Solving urban watershed problems in Los Angeles through the use of collaborative planning

Dan Rodrigo
CDM

INTRODUCTION

In 1999, the City of Los Angeles (City) embarked on a unique approach of technical integration and community involvement to guide policy decisions and water resources facilities planning. The Integrated Resources Plan (IRP) incorporates a future vision of water, wastewater and runoff management in the City that explicitly recognizes the complex relationships that exist among all of the City's water resources activities and functions. Using a holistic, watershed-based planning process, the IRP was a departure from the City's traditional single-purpose planning efforts for separate agency functions, and it will result in greater efficiency and additional opportunities for citywide benefits, including environmental restoration and increased quality of life.

The drivers for the IRP were significant, and included:

1. Reliability of wastewater collection, treatment and disposal system
2. Reliability of water supply, given that half of the City's water originates hundreds of miles away
3. Poor water quality of receiving waters, such as oceans, bays and rivers
4. Rising cost of providing water, wastewater and stormwater management services
5. Lack of public trust in city officials
6. Pending regulations concerning TMDLs
7. Lawsuits by environmental groups

The IRP sought to accomplish two basic goals in developing an implementable water resources plan:

1. Integrate water supply, water conservation, water recycling, and runoff management requirements and issues with wastewater facilities planning through a regional watershed approach; and

2. Enlist the public in the entire planning and design development process at a very early stage beginning with the determination of policy recommendations to guide planning.

METHODOLOGY

The IRP was divided into two phases:

Phase I (completed in 2001): focused on defining the future vision for the City by developing a set of guiding principles to direct future, more-detailed water resources planning.

Phase II (completed in 2006): Focused on the development of a detailed facilities plan for wastewater and stormwater, as well as a recycled water master plan, environmental impact report, and financial plan.

Recognizing that the level of analysis and decision-making would be different for the two phases, an overall decision process methodology was developed (see Figure 1). Based on the principles of strategic and tactical planning, the first phase of the IRP would use a high-level systems simulation model, while the second phase would use more detailed hydrologic and hydraulic models specific to wastewater and urban runoff systems. The second phase would also rely on a multi-attribute tool that would be used to interpret results and match stakeholder preferences with performance of the various alternatives.

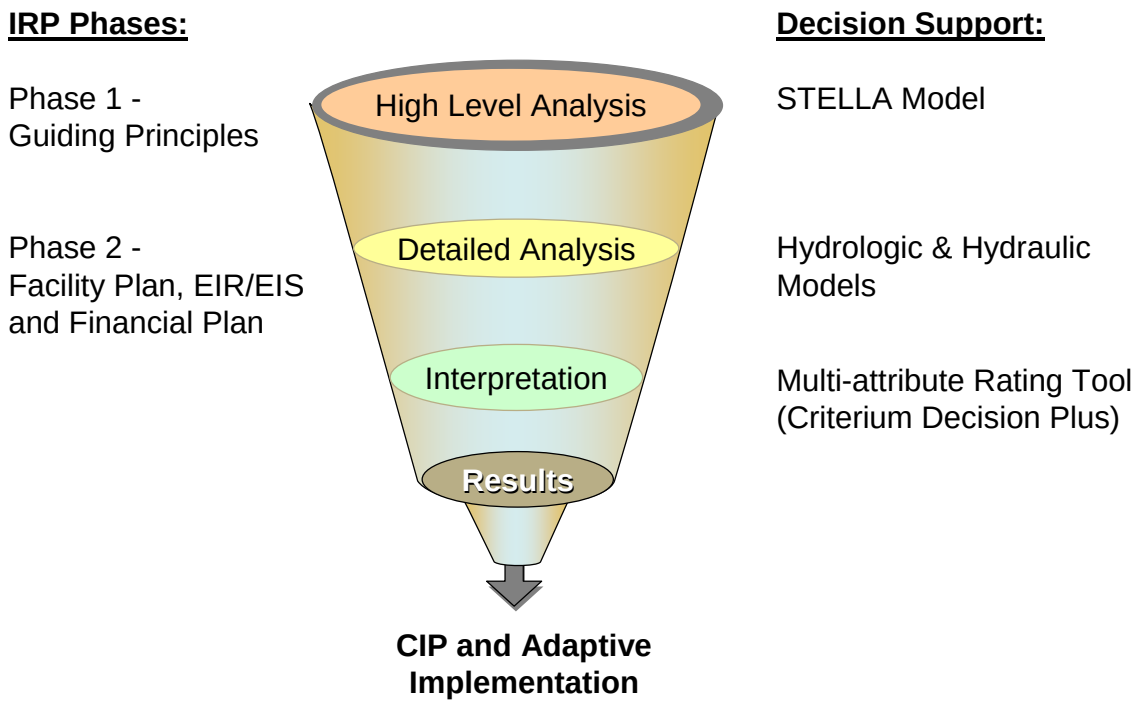


Figure 1
Overall Analytical Process for IRP

Both phases of the IRP evaluated alternatives and utilized stakeholder preferences to rank those alternatives. Phase 1 evaluated conceptual alternatives in order to develop a long-term vision, and to set policy principles that would be used to guide more detailed planning in Phase 2. Phase 2, in contrast, evaluated very specific integrated alternatives in order to develop facilities plans for water, wastewater and runoff.

One key aspect of the planning process was to separate the "why" from the "how." Often stakeholders come to a process with their positions firmly identified. These stakeholders want to jump to solving the problem (e.g., the "how"), rather than define what the problem is (e.g., the "why"). This was the case with the IRP. Many stakeholders came to

the process with their "pet" projects or with the notion that no projects should be build (in order to control growth).

Therefore, at the start of the process, stakeholders were asked to put their positions aside and define their values. Several facilitated workshops were required to accomplish this. For example, with persistent prodding we were able to get some stakeholders off of the position that "no projects should be built" to stating their implicit value of "protecting the environment" or "enhancing quality of life." Similarly we were able to get other stakeholders that wanted new facilities built to state their value in terms of "protecting public health" or "supporting economic growth." Moving stakeholders from positions to values offers a real chance for developing collaborative solutions and attaining consensus.

Once we were able to move stakeholders from positions to values, we could then focus on developing objectives and performance measures that would be used to evaluate alternatives. Figure 2 presents our method for keeping the "why" and the "how" separate until the timing was right to merge them.

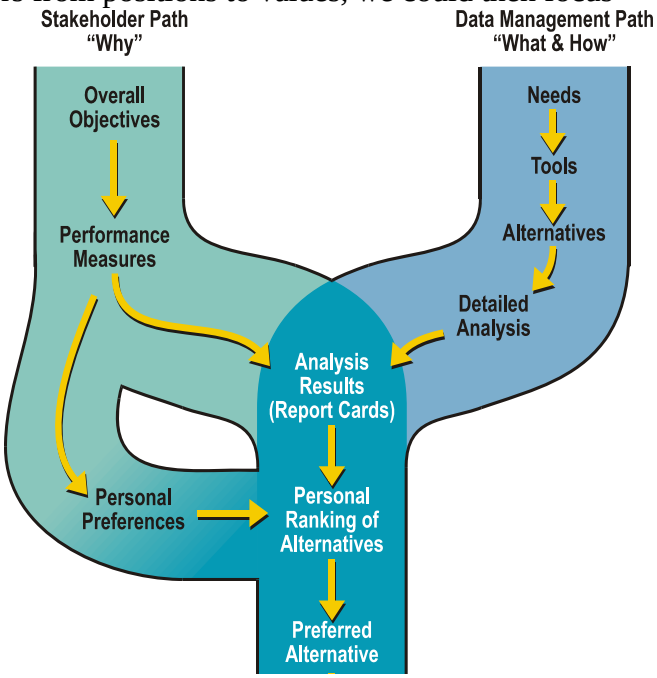


Figure 2.
Decision-making Paths

STAKEHOLDERS

The City conducted an extensive citywide outreach effort in order to identify stakeholders. Mass mailing to community leaders representing many diverse interest groups such as homeowners associations, church groups, business owners and environmental groups was used to solicit participation. In addition, targeted invitations to the process were conducted for regulators and key stakeholders that the City knew would be important. From this extensive effort, 372 stakeholders representing over 1,500 organizations and/or interest groups within the City were committed to participating in the IRP:

The stakeholders were broken into three tiers:

- Steering Group
- Advisory Group
- Information Group

Members of the Steering Group represented the Los Angeles population as they provided their inputs/concerns. They committed to attending a total of 13 half-day workshops

conducted over a three-year period. At these workshops, the Steering Group had two basic roles:

- To provide an on-going input on a regular basis on technical, environmental and financial development of the project; and

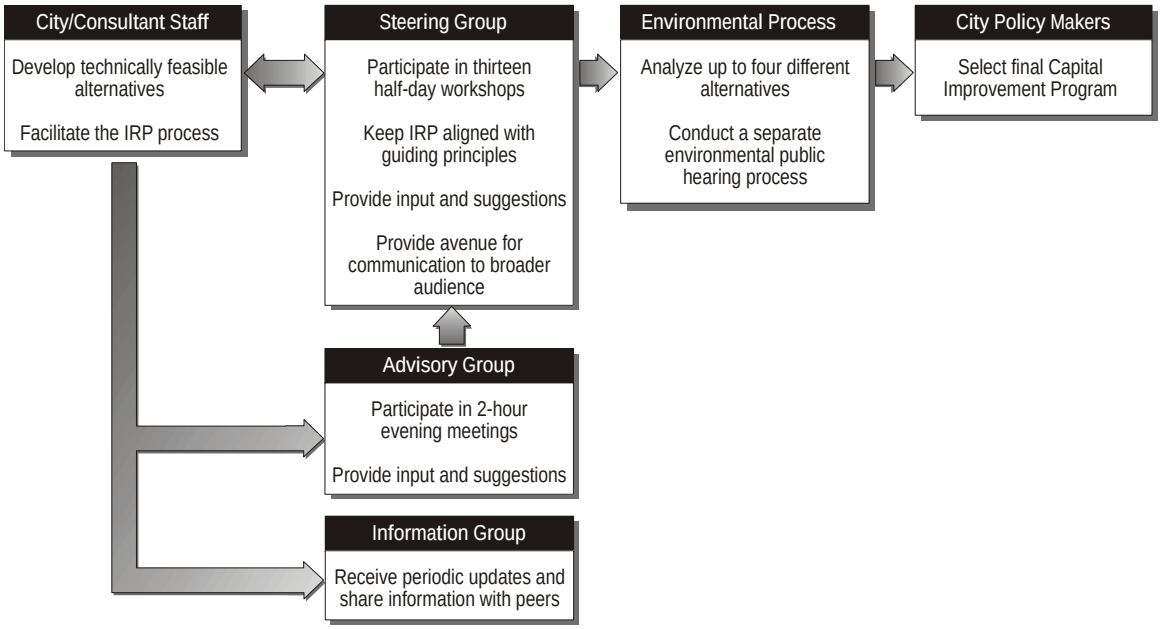
- To consider key project issues, such as facilities siting, implementation risks, and acceptability of costs that would invariably arise during the project.

Members of the Advisory Group participated in regular evening meetings over the three-year period and had the opportunity to provide comments and suggestions and to make observations for consideration by the Steering Group and the City. Members also were expected to inform their colleagues in the organizations, companies, and/or agencies they represent about the major milestones and recommendations of the IRP efforts. A total of ten sets of Advisory Group meetings were held in seven different areas throughout the City.

All interested parties were invited to stay informed of the facilities planning effort. Members of the Information Group received periodic newsletters to inform them of major milestones and recommendations of the IRP effort.

Figure 3 illustrates the relationships between the City and the stakeholders. These relationships provided the City with integral feedback from the stakeholders through Steering Group workshops and Advisory Group evening meetings; this interaction was designed to make sure that the IRP was aligned with the guiding principals developed in Phase I. The final outcome of this process will include a collaborative stakeholder-driven selection of a set of alternatives that will go through the environmental process discussed previously.

Figure 3 – Stakeholder Organization



ANALYTICAL PROCESS

During Phase 1 of the IRP, a high level systems simulation model was built using STELLA. STELLA is commercially available software that uses object oriented programming. It can be used to represent systems that have elements of mass-balance and flows. For this project, it was used to test conceptual alternatives and educate stakeholders on how water resources in the City are linked. For example, it allowed stakeholders to see the water supply opportunities and water quality benefits by capturing rainwater and storing it. Or to see the water supply benefits of locating a new wastewater plant near potential users of non-potable quality water. Figure 4 presents the basic interrelationships of the City's water resources that were captured in the STELLA model.

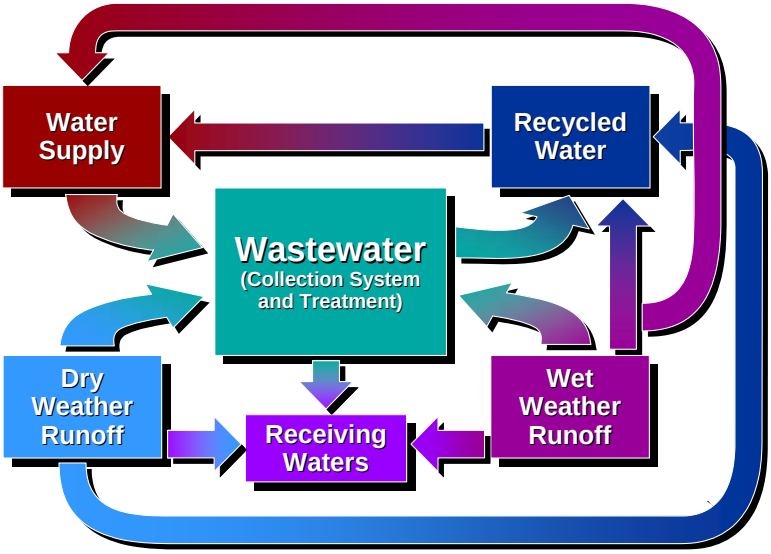


Figure 4.
Interrelationship of City's Water Resources

The model was built in a collaborative setting, allowing stakeholders to review all critical model linkages and relationships. This helped to build trust because stakeholders saw this as "their" model and not a "black box."

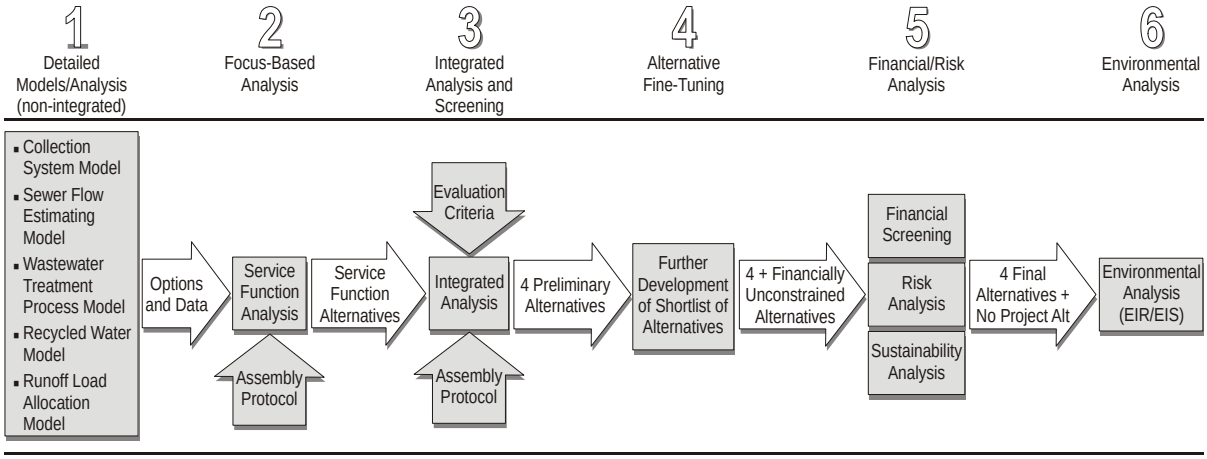
For each conceptual alternative, the STELLA model produced output on costs, water quality, reliability of the systems, and other output such as increased open space. This

analytical process helped stakeholders define policy principles that were then adopted by the City Council for use in subsequent and more detailed facilities planning.

■

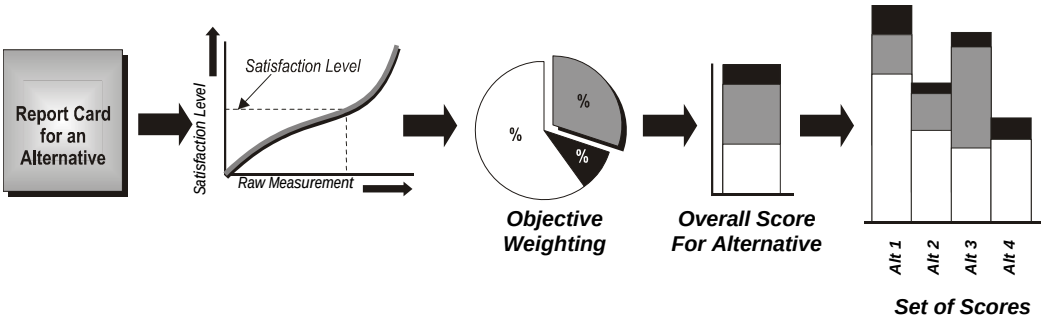
During Phase 2, detailed modeling was necessary for wastewater, stormwater and recycled water planning. Hydraulic models and hydrology simulation tools were used. Figure 5 presents the analytical approach used during this phase. Stakeholders were still very much a part of this process as well. They reviewed technical output and even crafted technical solutions to be tested in the models.

Figure 5 – Phase 2 Analytical Approach



The last step in the analytical process was bringing all the pieces together. We used a multi-attribute rating technique and the commercially available software called Criterium Decision Plus to bring stakeholder preferences into the mix of alternatives evaluation. Figure 6 demonstrates this approach. For each individual stakeholder we kept track of how they would rank alternatives using their specific values (or criteria weights). This was most useful in reaching consensus.

Figure 6 – Method of Calculating Scores for Alternatives Analysis



The outcome of this process was: (1) broad consensus on a preferred alternative from over 25 alternatives evaluated; (2) an approved facilities plan and certified environmental document; (3) settlement of pending lawsuit on beach closures; and (4) a voter approved City bond of $500 million to pay for project implementation.

NOTES FROM THE PRESENTATION

The above paper was provided as background material for participants in advance of the workshop. Additional detail was provided during the presentation and in through the discussion that followed. Included were the following topics:

- The workshops moved people from alternative-focused thinking to values-focused thinking in order to identify common ground. How were these general values then used to work toward developing collaborative solutions and attaining consensus?
- What were the performance measures and how were they developed and used in model development?
- Who participated in the process and how were they selected?
- Which stakeholders interacted with the model to test alternatives and learn about the system? (Any particular group described in Figure 3?)
- Did the model include a spatial dimension (as would be required to assess the benefits of locating a new wastewater plant near potential users)?
- What were the "policy principles" adopted by the City Council?
- Describe the detailed models developed in Phase 2. Were they also built with STELLA, or based on existing models that linked to the system model?
- During Phase 2, was there any distrust on the part of the stakeholders? If so, how was it resolved?
- The description in Figure 6 implies that the decision-making process was treated as a linear optimization problem; however, the description in the presentation showed that it contained iterative thinking about the relative weights and rankings.
- CADRe envisions that there is an integration of this process with models. It is in the process of simulating consequences of alternatives on performance metrics and costs within a budget constraint that stakeholders discover preferences and tradeoffs and reach agreement. How was the budget constraint understood in the process (the preferred alternative cost $5 billion, but only $500 million was ultimately available)? If the $500 million budget (or a budget constraint of some amount) was recognized at the outset how might process/outcomes have been different?

Can you elaborate on the outcome? What was the alternative? Did the city council adopt recommendations without change? Any dissenters from broad consensus? How arms-length was the city policy-makers to steering group?