Appendix C- Alternative Evaluation Methods

Methodology for Establishing Criteria Weighting

Chainwise Hierarchical Decision Process (HDP) Methodology

HDP is a process to make logical, rational-based decisions. There are two forms of this process. The Pairwise process evaluates the relative importance or weight of a decision element (e.g. criteria, alternatives, power of evaluators) against all others. As such the number of pairwise comparisons that must be made is:

$$C = n\ n -$$

Where: *C* is the number of comparisons, and *n* is the number of decision elements. For our 10 criteria, we would have 45 pairwise comparisons for the eight criteria.

A second method is known as the chainwise comparison method. In a chainwise comparison, we form a linear arrangement of the decision elements, and we compare only two at once, and then move to the next element. We compare elements in the following manner depicted by the graphic, thus we get the ***chainwise*** descriptive name.

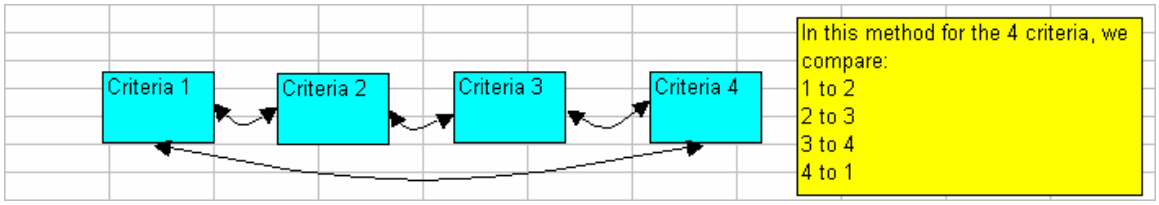

Figure 1- Chainwise HDP

Chainwise analysis has only n comparisons. Therefore, for the criteria of the case study, only 10 comparisons are required for each project (contrasted with 45 for the pairwise analysis). The obvious advantage of the chainwise method is that the number of comparisons is dramatically reduced for increasing number of decision elements. Consequently, the time commitment for evaluators is reduced as well.

Chainwise method was selected for this case study to minimize time required and inconvenience to participants.

For each pair, there is an aggregate sum of "100" that is divided between the criteria to reflect the rater's opinion on the relative importance of each. For example, an evaluator may feel that criteria 1 is twice as important as criteria two, in which case criteria 1 would get a "67" and criteria 2 would get a "33". If he feels that criteria 2 had no value at all when compared to criteria 1, he would score criteria 1 as "99" and criteria 2 as "1". As such, there are only two rules: the sum of the compared pairs has to equal "100", and the scoring must have values equal or greater than "1", and equal or less than "99".

Although this project used HDP in determine the relative weights of evaluation criteria, the method could also be used to evaluate alternatives. For example, for each criterion, we could evaluate Alternative A to B, the B to C, then C to D, and so on, in the same chainwise fashion and using the same method of relative importance.

Upon establishing the relative weights between criteria, the following table demonstrates the algorithm is used for the chainwise analysis (Source: Ra, Jang W. *Chainwise Paired Comparisons*, Decision Sciences Volume 30 Number 2 Spring 1999).

D_i	I_i	R'_i	M_i	Weights, V_i
$D_1=W_1/W_2$	$D_1 / \prod_{i=}^{n} D_i$	$R = D^{n-} \times I^{n}$	$M = \prod_{i=}^{n-} R_i$	$V = M \quad M$
$D_2=W_2/W_3$	$D_2 / \prod_{i=}^{n} D_i$	$R = D^{n-} \times I^{n}$	$M = \prod_{i=}^{n-} R_i$	$V = M \quad M$
$D_3=W_3/W_4$	$D_3 / \prod_{i=}^{n} D_i$	$R = D^{n-} \times I^{n}$	$M = \prod_{i=}^{n-} R_i$	$V = M \quad M$
:	:	:	:	:
$D_{n-1}=W_{n-1}/W_n$	$D_{n-1} / \prod_{i=}^{n} D_i$	$R_{n-} = D_{n-}^{n-} \times I_{n-}^{n}$	R_{n-}	$V_{n-} = M_{n-} \quad M$
$D_n = W_n/W_1$	$D_n / \prod_{i=}^{n} D_i$	$R_n = D_n^{n-} \times I_n^{n}$	1(seed number)	$V_n = M_n \quad M$
Column Product= $\prod_{i=}^{n} D_i$		This column, $\prod_{i=}^{n} R_i =$	$M = \sum_{i=}^{n} M_i$	$\sum_{i=}^{n} V_i =$

(The symbol $\prod$ is a product operator, for example: $\prod_{i=}^{n} D_i = D \times D \times \quad \times D_n$)

Table 1-HDP Chainwise Algorithm

This algorithm lends itself to spreadsheet solutions.

The consistency of the evaluator's decision process is computed by the following equation for the LOC (Level of Consistency) (Ra).

$$LOC = e^{-\left| \sqrt[n]{\prod D_i} \right|}$$

LOC values that are close to unity indicate a consistent evaluation. Ra's paper, summarized in Table 2, presents minimum acceptable consistency measures (Ra, Table 3).

Number of Criteria, n=	Minimum Acceptable LOC for Consistency
3	76.3%
4	81.9%
5	86.4%
6	88.9%
7	90.4%
8	91.6%
9	93.2%
10	93.8%
11	94.3%
12	94.8%
13	95.1%

Table 2- Minimum LOC for n Decision Elements (Source: Ra)

Criteria Evaluation

The following table summarizes the project team's weighting of the criteria by the HDP process. The average weight in the last column is applied to the criteria.

	Criteria	RK	AP	AB	DG	RO	AJ	Average Wt
1	Emergency, Service Summer and Winter access	14%	29%	9%	19%	8%	37%	19%
2	Neighborhood circulation/movement	6%	13%	13%	10%	7%	10%	10%
3	Appropriate Traffic Volumes	5%	5%	8%	4%	1%	7%	5%
4	Street Standards	12%	4%	10%	5%	5%	10%	8%
5	Alternative's likely impact on vehicular safety (improve, neutral, worsen)	18%	14%	14%	8%	7%	9%	12%
6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety (improve, neutral, worsen)	17%	14%	13%	23%	6%	5%	13%
7	Alternative traffic impacts on fronting properties	7%	4%	8%	7%	13%	2%	7%
8	Alternative impact on green space/wetlands/park	5%	2%	11%	4%	5%	1%	5%
9	Relative capital cost of alternative	7%	5%	7%	10%	39%	4%	12%
10	Relative M&O costs	10%	10%	7%	10%	9%	15%	10%
	Sum	1	1	1	1	1	1	1
	Level of Consistency (93.8% for 10)	96%	100%	94%	90%	89%	97%	

Table 3- HDP Criteria Weighting

Each of the evaluator's worksheets is included under Attachment A of this Appendix C.

Alternative Evaluation

The scoring system for the criteria (3A, 3B, 4A, 4B, 6, and 7) is summarized in the following table. The scoring values were designed to be simple for evaluators.

Criteria Number	Criteria	1	2	3
1	Emergency Service; Summer and Winter access	Same as, or Worse than Existing	Some Improvement	Large Improvement
2	Neighborhood Circulation/Movement	Worse than Existing	Same as Existing	Improved
3	Appropriate Traffic Volumes for Street/ Functional Class	Volumes Higher than Desirable	-	Volumes are appropriate for street class
4	Street Standards	Doesn't meet Standard	Substantially meets Standards (CSD)	Meets Standards
5	Alternative's likely impact on vehicular safety (improve, neutral, worsen)	Safety is about same or less than existing	Some Improvement	Large Improvement
6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety (improve, neutral, worsen)	Safety is about same or less than existing	Some Improvement	Large Improvement
7	Alternative traffic impacts on fronting properties	High Impacts (Full Takes of more than 1 property)	Minor Takes Only	No Takes or insignificant impact (permits)
8	Alternative impact on green space/wetlands/park	High Impacts	Minor	None
9	Relative capital cost of alternative	Scaled Automatically, lowest cost = 3, highest cost = 1		
10	Relative M&O costs	More Maintenance	No Change	Less M&O

Table 4 - Alternative Evaluation Scoring System

The alternative scores are summarized in the following table.

		Sum of Scores		Randy		Don		Anne		Alex		Art		Scores		
Alternative	**Description**	**Sum of Scores**	**Rank based on Scores**	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Average	Max	Min
3A	Street on Platted ROW, North Intersection	392.00	3	87.65	3.00	70.00	4.00	81.64	4.00	74.96	4.00	77.54	3.00	78.36	87.65	70.00
3B	Street on Platted ROW, South Intersection	392.00	3	87.74	2.00	70.09	3.00	81.73	3.00	75.04	3.00	77.62	2.00	78.44	87.74	70.09
4A	Street on Alley, Widening to North	453.00	1	94.24	1.00	94.24	1.00	98.81	1.00	84.68	1.00	80.57	1.00	90.51	98.81	80.57
4B	Street on Alley, Widening to South	422.00	2	87.50	4.00	87.50	2.00	92.07	2.00	79.48	2.00	75.38	4.00	84.39	92.07	75.38
6	Move Parking for Aparts to Platted 16th ROW, Improve existing Alleyway	312.00	6	74.77	6.00	53.00	6.00	73.71	6.00	53.66	6.00	56.87	6.00	62.40	74.77	53.00
7	Couplet; alley EB, platted ROW WB	345.00	5	80.78	5.00	54.53	5.00	74.43	5.00	67.64	5.00	67.64	5.00	69.00	80.78	54.53

Table 5 - Alternative Evaluations

Attachment B has the detailed worksheets for the evaluations.

Attachment A- Criteria Weighting

Participant's worksheet, please fill in orange cells as illustrated in the green cells

		Criteria	Link Pair Wt., 1 to 99		Criteria	Link Pair Wt., 1 to 99	Sum of Pair Wts. (should =100)
Example Link 1	A	Criteria A	55	C	Criteria B	45	100
Example Link 2	B	Criteria B	35	B	Criteria C	65	100
Example Link 3	C	Criteria C	99	D	Criteria D	1	100
Link 1	1	Improve Emergency, Service vehicle summer and winter access	40	2	Alternative provides hierarchical traffic movement- local to collector to arterial	60	100
Link 2	2	Alternative provides hierarchical traffic movement- local to collector to arterial	60	3	Alternative volumes are consistent for functional class classification	40	100
Link 3	3	Alternative volumes are consistent for functional class classification	45	4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	55	100
Link 4	4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	40	5	Alternative's likely impact on safety (improve, neutral, worsen)	60	100
Link 5	5	Alternative's likely impact on safety (improve, neutral, worsen)	50	6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	50	100
Link 6	6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	60	7	Alternative traffic impacts on fronting properties	40	100
Link 7	7	Alternative traffic impacts on fronting properties	40	8	Alternative impact on green space/wetlands/park	60	100
Link 8	8	Alternative impact on green space/wetlands/park	60	9	Relative capital cost of alternative	40	100
Link 9	9	Relative capital cost of alternative	50	10	Relative M&O costs	50	100
Link 10	10	Relative M&O costs	40	1	Improve Emergency, Service vehicle summer and winter access	60	100
							0
							0

Anne Brooks

Elements	Criteria	Direct, D_i	Indirect, I_i	Ratio, R_i	M_i	Normalized Wt., V_i	Rank
1	Improve Emergency, Service vehicle summer and winter access	2/3	1 2/9	0.71	1 7/17	9.4%	6
2	Alternative provides hierarchical traffic movement- local to collector to arterial	1 1/2	2 3/4	1.59	2	13.3%	2
3	Alternative volumes are consistent for functional class classification	9/11	1 1/2	0.87	1 1/4	8.3%	7
4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	2/3	1 2/9	0.71	1 25/57	9.6%	5
5	Alternative's likely impact on safety (improve, neutral, worsen)	1	1 5/6	1.06	2 1/32	13.5%	1
6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	1 1/2	2 3/4	1.59	1 31/34	12.8%	3
7	Alternative traffic impacts on fronting properties	2/3	1 2/9	0.71	1 1/5	8.0%	8
8	Alternative impact on green space/wetlands/park	1 1/2	2 3/4	1.59	1 52/75	11.3%	4
9	Relative capital cost of alternative	1	1 5/6	1.06	1 1/16	7.1%	9
10	Relative M&O costs	2/3	1 2/9	0.71	*Seed No. = 1*	6.7%	10
	0						
	0						
	0						
n= 10		*Col Prod = .55*		*Col Prod = 1*	*Col Sum= 14.99*	1.00	
	Level of Consistency	94%					

Participant's worksheet, please fill in orange cells as illustrated in the green cells							
		Criteria	Link Pair Wt., 1 to 99		Criteria	Link Pair Wt., 1 to 99	Sum of Pair Wts. (should =100)
Example Link 1	A	Criteria A	55	C	Criteria B	45	100
Example Link 2	B	Criteria B	35	B	Criteria C	65	100
Example Link 3	C	Criteria C	99	D	Criteria D	1	100
Link 1	1	Improve Emergency, Service vehicle summer and winter access	80	2	Alternative provides hierarchical traffic movement- local to collector to arterial	20	100
Link 2	2	Alternative provides hierarchical traffic movement- local to collector to arterial	60	3	Alternative volumes are consistent for functional class classification	40	100
Link 3	3	Alternative volumes are consistent for functional class classification	40	4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	60	100
Link 4	4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	55	5	Alternative's likely impact on safety (improve, neutral, worsen)	45	100
Link 5	5	Alternative's likely impact on safety (improve, neutral, worsen)	65	6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	35	100
Link 6	6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	70	7	Alternative traffic impacts on fronting properties	30	100
Link 7	7	Alternative traffic impacts on fronting properties	65	8	Alternative impact on green space/wetlands/park	35	100
Link 8	8	Alternative impact on green space/wetlands/park	25	9	Relative capital cost of alternative	75	100
Link 9	9	Relative capital cost of alternative	20	10	Relative M&O costs	80	100
Link 10	10	Relative M&O costs	30	1	Improve Emergency, Service vehicle summer and winter access	70	100
							0
							0

Art Johnson

Elements	Criteria	Direct, D_i	Indirect, I_i	Ratio, R_i	M_i	Normalized Wt., V_i	Rank
1	Improve Emergency, Service vehicle summer and winter access	4	2 11/13	3.87	2 41/99	37.3%	1
2	Alternative provides hierarchical traffic movement- local to collector to arterial	1 1/2	1 5/74	1.45	5/8	9.6%	4
3	Alternative volumes are consistent for functional class classification	2/3	37/78	0.64	28/65	6.6%	6
4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	1 2/9	20/23	1.18	2/3	10.3%	3
5	Alternative's likely impact on safety (improve, neutral, worsen)	1 6/7	1 9/28	1.80	43/76	8.7%	5
6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	2 1/3	1 37/56	2.26	29/92	4.9%	7
7	Alternative traffic impacts on fronting properties	1 6/7	1 9/28	1.80	13/93	2.2%	9
8	Alternative impact on green space/wetlands/park	1/3	14/59	0.32	6/77	1.2%	10
9	Relative capital cost of alternative	1/4	8/45	0.24	7/29	3.7%	8
10	Relative M&O costs	3/7	18/59	0.41	*Seed No. = 1*	15.4%	2
	0						
	0						
	0						
n= 10		*Col Prod = 1.41*		*Col Prod = 1.*	*Col Sum= 6.48*	1.00	
	Level of Consistency	97%					

Participant's worksheet, please fill in orange cells as illustrated in the green cells

		Criteria	Link Pair Wt., 1 to 99		Criteria	Link Pair Wt., 1 to 99	Sum of Pair Wts. (should =100)
Example Link 1	A	Criteria A	55	C	Criteria B	45	100
Example Link 2	B	Criteria B	35	B	Criteria C	65	100
Example Link 3	C	Criteria C	99	D	Criteria D	1	100
Link 1	1	Improve Emergency, Service vehicle summer and winter access	70	2	Alternative provides hierarchical traffic movement- local to collector to arterial	30	100
Link 2	2	Alternative provides hierarchical traffic movement- local to collector to arterial	70	3	Alternative volumes are consistent for functional class classification	30	100
Link 3	3	Alternative volumes are consistent for functional class classification	60	4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	40	100
Link 4	4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	20	5	Alternative's likely impact on safety (improve, neutral, worsen)	80	100
Link 5	5	Alternative's likely impact on safety (improve, neutral, worsen)	50	6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	50	100
Link 6	6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	80	7	Alternative traffic impacts on fronting properties	20	100
Link 7	7	Alternative traffic impacts on fronting properties	60	8	Alternative impact on green space/wetlands/park	40	100
Link 8	8	Alternative impact on green space/wetlands/park	33	9	Relative capital cost of alternative	67	100
Link 9	9	Relative capital cost of alternative	33	10	Relative M&O costs	67	100
Link 10	10	Relative M&O costs	25	1	Improve Emergency, Service vehicle summer and winter access	75	100
							0
							0

Alex Prosak

Elements	Criteria	Direct, D_i	Indirect, I_i	Ratio, R_i	M_i	Normalized Wt., V_i	Rank
1	Improve Emergency, Service vehicle summer and winter access	2 1/3	2 16/45	2.34	3	29.3%	1
2	Alternative provides hierarchical traffic movement- local to collector to arterial	2 1/3	2 16/45	2.34	1 17/60	12.6%	4
3	Alternative volumes are consistent for functional class classification	1 1/2	1 18/35	1.50	50/91	5.4%	6
4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	1/4	1/4	0.25	15/41	3.6%	8
5	Alternative's likely impact on safety (improve, neutral, worsen)	1	1	1.00	1 37/80	14.3%	2
6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	4	4 3/79	4.00	1 6/13	14.3%	3
7	Alternative traffic impacts on fronting properties	1 1/2	1 18/35	1.50	27/74	3.6%	9
8	Alternative impact on green space/wetlands/park	33/67	1/2	0.49	9/37	2.4%	10
9	Relative capital cost of alternative	33/67	1/2	0.49	35/71	4.8%	7
10	Relative M&O costs	1/3	1/3	0.33	*Seed No. = 1*	9.8%	5
	0						
	0						
	0						
n= 10		*Col Prod = .99*		*Col Prod = 1.*	*Col Sum= 10.22*	1.00	
	Level of Consistency	100%					

Participant's worksheet, please fill in orange cells as illustrated in the green cells

		Criteria	Link Pair Wt., 1 to 99		Criteria	Link Pair Wt., 1 to 99	Sum of Pair Wts. (should =100)
Example Link 1	A	Criteria A	55	C	Criteria B	45	100
Example Link 2	B	Criteria B	35	B	Criteria C	65	100
Example Link 3	C	Criteria C	99	D	Criteria D	1	100
Link 1	1	Improve Emergency, Service vehicle summer and winter access	70	2	Alternative provides hierarchical traffic movement- local to collector to arterial	30	100
Link 2	2	Alternative provides hierarchical traffic movement- local to collector to arterial	50	3	Alternative volumes are consistent for functional class classification	50	100
Link 3	3	Alternative volumes are consistent for functional class classification	30	4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	70	100
Link 4	4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	40	5	Alternative's likely impact on safety (improve, neutral, worsen)	60	100
Link 5	5	Alternative's likely impact on safety (improve, neutral, worsen)	50	6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	50	100
Link 6	6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	70	7	Alternative traffic impacts on fronting properties	30	100
Link 7	7	Alternative traffic impacts on fronting properties	60	8	Alternative impact on green space/wetlands/park	40	100
Link 8	8	Alternative impact on green space/wetlands/park	40	9	Relative capital cost of alternative	60	100
Link 9	9	Relative capital cost of alternative	40	10	Relative M&O costs	60	100
Link 10	10	Relative M&O costs	40	1	Improve Emergency, Service vehicle summer and winter access	60	100
							0
							0
							0

Randy Kinney

Elements	Criteria	Direct, D_i	Indirect, I_i	Ratio, R_i	M_i	Normalized Wt., V_i	Rank
1	Improve Emergency, Service vehicle summer and winter access	2 1/3	3 3/8	2.42	1 41/92	13.8%	3
2	Alternative provides hierarchical traffic movement- local to collector to arterial	1	1 25/56	1.04	40/67	5.7%	8
3	Alternative volumes are consistent for functional class classification	3/7	31/50	0.44	19/33	5.5%	9
4	Alternative traffic ways and pedestrian ways satisfy standards for de facto functional class	2/3	27/28	0.69	1 5/17	12.3%	4
5	Alternative's likely impact on safety (improve, neutral, worsen)	1	1 25/56	1.04	1 27/31	17.8%	1
6	Alternatives impact on Pedestrian, Bike, and Wheelchair Safety	2 1/3	3 3/8	2.42	1 53/66	17.2%	2
7	Alternative traffic impacts on fronting properties	1 1/2	2 9/53	1.56	35/47	7.1%	6
8	Alternative impact on green space/wetlands/park	2/3	27/28	0.69	11/23	4.6%	10
9	Relative capital cost of alternative	2/3	27/28	0.69	9/13	6.6%	7
10	Relative M&O costs	2/3	27/28	0.69	*Seed No. = 1*	9.5%	5
	0						
	0						
	0						
n= 10		*Col Prod = .69*		*Col Prod = 1.*	*Col Sum= 10.5*	1.00	
	Level of Consistency	96%					

Attachment B- Alternative Evaluations (Feasible Alternatives Only)

Product of Weight by score value

Don	Criteria=>>	1	2	3	4	5	6	7	8	9	10	Alternative Score	Normalized to 100 scale	Rank
Alternative	**Description**	0.19	0.1	0.05	0.08	0.12	0.13	0.07	0.05	0.12	0.1	1		
3A	Street on Platted ROW, North Intersection	2	2	2	2	2	3	2	1	2.98	1	2.10	70.00	4
3B	Street on Platted ROW, South Intersection	2	2	2	2	2	3	2	1	3.00	1	2.10	70.09	3
4A	Street on Alley, Widening to North	3	3	3	3	3	3	1	3	2.70	3	2.83	94.24	1
4B	Street on Alley, Widening to South	3	3	3	3	3	3	1	3	1.00	3	2.62	87.50	2
6	Move Parking for Aparts to Platted 16th ROW, Improve existing Alleyway	1	2	2	2	2	2	1	1	1.99	1	1.59	53.00	6
7	Couplet; alley EB, platted ROW WB	1	1	2	2	1	2	2	1	2.75	2	1.64	54.53	5

Criteria Weights

Product of Weight by score value

Art	Criteria=>>	1	2	3	4	5	6	7	8	9	10	Alternative Score	Normalized to 100 scale	Rank
		Criteria Weights												
Alternative	**Description**	0.19	0.1	0.05	0.08	0.12	0.13	0.07	0.05	0.12	0.1	1		
3A	Street on Platted ROW, North Intersection	3	3	3	2	1	3	2	1	2.98	1	2.33	77.54	3
3B	Street on Platted ROW, South Intersection	3	3	3	2	1	3	2	1	3.00	1	2.33	77.62	2
4A	Street on Alley, Widening to North	3	3	3	3	2	3	1	1	2.70	1	2.42	80.57	1
4B	Street on Alley, Widening to South	3	3	3	3	2	3	1	2	1.00	1	2.26	75.38	4
6	Move Parking for Aparts to Platted 16th ROW, Improve existing Alleyway	2	2	3	2	2	1	1	1	1.99	1	1.71	56.87	6
7	Couplet; alley EB, platted ROW WB	2	1	3	2	2	3	2	1	2.75	1	2.03	67.64	5

Product of Weight by score value

Anne	Criteria=>>	1	2	3	4	5	6	7	8	9	10	Alternative Score	Normalized to 100 scale	Rank
		Criteria Weights												
Alternative	**Description**	0.19	0.1	0.05	0.08	0.12	0.13	0.07	0.05	0.12	0.1	1		
3A	Street on Platted ROW, North Intersection	2	3	3	2	2	3	2	1	2.98	3	2.45	81.64	4
3B	Street on Platted ROW, South Intersection	2	3	3	2	2	3	2	1	3.00	3	2.45	81.73	3
4A	Street on Alley, Widening to North	3	3	3	3	3	3	3	3	2.70	3	2.96	98.81	1
4B	Street on Alley, Widening to South	3	3	3	3	3	3	3	3	1.00	3	2.76	92.07	2
6	Move Parking for Aparts to Platted 16th ROW, Improve existing Alleyway	3	3	2	2	2	2	3	1	1.99	1	2.21	73.71	6
7	Couplet; alley EB, platted ROW WB	3	3	2	2	2	2	2	1	2.75	1	2.23	74.43	5

Product of Weight by score value

Randy	Criteria=>>	1	2	3	4	5	6	7	8	9	10	Alternative Score	Normalized to 100 scale	Rank
		Criteria Weights												
Alternative	**Description**	0.19	0.1	0.05	0.08	0.12	0.13	0.07	0.05	0.12	0.1	1		
3A	Street on Platted ROW, North Intersection	3	3	3	2	3	2	2	1	2.98	3	2.63	87.65	3
3B	Street on Platted ROW, South Intersection	3	3	3	2	3	2	2	1	3.00	3	2.63	87.74	2
4A	Street on Alley, Widening to North	3	3	3	3	3	3	1	3	2.70	3	2.83	94.24	1
4B	Street on Alley, Widening to South	3	3	3	3	3	3	1	3	1.00	3	2.62	87.50	4
6	Move Parking for Aparts to Platted 16th ROW, Improve existing Alleyway	3	3	3	2	3	2	1	1	1.99	1	2.24	74.77	6
7	Couplet; alley EB, platted ROW WB	3	1	3	2	2	3	2	1	2.75	3	2.42	80.78	5

Product of Weight by score value

Alex	Criteria=>>	1	2	3	4	5	6	7	8	9	10	Alternative Score	Normalized to 100 scale	Rank
		Criteria Weights												
Alternative	**Description**	0.19	0.1	0.05	0.08	0.12	0.13	0.07	0.05	0.12	0.1	1		
3A	Street on Platted ROW, North Intersection	2	3	3	2	2	3	2	1	2.98	1	2.25	74.96	4
3B	Street on Platted ROW, South Intersection	2	3	3	2	2	3	2	1	3.00	1	2.25	75.04	3
4A	Street on Alley, Widening to North	2	3	3	3	3	3	1	1	2.70	3	2.54	84.68	1
4B	Street on Alley, Widening to South	2	3	3	3	3	3	1	2	1.00	3	2.38	79.48	2
6	Move Parking for Aparts to Platted 16th ROW, Improve existing Alleyway	2	1	3	2	2	1	1	1	1.99	1	1.61	53.66	6
7	Couplet; alley EB, platted ROW WB	2	1	3	2	2	3	2	1	2.75	1	2.03	67.64	5