APPENDIX B
ALTERNATIVES ANALYSIS MEMO

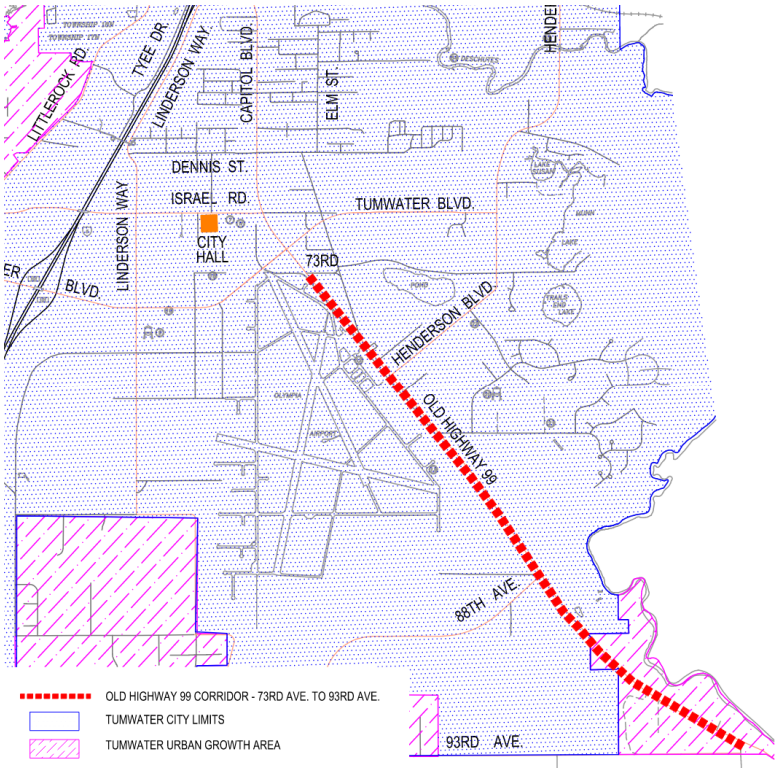
SCJ ALLIANCE
CONSULTING SERVICES

TECHNICAL MEMORANDUM

TO:	Mary Heather Ames
FROM:	Patrick Holm
DATE:	May 3, 2021
PROJECT #:	0625.29
SUBJECT:	Old Highway 99 Corridor Study – Alternatives Analysis – Methods Memo

BACKGROUND

The objective of the Old Highway 99 Corridor Study is to validate the transportation recommendations included in the Tumwater City Plan 2036, Transportation Master Plan November 2016 (Transportation Plan), manage necessary or recommended changes resulting from the validation process, and prepare preliminary design for the Old Highway 99 corridor improvements from approximately 73rd Avenue SE to 93rd Avenue SE. This project will perform transportation and alternatives analysis to determine and recommend roadway cross section and intersection improvements at Henderson Boulevard, 79th Avenue SE, 88th Avenue SE, and 93rd Avenue SE in context with the overall corridor improvements. The corridor study will build upon the Transportation Plan to ultimately define the footprint of improvements and progress a conceptual design.



Vicinity Map – Old Hwy 99 Corridor Study

PURPOSE

The purpose of this alternatives analysis is to analyze potential roadway cross sections proposed for the Old Highway 99 Corridor Study project. Each alternative will be rated based on performance and cost.

CONCEPTUAL ASSUMPTIONS/DESIGN CRITERIA

Old Highway 99 is a Minor Arterial based upon the classification of the City of Tumwater Development Guide (Development Guide). The City's Transportation Master Plan recommends a four-lane section from 73rd Avenue to 88th Avenue with roundabout intersections at Henderson Boulevard, 79th Avenue, 88th Avenue, and 93rd Avenue. All alternatives will meet these minimum requirements. Currently, the posted speed on the corridor varies from 35 mph to 50 mph.

PERFORMANCE RANKING

Criteria and Weighting

We based the following criteria (performance attributes) on the goals of the project and feedback from the first stakeholder's workshop.

The criteria follow:

- Bicycle Function/Usability
- Pedestrian Function/Usability
- Emergency Access Function/Usability
- Aesthetic
- Environmental Impact (Mazama Pocket Gopher Habitat)

Each criterion was originally weighed using pair-wise comparisons based on feedback from the stakeholder group.

PERFORMANCE ATTRIBUTE MATRIX

Old Highway 99 Corridor Study

Rate the relative importance of the attributes relative to the project's Need and Purpose.

Performance Attributes	Bike Function	Ped Function	EMS Function	Aesthetic	Enviro Impact	Total Count	PRIORITIES
Bike Function	A	A/B	C	A	A	3.5	**0.233**
Ped Function		B	C	B	B	3.5	**0.233**
EMS Function			C	C	C	5	**0.333**
Aesthetic				D	D	2	**0.133**
Enviro Impact					E	1	**0.067**
SUB-TOTALS						15.00	**1.00**

Figure 1 – Original Criteria Weighting

Scoring

Each of the six alternatives were scored against the criteria above by the stakeholder group at the second workshop. A rating of 0 to 10 was applied to each performance attribute.

Cost

We generated conceptual cost estimates for each alternative using industry standard cost breakdowns and unit cost values derived from WSDOT unit bid tabs. Each estimate was given a 20% contingency factor due to the conceptual nature. The calculated costs are based on 2021 dollars. We included the following cost-reducing ideas in the alternatives:

- Per discussion with the City, minimizing the roadway section with narrow lanes to decrease pavement.

In addition, the following opportunities may provide cost savings as design details progress:

- Integrating the stormwater mitigation into planter strips has the potential to minimize footprint for stormwater facilities.

Value Ranking

We ranked each alternative by its value. The value of each alternative is a function of the cost index and alternative score, where the cost index is the ratio of individual alternative cost divided by the sum of all alternative costs. The alternative value is determined by dividing the alternative score by the cost index. The alternative with the best value will be the recommended alternative.

$$Criteria\ Score = weight * rating$$

$$Alternative\ Score = \sum criteria\ scores$$

$$Cost\ Index = \frac{Alternative\ Cost}{\sum Alternative\ Cost}$$

$$Alternative\ Value = \frac{Alternative\ Score}{Cost\ Index}$$

Formulae for developing Value Index

ALTERNATIVES

(Exhibits of Cross Sections available in Attachment 1)

Alternative 1

Alternative 1 follows the standard City of Tumwater minor arterial prescription with the exception of lane width. The road has four 11-foot travel lanes and one 12-foot two-way left turn lane with 6-foot bike lanes on both sides. The cross section also features 6-foot sidewalks and 6-foot planter strips with a 2-foot buffer strip behind the back of walk. The total width of Alternative 1 is 96 feet.

Alternative 2

Alternative 2 shifts all pedestrian movement to the east side of Old Highway 99 with an 8-foot sidewalk and provides a 6-foot median in place of a two-way left turn lane. The bike lanes remain six feet but the inside lanes grow to 12 feet to provide shy distance for the median. The total width of Alternative 2 is 85 feet.

Alternative 3

Alternative 3 is similar to Alternative 2 but removes bikes from the northbound road and combines them with pedestrians on a 12-foot shared use path. The northbound outer lane grows to 13 feet. The total width of Alternative 3 is 85 feet.

Alternative 4

Alternative 4 builds on Alternative 3 and removes the bike lane from the southbound road and combines it with the eastside shared use path. This would require bikes to be re-routed to the shared use path at intersections bordering the study area. The total width of Alternative 4 is 81 feet.

Alternative 5

Alternative 5 removes bike lanes from the roadway and combines bicycle and pedestrian uses on their respective side with two 10-foot shared use paths. The inner travel lanes are 12 feet with the outer travel lanes at 13 feet. The total width of Alternative 5 is 92 feet.

Alternative 6

Alternative 6 provides the standard section on the northbound: two travel lanes (12-foot inner, 11-foot outer), 6-foot bike lane, 6-foot planter strip, and 6-foot sidewalk. On the southbound side, the bike and pedestrian traffic is separated from the road on a 10-foot shared use path as in Alternative 5. The total width of Alternative 6 is 92 feet

CONCLUSION

After Workshop 2, the stakeholder group completed the performance scoring and value ranking. This process yielded the following ranking:

1. Alternative 5
2. Alternative 1
3. Alternative 6
4. Alternative 3
5. Alternative 4
6. Alternative 2

The highest value alternative was Alternative 5 which has two 10-foot shared use paths and no bike lanes on the road.

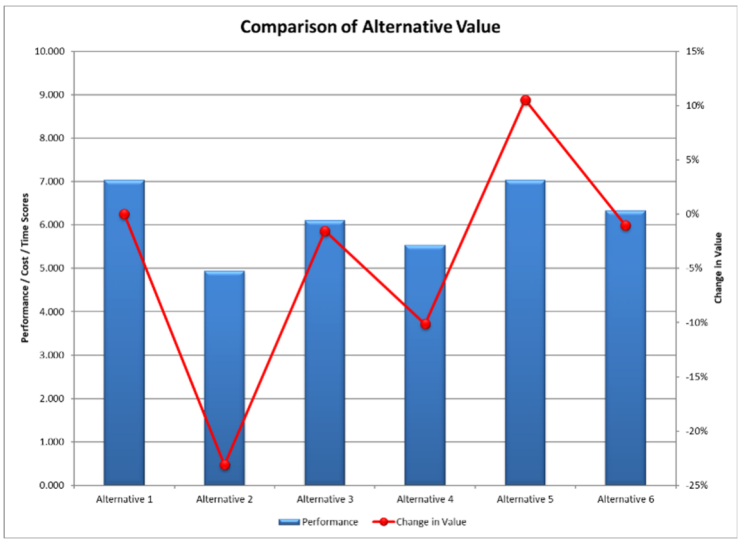


Figure 2 - Draft Ranking

After the workshop, the City reviewed the results internally and recommended revising steps of the process.

Revised Criteria

The original criteria had placed Environmental Impact as the least important criterion. The City advised to change Environmental Impact to be equally important as the highest criterion (EMS Function) because of the anticipated requirements and hard and soft costs of permitting for Federally listed endangered species. This was mentioned as a likely revision in Workshop 2.

These updated criteria ranking placed a higher value on footprint and impacted the rankings as follows:

1. Alternative 4
2. Alternative 3
3. Alternative 5
4. Alternative 2
5. Alternative 6
6. Alternative 1

The new highest value became Alternative 4 which had no bike lanes either direction and a 12-foot shared use path on the east side of Old Highway 99. The City felt bicycle users would still attempt to go southbound on the road in Alternative 4 introducing multi-modal conflict. For this reason, Alternative 4 was eliminated.

Two alternatives were modified to further reduce impact and look for the highest value:

Alternative 2B

Alternative 2B is the same as Alternative 2 with the exception of a 6-foot sidewalk instead of an 8-foot sidewalk which is more consistent with City sidewalk standards and reduces width.

Alternative 3B

Alternative 3B is the same as Alternative 3 but with a 10-ft sidewalk.

With these modified alternatives, the ranking shuffled slightly as follows:

1. Alternative 3B
2. Alternative 3
3. Alternative 2B
4. Alternative 5
5. Alternative 6
6. Alternative 1

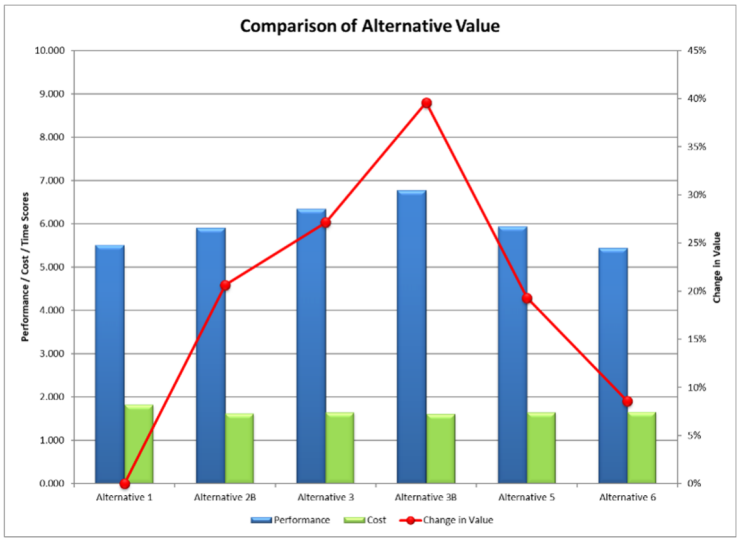


Figure 3 - Final Ranking

Recommendation

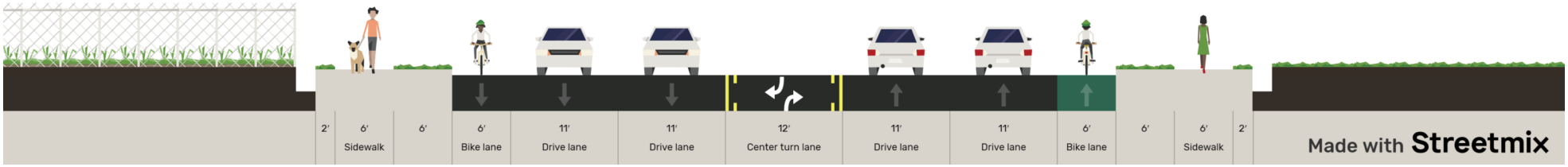
Alternative 3B has the highest value of the revised alternatives. It provides a wide shared use path for pedestrians and cyclists on the westside of Old Highway 99 while also allowing for cyclists to use a bike lane for southbound travel if they choose not to use the shared use path. This alternative will include implementation of a median along the corridor. As the design progresses, the design team will coordinate with stakeholders to coordinate appropriate breaks as needed for safety and access.

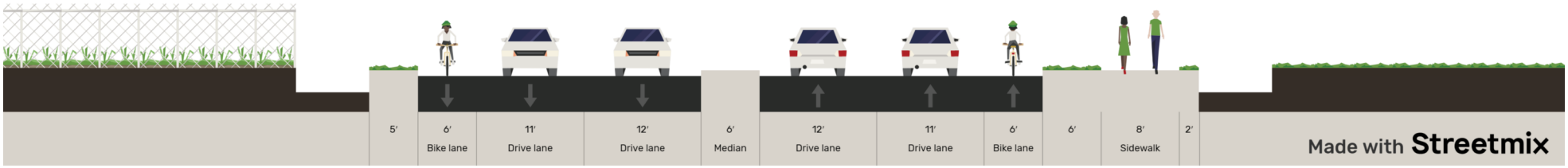
Attachment 1 – Alternative Cross Sections

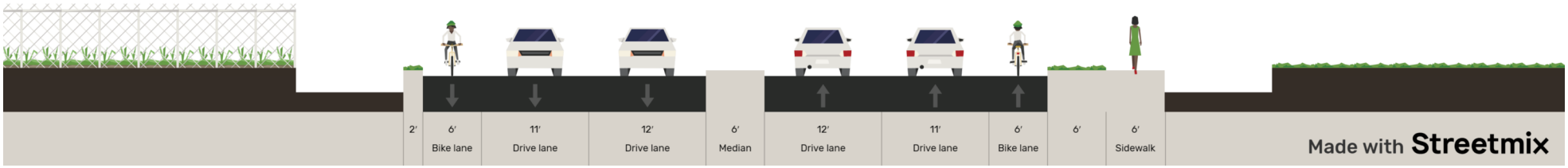
Attachment 2 – Value Metrics Data

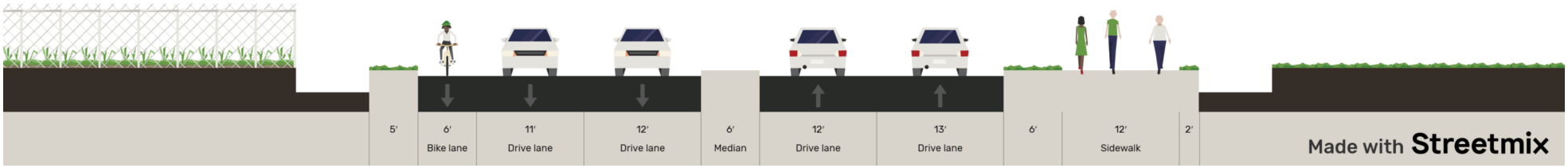
Attachment 3 – Cost Estimates

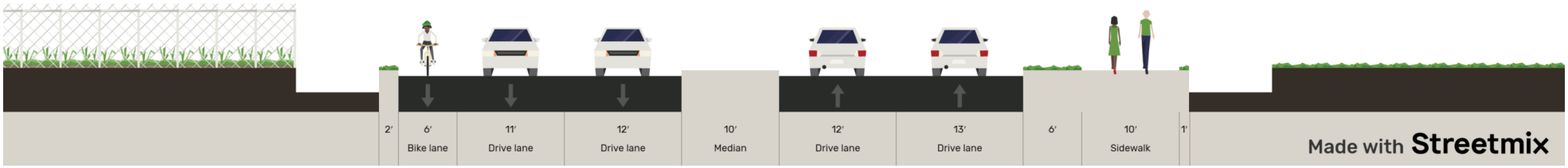
Attachment 1 – Cross Sections

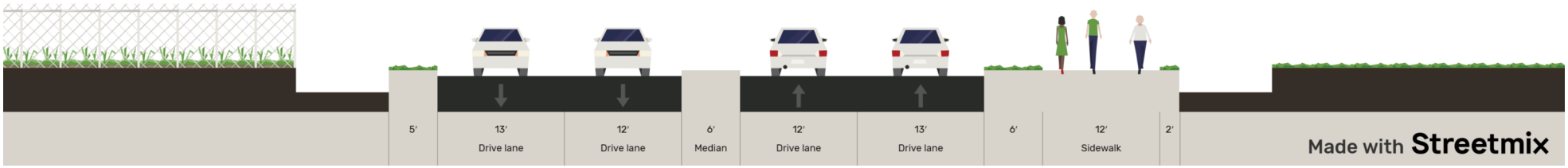

2′
6′
Sidewalk
6′
6′
Bike lane
11′
Drive lane
11′
Drive lane
12′
Center turn lane
11′
Drive lane
11′
Drive lane
6′
Bike lane
6′
6′
Sidewalk
2′
Made with Streetmix

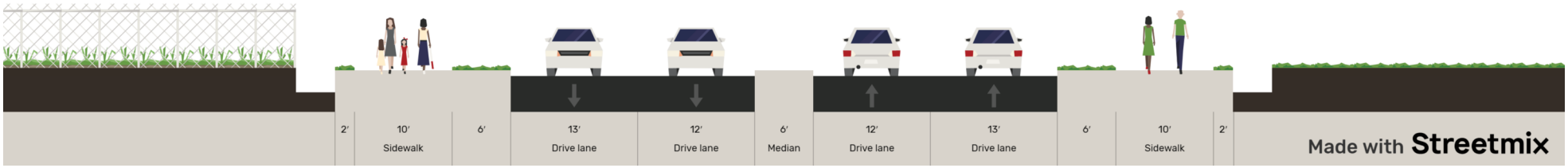

5′
6′
Bike lane
11′
Drive lane
12′
Drive lane
6′
Median
12′
Drive lane
11′
Drive lane
6′
Bike lane
6′
8′
Sidewalk
2′
Made with Streetmix

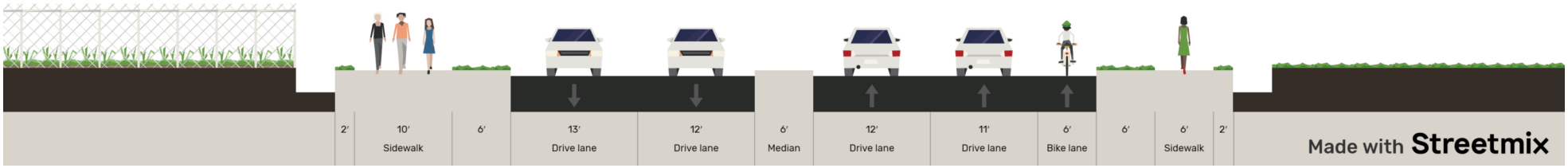

2′
6′
Bike lane
11′
Drive lane
12′
Drive lane
6′
Median
12′
Drive lane
11′
Drive lane
6′
Bike lane
6′
6′
Sidewalk
Made with Streetmix


5′
6′
Bike lane
11′
Drive lane
12′
Drive lane
6′
Median
12′
Drive lane
13′
Drive lane
6′
12′
Sidewalk
2′
Made with Streetmix


2′
6′
Bike lane
11′
Drive lane
12′
Drive lane
10′
Median
12′
Drive lane
13′
Drive lane
6′
10′
Sidewalk
1′
Made with Streetmix


5′
13′
Drive lane
12′
Drive lane
6′
Median
12′
Drive lane
13′
Drive lane
6′
12′
Sidewalk
2′
Made with Streetmix


2′
10′
Sidewalk
6′
13′
Drive lane
12′
Drive lane
6′
Median
12′
Drive lane
13′
Drive lane
6′
10′
Sidewalk
2′
Made with Streetmix


2′
10′
Sidewalk
6′
13′
Drive lane
12′
Drive lane
6′
Median
12′
Drive lane
11′
Drive lane
6′
Bike lane
6′
6′
Sidewalk
2′
Made with Streetmix

Attachment 2 – Value Metrics Data

PERFORMANCE ATTRIBUTES

Old Hwy 99 Corridor Study

Performance Attribute	Definition	
Bike Function		
Scales		
Rating	**Rating Rationale**	**Rating**
Unacceptable	No Bike Facilities	0
	6-ft bike lanes on road	5
	Separated 12-ft shared use trail ((both directions) one side of road	5
	Separated 10-ft shared use trail one direction, 6-ft bike lane	7
	Separated 12-ft shared use trail one direction, 6-ft bike lane	8
	Separated 10-ft shared use trails on both sides of road	9
Ideal	Separated 10-ft shared use trails on both sides of road, bike lanes	10

Performance Attribute	Definition	
Ped Function		
Scales		
Rating	**Rating Rationale**	**Rating**
Unacceptable	No Pedestrian Facilities/No sidewalk	0
	8-ft sidewalk on eastside	5
	12-ft shared use path on eastside	7
	6-ft sidewalks on both sides with buffer	8
	10-ft shared use trail one side, 6-ft sidewalk other side	9
Ideal	10-ft shared use trail on both sides	10

Performance Attribute	Definition	
EMS Function		
Scales		
Rating	**Rating Rationale**	**Rating**
	No turnarounds	0
	Medians with turnarounds at intersections	3
Ideal	Two-way left turn lane for full access	10

Performance Attribute	Definition	
Aesthetic		
Scales		
Rating	**Rating Rationale**	**Rating**
	No vegetation	0
	Least vegetation	5
	Median vegetation	8
Ideal	Most vegetation	10

Performance Attribute	Definition	
Enviro Impact		
Scales		
Rating	**Rating Rationale**	**Rating**
	Most impact to west	0
	Second most impact to west	4
	Second least impact to west	8
Ideal	Least impact to west	10

PERFORMANCE ATTRIBUTE MATRIX

Old Highway 99 Corridor Study

Rate the relative importance of the attributes relative to the project's Need and Purpose.

Performance Attributes	Bike Function	Ped Function	EMS Function	Aesthetic	Enviro Impact	Total Count	PRIORITIES
Bike Function	A	A/B	C	A	E	2.5	**0.167**
Ped Function		B	C	B	E	2.5	**0.167**
EMS Function			C	C	C/E	4.5	**0.300**
Aesthetic				D	E	1	**0.067**
Enviro Impact					E	4.5	**0.300**
SUB-TOTALS						15.00	**1.00**

PERFORMANCE ASSESSMENT MATRIX

Old Hwy 99 Corridor Study

Alternative 1

Performance Attributes	Rationale	Rating
Bike Function	6-ft bike lanes	5
Ped Function	Sidewalks on both sides	8
EMS Function	TWLTL	10
Aesthetic	Least Vegetation	5
Enviro Impact	Most Impact	0

Alternative 2B Name

Performance Attributes	Rationale	Rating
Bike Function		5
Ped Function		5
EMS Function		3
Aesthetic	Least Vegetation	5
Enviro Impact	Least Impact	10

Alternative 3 Name

Performance Attributes	Rationale	Rating
Bike Function		8
Ped Function		7
EMS Function		3
Aesthetic	Middle amount of vegetation	8
Enviro Impact	Second Least	8

Alternative 3B Name

Performance Attributes	Rationale	Rating
Bike Function		7
Ped Function		7
EMS Function		3
Aesthetic	Middle amount of vegetation	8
Enviro Impact	Least Impact	10

Alternative 5 Name

Performance Attributes	Rationale	Rating
Bike Function		9
Ped Function		10
EMS Function		3
Aesthetic		10
Enviro Impact	Second to Most	4

Alternative 6 Name

Performance Attributes	Rationale	Rating
Bike Function		7

Ped Function		9
EMS Function		3
Aesthetic		10
Enviro Impact	Second to Most	4

Alternative No. 6 Name

Performance Attributes	Rationale	Rating
Bike Function		
Ped Function		
EMS Function		
Aesthetic		
Enviro Impact		

Alternative No. 7 Name

Performance Attributes	Rationale	Rating
Bike Function		
Ped Function		
EMS Function		
Aesthetic		
Enviro Impact		

Alternative No. 8 Name

Performance Attributes	Rationale	Rating
Bike Function		
Ped Function		
EMS Function		
Aesthetic		
Enviro Impact		

Alternative No. 9 Name

Performance Attributes	Rationale	Rating
Bike Function		
Ped Function		
EMS Function		
Aesthetic		
Enviro Impact		

Alternative No. 10 Name

Performance Attributes	Rationale	Rating
Bike Function		
Ped Function		
EMS Function		
Aesthetic		
Enviro Impact		

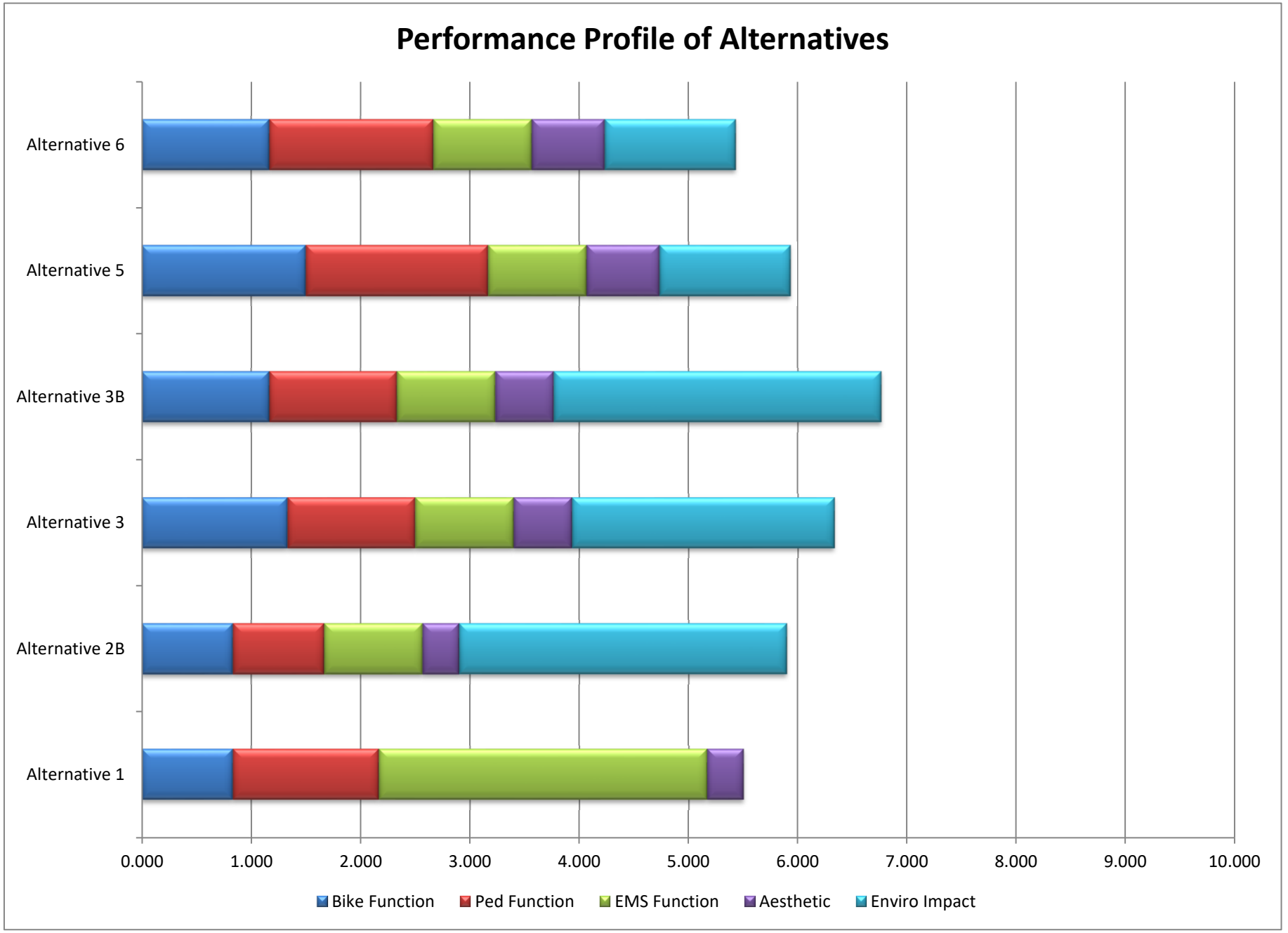
Alternative No. 11 Name

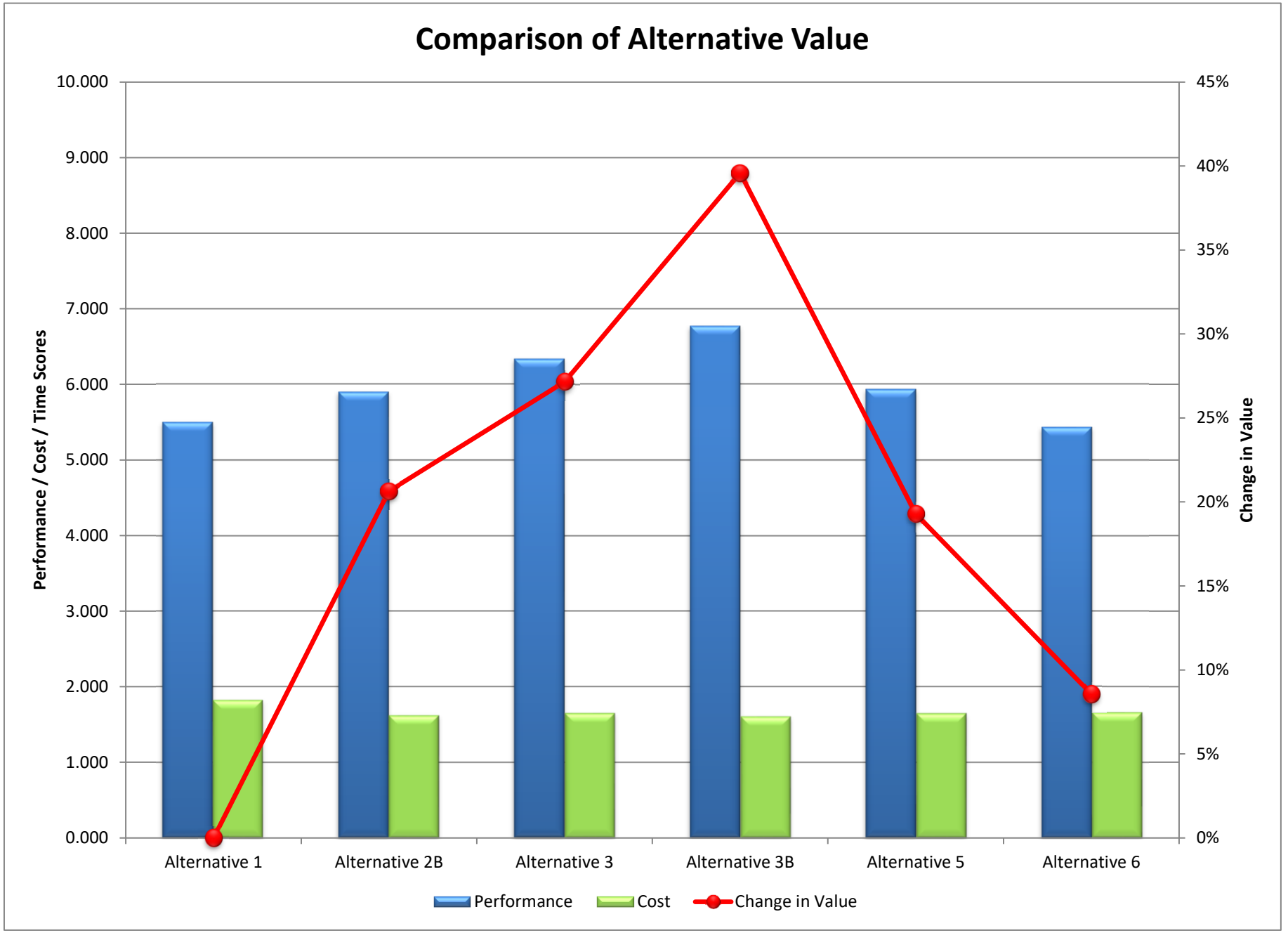
Performance Attributes	Rationale	Rating

Bike Function		
Ped Function		
EMS Function		
Aesthetic		
Enviro Impact		

Alternative No. 12 Name

Performance Attributes	**Rationale**	**Rating**
Bike Function		
Ped Function		
EMS Function		
Aesthetic		
Enviro Impact		


Performance Profile of Alternatives
Alternative 6
Alternative 5
Alternative 3B
Alternative 3
Alternative 2B
Alternative 1
0.000
1.000
2.000
3.000
4.000
5.000
6.000
7.000
8.000
9.000
10.000
Bike Function
Ped Function
EMS Function
Aesthetic
Enviro Impact


Comparison of Alternative Value
Performance / Cost / Time Scores
Change in Value
10.000
9.000
8.000
7.000
6.000
5.000
4.000
3.000
2.000
1.000
0.000
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Alternative 1
Alternative 2B
Alternative 3
Alternative 3B
Alternative 5
Alternative 6
Performance
Cost
Change in Value

Attachment 3 – Cost Estimates

SCJ ALLIANCE
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Element	Element Based Upon	Unit	Unit Cost	ALT 1 Estimate Measurement	ALT 1
Roadwork	**Estimated Quantities**				**$ 13,140,445**
	Mobilization	LS	8%	1	$ 1,139,365
	Clearing and Grubbing	SF	$0.23	578,000	$ 132,691
	Roadway Excavation/Select Borrow	CY	$25.00	30,222	$ 755,556
	Roadway Section	SF	$5.13	578,000	$ 2,966,296
	Conveyance	LF	$62.30	8,500	$ 529,550
	Water Quality/Flow Control	SF	$2.28	578,000	$ 1,314,950
	Sidewalk	SY	$45.83	11,333	$ 519,384
	Curb and Gutter	LF	$50.83	8,500	$ 432,038
	Erosion Control	LF	$16.80	8,500	$ 142,800
	Roundabouts	EACH	$1,000,000	3	$ 3,000,000
	Illumination	LF	$78	8,500	$ 663,816
	Permanent Signing	LF	$4.00	8,500	$ 34,000
	Landscaping	LF	$60.00	8,500	$ 510,000
	Traffic Control	LS	$1,000,000	1	$ 1,000,000
Right-of-Way					**$ 4,440,000**
	Parcels	Value			$ 4,440,000
Engineering	**22%**				**$ 2,890,898**
	PE	12%			$ 1,576,853
	CN	10%			$ 1,314,045
	Subtotal				$ 20,471,344
	Conceptual Contingency/Miscellaneous (20%)				$ 2,628,089
	Total				**$ 23,100,000**

SCJ ALLIANCE
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Element	Element Based Upon	Unit	Unit Cost	ALT 2 Estimate Measurement	ALT 2
Roadwork	**Estimated Quantities**				**$ 12,242,767**
	Mobilization	LS	8%	1	$ 1,063,813
	Clearing and Grubbing	SF	$0.23	425,000	$ 97,567
	Roadway Excavation/Select Borrow	CY	$25.00	23,926	$ 598,148
	Roadway Section	SF	$5.13	493,000	$ 2,530,076
	Conveyance	LF	$62.30	8,500	$ 529,550
	Water Quality/Flow Control	SF	$2.28	493,000	$ 1,121,575
	Sidewalk	SY	$45.83	11,333	$ 519,384
	Curb and Gutter	LF	$50.83	8,500	$ 432,038
	Erosion Control	LF	$16.80	8,500	$ 142,800
	Roundabouts	EACH	$1,000,000	3	$ 3,000,000
	Illumination	LF	$78	8,500	$ 663,816
	Permanent Signing	LF	$4.00	8,500	$ 34,000
	Landscaping	LF	$60.00	8,500	$ 510,000
	Traffic Control	LS	$1,000,000	1	$ 1,000,000
Right-of-Way					**$ 3,152,700**
	Parcels	Value			$ 3,152,700
Engineering	**22%**				**$ 2,693,409**
	PE	12%			$ 1,469,132
	CN	10%			$ 1,224,277
	Subtotal				$ 18,088,876
	Conceptual Contingency/Miscellaneous (20%)				$ 2,448,553
	Total				**$ 20,540,000**

SCJ ALLIANCE
CONSULTING SERVICES

Element	Element Based Upon	Unit	Unit Cost	ALT 3 Estimate Measurement	ALT 3
Roadwork	**Estimated Quantities**				**$ 12,342,668**
	Mobilization	LS	8%	1	$ 1,071,367
	Clearing and Grubbing	SF	$0.23	484,500	$ 111,226
	Roadway Excavation/Select Borrow	CY	$25.00	26,759	$ 668,981
	Roadway Section	SF	$5.13	459,000	$ 2,355,588
	Conveyance	LF	$62.30	8,500	$ 529,550
	Water Quality/Flow Control	SF	$2.28	459,000	$ 1,044,225
	Sidewalk	SY	$45.83	17,000	$ 779,076
	Curb and Gutter	LF	$50.83	8,500	$ 432,038
	Erosion Control	LF	$16.80	8,500	$ 142,800
	Roundabouts	EACH	$1,000,000	3	$ 3,000,000
	Illumination	LF	$78	8,500	$ 663,816
	Permanent Signing	LF	$4.00	8,500	$ 34,000
	Landscaping	LF	$60.00	8,500	$ 510,000
	Traffic Control	LS	$1,000,000	1	$ 1,000,000
Right-of-Way					**$ 3,390,000**
	Parcels	Value			$ 3,390,000
Engineering	**22%**				**$ 2,715,387**
	PE	12%			$ 1,481,120
	CN	10%			$ 1,234,267
	Subtotal				$ 18,448,054
	Conceptual Contingency/Miscellaneous (20%)				$ 2,468,534
	Total				**$ 20,920,000**

SCJ ALLIANCE
CONSULTING SERVICES

Element	Element Based Upon	Unit	Unit Cost	ALT 3B Estimate Measurement	ALT 3B
Roadwork	**Estimated Quantities**				**$ 12,406,904**
	Mobilization	LS	8%	1	$ 1,077,336
	Clearing and Grubbing	SF	$0.23	467,500	$ 107,323
	Roadway Excavation/Select Borrow	CY	$25.00	25,815	$ 645,370
	Roadway Section	SF	$5.13	459,000	$ 2,355,588
	Conveyance	LF	$62.30	8,500	$ 529,550
	Water Quality/Flow Control	SF	$2.28	459,000	$ 1,044,225
	Sidewalk	SY	$45.83	9,444	$ 432,820
	Curb and Gutter	LF	$50.83	17,000	$ 864,076
	Erosion Control	LF	$16.80	8,500	$ 142,800
	Roundabouts	EACH	$1,000,000	3	$ 3,000,000
	Illumination	LF	$78	8,500	$ 663,816
	Permanent Signing	LF	$4.00	8,500	$ 34,000
	Landscaping	LF	$60.00	8,500	$ 510,000
	Traffic Control	LS	$1,000,000	1	$ 1,000,000
Right-of-Way					**$ 2,734,118**
	Parcels	Value			$ 2,734,118
Engineering	**22%**				**$ 2,729,519**
	PE	12%			$ 1,488,828
	CN	10%			$ 1,240,690
	Subtotal				$ 17,870,541
	Conceptual Contingency/Miscellaneous (20%)				$ 2,481,381
	Total				**$ 20,360,000**

SCJ ALLIANCE
CONSULTING SERVICES

Element	Element Based Upon	Unit	Unit Cost	ALT 5 Estimate Measurement	ALT 5
Roadwork	**Estimated Quantities**				**$ 12,520,190**
	Mobilization	LS	8%	1	$ 1,085,720
	Clearing and Grubbing	SF	$0.23	544,000	$ 124,885
	Roadway Excavation/Select Borrow	CY	$25.00	28,963	$ 724,074
	Roadway Section	SF	$5.13	425,000	$ 2,181,100
	Conveyance	LF	$62.30	8,500	$ 529,550
	Water Quality/Flow Control	SF	$2.28	425,000	$ 966,875
	Sidewalk	SY	$45.83	24,556	$ 1,125,332
	Curb and Gutter	LF	$50.83	8,500	$ 432,038
	Erosion Control	LF	$16.80	8,500	$ 142,800
	Roundabouts	EACH	$1,000,000	3	$ 3,000,000
	Illumination	LF	$78	8,500	$ 663,816
	Permanent Signing	LF	$4.00	8,500	$ 34,000
	Landscaping	LF	$60.00	8,500	$ 510,000
	Traffic Control	LS	$1,000,000	1	$ 1,000,000
Right-of-Way					**$ 3,110,000**
	Parcels	Value			$ 3,110,000
Engineering	**22%**				**$ 2,754,442**
	PE	12%			$ 1,502,423
	CN	10%			$ 1,252,019
	Subtotal				$ 18,384,632
	Conceptual Contingency/Miscellaneous (20%)				$ 2,504,038
	Total				**$ 20,890,000**

SCJ ALLIANCE
CONSULTING SERVICES

Element	Element Based Upon	Unit	Unit Cost	ALT 6 Estimate Measurement	ALT 6
Roadwork	**Estimated Quantities**				**$ 12,606,457**
	Mobilization	LS	8%	1	$ 1,093,276
	Clearing and Grubbing	SF	$0.23	544,000	$ 124,885
	Roadway Excavation/Select Borrow	CY	$25.00	28,963	$ 724,074
	Roadway Section	SF	$5.13	459,000	$ 2,355,588
	Conveyance	LF	$62.30	8,500	$ 529,550
	Water Quality/Flow Control	SF	$2.28	459,000	$ 1,044,225
	Sidewalk	SY	$45.83	20,778	$ 952,204
	Curb and Gutter	LF	$50.83	8,500	$ 432,038
	Erosion Control	LF	$16.80	8,500	$ 142,800
	Roundabouts	EACH	$1,000,000	3	$ 3,000,000
	Illumination	LF	$78	8,500	$ 663,816
	Permanent Signing	LF	$4.00	8,500	$ 34,000
	Landscaping	LF	$60.00	8,500	$ 510,000
	Traffic Control	LS	$1,000,000	1	$ 1,000,000
Right-of-Way					**$ 3,110,000**
	Parcels	Value			$ 3,110,000
Engineering	**22%**				**$ 2,773,420**
	PE	12%			$ 1,512,775
	CN	10%			$ 1,260,646
	Subtotal				$ 18,489,877
	Conceptual Contingency/Miscellaneous (20%)				$ 2,521,291
	Total				**$ 21,020,000**