 and York Temple Drive intact
Relocation	Relocate York Temple Drive to Intersect Campus View Blvd. instead of US 23
I-71 Interchange	
1	Replace the I-270 EB to I-71 NB loop ramp with a flyover ramp

For the most part, alternatives at one location do not impact alternatives at other locations. There is, however, one combination of alternatives which is not feasible. Because of spatial conflicts the US 23 Interchange Alternative 2 can not be combined with Alternatives C or D for US 23 North of I-270.

The recommendations contained in the document consider not only how the alternatives address the established needs of the North Central Outerbelt (operational efficiency and safety) but also their environmental impacts, constructibility, overall costs, and feasibility with alternatives at other locations. They are also consistent with the goals and objectives established for the study corridor.

1.1 SR 315 Interchange

The following table contains the analysis of the SR 315 Interchange conceptual alternatives.

Table 2: Alternative Analysis Summary for I-270 at SR 315

Evaluation Criteria			SR 315 Interchange	
Category	**Criteria**	**Description**	**1**	**2**
Operational Efficiency	**Speed**	2028 Average Vehicle Speed - AM & PM Peak (MPH)	**54.1**	**51.4**
	Travel Time	2028 Total Time - AM & PM Peak (Hours)	**793**	**1127**
	Operational Notes		Alt 1 has a slight advantage in average speed, but a substantial advantage in total travel time. Analysis of the existing configuration of the SR 315 interchange with 2028 traffic produced values that were so poor they could not be accurately quantified & presented.	
Safety	**Weaving**	Approximate % reduction in the volume of weaving traffic	**77%**	**51%**
	Safety Notes		Alt's 1 & 2 still contain a "weave" between the movements for 270 WB to 315 NB and 23 NB/SB to 315 SB. In addition, Alt 2 will require traffic from 315 SB to 270 EB to make a double lane change to compete the weave maneuver.	
Environmental and Community Issues	**General Impact**	Level of impact to environmentally sensitive sites	**Low**	**Medium**
	Local Agencies	Level of impact to other/local initiatives/plans/projects in progress	**Low**	**Medium**
	Environmental Notes		Alt's 1 & 2 both have potential noise impacts on the Olentangy Parklands in the SE quadrant of the interchange. In addition to noise impacts, Alt 2 will have Right-of-Way impacts on the parklands, and overlap planned improvements to Hard Rd. at 315.	
Construction	**Duration**	Construction duration *Note: Const. at different locations can overlap*	**2 Years**	**2.5 Years**
	Maintenance of Traffic	Delay caused by lane & ramp closures	**Low**	**High**
	Construction Notes		Alt 1 will require the closure of the 315 NB to 270 WB and the 315 SB to 270 EB ramps for approximately 1 month, each. During this period, traffic would need to use alternate routes. Alt 2 would require these same closures, except they would be for a 2 year duration.	
Cost	**Estimated Total Costs**	Cost in Millions	**$54 Mil**	**$78 Mil**
	Cost Effectiveness Notes *(Costs include Engineering, Additional Right-of-Way and Construction)*		Both Alts 1 & 2 will require substantial retaining wall and bridge construction, but minimal additional Right-of-Way.	

Based upon the analysis, Alternative 1 is recommended over Alternative 2 for the following reasons:

Superior operational performance

Alternative 1 has a higher average vehicle speed and lower overall travel time.

Larger reduction of weaving traffic

Alternative 1 eliminates 25 percent more of the existing weaving conditions.

Fewer environmental impacts

Alternative 1 does not require additional Right-of-Way from the Olentangy parklands and does not interfere with locally planned improvements to Hard Rd.

Shorter construction duration

Alternative 1 requires less complicated construction methods and smaller quantities of materials.

Shorter delays from ramp and lane closures

Alternative 1 requires only short term ramp and lane closures.

Smaller total cost

Alternative 1 is estimated to cost $24 million less than the other alternative.

Alternative 1 is rated higher in every category. It can also be combined with either alternative at the US 23 Interchange location.

1.2 US 23 Interchange

The following table contains the analysis of the US 23 Interchange conceptual alternatives.

Table 3: Alternative Analysis Summary for I-270 at US 23

Evaluation Criteria			US 23 Interchange	
Category	**Criteria**	**Description**	**1**	**2**
Operational Efficiency	**Speed**	2028 Average Vehicle Speed - AM & PM Peak (MPH)	**48.3**	**48.5**
	Travel Time	2028 Total Time - AM & PM Peak (Hours)	**1196**	**1123**
	Operational Notes		Alt 2 has a slight edge over Alt 1 in average speed and total travel time. Analysis of the existing configuration of the US 23 interchange with 2028 traffic produced values that were so poor they could not be accurately quantified & presented.	
Safety	**Weaving**	Approximate % reduction in the volume of weaving traffic	**89%**	**84%**
	Safety Notes		Alt's 1 & 2 contain a "weave" between the movements for 270 EB to 23 SB and 315 NB/SB to 23 NB. However, the length of the "weave" is very long (over 3000 ft for both alt's.) Alt 1 eliminates all weaving on US-23 at the interchange.	
Environmental and Community Issues	**General Impact**	Level of impact to environmentally sensitive sites	**Low**	**Low**
	Local Agencies	Level of impact to other/local initiatives/plans/projects in progress	**Low**	**Low**
	Environmental Notes		Both Alts require minimal Right-of-Way from non-sensitive sites and will possibly impact a small stream in the NW quadrant of the interchange.	
Construction	**Duration**	Construction duration *Note: Const. at different locations can overlap*	**2.5 Years**	**2 Years**
	Maintenance of Traffic	Delay caused by lane & ramp closures	**High**	**High**
	Construction Notes		Both Alts will require replacement of the US-23 bridge over I-270, braiding ramps in the NW quadrant, and separating the CD roads between 315 and 23 from 270 with barrier walls. This work will require multiple closures of lanes and ramps.	
Cost	**Estimated Total Costs**	Cost in Millions	**$39 Mil**	**$29 Mil**
	Cost Effectiveness Notes *(Costs include Engineering, Additional Right-of-Way and Construction)*		Both Alts 1 & 2 will require extensive retaining wall and bridge construction, but minimal additional Right-of-Way.	

Operational performance, environmental, and maintenance of traffic factors being similar, Alternative 1 is recommended over Alternative 2 for the following reasons:

Larger reduction of weaving traffic

Alternative 1 eliminates 100 percent of the existing weaving conditions on US 23 near interchange ramps.

While Alternative 1 will take a little longer to construct and cost approximately $10 million more than Alternative 2, it will completely eliminate weaving conditions on US 23 and therefore greatly improve safety. In addition, Alternative 1 is the only alternative for the US 23 Interchange that can be combined with Alternatives C & D on US 23 North of I-270.

1.3 US 23 North of I-270

The following table contains the analysis of the US 23 North of I-270 conceptual alternatives.

Table 4: Alternative Analysis Summary for US 23 - From I-270 to Flint Rd.

Evaluation Criteria			US 23 North of I-270		
Category	**Criteria**	**Description**	**A**	**C**	**D**
Operational Efficiency	**Speed**	2028 Average Vehicle Speed - PM Peak Only (MPH)	**13**	**15 - Surface 33 - Express**	**15 - Surface 33 - Express**
	Travel Time	2028 Total Time - PM Peak Only (Hours)	**1072.6**	**638.4**	**638.4**
	Operational Notes		Alts C & D have a slight edge in the average speed of the surface (at grade) streets, but a substantial advantage in Total Travel Time. Analysis of the existing configuration with 2028 traffic produced values that were so poor they could not be accurately quantified & presented.		
Safety	**Weaving**	Approximate % reduction in the volume of weaving traffic	**N/A**	**N/A**	**N/A**
	Safety Notes		Weaving is more a function of the design of the I-270 interchange than the design of US-23.		
Environmental and Community Issues	**General Impact**	Level of impact to environmentally sensitive sites	**Low**	**Low**	**Medium**
	Local Agencies	Level of impact to other/local initiatives/plans/projects in progress	**Low**	**Low**	**Low**
	Environmental Notes		Alts C & D have a larger Right-of-Way footprint and a higher potential of cultural risk impacts. In addition, Alts C & D will overlap and impact a local project planned to widen US 23 north of Flint Rd. Alt D will have a greater environmental impact on US-23, than Alt C.		
Construction	**Duration**	Construction duration *Note: Const. at different locations can overlap*	**1 Year**	**2.5 Years**	**2 Years**
	Maintenance of Traffic	Delay caused by lane & ramp closures	**Low**	**High**	**High**
	Construction Notes		Alt A does not require construction of any bridges or retaining walls. Alts C & D will require multiple lane closures and phases to construct the grade separated NB roadway.		
Cost	**Estimated Total Costs**	Cost in Millions	**$6 Mil**	**$70 Mil**	**$44 Mil**
	Cost Effectiveness Notes *(Costs include Engineering, Additional Right-of-Way and Construction)*		Alts C & D have larger total costs due to the need for retaining walls, bridges, and additional Right-of-Way.		

The performance of US 23 North of I-270 in the northbound direction is critical to the performance of the US-23 interchange, and therefore, the performance of I-270. Alternative C is recommended over Alternative A due to:

Superior operational performance

Alternative C will provide higher average vehicle speeds and decreased travel times. In addition, Alternative C will provide larger residual traffic capacity in the northbound direction of US 23 (the direction traveling away from I-270) for the design year (2028). It is anticipated that Alternative A will experience performance failures at critical intersections on US 23.

Alternative C is recommended over Alternative D due to:

Fewer environmental impacts
Alternative D will have extensive impacts to the US 23 and the Pontifical College Josephinium areas, which are an environmentally sensitive locations. Alternative C will have minimal environmental impacts.

While Alternative C will take longer to construct and cost approximately $26 million more than Alternative D, as stated above, Alternative C presents fewer impacts on the environment.

1.4 York Temple Drive

The Relocation Alternative is recommended over the No-build Alternative for the following reasons:

Improved operational performance

The Relocation Alternative will enable southbound US 23 to experience improved operational efficiency by the elimination of an access point near the I-270 interchange.

Improved Safety Conditions

The Relocation Alternative will clearly provide safer access to US 23 (via W. Campus View Blvd.) for York Temple Drive traffic.

Safety and improved operations are the key benefits of the Relocation Alternative over the No-build Alternative. This is especially true in light of the fact that the No-build conditions created by the recommendation of US 23 Interchange Alternative 1 and US 23 North of I-270 Alternative C, are substantially less safe than the existing conditions. In other words, without the relocation of York Temple Drive, the recommended "improvements" made to the US 23 Interchange and on US 23 itself will degrade the existing operational and safety conditions at the York Temple Drive/ US 23 intersection.

1.5 I-71 Interchange

The following table contains the analysis of the I-71 Interchange conceptual alternatives.

Table 5: Alternative Analysis Summary for I-270 at I-71

Evaluation Criteria			I-71 Interchange
Category	**Criteria**	**Description**	**1**
Operational Efficiency	**Speed**	2028 Average Vehicle Speed - AM & PM Peak (MPH)	**56**
	Travel Time	2028 Total Time - AM & PM Peak (Hours)	**1789**
	Operational Notes		Again, analysis of the existing configuration of the I-71 interchange with 2028 traffic produced values that were so poor they could not be accurately quantified & presented.
Safety	**Weaving**	Approximate % reduction in the volume of weaving traffic	**100%**
	Safety Notes		Alt 1 also eliminates 100% of inside merge for 71 to 270 WB.
Environmental and Community Issues	**General Impact**	Level of impact to environmentally sensitive sites	**Low**
	Local Agencies	Level of impact to other/local initiatives/plans/projects in progress	**Low**
	Environmental Notes		Alt 1 will require Right-of-Way in the SW quadrant of the interchange and impact to small, low quality wetlands and streams.
Construction	**Duration**	Construction duration *Note: Const. at different locations can overlap*	**1.5 Years**
	Maintenance of Traffic	Delay caused by lane & ramp closures	**Low**
	Construction Notes		Alt 1 will require the closure of the 270 EB to 71 NB loop ramp for one month, or less. All other work will not require ramp closures.
Cost	**Estimated Total Costs**	Cost in Millions	**$26 Mil**
	Cost Effectiveness Notes *(Costs include Engineering, Additional Right-of-Way and Construction)*		

Alternative 1 is recommended over the Existing (No-build) Alternative for the following reasons:

Improved operational performance

Alternative 1 will increase the operational performance of many different movements of the I-71 Interchange.

Improved Safety Conditions

Alternative 1 will eliminate 100 percent of the weaving conditions of the I-71 Interchange, and all inside merge conditions.

Chapter 2: Cost

Planning level cost estimates for the recommended alternatives are provided in Table 6 below. It includes the estimated costs for each phase of the project (PE - Design; R/W - Right-of-Way acquisition; Const. - Construction). Costs are shown in millions of dollars.

Table 6: Planning Level Cost Estimates

Phase	Location				
	SR-315 Interchange Alt 1	US-23 Interchange Alt 1	US-23 North of I-270 Alt C	York Temple Dr. Relocation	I-71 Interchange
PE	$4.7 M	$3.4 M	$5.0 M	$0.01 M	$2.2 M
R/W	$2.0 M	$1.9 M	$14.7 M	$0.40 M	$2.1 M
Construction	$47.4 M	$33.9 M	$50.1 M	$0.10 M	$21.9 M
TOTAL	**$54 M**	**$39 M**	**$70 M**	**$0.51 M**	**$26 M**

The total estimated cost for the recommended work is $190 million.

Chapter 3: Environmental Impacts

While all of the recommended alternatives avoid the "red flag" locations identified in the Environmental Red Flag Summary, there are still areas of concern which will require additional environmental studies. Further detailed design of the recommended alternatives will be necessary to complete these studies, quantify all impacts, and assemble the appropriate NEPA documentation. It is anticipated that the necessary class of NEPA documentation will be a Categorical Exclusion (CE) - Level 4.

Listed below are areas of concern for the various study locations. Others may be identified as the detailed design and environmental studies progress.

SR 315 Interchange

- Noise impacts to the Olentangy Parklands
- Impacts to the Olentangy River

US 23 Interchange

- Impacts to existing small streams within the interchange

US 23 North of I-270

- Cultural impacts from additional R/W
- Storm water run off through Camp Mary Orton

York Temple Drive

- Open lines of communication with local property owners

I-71 Interchange

- Impacts to existing small streams and retention ponds