

Refinement Task 19 – Saddle Creek Basin Search for Hybrid Alternatives – Revised Summary

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Purpose

The purpose of this Revised Summary Memorandum is to present the revised information resulting from incorporation of corrected sewer separation pipe lengths and costs.

Background

After the Task 19 Summary Technical Memorandum dated March 13, 2009 was submitted it was discovered that the pipe lengths used in the cost estimates for the three alternatives were incorrect. The PMT Refinement Task Team requested the Saddle Creek Basin Team to provide additional pipe length information for the three hybrid alternative projects which would provide sewer separation of portions of the basin while reducing the size of the proposed retention treatment basin (RTB) facility.

The three projects were:

- HY-205-1 – Sewer separation in the sub-basin east of the Bohemian Cemetery.
- HY-205-2 – Sewer separation in the sub-basins west and east of the Bohemian Cemetery (HY 205-1).
- HY-205-3 – Sewer separation in the sub-basin surrounding 55th Street from Center Street to Leavenworth and east and west of the Bohemian Cemetery (HY-205-1 and HY-205-2).

Summary

The Decision Science Tool information was updated with the new sewer separation cost estimate results to incorporate non-monetary criteria. This analysis found hybrid alternative HY-205-3 still offered the most benefits for the least cost and the revised baseline option still offered the least benefit for the project cost. The other two alternatives still fell between the Baseline and HY-205-3 in terms of offering the most benefits for the cost.

Recommendations

From the updated alternative evaluation process the same conclusions can be reached. The revised Baseline Alternative is the lowest cost alternative of the four evaluated, but this alternative also provides the lowest benefits to the basin.

HY-205-1 provides sewer improvements in the basin which will remove stormwater flows associated with the existing creek from the combined sewer system for an increase in cost of \$6.6 million (based on 50-Year Present Worth Costs including PCWWTP costs).

Alternative HY-205-3 offers the most benefits for the cost. While this alternative is approximately \$11.6 million more costly than the Baseline Alternative (based on 50-Year Present Worth Costs including PCWWTP costs), the additional sewer separation provided in this alternative offers additional benefits to the Saddle Creek Basin.

The recommendation to proceed with HY-205-1 for the Long Term Control Plan is reaffirmed, as this alternative includes removal of the existing creek from the combined sewer system. This alternative also adds the minimum cost for sewer separation in the basin. Further refinement of this alternative may occur after the Long Term Control Plan is submitted and additional information is gathered for the basin.

Attachment A

Revised Decision Model for the Saddle Creek Basin (Hybrid Solutions)



Omaha CSO Control Program

Decision Model for the Saddle Creek Basin (Hybrid Solutions)

Prepared by: Jami Cerone

DECISION EVALUATION LESSONS LEARNED FROM EXPERIENCE

1. Cost is Best Captured as a Stand Alone Factor in a Benefit/Cost Analysis as Opposed to Treating Like a Non-Monetary Benefit to Prevent Under or Over Emphasizing Importance.
2. Evaluation Criteria Must be Mutually Exclusive to Prevent Double Counting Benefits or Lack Thereof.
3. Evaluation Criteria Must Offer Differentiation Among Alternatives or No Value is Added.
4. Evaluation Criteria Must be Quantitatively Measurable to Minimize Subjectivity of Evaluation and Maximize Defensibility.
5. Based on Experience, a Typical Maximum Number of Evaluation Criteria is 5-7 to Pass the Previous Requirements.
6. Based on Experience, Sub-Criteria Increase the Complexity of the Evaluation and Explanation of Results, and Typically Offer Minor In-Sight to the Decision Process as Their Weight is Already Superseded by the Primary Criteria Weights.
7. Based on Experience, an Excel Workbook for Calculations and Integrated Graphic Presentation of Results is Simpler to Customize for Specific Project Needs, Operate and Explain than Many of the "Decision Science" Software Packages such as Criterium Decision Plus.
8. Use a Decision Process if the Problem is too Complicated to Solve in Your Head and/or too Important to Solve by Your Gut.

CSO Control Alternatives (No. & Title)

- 1 Alternative No. 1: Baseline
- 2 Alternative No. 2: HY-205-1
- 3 Alternative No. 3: HY-205-2
- 4 Alternative No. 4: HY-205-3
- 5 Alternative No. 5:
- 6 Alternative No. 6:
- 7 Alternative No. 7:
- 8 Alternative No. 8:
- 9 Alternative No. 9:
- 10 Alternative No. 10:

Base Assumptions-Fatal Flaw Criteria

- Item 1:
- Item 2:
- Item 3:

Non-Monetary Criteria	Weight
Water Quality Improvement	0.14
Reduction of Combined Sewer Backups	0.13
Reduction of Street Flooding	0.19
Minimizing Community Disruption	0.14
Simplicity of Solutions	0.10
Opportunities for Infrastructure/Utility Improvements	0.12
Compatibility with Community	0.10
Opportunities for Community Enhancements	0.09
	1.01

Note: These weights are from the Community Basin Panel.
BAP weights should be substituted here.

Non-Monetary Criteria:	Water Quality Improvement	Reduction of Combined Sewer Backups	Reduction of Street Flooding	Minimizing Community Disruption	Simplicity of Solutions	Opportunities for Infrastructure/Utility Improvements	Compatibility with Community	Opportunities for Community Enhancements
Scoring Methodology Descriptions:								

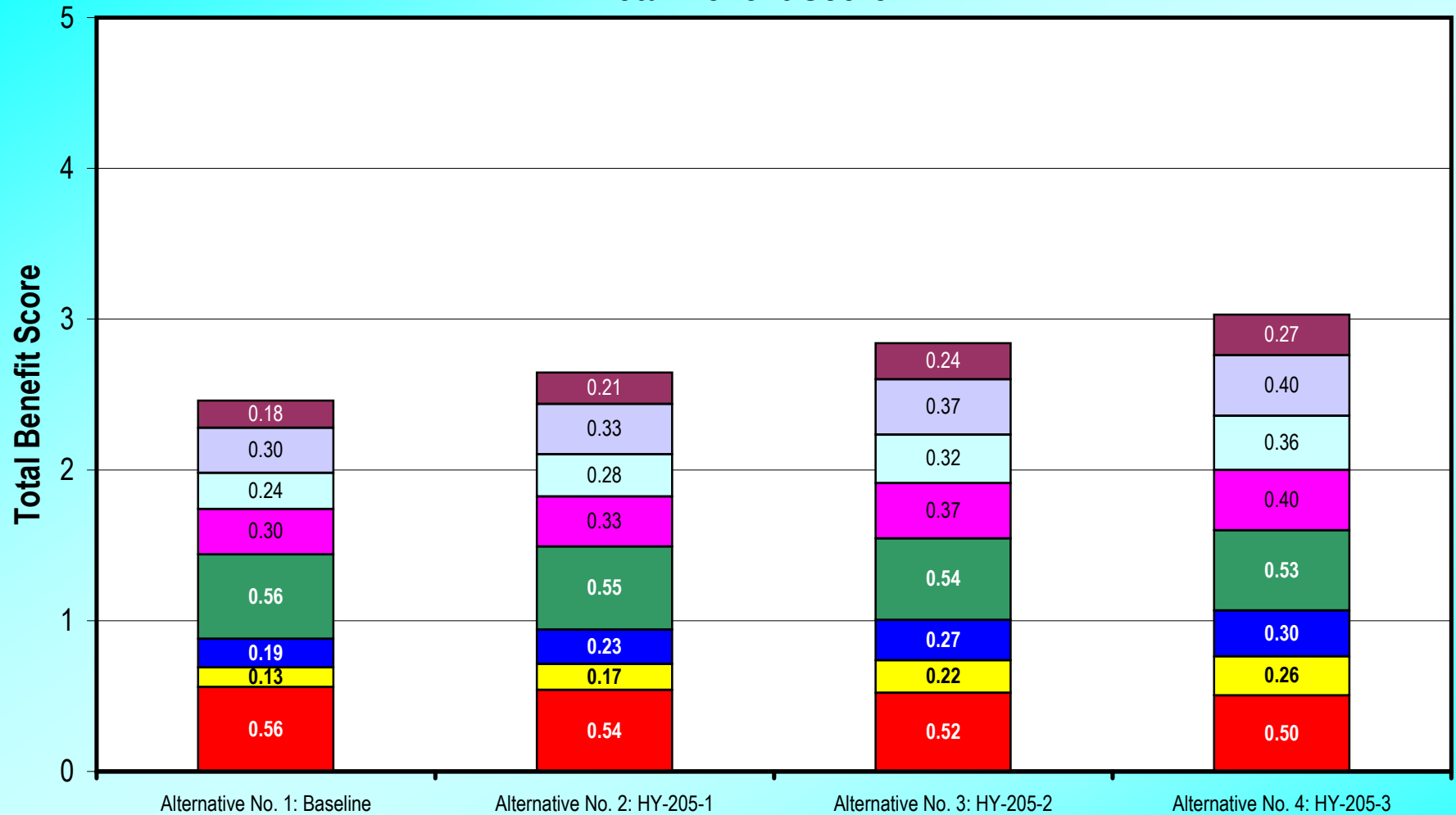
Relative Benefit Scores - Normalized 1 to 5 (Higher Scores Indicate More Benefit for the Alternative w/r to the Criterion)

1	Alternative No. 1: Baseline	4.0	1.0	1.0	4.0	3.0	2.0	3.0	2.0
2	Alternative No. 2: HY-205-1	3.9	1.3	1.2	3.9	3.3	2.3	3.3	2.3
3	Alternative No. 3: HY-205-2	3.7	1.7	1.4	3.9	3.7	2.7	3.7	2.7
4	Alternative No. 4: HY-205-3	3.6	2.0	1.6	3.8	4.0	3.0	4.0	3.0
5	Alternative No. 5:								
6	Alternative No. 6:								
7	Alternative No. 7:								
8	Alternative No. 8:								
9	Alternative No. 9:								
10	Alternative No. 10:								

Criteria	Weights	Alternative No. 1: Baseline	Alternative No. 2: HY-205-1	Alternative No. 3: HY-205-2	Alternative No. 4: HY-205-3	"PERFECT"
Water Quality Improvement	0.14	0.56	0.54	0.52	0.50	0.70
Reduction of Combined Sewer Backups	0.13	0.13	0.17	0.22	0.26	0.65
Reduction of Street Flooding	0.19	0.19	0.23	0.27	0.30	0.95
Minimizing Community Disruption	0.14	0.56	0.55	0.54	0.53	0.70
Simplicity of Solutions	0.10	0.30	0.33	0.37	0.40	0.50
Opportunities for Infrastructure/Utility Improvements	0.12	0.24	0.28	0.32	0.36	0.60
Compatibility with Community	0.10	0.30	0.33	0.37	0.40	0.50
Opportunities for Community Enhancements	0.09	0.18	0.21	0.24	0.27	0.45
TOTAL	1.01	2.46	2.65	2.84	3.03	5.05

Cost Basis	Alternative No. 1: Baseline	Alternative No. 2: HY-205-1	Alternative No. 3: HY-205-2	Alternative No. 4: HY-205-3
TOTAL CAPITAL COST	\$107,300,000	\$119,600,000	\$121,400,000	\$125,400,000
ANNUAL O&M COST	\$770,000	\$550,000	\$550,000	\$560,000
50-YEAR PRESENT WORTH COST	\$130,800,000	\$137,400,000	\$139,000,000	\$142,400,000
NORMALIZED TOTAL PRESENT WORTH COST TO LOW COST	1.000	1.050	1.063	1.089
BENEFIT/NORMALIZED TOTAL PRESENT WORTH COST RATIO	2.460	2.520	2.673	2.783

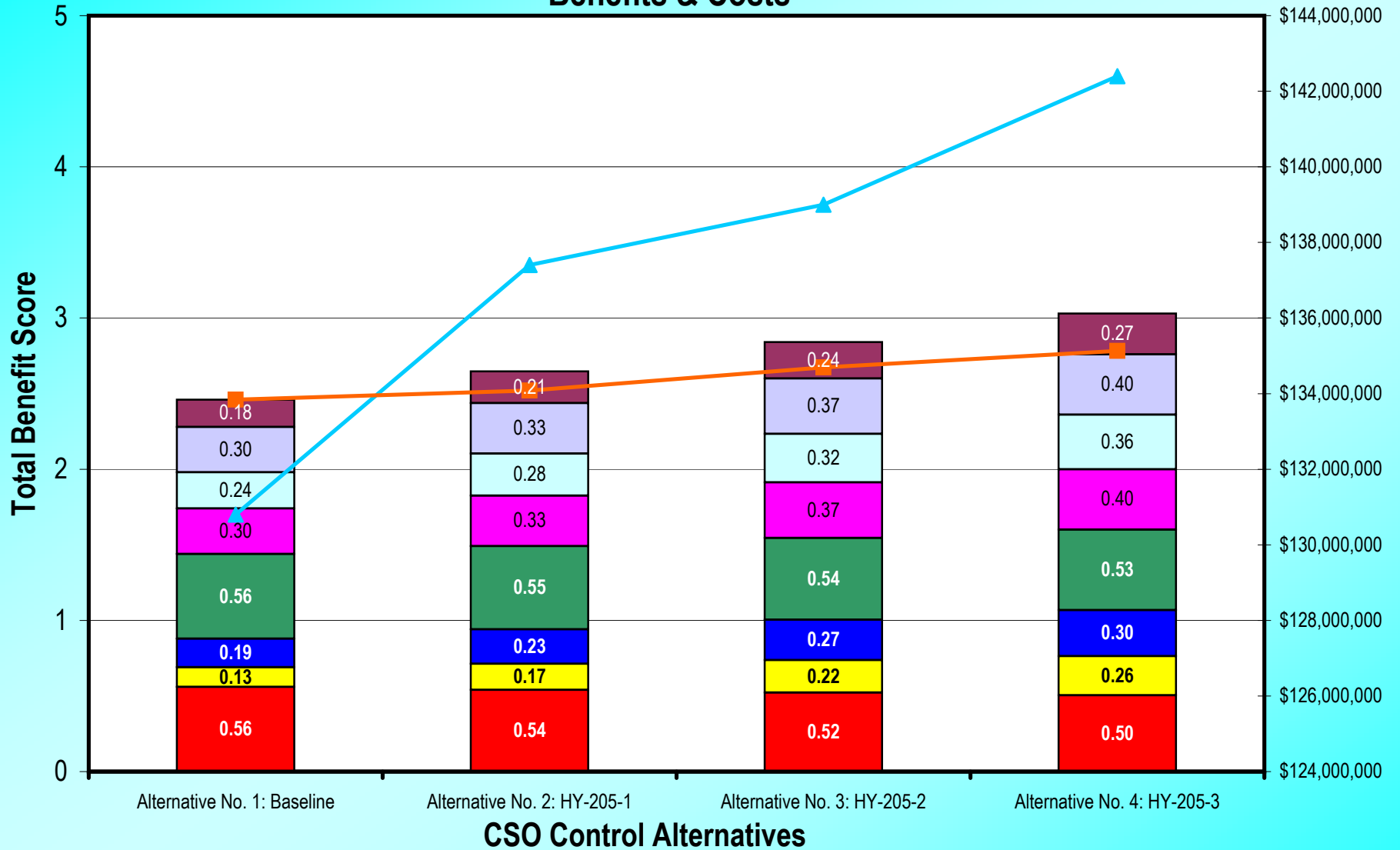
Total Benefit Score



CSO Control Alternatives

- Water Quality Improvement
- Minimizing Community Disruption
- Reduction of Street Flooding
- Reduction of Combined Sewer Backups
- Simplicity of Solutions
- Opportunities for Community Enhancements
- Opportunities for Infrastructure/Utility Improvement
- Compatibility with Community

Benefits & Costs



- Water Quality Improvement
- Reduction of Combined Sewer Backups
- Reduction of Street Flooding
- Minimizing Community Disruption
- Simplicity of Solutions
- Opportunities for Infrastructure/Utility Improvements
- Compatibility with Community
- Opportunities for Community Enhancements
- ▲ 50-YEAR PRESENT WORTH COST
- BENEFIT/NORMALIZED TOTAL PRESENT WORTH COST RATIO