

SECTION 4.0 WATERSHED MANAGEMENT PLAN PROJECT PRIORITIZATION

As stated in the introduction, the objectives of this Watershed Management Plan are to identify the causes of the problems of flooding, surface water quality degradation, excessive channel erosion, and loss of riparian habitat; and to identify, evaluate and recommend solutions to these problems. The problems and the causes of these problems were identified in Section 2.0. Recommendations for solutions to the problems were made in Section 3.0. This section serves to prioritize the improvements on the basis of benefits provided, cost effectiveness, and logical precedence.

The projects recommended in this document, whether considered singly or as a whole, are economically justifiable, and clearly in the interest of public safety, health, and welfare. The management plan is consistent with the laws of the federal, state and local government, and follows the policies outlined in State, regional, and local comprehensive plans.

In this section, projects that can be expected to provide the greatest overall benefit in the most cost effective manner are identified using a project ranking procedure. This management tool is a convenient and effective method of recommending priorities for the allocation of available funding. To help identify the priority projects in the Stevenson Creek Watershed Management Plan, a set of comparative evaluation criteria were identified, and a project ranking matrix was developed. The evaluation criteria selected as a means of grading the relative merits of the recommended master plan projects are discussed below. Within each category, individual projects were graded on a scale from 0 to 10, with the lowest score indicating no real benefit and the highest indicating a high beneficial value.

Flood Control Benefits. The relative flood control benefit of an individual project is a function of the number and type of Flood Protection Level of Service (FPLOS) deficiencies remedied by that project. The projects that rank the highest in this category



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will either alleviate flooding over a large geographic area, or reduce flooding within a geographically concentrated large group of flood-susceptible homes and businesses. A score of one-half point was earned for each structure FPLOS deficiency and each residential street FPLOS deficiency remedied by the project. Remediation of each collector, arterial, and evacuation route FPLOS deficiencies earned scores of 1.0, 1.5, and 2.0 points, respectively. The scores were summed for each individual project. Two projects, (3A) Glen Oaks, and (4A) Hillcrest Avenue Bypass, initially exceeded the maximum score of 10, and thus were assigned a score of 10.

Water Quality Benefits. The relative water quality benefits of an individual project reflect the ability of the project to capture and remove pollutant loads from the stormwater runoff prior to discharge into downstream waterbodies. Those projects with little or no real water quality benefits receive a score of 0, while a project specifically designed to provide a high level of treatment of currently untreated stormwater runoff from a large drainage basin would receive a high score. In assigning scores in this category, the total suspended solids (TSS) and total nitrogen (TN) loads expected to be removed (lb./year) by each project were determined from the proposed conditions pollutant loading model. These removal rates were used as comparative indicators of relative water quality benefits. The project with the largest rate of pollutant removal (Glen Oaks), was assigned a score of 10, and the scores for the other projects are based on their individual pollutant removal rates, expressed as a fraction of the removal rates of the Glen Oaks Project.

Ecological Benefits. The potential ecological benefits of individual projects are ranked based on evaluations of the anticipated improvements to wildlife habitat that will be realized after project construction. Factors such as the size of the affected area, current quality and ecological conditions, and proximity to other habitat areas are considered in the evaluation of benefits and the relative ranking. Areas that currently provide no habitat, but will provide significant habitat upon project completion, will rank



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the highest in the matrix. Conversely, those projects which will have no habitat impacts, such as the replacement of culverts for flood control, will rank the lowest.

Channel Erosion and Sedimentation Control Benefits. Projects which will have little or no effect in the remediation of channel erosion problems and sedimentation in the watershed are assigned a score of 0. Secondary benefits of projects that attenuate downstream peak discharge rates tend to reduce the potential for channel erosion, and therefore would earn the project a score of up to 5, depending on the magnitude of the attenuation and the proximity and severity of downstream erosion problems. Projects designed to permanently remedy severe channel erosion problems along a substantial length of channel would receive the highest ranking of 10. Projects that involve creation or expansion of maintainable sediment sumps on Stevenson Creek and Spring Branch would also receive a high score.

Recreational and Educational Benefits. The recreational and educational benefits associated with a project are those that provide new opportunities for the general public by accommodating the placement of features such as picnic areas and shelters, trails and boardwalks, nature parks, fishing, boating, and/or interpretive exhibits. Projects that provide no new opportunities for recreational and educational benefits receive a score of 0, and those that can provide a high level of recreational and educational opportunity would be assigned a score of 10.

Implementability. Implementability as a ranking criterion is an assessment of the relative severity of obstacles that must be overcome in order to construct the project. It is a cumulative assessment of factors such as property and easement acquisition requirements, permitting requirements, temporary impacts to nearby residences and businesses during construction, long-term maintenance and operation requirements, and relative ease of construction. A low ranking would be assigned to projects which would have a high degree of difficulty related to any or all of these issues. A high ranking would be assigned to a project with no foreseeable implementation concerns.



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Relative Benefits to Cost. As stated previously, all of the recommended projects of the Stevenson Creek Watershed Management Plan can be justified economically. However, because funding for public infrastructure improvements is not unlimited, it is useful to identify those projects that provide the most benefit for the least cost. In order to assign a score for this criterion, a total weighted benefits score was assigned to each project based on the sum of the weighted scores of the project in the five categories of flood control, water quality, ecological benefits, erosion control benefits, and recreational/educational benefits. The total benefit score was then divided by the preliminary cost estimate of the project in thousands of dollars. A multiplier was applied to the result to force an average score of 5.0, on a scale of 1 to 10, with 0 being the least cost effective and 10 being the most cost effective. A few projects earned scores greater than 10; these were subsequently reduced to 10. It should be noted that the result is not an actual benefit to cost ratio, but rather a relative measure of each project's cost effectiveness compared to the other projects the plan.

While each of the listed ranking criteria is an important factor when evaluating the individual watershed management projects, it is not essential that each should have an equal weighting in the evaluation matrix. For that reason, weighting factors were assigned to each, ranging from 1 to 5, to establish the relative importance of individual ranking criteria. The following is a list of the weighting factors used:

Ranking Criterion	Weighting Factor
Flood Control Benefits	5
Water Quality Benefits	4
Ecological Benefits	4
Channel Erosion and Sedimentation Control Benefits	3
Recreational and Educational Benefits	2
Implementability	2
Relative Benefits versus Cost	5



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Table 4-1. Stevenson Creek Watershed Management Plan Project Ranking Matrix

Project No.	Project Description	Flood Control Benefits 5	Water Quality Benefits 4	Ecological Benefits 4	Erosion Control Benefits 3	Recreational/Educational Benefits 2	Ability to Implement 2	Relative Benefits vs. Cost 5	Weighted Score	Rank
<u>Spring Branch</u>										
1A.1	Spring Branch Conveyance Enhancements (Lower Portion)	10	1.5	0	10	0	6	10.0	5.7	3
1A.2	Spring Branch Conveyance Enhancements (Upper Portion)	6.5	0.5	0	0	0	8	4.2	2.8	14
1B	Springtime Avenue and Douglas Avenue Bridges	1	0	0	0	0	7	0.7	0.9	28
1C	Spring Branch Flood Detention Basin	1	5.7	10	5	2	4	3.9	4.4	6
1D	Woodland Terrace Storm Sewer Replacement	2.5	0.1	0	0	0	9	3.4	1.8	22
1E	Byram Pond Dredging and Expansion	1.5	0.8	0	5	0	4	3.6	2.0	21
1F	Spring Branch Stabilization, Union Street to Byram Pond	0	0	0	10	0	10	3.8	2.6	16
1G	Clearview Lake	0.5	0.9	0	1	0	8	1.7	1.3	27
1H	Betty Lane Forested Habitat Preservation Site	0	0	10	0	6	3	5.5	3.3	12
<u>Lower Stevenson</u>										
2A	Palmetto Street Sediment Sump	0.5	0.2	2	9	0	4	10.0	3.7	9
2B	N. Missouri Ave. and Palmetto St. Drainage Improvements	1	0.9	0	0	0	9	2.1	1.4	24
2C	Installation of Additional CDS Units	0	4	1	0	0	10	4.4	2.4	18
2D	Overbrook Avenue Detention Pond	2	1.8	6	0	4	6	3.3	3.0	13
<u>Middle Stevenson</u>										
3A	Glen Oaks Stormwater Detention Facility	10	10	10	5	10	6	8.8	8.5	1
<u>Upper Stevenson</u>										
4A	Hillcrest Avenue Overflow Bypass Culvert	10	0	0	3	0	6	3.0	3.3	10
4B	Upper Stevenson Creek Stabilization	0	0	0	10	0	8	2.5	2.2	19
4C	St Thomas Drive / Bellevue Boulevard Creek Restoration	9.5	0.4	6	2	2	3	5.4	4.5	5
<u>Hammond Branch</u>										
5A	Flagler Drive / CSX Railroad North Swale Improvements	5.5	0	0	2	0	4	5.3	2.6	17
5B	Palmetto Street Drainage Improvements	2	0	0	2	0	8	2.5	1.7	23
5C	Saturn Avenue Drainage Improvements	1	0.2	0	0	0	9	2.2	1.3	26
5D	Smallwood Circle Drainage Improvements	1	0.1	0	0	0	6	3.9	1.4	25
5E	Lake Hobart Outfall Control Structure	0	0.8	0	0	0	10	10.0	2.8	15
<u>Lk Bellevue Branch</u>										
6A.1	Expansion of Lake Bellevue	4.5	8.7	7	1	3	8	9.7	6.1	2
6A.2	Upper Lake Bellevue Culverts	7.5	0	0	0	0	10	10.0	4.1	8
6B	Turner Street Box Culverts	4.5	1.2	0	0	0	7	2.1	2.0	20
<u>Jeffords St Branch</u>										
7A	Crest Lake Expansion	2	1.6	6	1	4	10	6.8	4.1	7
7B	Duncan Avenue/Turner Street Detention Pond	7	0.8	4	0	0	5	4.2	3.3	11
7C	Jeffords Street/Barry Road Detention Pond	8	2.8	5	10	0	3	7.0	5.5	4

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The project prioritization ranking matrix for the Stevenson Creek Watershed Management Plan is presented in Table 4-1. It is noted that this ranking matrix evolved over time, with input from all the participating entities and the general public.

It should be stressed that the ranking process is, to a certain degree, a subjective process that is oriented towards personal values. It is, however, a valuable tool for screening projects and grouping them into relative priority classes. It is apparent through examination of Table 4-1 that those projects which serve multiple purposes rank the highest when compared to those with singular objectives. Also apparent is the observation that the projects that rank the highest generally have the highest scores in the relative benefits to cost category.

Logical Precedence. Although not included as a ranking criterion per se, the successful implementation of the Stevenson Creek Watershed Management Plan will require consideration of the logical precedence, or order of construction of the individual projects. Many of the projects will rely on the prior completion of downstream improvements, in order to avoid creating unintended flooding impacts. Or, a project might not function at its intended full capacity unless constructed in conjunction with another nearby project. Within the Stevenson Creek Watershed Management Plan, four groups of projects were identified that require ordering by logical precedence. The four groups could be constructed in any order, however the projects within each group must follow the specified sequences. For comparison, the project rank is provided for each project in the sequence, within Table 4-2 below:



Table 4-2. Project Precedence

Project Precedence Grouping	Required Sequence of Construction	Project Rank (Independent of Sequence)
Spring Branch Group	1. 1B <u>or</u> 1C	28 (1B), 6 (1C)
	2. 1A.1	3
	3. 1A.2	14
	4. 1G	27
Glen Oaks Group	1. 3A	1
	2. 4A, 6B	10 (4A), 20 (6B)
Hammond Branch Group	1. 5A	17
	2. 5C	26
Lake Bellevue Group	1. 6A.1	2
	2. 6A.2	8

By examination of the Spring Branch Group in Table 4-2, it is apparent that construction of third-ranked project (1A.1) Spring Branch Improvements, Lower Portion, will require the prior construction of a lower-ranked project, either (1B) or (1C), in order to avoid downstream flooding impacts associated with the channel improvements. The preferred alternative, Project (1C) Spring Branch Detention Basin, is close in rank to project (1A.1) at a rank of 6. However, if Project (1C) cannot be implemented, for any reason, 28th-ranked Project (1B) Springtime Avenue and Douglas Avenue Bridges must be built instead. This raises the question of how to assign priorities to two projects with widely different ranks that must be built together. This could be resolved by re-assigning some of the flood control benefits from Project (1A.1) to (1B), until the scores of the two projects in Table 4-1 are equal. The resulting weighted score would be 3.8, which would result in an overall rank of 8 for the combined projects (1A.1 and 1B). The relative benefits to cost scores for projects (1A.1) and (1B) would change to 9.1 and 7.0, respectively.

In the remaining project precedence groups, the project precedence follows the order of the project rankings. Projects not specifically listed in the above table are

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considered “stand alone” projects that could logically be constructed at any point during plan implementation.

Public Acceptance. Public acceptance is a qualitative measure of the support for a particular project among the City’s taxpaying residents. In the early planning stages of a future public works project, public acceptance of the project can be difficult, if not impossible to gauge with any certainty. For this reason, it was not included herein as a ranking criterion. However, public involvement is a very important component of this plan; watershed improvements cannot be realized without the willingness and cooperation of residents within the watershed boundaries. For this reason, three (3) public meetings, or workshops, are being held to provide information and to receive comments and suggestions from the public. These comments and suggestions have helped to determine improvement projects and priorities. The first meeting was held in November of 1999, prior to the commencement of the project, to receive input from the public on known problems. A total of 68 questionnaires were received, containing descriptions by the residents of problems of sedimentation/erosion, water quality, and flood control. These questionnaires, along with the City’s complaint logs, were used to create a GIS map of the known problem areas, which was compared with the results of the computer modeling analyses by overlaying it on the 100-year floodplain map and the pollutant loading map. This information was then used in identifying areas to be targeted for watershed improvements.

The second meeting was held in January of 2001, where the results of the existing conditions analysis were presented along with the preliminary identified solutions for flood control, water quality, erosion and sedimentation. The residents were asked to comment in writing on the potential improvement projects. Approximately 70 residents attended, and 28 questionnaires were filled out. Most of the project-related comments received were positive, and many additional suggestions were made regarding specific components of the projects. These comments and suggestions were thoroughly reviewed and considered during the final completion of the Stevenson Creek Watershed Management Plan. Public meeting questionnaires from the first two public meetings are



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included as Appendix L of this report. A third public meeting is scheduled to be held later this year to present the completed Plan during a City Commission workshop, which will be televised city-wide.

Through the public meetings, workshops, and meetings among members of the project team, five projects were identified as potentially controversial projects. Project 3A (Glen Oaks), although on City-owned property, will eliminate the existing golf course at that location, currently operated through a lease agreement by the non-profit Chi-Chi Rodriguez Foundation. Projects 4C (St. Thomas Drive to Bellevue Boulevard), and 7C (Jeffords/Barry Road Pond) were identified as potentially controversial projects due to the proposed acquisition of several residential properties. Projects 6A (Expansion of Lake Bellevue) and 7A (Crest Lake Expansion) were identified by the City Parks and Recreation Department as potentially controversial due to the proposed conversion of existing upland park areas to wetland habitat.

Winning public support for these projects through the City's public information initiatives will be crucial to successful implementation of these projects. The final design and implementation of these projects must be sensitive to resident's potential concerns regarding alternative recreational opportunities, the environment, safety, aesthetics, and property values.

