

This document serves in conjunction with the spreadsheet labeled:

BSB Alternatives Comparison Matrix
Evaluation Criteria

The information in this document was developed using a comparative approach to evaluating the proposed alternatives.

Areas of consideration (with detailed components) included are:

- Congestion Mitigation
- Safety
 - Geometric Improvement
 - Separation of Regional and Local Traffic
 - Simplification of Roadway Network
- Engineering
 - Meets Current Design Standards
 - Sustainability/Flexibility
- Environmental Resource Impacts
 - Hazardous Materials
 - Ecological
 - Historical
 - Archaeological
 - Community
 - Environmental Justice
- Access/Accessibility
 - Interstate/US Routes
 - Local Roads
 - Overall
- Construction Cost
- Constructability

The system for comparison was developed as “Good”, “Average” and “Poor”. Each of these has a unique meaning for each component of comparison, and is qualified in the descriptions provided in this document. Experience with the alternatives study process, engineering judgment and information provided by various agencies (ODOT, KYTC, et al.) was used to quantify each component. The included matrix was developed using all of the alternatives as a basis for determining which alternatives to carry forward into the next step of development.

Operational analysis and traffic modeling is not incorporated in this step of the process. These items, as well as vertical analysis, will be completed in future steps, and may alter details and specific configurations of each alternative.

Considerations for development of each component and evaluation of the matrix:

Congestion Mitigation:

Congestion mitigation was evaluated as “the improvement of the flow of traffic”. Although the future level of service (LOS) for many of these roadway segments remains low (LOS E or LOS F), the degree to which the traffic can move within that LOS was considered. The basis for the criteria “Good” “Average” and “Poor” is explained below, with regard for the future condition and proposed alignment design:

Good:

- Provides elements and conditions for improving the current flow of traffic

Average:

- Provides elements and conditions for maintaining the current flow of traffic

Poor:

- Provides elements and conditions that worsen the current flow of traffic

It should be noted that for the evaluation of Congestion Mitigation for each segment, current and future traffic numbers or modeling was not available. The “flow of traffic” is an observed engineering judgment based on knowledge of the corridor and experience with traffic demand. It should also be noted that at this phase in the evaluation process, consideration is given for horizontal elements only. Applying vertical information can change how a segment is regarded.

Safety:

This section discusses: Geometric Improvement, Separation of Regional and Local Traffic, and Simplification of Roadway Network

Geometric Improvement:

Geometric improvements were evaluated as “layout of alignment elements to promote safe navigation” for the future condition. Although only horizontal elements are considered during this step in the process, consideration was given for situations where extreme vertical challenges were present--steep slopes from requiring an overpass structure to tie into an underpass roadway over a short distance. The basis for the criteria “Good” “Average” and “Poor” is explained below:

Good:

- Improvement on the existing condition
- Proposed alignment meets current design practices
- Connections and transitions to existing are geometrically appropriate

Average:

- Comparable to the existing condition*
- Proposed alignment meets most current design practices
- Connections and transitions to existing may require undesirable geometric elements

Poor:

- Less desirable than the existing condition
- Proposed alignment may or may not meet current design practices
- Connections and transitions to existing require design exceptions

** For the WHV alternatives, the existing left-hand exit is considered a “Poor” geometric condition, and proposed alternatives that maintain this were ranked as “Poor” in the matrix.*

Separation of Regional and Local Traffic:

Separation of regional and local traffic was evaluated as “improving traffic movements by separating through travelers from local trips” for the future condition. Traffic can be eased by removing those using the I-75 corridor in the region, such as trucks and long-distance travelers, from those traveling into Cincinnati and Covington on a daily basis for work and commerce. The basis for the criteria “Good” “Average” and “Poor” is explained below:

Good:

- Complete separation of I-75 with I-71 and local roadways
- Proposed I-75 only connects with major highways through interchanges and CD roads
- I-71 and local roadways make all local connections

Average:

- Partial separation of I-75 with I-71 and local roadways (parallel alignments)
- Proposed I-75 connects with major highways and local roadways through interchanges, CD roads and some direct access ramps
- I-71 and local roadways provide majority of connections to I-75

Poor:

- No separation of I-75 from I-71 and local roadways (shared alignments)
- Proposed I-75 connects directly with major highways and local roadways through interchanges, possible CD roads, and direct access ramps to all existing connections
- I-71 and local roadways are the same connections as I-75

Simplification of Roadway Network:

Simplification of roadway network was evaluated as “ease of use to the traveler through clear ingress and egress with adequate decision time and distance” for the future condition. Safety can be attained by giving the driver ample time and clear direction as to what movement to make, as well as minimizing the number and complexity of weaving and entrance/exit movements over short distances. The basis for the criteria “Good” “Average” and “Poor” is explained below:

Good:

- Mainline highway is clearly defined and identifiable separate from other roadways
- Entrances/Exits are adequately spaced, with access limited to other major roadways and CD roads
- Local access separate from main through network with simple, clear access to and from highways
- (WHV alternatives only: simple design, improves existing layout for ease of use)

Average:

- Mainline highway operates primarily separate from other roadways
- Entrances/Exits meet or improve existing conditions, with access to/from other major roadways, CD roads and some local road access
- Local access integrated where necessary with main through network
- (WHV alternatives: adequate design, uses some existing features while improving others)

Poor:

- Mainline highway integrated with other roadways and highways
- Entrances/Exits meet or worsen existing conditions, with access ramps to/from all types of roadways, local or through
- Local access integrated with main network, complicating navigation of the system
- (WHV alternatives: complex design, worsens existing layout to inhibit ease of use)

Engineering Design:

This section discusses: Meets Current Design Standards and Sustainability/Flexibility.

Meets Current Design Standards:

Meeting current design standards was evaluated as “meeting ideal or minimum design standards set forth by AASHTO, ODOT and KYTC” for the future condition. It should be noted that at this step in the process, only horizontal elements are considered for evaluation. The basis for the criteria “Good” “Average” and “Poor” is explained below:

Good:

- Improves existing conditions to meet ideal or, in some cases, minimum design criteria anticipated at this step

Average:

- Improves or matches existing conditions to meet many ideal or minimum design criteria anticipated at this step

Poor:

- Matches or worsens existing conditions to meet few ideal or minimum design criteria anticipated at this step

Sustainability/Flexibility:

Sustainability and flexibility was evaluated as “the capacity of the design to be further expanded, improved or connected to in the long-term future” for the proposed condition. The basis for the criteria “Good” “Average” and “Poor” are explained below:

Good:

- Readily expandable system, can be adapted to a variety of long-term future improvements

Average:

- System capable of being expanded to fit some long-term future improvements

Poor:

- System incapable of being expanded or improved upon in the future

Environmental Resource Impacts:

This section discusses: Hazardous Materials, Ecological, Historical, Archaeological, Community, and Environmental Justice

The impacts from these categories are quantitatively measured, and compared relative to each alternative. After an explanation of each category, all are summarized numerically in the table below.

Hazardous Materials: include “underground storage tanks and hazardous materials sites” as listed in resource agency data bases.

Ecological: includes wetlands, streams and rivers and floodplains.

Historical: includes National Register of Historic Places (NRHP) listed resources and historic districts, both in Kentucky and Ohio.

Archaeological: includes recorded sites in the study area.

BSB Alternatives Comparison Matrix

Evaluation Criteria

Revised: 2/17/2006

Community: includes community facilities and services such as schools, parks, facilities and churches; business and residential displacements and community cohesion.

Environmental Justice: includes low-income and minority populations, and are evaluated based on census tracts and census data.

The quantitative values used as the basis for the criteria for “Good” “Average” and “Poor” was defined by the number of occurrences counted from Red Flag mapping locating each item in the table below:

Environmental Resource Impacts Table

Rating	Sect.	Hazardous Materials	Ecological	Historical	Archaeological	Community	Env. Justice
Good	1	0 Sites	0 to 4 Streams	0 Sites	0 Sites	0 Parks and/or 0 to 10 Displacements	Follows Exist. Minimum Disruption of Community
	2		0 Floodplains				
	3		Streams				
	4		Wetlands				
Average	1	1 to 5 Sites	5 to 9 Streams	1 Site	1 Site	1 Park and/or 11-15 Displacements	Primarily Follows Exist. Some Disruption of Community
	2		1 to 2 Floodplains				
	3		Streams				
	4		Wetlands				
Poor	1	6+ Sites	10+ Streams	2+ Sites	2+ Sites	2+ Parks and/or 15+ Displacements	New Alignment. Considerable Disruption of Community
	2		3+ Floodplains				
	3		Streams				
	4		Wetlands				

Access and Accessibility:

This section discusses: Interstate/US Routes, Local Roads, and Overall.

For the portion of the matrix addressing the independent evaluation of the Western Hills Viaduct alternatives (WHV-1 through WHV-9), consideration was given--in addition to the criteria below--to honoring the previous studies that have been completed for the area, and the conclusions and recommendations offered by the parties involved in the development of those documents.

Interstate/US Routes:

Interstate/US Routes was evaluated as “ease and clarity of access to the traveler to and from interstate and US routes from other interstate US routes” for the future condition. The basis for the criteria “Good” “Average” and “Poor” is explained below:

Good:

- Improves existing condition to simplify the interstate network access
- Provides clear and simple navigation to, from and between the Interstate and US Routes

Average:

- Meets existing conditions with elements that match or simplify the interstate network access
- Navigation to, from and between the Interstate and US Routes is maintained as-is

Poor:

- Worsens existing conditions by complicating the interstate network access
- Traveling to, from and between Interstate and US Routes is difficult to discern or navigate

Local Roads:

Local Roads were evaluated as “ease and clarity of access to the traveler to and from interstate and US routes from the local roadway network” for the future condition. The basis for the criteria “Good” “Average” and “Poor” is explained below:

Good:

- Improved the exiting condition to simplify local access to and from the interstate
- Provides clear and simple navigation to and from local roadways
- (WHV alternatives: additional movements to connect the area)

Average:

- Meets existing conditions with elements that match or simplify the local roadway network access
- Navigation to and from the local roadways is maintained as-is
- (WHV alternatives: same movements as existing to connect the area)

Poor:

- Worsens existing conditions by complication the local roadway network access
- Traveling to and from local roadways is difficult to navigate
- (WHV alternatives: fewer movements than existing to connect the area)

Overall:

Overall conditions for access and accessibility were evaluated as “ease and clarity of access to the traveler for the system as a whole” for the future condition. The basis for the criteria “Good” “Average” and “Poor” is explained below:

Good:

- Improved network between all configurations of Interstate, US Routes and local roadways
- Navigation to, from and between all networks is clear and simple

Average:

- Meets existing conditions for configurations of Interstate, US Routes and local roadways
- Navigation to, from and between all networks is maintained as-is

Poor:

- Worsens existing conditions by complication of the overall network access
- Traveling to, from and between is difficult to navigate

Construction Cost:

Construction cost was evaluated as “relative expense for construction based on structure” for the future condition. The costs for each alternative were weighed against each other, and the basis for the criteria “Good” “Average” and “Poor” is explained below:

Segment/ Rating	1. Kyles Lane to 5th St. In KY	2. 5th St. in KY to 7th/Elm St. in OH	3. Elm. St to N. of Ezzard Charles	4. Ezzard Charles to WHV
Good	Up to 3,000 ft of Structure	Up to 7,000 ft of Structure	Up to 4,000 ft of Structure	Up to 1,000 ft of Structure
Average	3,000 ft to 10,000 ft of Structure	7,000 ft to 11,000 ft of Structure	4,000 ft to 10,000 ft of Structure	1,000 ft to 8,000 ft of Structure
Poor	More than 10,000 ft of Structure	More than 11,000 ft of Structure	More than 10,000 ft of Structure	More than 8,000 ft of Structure

Constructability:

Constructability cost was evaluated as “consideration given for buildability by using engineering judgment and field experience with complex, urban roadways and structures crossing many obstacles and features” for the future alternative. The basis for the criteria “Good” “Average” and “Poor” is explained below:

Good:

- A buildable alternative and system, through one-time or staged programming
- Ideal conditions for maintaining through and local access for traffic at most all times while under construction
- Relatively minimum number of obstacles, and easy access for construction equipment
- Maximized opportunity for worker safety
- Minimized temporary construction elements and work that will need to be removed

Average:

- Likely buildable alternative and system, requiring staged programming
- Workable conditions for maintaining through and local access for traffic while under construction, some creative traffic movements will be necessary to keep the system in operation
- Moderate number of obstacles present, and access for construction equipment is available but not readily accessible
- Can meet criteria for worker safety
- Some temporary construction elements and work that will need to be removed will be required

Poor:

- May not be buildable in the current configuration, long-term staging required
- Difficult to impossible to maintain through or local traffic while under construction, complete stoppages in some movements will be required
- High number of obstacles present, construction equipment access will be limited and may inhibit certain types of design due to lack of buildability
- High likelihood of worker injury
- Extensive temporary construction elements and work that will need to be removed will be required