

Appendix 11 Decision Support System (DSS) Report



Tujunga Watershed Project

DECISION SUPPORT SYSTEM - PHASE ONE: Criteria, Rules & Rough-Scoring Process

Introduction

As part of the Tujunga Watershed Management Plan (WMP), a Decision Support System (DSS) is being developed to assist in the identification and assessment of proposed and/or potential projects most likely to help accomplish the goals and objectives of the WMP. The project's Technical Advisory Committee (TAC) and Steering Committee have been working with the Project Team to develop the DSS throughout the spring and summer of 2006. This memo presents a brief summary of the DSS development process and the Draft DSS Criteria and Rules to date.

DSS Development Process

Development of the DSS relies upon an iterative consensus-building approach which incorporates input from the TAC, Steering Committee, and the Project Team. The TAC is comprised of agency representatives with defined roles and responsibilities which include technical and conceptual review of the DSS. The Steering Committee consists of project partners, agencies, and the community which provide additional insight and guidance relating to the DSS. Larry Walker Associates (LWA) is working with the Project Team to coordinate development of the DSS by organizing meetings of the TAC and Steering Committee and to implement input from those two entities into the DSS.

Thus far, three TAC meetings and one Steering Committee meeting have been held to discuss the DSS. The first meetings were used to introduce the context and proposed approach for developing the DSS. At subsequent meetings, LWA presented a summary of the work done to date, illustrated implementation of TAC/Steering Committee suggestions, and worked with the TAC, Steering Committee, and Project Team to continue progressing and refining the DSS. Per TAC suggestion that the Tujunga WMP need not "reinvent the wheel" a review was conducted of the processes used by other WMPs in the region for identifying/selecting projects. Also, the TAC utilized an early draft version of the DSS to evaluate hypothetical projects, as a means of "test-driving" the DSS to more clearly reveal strengths and weaknesses of the planned approach.

DSS Criteria

Early input from TRP, in conjunction with TAC and Steering Committee agreement, suggested the Tujunga WMP Goals and Objectives (see Appendix A) should serve as the foundation for establishing DSS criteria. Several other factors were identified during TAC and Steering Committee meetings for inclusion in the set of criteria by which projects should be evaluated. Table 1 shows the criteria currently planned for inclusion in the DSS, according to category and sub-category. Category-A, Category-B, and Category-C shown in Table 1 are derived directly from the Tujunga WMP Goals and Objectives, while the Additional Factors are derived from the various TAC and Steering Committee meetings.

Table 1. Criteria for Rough-Scoring and Project Rating.

Category	Sub-Category
Category-A	Optimize Local Water Resources
	Improve Surface Water & Groundwater Quality
	Restore Hydrologic Function to Watershed while Maintaining Public Safety
Category-B	Enhance Quality, Quantity and Connectivity of Native Habitats
	Improve and Increase a Network of Public Open Space
	Create Green Transit Linkages and Recreational Access
Category-C	Promote Watershed Awareness through Public Outreach and Education
	Implement Watershed-based Planning and Projects
	Improve Collaboration among Organizations & Communities in Watershed
Additional Factors	Project Necessity and Importance
	Feasibility and Cost
	Project Readiness and Timeliness
	Availability of Financial and Human Resources
	Visibility of Project in the Community and Region
	Innovation, Precedence, Continuity
	Completion Timeframe

DSS Rules

The DSS incorporates three phases of analysis: Rough-Scoring, Project Rating, and Scenario Evaluation. The Rough-Scoring phase utilizes expertise of the TAC members to provide an initial assessment of each project based on best professional judgment. Once all necessary information for each potential or proposed project has been collected, TAC members will review the information and assign a value of 0 - 4 or 'not enough information' (NI), according to the scoring system shown below in Table 2. A value of NI suggests more information is necessary for a reviewer to assign a score. If missing information is not eventually submitted, each NI receives a score of zero points. It has not been decided as of yet the process for requesting and collecting additional information.

Table 2. DSS Rough-Scoring System.

Scoring for Category A, Category B, and Category C		Scoring for Additional Factors	
NI	Insufficient information available, needs	NI	Insufficient information available, needs information
0	No benefit, or not relevant for project being	0	Not favorable, or not relevant for project being
1	Benefit unlikely or very minor	1	Likely not favorable
2	Potentially measurable benefit	2	Neither clearly favorable nor unfavorable
3	Likely measurable benefit / secondary purpose	3	Likely favorable
4	Clearly expected benefit / primary purpose	4	Highly favorable

Note: reviewers may assign scores from 0-4 using 0.5 decimals (e.g., 0.5, 1.5, 2.5, 3.5).

The next phase of analysis, Project Rating, utilizes available tools (such as water quality and quantity models, GIS analysis, and other methods) to estimate the likely benefits, costs, and other effects of proposed projects. Once project rating is completed for all relevant projects for each criterion/subcategory, the values are categorized from 0 - 4 or 'not enough information' according to a bell-curve distribution relative to the set of all projects considered.

In both the Rough-Scoring and Project Rating phases, weighting factors will be applied to the scores for each sub-category. Although the final weighting values are not yet determined, consensus has been reached that weighting of each subcategory should ensure the following order of importance for each category (from greatest to least emphasis): Category-A, Category-B, Category-C, and Additional Factors.

Finally, the Scenario Evaluation process includes issues which are not project-specific, by considering the effect of different combinations of projects. The issues considered during the Scenario Evaluation process are shown below in

Table 3. By reviewing the effect of selecting different combinations of projects and emphasizing the relative importance of various criteria, the Scenario Evaluation process creates the potential to identify sets of projects with synergistic, additive, or otherwise desirable outcomes.

Table 3. Criteria for Scenario Evaluation.

Criteria	Sub-Criteria
range of project types	<ul style="list-style-type: none"> • wide range of G&Os covered? • most critical G&Os addressed proportionally? • selection of multiple benefit projects is maximized?
spatial distribution	<ul style="list-style-type: none"> • geographic (physical, biological, cultural) distribution... sensible? • political distribution... fair? equitable? rational? • upper watershed (protected open space) vs. lower watershed (urban) projects
completion timeframes	<ul style="list-style-type: none"> • mixture of short-term and long-term projects • feasible combination of start dates (all at once vs. staggered/offset)
synergistic potential	<ul style="list-style-type: none"> • select projects with complementary sets of goals, objectives, and tasks • avoid projects with competing funding • select sets of projects which are part of a large coordinated effort
overall benefit-cost	<ul style="list-style-type: none"> • maximize the overall benefit, while minimizing the overall cost • remain within boundary of realistic overall budget constraints
low hanging fruit, big ideas	<ul style="list-style-type: none"> • include projects likely to yield early successes • include some 'big idea' projects, even if challenging to implement



Tujunga Watershed Project

DECISION SUPPORT SYSTEM - PHASE TWO: Project Rating, Scenario Evaluation & Feedback

Introduction

As part of the Tujunga Watershed Management Plan (WMP), a Decision Support System (DSS) was developed to assist in the identification and assessment of proposed and/or potential projects most likely to help accomplish the goals and objectives of the WMP, considering that water supply, water quality and restoration of hydrologic function would be the most heavily weighted. Other goals and objectives included trails, habitat enhancement, community improvement and other “soft” factors. All project submittals were rough-scored. Many projects suffered in scoring because of lack of sufficient critical data; specific examples of critical data gaps included parks without acreage, detention basins without depth or acre-footage generated, and trails with indeterminate destinations. Significant time and effort was expended in an effort to extract and elicit data from key stakeholders. Absent provision of data, the Project Team worked to develop GIS data where possible. GIS-derived data was assembled and combined with the rough score. Analysis of this data gave a rating for each project. This memo presents background detail on the latter phase of the DSS and a brief summary of the Steering Committee input to and feedback on the DSS results.

Project Rating & Scenario Development

Projects were rated within three categories according to type:

Category A

Goals and Objectives: Water quality, water resources, water quantity, hydrologic function.

What impacted the score: Infiltration analysis based on project acreage, soil type, and percentage of the project’s land area devoted to storm water capture, storage and infiltration. The big tools were volumetric percentiles of projects ranked against one another and the volumes of capture, infiltration and cleanup projects provided.

Category B:

Goals and Objectives: Habitat and Ecology, Open Space, Transit, Trails

What impacted the score: Analysis based on project length, number of connections to existing trails, waterways, parks, storm drains, transportation and other relevant features. For parks, the team combined a Trust for Public Land Green Printing Rank, which scored park projects on the basis of greatest park need with analysis of habitat and open space adjacency and connectivity.

Category C:

Goals and Objectives: Softer factors such as watershed awareness, innovation, collaboration, visibility, precedent, geographic spread, and other factors not easily quantified.

For many projects, especially ones that don’t have all the expected scientific data, one can argue for their importance, relevance and impact based on educational value, political factors, etc. The Scenario Evaluation provided the forum in which to consider these factors.

Four scenarios were developed to determine high value projects:

- Group 1 Scenario was taken directly from rough score rankings by Tujunga TAC
- Group 2 Scenario combined the rough score with project ranking based on the GIS analysis, which gave different values to projects based on the added information.
- Group 3 Scenario combined the rough-score with project rankings given by the LA Integrated Regional Management Plan (IRWMP), which were developed separately and in parallel by the IRWMP team. Project scores were combined averages, each part given equal weighting.
- Group 4 Scenario was given by combining Group 2 with the IRWMP rankings, each part given equal weighting.

Certain projects made the top 24 in every scenario. In other cases there were wide disparities despite the IRWMP and Tujunga processes being very similar. In some cases, lack of data skewed ratings downward. There was wide variance in data quality from project to project, and the Scenario Evaluation provided an opportunity to make a case for project value in lieu of adequate data.

Scenario Evaluation

The final phase of the DSS process was Scenario Evaluation. The process was intended to address issues which may not project-specific, by considering the effect of different combinations of projects. The issues considered during the Scenario Evaluation process were qualitative and essentially represented a discussion between stakeholders as to how well the DSS Process selected a representative range of projects to meet the Goals and Objectives. By conducting a qualitative review of the effect of selecting different combinations of projects and emphasizing the relative importance of various criteria, the Scenario Evaluation process created the potential to identify sets of projects with synergistic, additive, or otherwise desirable outcomes. The Scenario Evaluation was conducted at the Steering Committee Meeting held on October 2, 2007. The Scenario Evaluation focused solely on neighborhood-scale projects and was intended to generate a list of the top 24 projects for inclusion in the WMP. The large-scale projects concern major infrastructure such as LA City or County owned projects, spreading grounds and dams, and Army Corps projects, and were considered separately.

The intention of the Scenario Evaluation Meeting included not only agreeing on the top 24 projects but aligning on a well rounded suite of projects that met all WMP Goals and Objectives. Methodology included analyzing the disparities, noting where the projects lie in the watershed, and considering Category C and other factors often overlooked such as project visibility, continuity, precedent, innovation and having a geographic spread that meets the various needs in the watershed.

Stakeholders reviewed the four project scenarios determined by the DSS to decide whether or not any one scenario reflected a satisfactorily robust and holistic outcome. Questions considered included:

- Did the DSS capture a well rounded range of project types?
- Do the projects reflect a good variety of BMP's?
- Have we captured all the means for managing a watershed powerfully?
- What to do about projects that didn't make the rankings but jump out as important, including Arundo Removal, Toad Habitat, and the Grace Community Church Parking Lot Retrofit?

Tools for facilitating the process included

- Large-scale printed project scenario maps distributed about the room, which showed only neighborhood and not the large scale projects.
- A projected master spreadsheet in which all 143 projects were color coded by the number of scenarios where they made the top 24 (9 projects made all four, several more made three, two, or only one). The sheet included project descriptions, lengths, areas and infiltration data where relevant and the data gaps in these categories; council, assembly and senate districts. 60 projects had infiltration data; 30 trail projects were analyzed.
- A projected map showing project distribution throughout the watershed compiled from GIS data. Projects were also color coded here. Distribution was important to consider as well as project characteristics because adjacency could provide opportunities and it was considered important to have projects distributed throughout all council districts represented.

Stakeholders decided to reviewed and evaluate projects all four scenarios individually, utilizing the visual aids and each other's direct knowledge to select a suite of projects for a preferred scenario.

Feedback

In general, stakeholders found the DSS useful in cases where project data was sufficiently robust. Where data was lacking, stakeholders felt that the peer review process and the utilization of GIS information and project mapping helped them make a more comprehensive analysis of project values. Stakeholders were able to verify project locations, better understand rating scores and the impact of data gaps, identify beneficial project combinations, and tease out the occasional 'criteria error' in project ratings. Open discussion of the 'fuzzy factors' inherent in Category C helped illuminate important project benefits that were not otherwise quantifiable through the DSS. In addition, stakeholders felt that the time spent in discussion of individual project particulars and benefits had educational value and strengthened stakeholder relationships.