

APPENDICES

Appendix A – Supplemental Design Concept Alternative Information

Design Concept Alternatives

In the project's Location/Design Concept Report (L/DCR), the design concepts for each alternative are identified by alphanumeric designations associated with the three study segments shown in Figure 6. The design concept alternatives include varying cross sections and constructing the improvements on either side of the existing roadway. For these variations, the alternatives were assigned names according to the following method as summarized in Table A:

- The first letter (A, B, or C) identifies the study segment.
- The number corresponds to the type of typical cross section applied ("1" indicates narrow median, "2" indicates standard median, and "3" indicates variable-width median).
- The final letter corresponds to which side of the existing roadway the improvements would be constructed ("a" indicates the west side, "b" indicates the east side, and no final suffix is included if improvements would be constructed on alternating sides).

Table A – Design Concept Alternatives Summary

<i>Segment</i>	<i>Alternative</i>	<i>Location of New Lanes Relative to Existing US 93</i>	<i>Cross Section</i>
A	A-1a	West	Narrow median
	A-1b	East	Narrow median
	A-2a	West	Standard median
	A-2b	East	Standard median
	A-3a	West	Variable-width median
	A-3b	East	Variable-width median
B	B-1a	West	Narrow median
	B-1b	East	Narrow median
	B-2a	West	Standard median
	B-2b	East	Standard median
	B-3a	West	Variable-width median
	B-3b	East	Variable-width median
C	C-1a	West	Standard median
	C-1b	East	Standard median
	C-2a	West	Variable-width median
	C-2b	East	Variable-width median
	C-3	Varies	Variable-width median

Cross Sections Considered

Three typical roadway cross sections that would provide the needed capacity and meet the goals for the project area were identified and considered for each of the study segments, as illustrated in Figure A.

Narrow Median

A 70-ft centerline-to-centerline roadway separation, which provides a 46-ft graded median, is the minimum cross section to be used in rural areas, based on ADOT's *Roadway Design Guidelines*. This cross section, which requires the least amount of R/W of any rural divided highway cross section, would be used in areas where a wider separation would have negative impacts on adjacent properties. In the L/DCR, the narrow median cross section is recommended for Segment A.

The advantages of this cross section would include:

- Requires the least amount of new R/W of any rural divided highway cross section
- Results in the least impact on adjacent property for any rural divided highway cross section

The disadvantages of this cross section would include:

- Reduced opportunities for independent lane elevations for each direction of travel, which would result in increased land disturbance in rolling terrain
- Requires removal of natural drainage features or vegetation in the median because the full width of the median is graded
- Less shielding from the headlight glare of oncoming traffic than would be provided with a wider median
- Less capacity for storing turning vehicles at crossovers than would be provided with a wider median

Standard Median

A 108-ft centerline-to-centerline roadway separation, which provides an 84-ft median, would be the desirable cross section for use in rural areas. In the L/DCR, the standard median cross section is recommended for Segment B.

Advantages of this cross section would include:

- A greater range of independent profile grades for each set of lanes than could be achieved with a narrow median
- Increased opportunities to provide a landscaped area or retain natural vegetation in the median to improve aesthetics
- Greater capacity for storing turning vehicles at crossovers than would be provided by a narrow median
- More room for drainage improvements than would be provided by a narrow median

The disadvantage of this cross section would be that it would require more R/W and have a greater impact on adjacent land parcels than the narrow median.

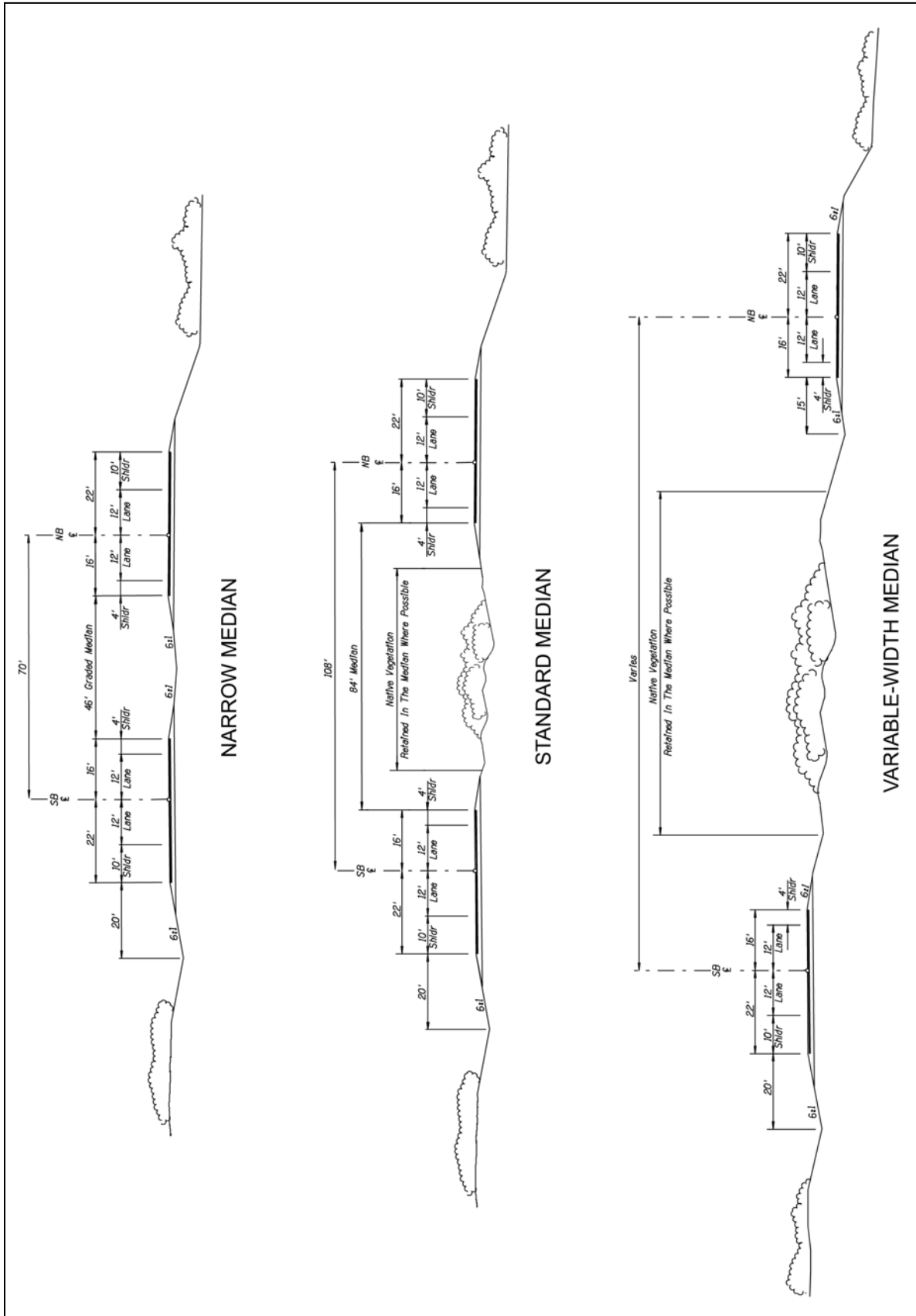


Figure A – Cross Sections

Variable-Width Median

A divided four-lane facility with a variable-width median, which allows development of independent alignments for each direction of travel, would be the desirable cross section in rural areas where the topography is rolling and there are scenic elements that should be avoided. In the L/DCR, the variable-width median cross section is recommended for Segment C.

Advantages of this cross section would include:

- Independent vertical and/or horizontal alignments to fit the terrain, minimizing the need for cut and fill, reducing vegetation disturbance, and lowering construction costs
- Use of independent alignments to enhance the aesthetic quality of the roadway by improving views from the roadway and/or allowing natural vegetation to remain in the median
- Use of independent alignments to retain natural drainage channels in the median
- Use of two independent roadways minimizes impacts on the visual setting by reducing the dominance of the opposing lanes in motorists' views from the roadway

The disadvantage of this cross section would be that it would require more R/W than the standard median or narrow median, resulting in higher R/W costs and greater impacts on adjacent properties.