

CHAPTER 4 –COMPARISON OF ALTERNATIVES

4.1 Context and Key Issues

In order to provide a comparison of the alternatives, key features have been identified and quantified. The impacts of the alternatives are discussed in detail in the Technical Reports which have been prepared as separate documents. Examples of the Technical Reports include Land Use, Transportation, Cultural Resources, Wetlands, and Socioeconomic Reports.

From a preliminary design perspective, the key issues include the control of intersections by signals or roundabouts, the wetland impacts, right-of-way required for each alternative, and the costs associated with each alternative.

4.2 Signals vs. Roundabouts

A major difference in the alternatives is whether the intersection control is based on signals or roundabouts. Signalized control of intersections is utilized as the primary control for Alternatives 2 and 18. Roundabouts have been analyzed for Alternatives 3 and 19. Combinations of these methods of control have been studied for the other alternatives. In many cases, either signal control or roundabouts will function well at the study intersections, and the selection is often based on personal preference. The decision of which control to utilize at each intersection may be interchanged as a selected alternative proceeds into final design.

4.3 Wetland Impacts

All of the alternatives will have some impact on wetlands within the study area. Along the VT 2A corridor, small pockets of wetlands exist adjacent to the road and are generally associated with the stormwater runoff from the existing paved surface areas. For the alternatives that involve the widening of VT 2A, it is not practical to avoid impacting small portions of these wetland areas. The preliminary design sought to minimize the impacts by increasing side slopes and/or constructing small retaining walls. These impacts are discussed in the Wetland Technical Report.

Portions of the Circ A/B corridor contain extensive wetlands. Some of these areas were previously delineated in 1987 for the original Circ design, and were then reevaluated in 2005 for this EIS study. It was found that the extent of wetland area had increased significantly because areas of agricultural fields had been abandoned, allowing wetland vegetation to establish on the hydric soils. Consequently, the previous Circ design was modified to steepen the roadway side slopes to minimize the wetland impact. Slopes previously designed at 4:1 and 6:1 have been increased to 2 :1 and guard rail added to reduce the area of impact.

4.4 Right-of-Way

The number of right-of-way acquisitions and the value of these differ significantly between the alternatives. For the VT 2A corridor, the road is densely developed with both commercial and residential properties situated on generally small lots. Much of the corridor has a relatively narrow 66 foot wide right-of-way, and the recommended widening for roadway and multi-use path purposes will necessitate many takings. In addition to area needed for the roadway widening itself, additional areas were identified to provide stormwater management areas to control and treat the runoff from the paved surfaces of VT 2A.

VTrans previously acquired the right-of-way for the Circ A/B corridor. Alternative 16a requires no additional right-of-way in the Circ corridor. The other alternatives in this corridor require relatively few acquisitions, primarily associated with the alternative interchange configurations. Alternatives 16a, 16b, 16c, and 17 include spot improvements at certain intersections on the VT 2A corridor. Some of these spot improvements will require additional right-of-way.

The taking areas were determined by the proposed layout plans for each alternative and the methodology is described generally in Section 3.6. The required acquisitions were defined for each alternative and are summarized on Table 4.1. Complete listings of the parcel takings required are contained in the Socioeconomics Technical Report. The VTrans Right-of-Way Section prepared estimates of the costs required for the process based on similar recent projects and these are discussed in Section 4.5 below.

**TABLE 4.1
RIGHT-OF-WAY REQUIREMENTS**

| Alternatives | Full Acquisitions | | | | Partial Acquisitions | | | | | | Right of Way Cost (\$) |
|--------------|-------------------|------------|--------|-------|----------------------|------------|---------------|-----------|--------|-------|------------------------|
| | Residential | Commercial | Vacant | Total | Residential | Commercial | Manufacturing | Community | Vacant | Total | |
| 2 | 3 | 4 | 1 | 8 | 111 | 29 | 11 | 3 | 1 | 155 | \$15,800,000 |
| 3 | 6 | 4 | 2 | 12 | 108 | 35 | 10 | 3 | 1 | 157 | \$16,800,000 |
| 16a | 0 | 0 | 1 | 1 | 5 | 0 | 0 | 0 | 2 | 7 | \$400,000 |
| 16b | 1 | 0 | 1 | 2 | 8 | 0 | 0 | 0 | 4 | 12 | \$3,800,000 |
| 16c | 0 | 0 | 2 | 2 | 6 | 1 | 0 | 0 | 4 | 11 | \$2,600,000 |
| 17 | 0 | 0 | 1 | 1 | 5 | 0 | 0 | 0 | 5 | 10 | \$700,000 |
| 18 | 3 | 4 | 1 | 8 | 111 | 29 | 11 | 3 | 4 | 158 | \$16,100,000 |
| 19 | 6 | 4 | 2 | 12 | 108 | 35 | 10 | 3 | 4 | 160 | \$17,000,000 |
| 22 | 1 | 5 | 2 | 8 | 43 | 23 | 8 | 2 | 1 | 77 | \$13,100,000 |
| 23 | 1 | 5 | 2 | 8 | 43 | 23 | 8 | 2 | 4 | 80 | \$13,400,000 |

4.5 Cost Estimates

To assist in a comparison of the alternatives, construction cost estimates of each alternative were prepared. The roadway construction estimates include excavation, gravel, pavement, curbing, drainage, multi-use trails, and utility costs. Unit price costs were obtained by a review of recently bid projects. Unit prices may vary between alternatives to reflect different working conditions and construction difficulties. Utility relocation costs were obtained from discussions with the utility agencies. Right-of-Way costs were estimated separately by VTrans and are discussed in Section 4.4. A summary of the estimated costs for all of the alternatives is provided in Table 4.2. Back-up information is contained in Appendix D of this Technical Report.

Table 4.2
Alternatives Cost Summary

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| Alternative | Roadway | Bridge | Right of Way | Total |
|-------------|--------------|--------------|--------------|--------------|
| 2 | \$27,300,000 | \$6,200,000 | \$15,800,000 | \$49,300,000 |
| 3 | \$25,500,000 | \$3,100,000 | \$16,800,000 | \$45,400,000 |
| 16a | \$36,500,000 | \$31,000,000 | \$400,000 | \$67,900,000 |
| 16b | \$38,100,000 | \$31,900,000 | \$3,800,000 | \$73,800,000 |
| 16c | \$33,600,000 | \$29,600,000 | \$2,600,000 | \$65,800,000 |
| 17 | \$29,000,000 | \$20,600,000 | \$700,000 | \$50,300,000 |
| 18 | \$37,500,000 | \$10,700,000 | \$16,100,000 | \$64,300,000 |
| 19 | \$35,700,000 | \$7,600,000 | \$17,000,000 | \$60,300,000 |
| 22 | \$19,300,000 | \$4,500,000 | \$13,100,000 | \$36,900,000 |
| 23 | \$29,500,000 | \$5,900,000 | \$13,400,000 | \$48,800,000 |

Notes:

1. Roadway and bridge costs are estimated for 2007 and do not include engineering and permitting costs.
2. Right-of-way costs include severance, relocation and incidental costs.

Costs were initially calculated based on 2007 year prices. It is anticipated that there would be a significant difference as to when the alternatives could realistically be constructed. For the Circ A/B corridor, the layout, profile and structure design for Alternative 16a has already been carried through to final design and has received all necessary permits. In addition, the Right-of-Way is already owned by VTrans. It is anticipated that this alternative would require minor redesign, would require modification and updating of the existing permits, and could be advertised for construction sooner than any other alternative. Alternatives 16b, 16c, and 17 would require some additional design, a relatively few right-of-way transactions, and possibly could be constructed with modification to the existing permits since the impacts are similar to Alternative 16a.

All of the alternatives requiring major reconstruction of VT 2A will take significantly longer to initiate construction. Additional time will be needed for the preliminary and final design, acquisition of the necessary right-of-way, and completion of the permitting process. Extensive coordination would be required with abutting property owners, Town officials and utility agencies. Table 4.3 provides an estimate of the time for initiation of construction and the effort required for design and permitting of the different alternatives. Project costs have been adjusted to account for the differences in effort and schedule for the alternatives and are presented in Table 4.3.

**Table 4.3
Adjusted Cost Summary**

| Alternative | Total Cost 2007 | Anticipated Start Date | Design and Permitting | Adjusted Cost |
|-------------|-----------------|------------------------|-----------------------|---------------|
| 2 | \$49,300,000 | 2013 | 15% | \$68,300,000 |
| 3 | \$45,400,000 | 2013 | 15% | \$62,400,000 |
| 16a | \$67,900,000 | 2009 | 5% | \$78,000,000 |
| 16b | \$73,800,000 | 2010 | 6% | \$89,100,000 |
| 16c | \$65,800,000 | 2010 | 7% | \$80,100,000 |
| 17 | \$50,300,000 | 2010 | 10% | \$62,800,000 |
| 18 | \$64,300,000 | 2013 | 15% | \$90,100,000 |
| 19 | \$60,300,000 | 2013 | 15% | \$84,000,000 |
| 22 | \$36,900,000 | 2013 | 15% | \$50,900,000 |
| 23 | \$48,800,000 | 2013 | 15% | \$68,100,000 |

4.6 Summary Comparison of Alternatives

The alternatives contain significant differences in the extent and location of the improvement and the impacts associated with these alternatives. The impacts are discussed in detail in the Technical Reports. Table 4.4 provides an overview of some of the important components of the alternatives.

**Table 4.4
Summary Comparison of Alternatives**

| | Roadway Construction (ft.) | | | Intersections | | Structures | | Wetlands Impact | Acquisitions | | Project Cost |
|------------|----------------------------|----------|----------------|---------------|------------|------------|----------------|-----------------|--------------|---------|--------------|
| | New Road | New Ramp | Reconstruction | Signal | Roundabout | New | Modify/Replace | Acres | Full | Partial | |
| 2 | 0 | 0 | 19,900 | 9 | 0 | 0 | 3 | 1.4 A | 8 | 155 | \$68.3 M |
| 3 | 0 | 0 | 19,900 | 0 | 9 | 0 | 2 | 0.9 A | 12 | 157 | \$62.4 M |
| 16a | 20,000 | 13,400 | 5,300 | 2 | 0 | 9 | 0 | 31.4 A | 1 | 7 | \$78.0 M |
| 16b | 20,000 | 18,600 | 5,300 | 4 | 0 | 9 | 0 | 36.0 A | 2 | 12 | \$89.1 M |
| 16c | 20,000 | 11,400 | 5,600 | 3 | 0 | 8 | 0 | 26.7 A | 2 | 11 | \$80.1 M |
| 17 | 18,900 | 5,100 | 4,100 | 2 | 2 | 6 | 0 | 24.1 A | 1 | 10 | \$62.8 M |
| 18 | 8,900 | 5,100 | 19,000 | 11 | 2 | 1 | 3 | 21.3 A | 8 | 158 | \$90.1 M |
| 19 | 8,900 | 5,100 | 22,600 | 2 | 11 | 1 | 2 | 20.9 A | 12 | 160 | \$84.0 M |
| 22 | 0 | 0 | 19,900 | 3 | 6 | 0 | 2 | 1.0 A | 8 | 77 | \$50.9 M |
| 23 | 8,900 | 5,100 | 22,600 | 3 | 10 | 1 | 1 | 21.0 A | 8 | 80 | \$68.1 M |