

City of Los Angeles
Integrated Resources Plan

Planning for Wastewater, Recycled Water and Stormwater Management

A Visionary Strategy for the Right Facilities, in the Right Places, at the Right Time

City of Los Angeles
Department of Public Works
Bureau of Sanitation
and
Department of Water and Power

EXECUTIVE SUMMARY

December 2006



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A bright future awaits Los Angeles—one of urban vitality and environmental renewal. We at the Bureau of Sanitation and our colleagues in the Department of Public Works have been planning for our part in that future. As civic leaders, public servants and environmental stewards, we are preparing now to assure we will be ready to meet the needs of future Angelenos. Framing a roadmap to this future is the Integrated Resources Plan (IRP) for our wastewater program, a comprehensive, contemporary document that considers *all* of our city's diverse water resource needs.

The document you hold in your hands offers an overview of the IRP and describes the extensive, inclusive process by which it was developed. Hundreds of individuals and organizations were part of this effort, representing millions of Los Angeles citizens, businesses and stakeholders. Their ideas and input have been crucial to the IRP's development and decision-making process, ensuring the facilities and solutions we plan not only meet technical requirements, but reflect the values and ideals of the people who will be served or affected by their implementation.

For the first time in water resource planning for our city, multiple departments worked collaboratively to create a single, integrated plan for the future. How sensible, given the reality that all water uses are integrated and directly impact one another. The IRP benefits from the participation of the Mayor's office, all 15 City Council offices, and various City departments. Our close colleagues in the Bureau of Engineering contributed so much of their expertise and leadership towards this extraordinary plan.

I especially appreciate the leaders and staff of the Department of Water and Power for their investment of time, resources and exceptional talent in developing this report.

I feel most gratified to have been a part of this process and take great pride in the results. Many wonderful things lie ahead for Los Angeles. Working together, we will bring this future to reality.

Sincerely,



RITA L. ROBINSON, Director
Bureau of Sanitation





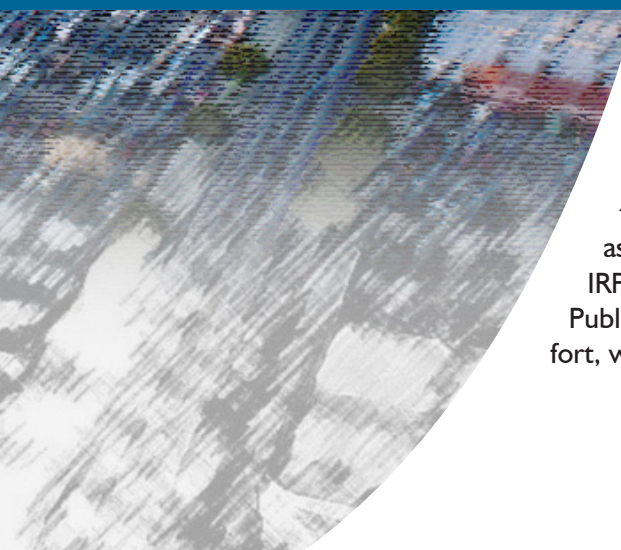
Shaping LA's Future for Tomorrow...

At the close of 2006, the City of Los Angeles put the finishing touches on its progressive, comprehensive Integrated Resources Plan (IRP) for the City's wastewater program. Departing from all of their prior approaches to facilities planning, City leaders applied a contemporary, integrated and stakeholder-driven process to frame a vision of LA's future water resource needs.

This IRP is unique in concept, interweaving strategies to address the City's wastewater, stormwater management and recycled water needs. This integrated approach supplants the traditional method of separate, independent planning efforts by the individual City departments responsible for each of these critical functions. This approach makes great sense and reflects the reality that all water programs are interrelated; what happens within one system ultimately affects the others.



The resulting document represents the input of hundreds of individuals and organizations whose aggregate ideas, concepts, technical prowess and dedication contributed to create a progressive, proactive, stakeholder-driven strategy that will provide the right facilities, in the right places, at the right time, while offering the greatest benefits for the people of Los Angeles—current and future.



This IRP also is unique in the level and scope of public involvement for a City planning effort. In developing the IRP, Los Angeles City leaders set a new highpoint of stakeholder involvement and public input. Beginning at the program's inception, community leaders and stakeholders were gathered as a Steering Group, to frame the values and Guiding Principles by which the IRP process would be conducted and with which projects would be selected. Public input was solicited, encouraged and valued throughout the multi-year effort, with growing numbers of individuals joining as time passed.



Looking to the Future

The City of Los Angeles' future depends on its ability to provide critical services, staged to keep pace with evolving population, regulations, economic drivers and environmental needs. The IRP provides a roadmap to meet these challenges. It sets forth the best mix of facilities, upgrades, programs and strategies to serve LA's wastewater and water resource needs, at the same time reflecting the values, ideas and input of hundreds of stakeholders and technical contributors.

A Unique Approach

The City of Los Angeles applied a contemporary approach to develop this IRP by incorporating wastewater, stormwater and runoff, and recycled water management into a single strategy. This reflects the reality that all water services are interdependent and recognizes the complex, intertwined relationships of the City's varied water resource departments and functions. Los Angeles' Department of Public Works and Department of Water and Power partnered in developing the IRP, a departure from prior single-purpose plans.

More than ever before, this IRP process enlisted stakeholders to take an active part in the planning and design development process, resulting in hundreds of individuals and organizations voicing their ideas and providing input. Public outreach for the IRP focused on extensive, ongoing information sharing to educate people about the IRP and its potential impacts, seek broad-based input from diverse constituencies, and engage people who might be affected by construction or placement of proposed facilities to gather their ideas for mitigation.

Los Angeles had never before undertaken such a comprehensive public outreach and involvement effort for its water, wastewater and runoff management planning. Open dialogue, City leaders believed, was crucial not only to gain public understanding of the IRP approach, but also to capture the best collective ideas, experiences and opinions of LA's diverse residents and customers.

All water systems are interrelated. For example, aggressive conservation not only lowers demand for water supplies, it reduces the need for additional wastewater treatment capacity. Similarly, beneficial use of highly treated wastewater for irrigation reduces the quantity of water imported to this arid region and also means less treated effluent discharged to streams, rivers and the ocean.

The benefits of integrated planning and intensive stakeholder input go beyond protecting public health and the environment.

Integrated planning improves efficiency and fosters solutions that offer the greatest benefit at lower costs for residents. Integrated planning encourages conservation of drinking water supplies, expands beneficial uses for highly treated recycled water, and manages urban runoff to enhance water and environmental quality.

Broad-based outreach demonstrates respect for the interests and choices of people throughout the community and makes it possible to capture the collective ideas, experiences and opinions of the City’s residents and customers. Outreach helps residents, particularly those who may be affected, to understand the complexity of the City’s public service operations and the reasons for constructing or expanding large facilities that are costly and may impact neighborhoods.

The Approved Alternative combines the best and highest options that will increase wastewater collection and treatment capacity, water reclamation storage and beneficial use, water conservation and runoff management opportunities.

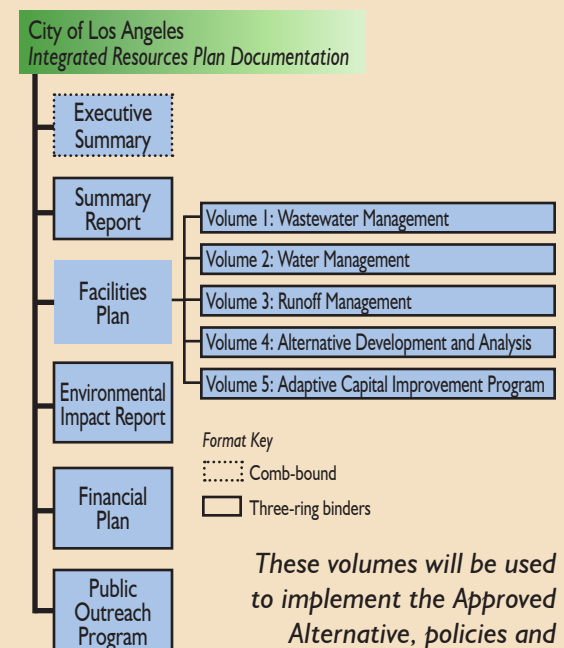
Phase I of the Integrated Resources Plan was called the “Integrated Plan for the Wastewater Program” (IPWP 1999—2001). The IPWP addressed the complex interrelationships of the water, wastewater and stormwater systems and the anticipated needs of the City in the year 2020. In the process, the Bureau of Sanitation of the Department of Public Works, the Department of Water and Power, and the IPWP Steering Group took an important step towards comprehensive, basin-wide water resources planning in the Los Angeles area.

The City and the IPWP Steering Group worked extremely hard and well together, in large part because they shared the vision that Los Angeles would have adequate water supply, wastewater treatment, flood control and stormwater pollution prevention, while protecting and restoring the environment and improving the quality of life.

During this initial, ground-breaking phase, through a series of facilitated workshops, the IPWP Steering Group examined gaps in the current water systems’ capabilities to serve future populations and studied broad approaches to bridge those gaps, called “themes” or “thematic alternatives”. The three thematic alternatives—Build to Fix, Resource Management and Demand Management—helped the City and the Steering Group to consider a range of methods to plan future facilities. At the end of the IPWP, the Steering Group identified Guiding Principles for the detailed facilities planning that would follow.

In Phase II (IRP 2002—2006), technical studies and continuing stakeholder collaboration led to the identification and intensive comparison of alternatives. The final four Proposed Alternatives were based on the Guiding Principles developed during Phase I to ensure that the appropriate infrastructure, policies and programs would be in place to reliably serve Los Angeles in 2020 and beyond. The Approved Alternative combines the best and highest options that will increase wastewater collection and treatment capacity, water reclamation storage and beneficial use, water conservation and runoff management opportunities.

The Integrated Resources Plan is documented in a series of reports that addresses facilities planning, financial planning and environmental documentation.



These volumes will be used to implement the Approved Alternative, policies and programs developed by the stakeholders and supported by the City Council, Los Angeles Board of Public Works and the Board of Commissioners of the Department of Water and Power. Full documents can be found at www.lacity.org/san/irp.

A Growing Need for Wastewater Treatment Facilities

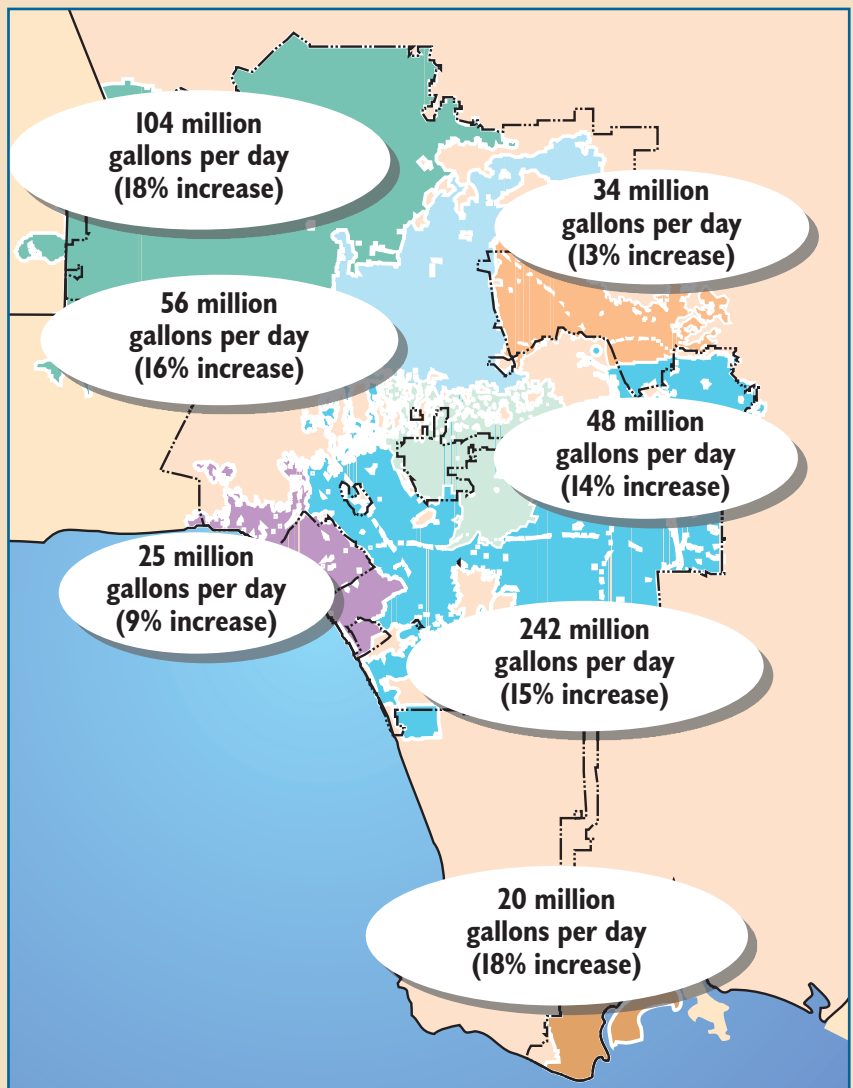
Wastewater treatment facilities are rarely seen or even thought of—yet they are critical contributors to public health, environmental stewardship and the economic vitality of communities. The City of Los Angeles owns and operates four plants that process wastewater generated within the City as well as several nearby communities that contract with the City.

These facilities are sufficient for current needs, but not for the future. The population of the service area is expected to expand by 700,000 people before the year 2020, according to projections of the Southern California Association of Governments in 2001. Planning now assures there will be adequate time to carefully design, fund and construct the massive infrastructure necessary to assure adequate, safe, environmentally protective facilities.

Projected wastewater flows by the year 2020 will increase 16%, totaling 531 million gallons per day

Requirements to comply with regulations for water quality and environmental protection (both current and anticipated) require the City to minimize pollution, assure safe and highly reliable operation of wastewater treatment systems, and make better use of existing water supplies.

The Southern California Association of Governments regularly updates its demographic projections for the region, which could affect timing of projects. For example, SCAG's 2004 projections would result in new facilities needed by 2025, rather than before 2020.



Source: Southern California Association of Governments 2001 Transportation Plan

Community Leaders Steer the Course

From the outset of the IRP process, the depth and authenticity of the City's commitment to extensive stakeholder participation and open public involvement were clearly evident. Starting in 1999, as part of Phase I of the process, a group of community leaders was gathered to form a Steering Group, with the specific mission of developing policy guidelines to steer the City's wastewater, recycled water and stormwater planning efforts. The Steering Group—initially numbering 31—represented a broad range of political, economic, geographic, environmental and social interests throughout the City. They were given the charter to capture and articulate the community's objectives and preferences regarding the future of water resources management in Los Angeles.

Work of the group was intensive, involving not only meetings and workshops, but site visits and facility tours to gain a clear picture of the infrastructure requirements, processes and technical complexities of managing water resources.

Primary Objectives Developed by the Steering Group

The IPWP Steering Group developed a series of primary objectives along with sub-objectives. These objectives are the goals that define the essential purposes of the IRP in broad, overarching terms. One-on-one interviews with each of the Steering Group members helped them to evaluate and compare these objectives in terms of their relative importance and contribution to satisfaction. These objectives provided an important tool for the Steering Group to develop the Guiding Principles, the instructions or guidelines for building alternatives, which were carried into Phase II of the IRP.

Protect the health and safety of the public

- ▶ Comply with all regulations protecting public health
- ▶ Provide for the safe use of recycled water
- ▶ Provide adequate wastewater systems capacity
- ▶ Protect the public from environmental health hazards related to water
- ▶ Maximize system reliability

Effectively manage the system capacity

- ▶ Provide for adequate wastewater treatment and discharge
- ▶ Enhance the efficient use of system assets

Protect the environment

- ▶ Comply with all regulations protecting the environment
- ▶ Protect the ocean, beaches, watersheds and their associated beneficial uses
- ▶ Properly manage biosolids
- ▶ Enhance the efficient use of natural resources
- ▶ Promote water self-sufficiency (conservation, recycling, beneficial use of stormwater)
- ▶ Protect air quality

Enhance cost efficiency

- ▶ Provide services cost-effectively
- ▶ Allocate costs equitable
- ▶ Maximize external funding opportunities

Protect quality of life

- ▶ Promote environmental justice
- ▶ Maximize environmental benefits to Los Angeles
- ▶ Comply with environmental review requirements
- ▶ Enhance public lands where possible

Promote education

- ▶ Provide education on the benefits of recycled water
- ▶ Provide outreach on technology and operations
- ▶ Provide education on stormwater issues



The commitment of the initial Steering Group is best articulated in their own words:

“We have participated in this process and assisted in the development of these policy recommendations because we want to be sure that Los Angeles has adequate water supply, wastewater treatment, flood control, and stormwater pollution prevention, while protecting and restoring our environment and improving our quality of life. With comprehensive planning and bold innovations, we can attempt to ensure that we meet the needs of Los Angeles.”

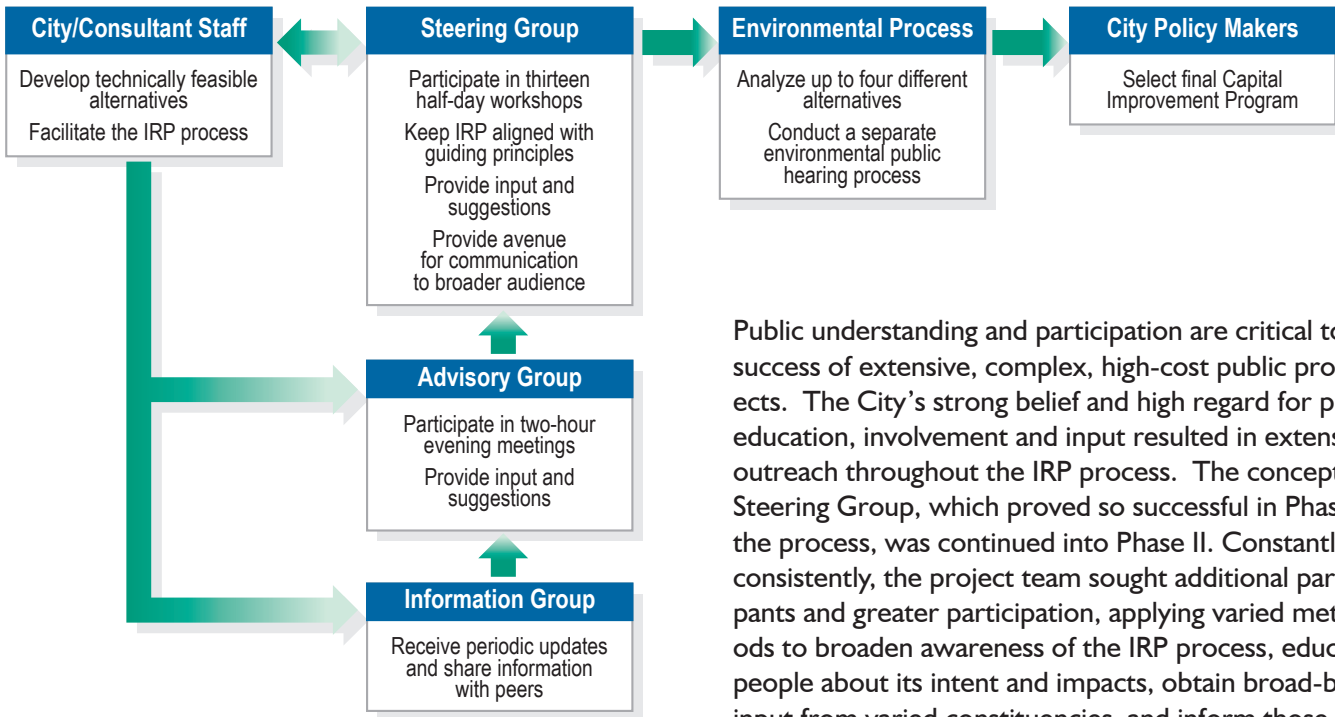


Guiding Principles for Water Resources Planning

Rigorous, facilitated group process and sophisticated assessment techniques helped the Steering Group work through their differing perspectives and arrive at a series of performance-based guiding principles to reflect their values and objectives that, in turn, would help frame future planning efforts. These concepts were recommended in the form of Guiding Principles, and were concurred with by the City Council in November 2001.

- ▶ **Build new wastewater facilities “upstream” in the system.** New or expanded wastewater facilities will be needed. Placing these facilities upstream in the system offers greater operating flexibility systemwide, increases opportunities to beneficially reuse treated effluent, and reduces dependency on imported water for uses such as irrigation, industrial processing and cooling, etc.
- ▶ **Produce and use as much recycled water as possible from existing and planned facilities.** Los Angeles is located in an arid region, thus maximum responsible use should be made of recycled water, recognizing it as a valuable resource, not a nuisance product to be disposed. Irrigation and industrial uses were most preferred by the group, followed by environmental enhancement. Potential use for groundwater recharge must be approached thoughtfully and provide public education, address health concerns, include an open public process with participatory decision making, and consider benefits and potential risks.
- ▶ **Reduce the amount of rainfall-dependent inflow and infiltration as much as possible.** Programs should be pursued to reduce the amount of wet-weather urban runoff that makes its way into the wastewater system as inflow and infiltration (I/I). I/I reduces space for wastewater, increases demand on treatment facilities, reduces the effective lifespan of the system, and increases both operating and maintenance costs.
- ▶ **Increase the level of water conservation beyond what is already planned.** Water conservation programs have proven to be effective, particularly when people appreciate both the need to conserve and the resulting benefits. Sufficient water supplies are available for Southern California’s quality of life and environmental resources, yet there is reduced availability of imported water supplies. Given these realities, conservation efforts need to be increased beyond what is currently planned, with emphasis on the responsibility of every individual to reduce water waste.
- ▶ **Increase the amount of dry weather urban runoff that is diverted and treated or captured and beneficially used.** An extensive program is recommended for dry weather runoff capture and beneficial reuse. Diverting dry weather runoff to be captured or treated will significantly reduce pollution of the City’s waterways, with resulting benefits to the region’s quality of life and potential for additional beneficial reuse opportunities. Assurances must be provided that dry-weather diversions do not impair beneficial uses of the Los Angeles basin’s receiving waters.
- ▶ **Increase the amount of wet weather urban runoff that can be captured and beneficially used.** Initiatives to capture and beneficially use wet weather urban runoff are supported, to provide an additional water resource and reduce local dependence on imported water.
- ▶ **Beneficially reuse biosolids. Biosolids should continue to be beneficially reused, with utilization locally (within Los Angeles County) as much as possible.** External alternatives for biosolids use are decreasing, yet there are multiple community advantages for beneficially reusing this important resource.
- ▶ **Focus on lower-cost solutions, within the framework of all the other Policy Guidelines.** A broad range of programs and projects can be applied to meet the City’s future wastewater needs. Where possible, lower cost solutions are supported when they can be applied within the framework of the other Policy Guidelines and also meet the performance requirements of the task.

Listening to the Community



Public understanding and participation are critical to the success of extensive, complex, high-cost public projects. The City's strong belief and high regard for public education, involvement and input resulted in extensive outreach throughout the IRP process. The concept of a Steering Group, which proved so successful in Phase I of the process, was continued into Phase II. Constantly and consistently, the project team sought additional participants and greater participation, applying varied methods to broaden awareness of the IRP process, educate people about its intent and impacts, obtain broad-based input from varied constituencies, and inform those potentially impacted directly by proposed facilities, to solicit their ideas for mitigation.

The foundation of the IRP's public outreach program took the form of three distinct stakeholder groups, each with a specific level of interaction and expectations for involvement. People were not assigned to a given group, but were provided a choice according to their personal level of interest and ability to fulfill specific degrees of time commitment. Membership for these groups was open to all. Participation was solicited through mailings, announcements at public meetings, notices on the web, notification at Neighborhood Council meetings, distribution of flyers, press releases and at speaking engagements to inform community members about the IRP process. Word was broadly cast; anyone wishing to participate was welcomed.

Categories of Participants

- ▶ **Steering Group** members reflected the majority the service area as well as the cultural diversity of the City's population. Members included representatives of community groups, environmental and business organizations, regulatory agencies, contract cities and policy makers including several City of LA Council Offices. These individuals made a commitment to actively and directly participate in detailed planning and alternatives development, which would ultimately result in an Approved Alternative and the associated Capital Improvements Program and implementation plan. The Steering Group conducted their work in 14 facilitated half-day workshops, each building upon the outcomes of the prior sessions.
- ▶ **Advisory Group** members had a high level of interest in the IRP and committed to take part in a series of quarterly, two-hour meetings within their communities. Advisory Group members shared ideas and concerns about the alternatives, and provided advice and feedback to the Steering Group. Advisory Group meetings were conducted at seven locations, four times between February 2003 and April 2004. The content was the same for each series of meetings, but was repeated at separate venues throughout the City to provide convenient access for residents and gather area-specific feedback. Interactive exercises at these meetings encouraged participants to ask questions and provide suggestions.
- ▶ **Information Group** members were recipients of important information and developments relative to IRP in the form of newsletters. They were expected to share what they learned with others in their organizations and offices. This provided a mechanism to more broadly convey information to stakeholders and residents who otherwise might not have been aware of the IRP process or informed about emerging issues.

Stakeholder Group membership expanded over the course of the IRP process: the Steering Group more than tripled to 125 members; the Advisory Group nearly tripled, starting with 74 people in early meetings and expanding to 218; the Information Group quadrupled over time, to a total listing of 232 at the project's end. This was opposite the more typical trend for public projects, in which stakeholder participation tends to diminish over time.

IRP Stakeholders Represented Over 1.5 Million People

Steering Group

- ▶ 125 stakeholders
- ▶ 300,000 constituents

Advisory Group

- ▶ 218 stakeholders
- ▶ 1,800,000 constituents

Information Group

- ▶ 232 stakeholders
- ▶ 400,000 constituents

Stakeholder group members were surveyed to assess who and how many constituents they represented. The results reflect a total of over 1.5 million people represented in the IRP.

As the IRP moved forward with the environmental review process and the associated focused outreach, a new set of stakeholders came forward—those who might be affected by construction or placement of facilities. Special effort was made to inform and engage this group of stakeholders; help them to learn more about the IRP, its importance and impacts; invite them to comment on the Draft EIR; and encourage them to bring forward concerns as well as their ideas for mitigation.

Developing Solutions

Facilities planning is a complicated and highly technical task. The City's commitment to integrate multiple objectives, water resources, and stakeholder values into the IRP made the development and choice of facility and program alternatives all the more challenging.

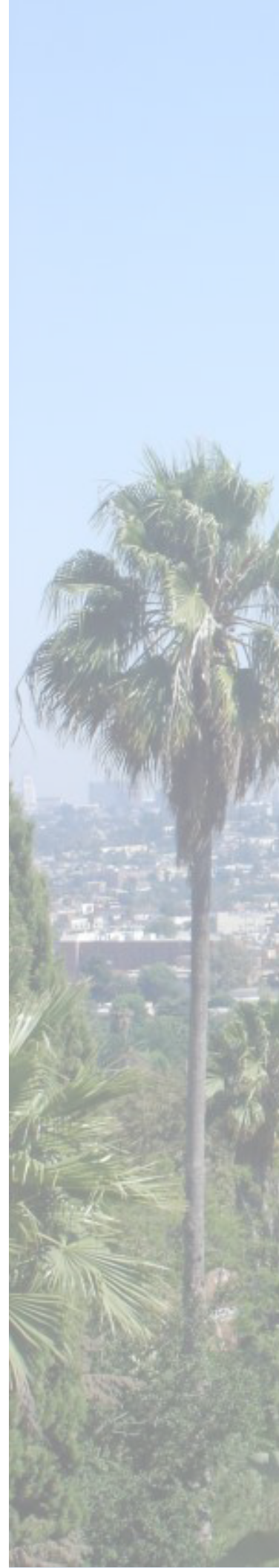
The Bureau of Sanitation of the Department of Public Works and the Department of Water and Power led the IRP planning process and were the face and voice of the program. Other City departments and offices were deeply involved in varied ways, primarily the Management Advisory and Technical Advisory Committees (MAC and TAC). Some elements of the IRP facilities planning process required extensive involvement from several divisions and groups of the Bureau of Engineering, including preliminary and conceptual design of treatment facilities as well as environmental documentation. Additional City departments provided technical information and policy guidance, among them all Los Angeles City Council offices, Planning, Environmental Affairs, Neighborhood Empowerment, Building and Safety, Recreation and Parks, the City Attorney's Office and the Ad hoc Committee on the Los Angeles River.

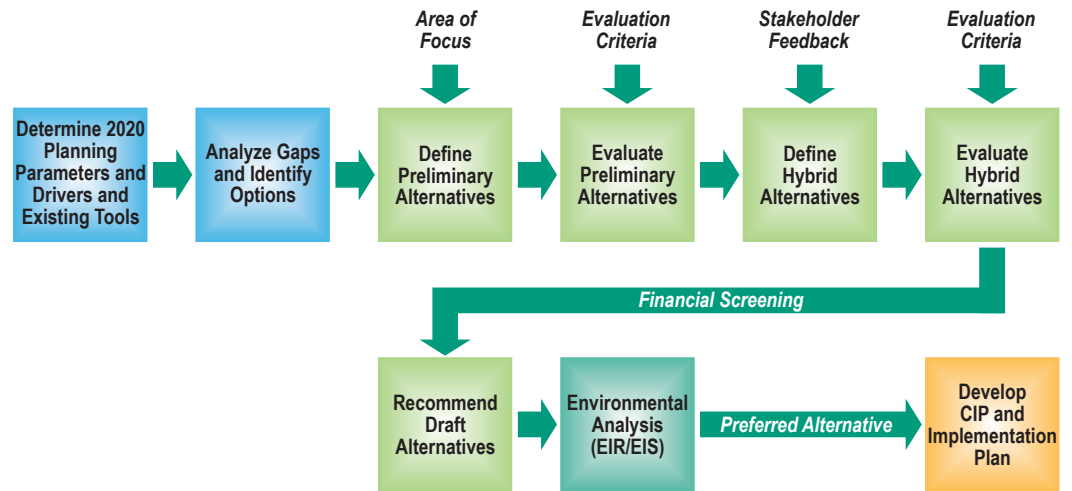
Assistance was sought from a team of technical and program management specialists from the consulting firms of CH2M Hill (CH) and Camp Dresser & McKee Inc. (CDM). This joint venture of CH:CDM supported City staff by helping guide the process, keeping it on track, and providing specialized technical expertise.

Deciding on Alternatives

Dozens of concepts were brought forward, each a single program or project to address a specific wastewater, stormwater, runoff or recycled water need. The challenge for the IRP team was to group concepts into alternatives that could meet the City's overall water resource management needs and honor the stakeholders' Guiding Principles and Objectives.

With this framework, the IRP team first generated a dozen Preliminary Alternatives, each designed to respond to a specific focus such as low cost, high beneficial use of resources, low risk, etc. The IRP team weighed each of the Preliminary Alternatives against the others in terms of its potential as a solution, how readily it could be implemented, system impacts, cost effectiveness, environmental impacts and long-term feasibility. A Decision Model was used—a powerful tool that enables a group to systematically apply multiple criteria to multiple options in an organized and objective manner, while tracking the preferences of each individual.





The results were referred to the stakeholder Steering Group to select those elements of the Preliminary Alternatives that best reflected the Guiding Principles as well as their individual preferences or weightings. The IRP team applied the results of this Steering Group assessment to create Hybrid Alternatives that gathered the best elements of multiple Preliminary Alternatives and were capable of addressing multiple needs.

The resulting nine Hybrid Alternatives were evaluated using a simplified Quadrant Analysis to compare their costs against wastewater, recycled water and runoff management benefits. The four highest ranking alternatives emerged from this process as Proposed Alternatives that were carried forward to the Environmental Impact Report (EIR) process.

Under the California Environmental Quality Act, decision makers must consider the environmental effects of their actions before approving discretionary projects. The primary way that environmental effects are disclosed is through the preparation of environmental documents, including EIRs. The EIR process for the IRP evaluated the environmental impacts (traffic, air quality, noise, etc.) of the four Proposed Alternatives.

The Draft EIR (DEIR) evaluated the four Proposed Alternatives at a co-equal level; no single alternative was identified as “preferred” or recommended for implementation. During the DEIR public review process, 2,767 comment letters were received. Only after the close of this process was a Recommended Alternative selected on the basis of comments, consideration of differences in environmental impacts among alternatives, and application of results from prior rankings of alternatives.

The Los Angeles City Council certified the EIR on November 14, 2006 and selected one of the four alternatives for implementation. The Approved Alternative is a mix of projects and programs which manages future wastewater flows with the expansion of the City’s Donald C. Tillman Water Reclamation Plant to 100 mgd as well as providing increased recycled water reuse and urban runoff management. It represents the best value to residents while providing a high level of sustainability and benefits for the environment.

Looking at the Future

Under the Approved IRP Alternative, future Angelenos will be served by an integrated system that provides enhanced wastewater conveyance and treatment, expanded delivery of recycled water, and progressive runoff management facilities—all developed and designed with stakeholders' interests among the top priorities. This is infrastructure planning reinvented—providing for a greener future with facilities and programs that set stakeholders' interests among the top priorities.



An Integrated Future for Water Resources

Future plans for Los Angeles' water resources are the result of seven years of effort, the articulated values and concepts of hundreds of residents and stakeholders, thousands of hours of meetings and interchanges, intensive analysis, and thoughtful determinations by City staff and their technical consultant team of CH:CDM, a Joint Venture. City staff and the stakeholder Steering Group worked collaboratively to develop integrated, environmentally sensitive, cost effective, alternatives to meet the City's future wastewater, recycled water, and runoff management needs, based on the input and values of the people of Los Angeles.

As an overview:

- ▶ Wastewater treatment facilities will be expanded and improved to accommodate future flow increases and comply with new regulations;
- ▶ Three new sewers lines will be installed to assure sufficient capacity and to safely accommodate future wastewater flows while minimizing overflows;
- ▶ Use of recycled water will be expanded to up to 56,000 acre-feet per year;
- ▶ New programs and water-saving fixtures will conserve more than 15 million gallons of potable-quality water per day;
- ▶ Technology, programs and education will be applied to increase the City's ability manage as much as 800 million gallons of stormwater and urban runoff per day.



Wastewater Treatment

- ▶ Central to the IRP's mix of projects and programs is expansion of the Tillman Water Reclamation Plant in the Sepulveda Flood Control Basin, from the current capacity of 80 million gallons per day (mgd) to 100 mgd. The expansion and upgrade of Tillman will maximize production of recycled water upstream in the wastewater system—as recommended by the Steering Group. The plant expansion will remain within the Tillman Plant's current footprint, behind the existing landscaped berm.



Water Recycling at Tillman

- ▶ Storage will be added at the Tillman Plant for wastewater (outside the berm beneath the existing Cricket Field, which will be restored) and at the Los Angeles-Glendale Plant (LAG) for recycled water and wastewater.
- ▶ New treatment facilities will be added at the Hyperion Treatment Plant, including additional egg-shaped digesters like those already on site, a truck loading facility for biosolids (the solid materials removed during the wastewater treatment process) and secondary clarifiers.



Egg-shaped Digesters at Hyperion

- ▶ New major sewer lines will be constructed, extending from the Eagle Rock area to the Tillman Plant, to gather wastewater from neighborhoods and convey the flow to the treatment facility. This additional conveyance capacity will accommodate wet-weather flows and minimize wastewater spills.



New Sewer Construction

Water Recycling

- ▶ The existing system that distributes recycled water will be expanded, so that as much as 56,000 acre-feet per year can be beneficially used. The option will remain open at LAG to convert to advanced treatment.
- ▶ Recycled water will be used to help meet baseline needs of the Los Angeles River, to maintain habitats and other uses along the river.



Runoff Reduction, Treatment, Reuse

- ▶ Neighborhood-scale percolation systems will be developed in vacant lots, parks, alleys and open space in the eastern San Fernando Valley, to capture and naturally treat runoff.



School and Education Programs

- ▶ On-site wet-weather runoff capture and percolation systems will be created at schools and government facilities.
- ▶ Dry-weather runoff from coastal areas will be diverted to the existing sewer system for treatment at the Hyperion facility.
- ▶ New and redeveloped areas will incorporate on-site treatment for wet-weather runoff as well as facilities for percolation or discharge of the cleaned water.
- ▶ Runoff management projects for the IRP will be coordinated and implemented to achieve the City's requirements for Total Maximum Daily Loads, which are new water quality regulations.
- ▶ Runoff will be reduced through smart irrigation and other conservation measures.
- ▶ Overall, the City will enhance its already-aggressive efforts to promote conservation practices and assist residents in obtaining and using modern devices that save water.

Staged Implementation

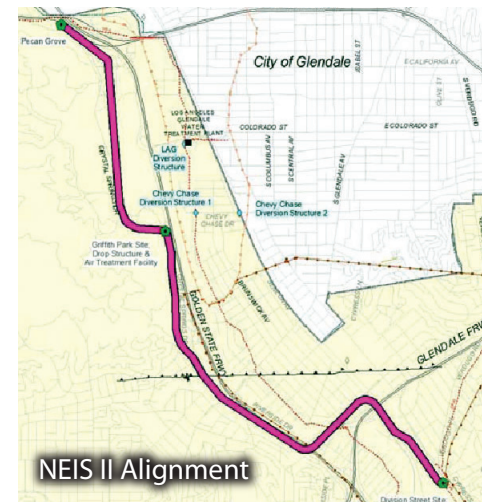
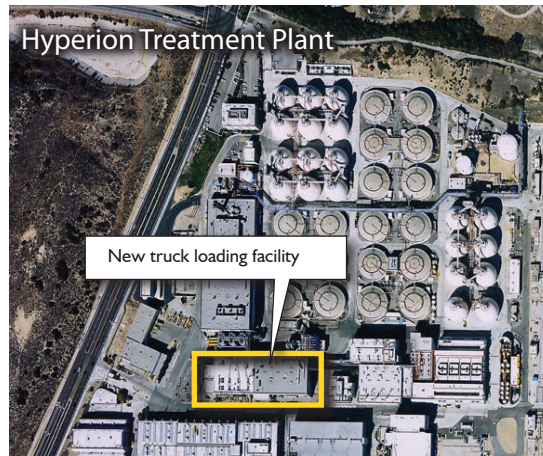
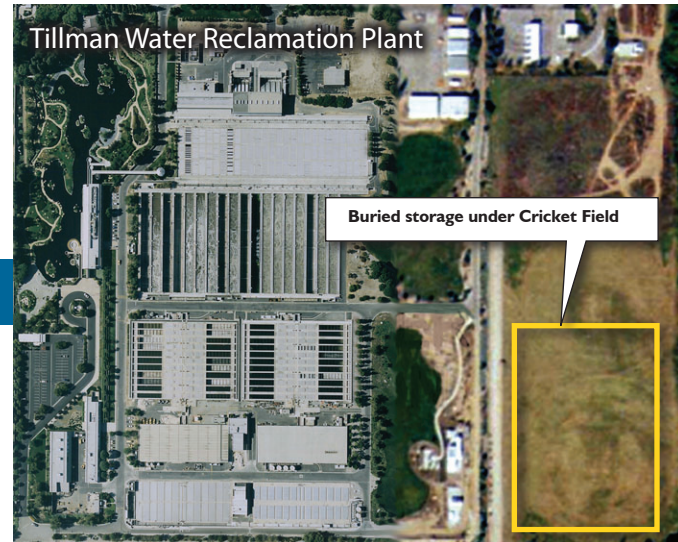
Some of the IRP projects will be started immediately, with others postponed until a later time when changes take place or additional information is available. Implementation is dependent on monitored triggers, including population growth, recycled water regulations, wastewater discharge regulations, Total Maximum Daily Load (TMDL) requirements, available funding, etc. This staging of projects enables the City to target the most critical and immediate needs to assure health and environmental protection, while assuring that public monies are conserved for the highest priorities.

“Go-Projects” are so called because design and construction are intended to begin right away as a measure to protect public health and the environment, because associated triggers have been met.

“Go-If-Triggered Projects” will be implemented if or when additional information or circumstances—such as regulatory determinations, population growth or changes in demand for sewage capacity—“trigger” the need to begin design and construction.

Go-Projects for Immediate Implementation include:

- ▶ Construct wastewater storage facilities at Tillman
- ▶ Construct wastewater storage facilities at LAG
- ▶ Construct recycled water storage at LAG
- ▶ Construct solids handling/truck loading facility at Hyperion
- ▶ Construct two new sewer lines, Glendale Burbank Interceptor Sewer (GBIS) and Northeast Interceptor II (NEIS-II)



Go-If-Triggered Projects for Future Implementation include:

- ▶ Potential upgrades at Tillman to advanced treatment at current capacity (if triggered by regulations and/or decision to reuse Tillman effluent for groundwater replenishment).
- ▶ Potential expansion and upgrade of Tillman to 100 mgd (if triggered by an increase in population, regulations and/or groundwater replenishment decision). In the unlikely event that the overall framework for recycled water changes to disallow its use, then Hyperion would be potentially expanded to 500 mgd instead.
- ▶ Potential upgrades at Los Angeles-Glendale Water Reclamation Plant to advanced treatment at current capacity (if triggered by regulations and/or availability of downstream sewer capacity).
- ▶ Design and construct additional secondary clarifiers at Hyperion to provide 450 mgd operational performance.
- ▶ Design and construct up to 12 solids digesters at Hyperion (if triggered by increased biosolids production in the service area).
- ▶ Prepare alignment study, environmental documentation and subsequent design/construction of Valley Spring Lane Interceptor Sewer.

Go-Policy Directions

“Go-Policy Directions” provide specific directions to staff on the next studies and evaluations required to provide progress on the programmatic elements in the Approved Alternative. They include:

Recycled Water – Non-Potable Uses

- ▶ Direct DWP and Public Works to work together to maximize use of recycled water for non-potable uses in the Terminal Island Treatment Plant service area, west side, and LAG services areas. DWP to conduct additional Tier 1 and 2 customer analysis to verify the potential demands and feasibility. Develop a long-range marketing strategy for recycled water that includes a plan for recruiting (and keeping) new customers.
- ▶ Direct Building and Safety to evaluate and develop ordinances to require installation where feasible of dual plumbing for new multi-family, commercial and industrial developments, schools and government properties in the vicinity of existing or planned recycled water distribution systems in coordination with LA River Revitalization Master Plan. Proximity and demand will be considered when determining feasibility. The dual plumbing will consist of separate plumbing and piping systems, one for potable water and the second for recycled water for non-potable uses such as irrigation and industrial use.
- ▶ Direct Public Works and DWP to coordinate where feasible the design/construction of recycled water distribution piping (purple pipe) with other major public works projects, including street widening, and LA River Revitalization Master Plan project areas. Also coordinate with other agencies, including MTA and Caltrans, on major transportation projects.



Purple Pipe for Recycled Water

Recycled Water - Indirect Potable Uses (Groundwater Replenishment)

- ▶ Direct DWP to develop a public outreach program to explore the feasibility of implementing groundwater replenishment with advanced treated recycled water.

Recycled Water - Environmental Uses

- ▶ Direct DWP and Public Works to continue to provide water from Tillman to Lake Balboa, Wildlife Lake, and the Japanese Garden at Sepulveda Basin, and the LA River to meet baseline needs for habitat, i.e., approximately 27 mgd through flow-through lakes.



Los Angeles River Monitoring

Water Conservation

- ▶ Direct DWP to continue conservation efforts, including programs to reduce outdoor usage, including using smart irrigation devices on City properties, schools and large developments (those with 50 dwelling units or 50,000 gross square feet or larger), and to increase incentives to residential properties.



Smart Irrigation for Conservation

- ▶ Direct DWP to work with Building and Safety in continued conservation efforts, including evaluating and considering new water conservation technologies, including no-flush urinal technology.
- ▶ Direct DWP to continue conservation efforts, including working with Building and Safety to evaluate and develop a policy that requires developers to implement individual water meters for all new apartment buildings.
- ▶ Direct DWP to continue conservation awareness efforts, including increasing education programs on the benefits of using climate-appropriate plants with an emphasis on California friendly plants for landscaping or landscaped areas developed in coordination with LA River Revitalization Master Plan, and to develop a program of incentives for implementation.

- ▶ Direct Planning to consider the development of a City Directive to require the use of California friendly plants in all City projects where feasible and not in conflict with other facilities usage.

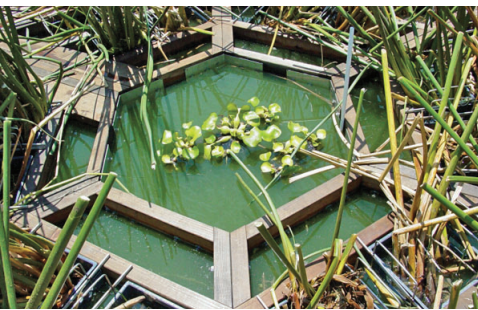
Runoff Management – Wet Weather Runoff

- ▶ Direct Public Works to review SUSMP (Standard Urban Stormwater Management Plan) requirements to determine ways to require where feasible on-site infiltration and/or treat/reuse, rather than treat and discharge, including in-lieu fees for projects where infiltration is infeasible (e.g., similar programs developed by City of Santa Monica).

- ▶ Direct Building and Safety to evaluate and modify applicable codes to encourage all feasible Best Management Practices (BMPs) for maximizing on-site capture and retention and/or infiltration of stormwater instead of discharge to the street and storm drain, including porous pavement. (This is currently handled through variances.)



- ▶ Direct Public Works and Planning to evaluate the possibility of requiring porous pavements in all new public facilities in coordination with LA River Revitalization Master Plan, and large developments greater than one acre. Program feasibility should consider slope and soil conditions.
- ▶ Direct Planning to evaluate ordinances that would need to be changed to reduce the area on private properties that can be paved with non-permeable pavement (i.e., change/support landscape ordinance and encourage the use of permeable pavement).



Floating Wetland

- ▶ Direct Public Works to evaluate and implement integration of porous pavements into the sidewalks and street programs where feasible. For example, conduct a pilot program in East Valley, taking into consideration soil conditions and Proposition O project criteria, as well as the future LA River Revitalization Master Plan.
- ▶ Direct Public Works, DWP and Recreation and Parks to prepare a concept report and determine the feasibility of developing a powerline easement demonstration project (for greening, public access, stormwater management, and groundwater replenishment).

- ▶ Direct Public Works and DWP to work with LAUSD to determine the feasibility of developing projects for both new and retrofitted schools, as well as for government/city-owned facilities, with stormwater management BMPs. Provide wet weather runoff storage (cisterns) to beneficially use wet weather runoff for irrigation. Also, schools and government properties to reduce paving and hardscape and add



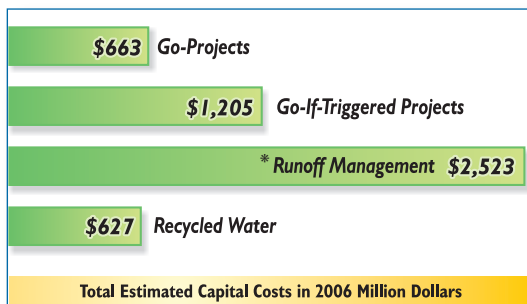
Before Installing Cistern

Cistern Installation Underway

What will this cost?

It's impossible to put a price on people's health, safety of our communities and care for the environment. Major infrastructure, however, comes at a significant cost. Total estimated capital costs in 2006 dollars to design and build facilities proposed in the IRP total \$663 million for "Go-Projects" (projects for which implementation will immediately start), and an additional \$1,205 million total would be needed for all of the "Go-If-Triggered" projects (those that may be needed based on future conditions). The "Go-Policy Directions" could result in an additional \$627.2 million in recycled water projects and \$2,523 million for runoff management initiatives. Runoff management projects will be further defined as part of the development of specific Total Maximum Daily Load implementation plans.

Costs of the Projects and Programs Recommended by the IRP



* Implementation will be based on TMDL implementation plans.

infiltration basins to allow percolation of wet weather runoff into the ground where feasible. As appropriate, integrate with LAUSD's new schools development program.



During Installation



After Installation

On-site infiltration at Los Angeles School: putting runoff to beneficial use.


Photos courtesy of TreePeople

- ▶ Direct Public Works, General Services, and Recreation and Parks to identify sites that can provide on-site percolation of wet weather runoff in surplus properties, vacant lots, parks/open space, abandoned alleys in East Valley, and along the LA River in the East Valley where feasible. Program feasibility should consider slope and soil conditions.
- ▶ Direct Public Works, General Services and the Department of Transportation (DOT) to maximize unpaved open space in City-owned properties and parking medians through using all feasible BMPs and by removing all unnecessary pavement.
- ▶ Direct Public Works to include all feasible BMPs in the construction or reconstruction of highway medians under its jurisdiction.
- ▶ Direct Public Works to coordinate with the Million Trees LA team on identifying potential locations of tree plantings that would provide stormwater benefit, with consideration of slope and soil conditions.
- ▶ In the context of developing TMDL implementation plans, direct Public Works to consider diversion of dry weather runoff from Ballona Creek to constructed wetlands, wastewater system, or urban runoff plant for treatment and/or beneficial use. Coordinate with the Department of Recreation and Parks. Coordinate and evaluate the impact with the LA River Revitalization Master Plan.
- ▶ In the context of developing TMDL implementation plans, direct Public Works to consider diversion of dry weather runoff from inland creeks and storm drains that are tributary to the Los Angeles River to wastewater system or constructed wetlands or treatment/retention/infiltration basins with consideration for slope and topography.

General

- ▶ Direct the Department of Planning to consider opportunities to incorporate IRP policy decisions in the General Plan, Community Plan, and Specific Plan updates or revisions, and in the future LA River Revitalization Master Plan and Opportunity Areas.
- ▶ Direct Department of Recreation and Parks to coordinate with Public Works on including stormwater management BMPs in all new parks.
- ▶ Direct General Services, in coordination with Planning and Public Works, to evaluate feasibility of all City properties identified as surplus for potential development of multiple-benefit projects to improve stormwater management, water quality and groundwater recharge.





Implementation of the Integrated Resources Plan is just the beginning. The IRP's content and development process have set a new standard for visionary infrastructure planning for municipalities—one that integrates analysis of resource needs and places equal weight on technical requirements and stakeholder desires. By working collaboratively, listening to people throughout the community and planning proactively, the City of Los Angeles is poised to ensure that implementation of the right infrastructure and programs occurs in the right places and at the right time to best meet residents' needs.

Our Future Begins Today



Prepared by

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