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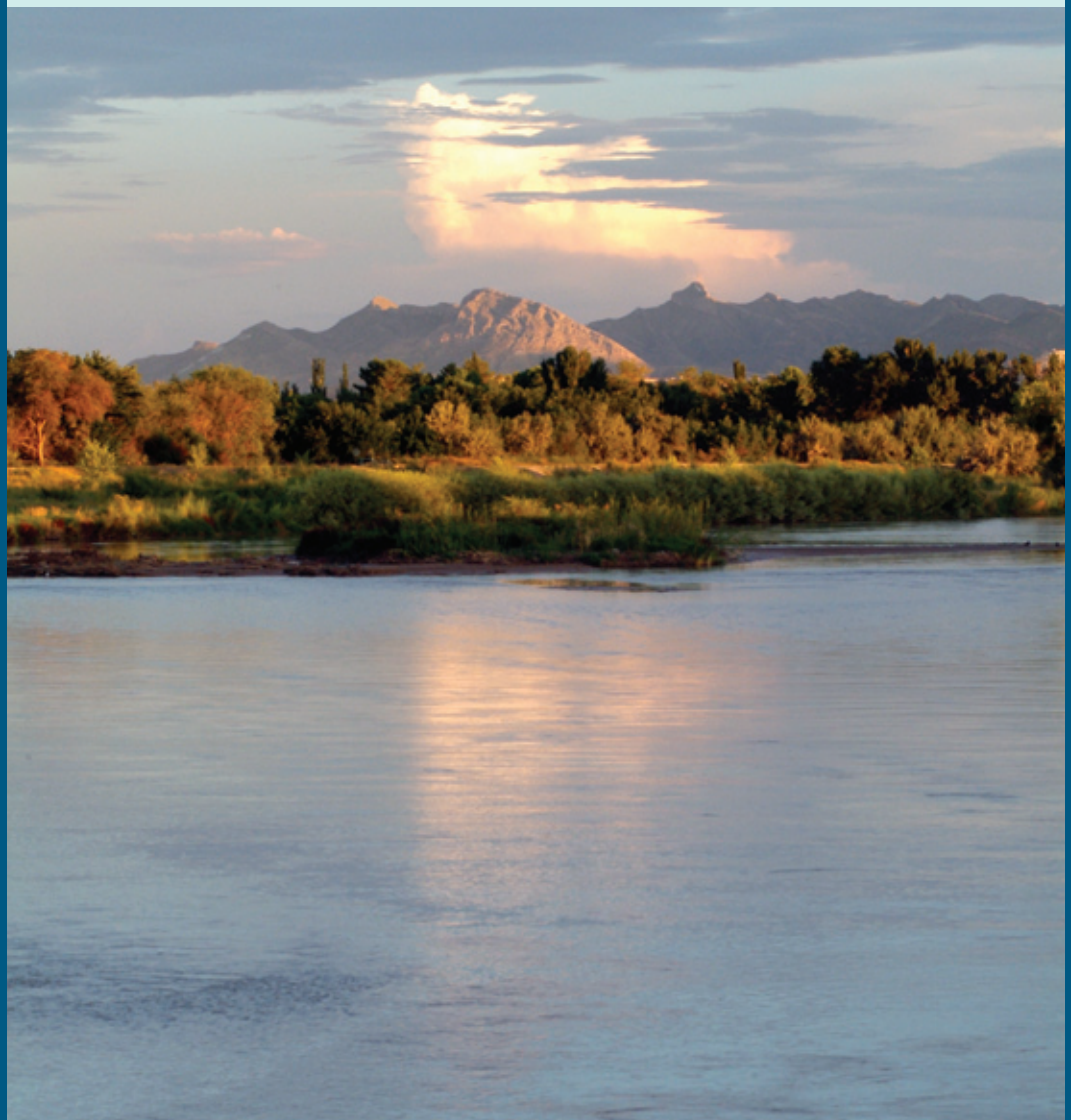
Views from the River Front

Rio Grande Decision Makers Rank Water Conservation Strategies



Views from the River Front

Rio Grande Decision Makers Rank Water Conservation Strategies

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Elected city officials and water managers in the Rio Grande River Basin of Texas and New Mexico have identified three water conservation strategies as the most viable for their communities:

- Encouraging drought-tolerant landscapes,
- Developing public education campaigns about water conservation, and
- Conducting residential water audits to review use and suggest conservation measures.

These strategies were ranked highest of 15 possible water conservation options listed in a survey sent in 2004 to Rio Grande Basin decision makers. The survey was conducted to help city officials identify the most preferred and feasible strategies for persuading residents in the Rio Grande area to adopt water conservation practices.

Communities in the Rio Grande Basin are facing critical water shortages as populations and water demands grow faster than the local water supplies can be replenished. Cities in this area have experienced explosive growth that is already taxing their water supplies. Further population increases are expected in both states in the coming years.

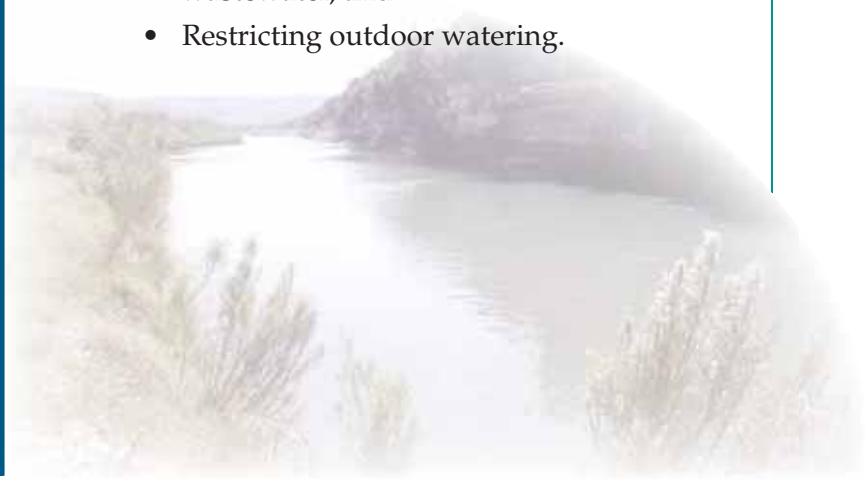
In addition to the challenge of rising populations, local officials in these areas are under increasing pressure by state authorities to either develop new sources of water or reduce water demands through conservation, efficiency measures and/or drought management.

For these communities to be able to provide water for new population and economic growth, water conservation is not an option, but an imperative.

But what are the most preferred and feasible strategies for conserving water in these areas? And what are the barriers to implementing these strategies? For answers to these questions, local Rio Grande Basin officials—the people with firsthand knowledge of their cities' people, strengths, problems and potential—were tapped to share their views on the best ways to conserve their communities' water supplies.

In their survey responses, Rio Grande Basin officials considered all 15 water conservation strategies listed (See Appendix I, Water Conservation Strategies) to be viable. But seven approaches were identified as the most preferred and most feasible. In addition to those listed previously, respondents ranked these options highest:

- Using graywater (household bath and laundry water, for example) for landscape watering,
- Requiring drip irrigation as appropriate,
- Reusing treated municipal wastewater, and
- Restricting outdoor watering.



Conversely, three strategies were consistently identified as least preferred and least feasible:

- Offering rebates,
- Restricting landscapes and planting, and
- Increasing prices to reduce use.

The survey also asked the officials to indicate the importance of 10 barriers to water conservation programs. Knowing about such barriers can help cities devise strategies to overcome them and increase their programs' chances of success.

Survey respondents indicated that the most important barriers were financial concerns—revenue loss, cost to implement and increased prices to consumers. Other barriers included lack of awareness and public opposition.

The Study

The survey was developed from case studies, prior research on the Rio Grande Basin and information on existing water conservation practices, economics and efficiency. The survey investigated three variables of water conservation:

- **Preferences** for and **feasibility** of common water conservation strategies. These were measured to help officials determine the strategies that were compatible within each community.
- **Barriers** to water conservation programs. These barriers were identified and measured to provide factors for officials to consider when implementing a program.

The surveys were mailed during the spring and summer of 2004. They were sent to elected city officials and city staff in cities with populations of more than 5,000 as listed by the Texas or New Mexico Municipal League. In all, surveys were mailed to 239 addresses at city council or business addresses in 22 cities in Texas and eight cities in New Mexico in the Rio Grande Basin.

A follow-up postcard was sent to non-respondents with the option of responding by a Web-based survey format. A third request was mailed to nonrespondents with a survey enclosed.

Responses were sent in by decision makers from all eight cities in New Mexico and from 19 of the 22 cities in Texas. Responses were received from staff members from six cities in New Mexico and thirteen cities in Texas.

Preference-Feasibility Analysis

In this study, a preference-feasibility analysis (P-FA) was used to measure acceptance of water conservation strategies. The preference dimension is based on a respondent's perception of the positive value or usefulness of conservation programs—for example, cost, savings, community perceptions or cultural acceptability.

The feasibility option reflects the respondents' perceptions about hindrances or aids to implementation, such as costs, disruptions or community aversion to a strategy.

By combining both ratings, decision makers may identify programs that are considered reasonable for a community and those that may require more substantial effort to gain acceptance.

P-FA Process

This P-FA analysis used a three-step process:

1. All respondents were asked to rank their preferences for 15 strategies on a five-point scale from "do not prefer" to "strongly prefer." Then they were asked to rank how feasible each strategy was on a five-point scale from "not feasible" to "very feasible."
2. From those results, median scores were calculated for each strategy for preference and feasibility.
3. Each score was plotted on the two-dimensional action grid.

P-FA Action Grid

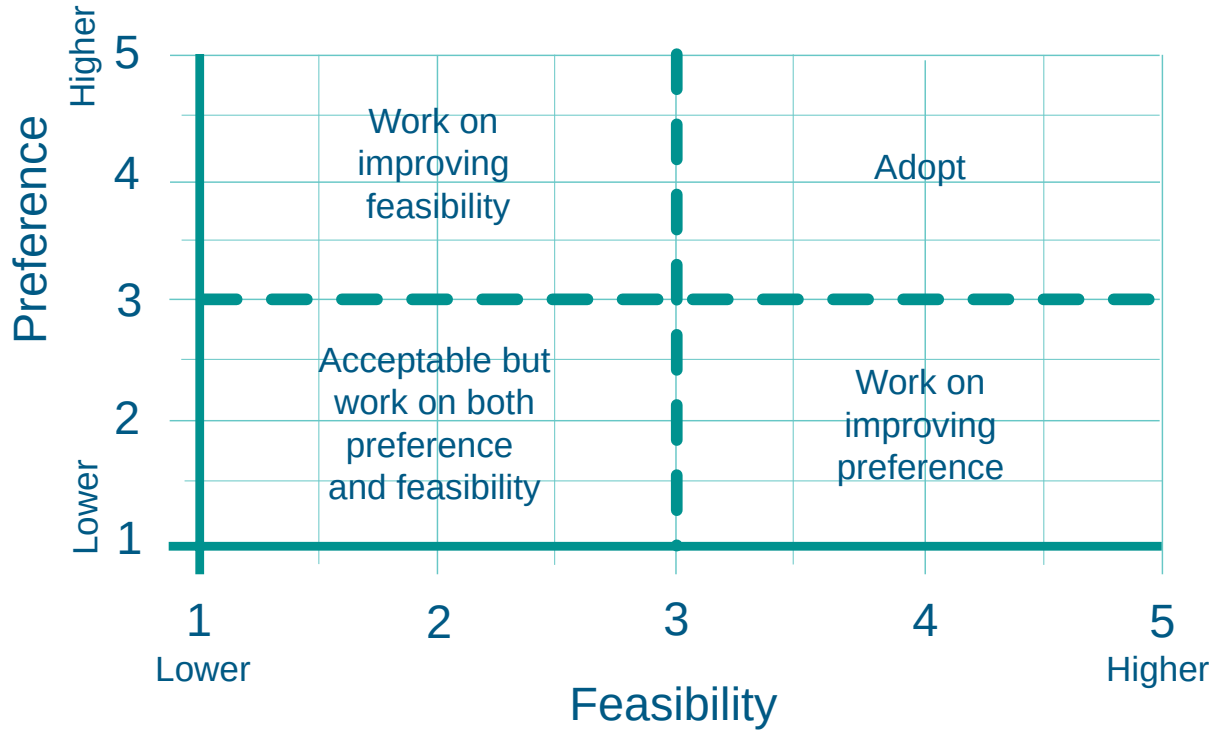
The P-FA action grid portrays the survey results graphically. It was devised to help officials determine and direct various water conservation strategies. Preference and feasibility are plotted on the x- and y-axis respectively.

Strategies appearing in the upper right quadrant are both preferred and considered feasible; therefore, they are considered easily adoptable. The strategies appearing in the lower left quadrant have merit but need further study or additional effort to increase both the preference and feasibility of the strategy. Strategies in the upper left indicate a strong preference, but a lack of feasibility. Those in the lower right have a strong feasibility, but low preference scores.

All water conservation strategies listed were considered valuable by the survey respondents. Some have high financial costs, others higher political costs. Many strategies require a combination of programs (for example: education is often necessary to gain compliance with most programs).

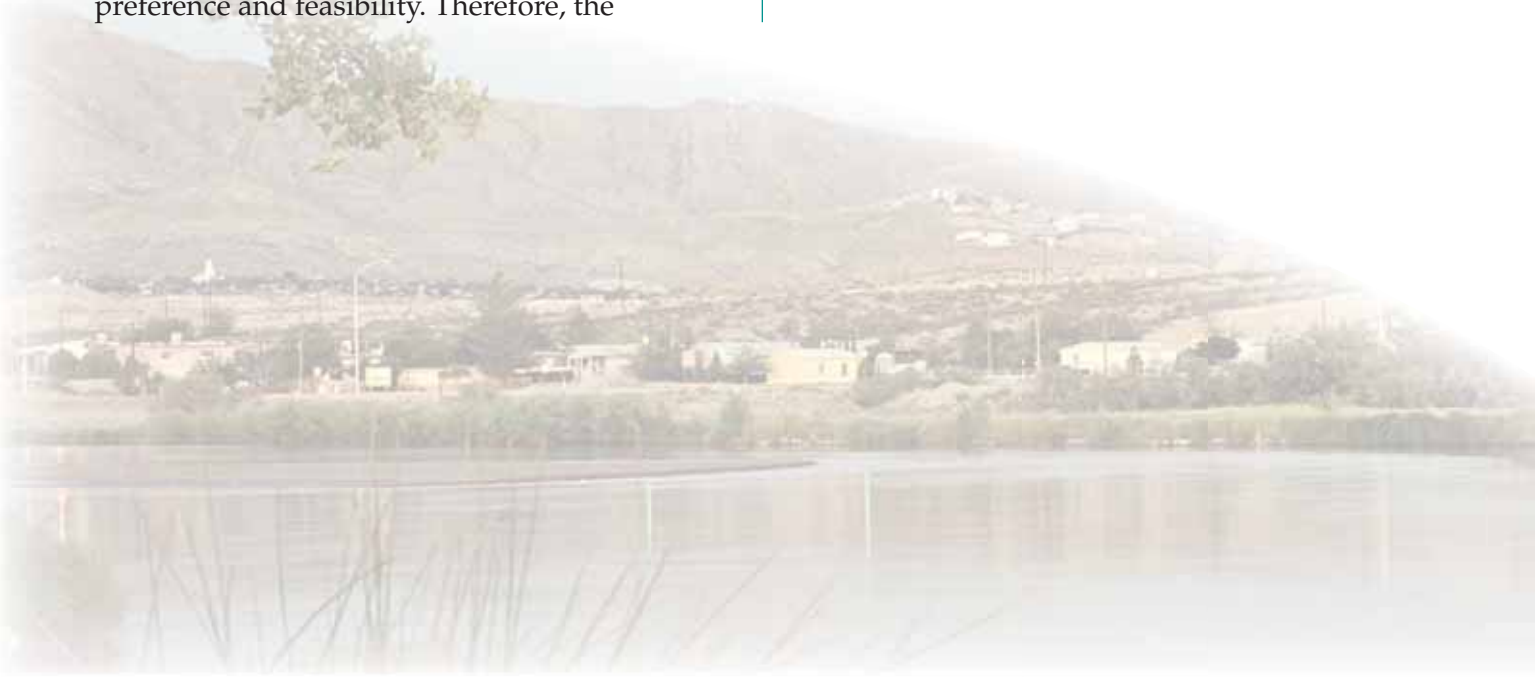
Therefore, no strategy should be eliminated because of its position. Rather, if the strategy fits a community, a low rating in a category may indicate a need for a combination or sequence of programming as well as appropriate timing and conditions.

Preference-feasibility action grid

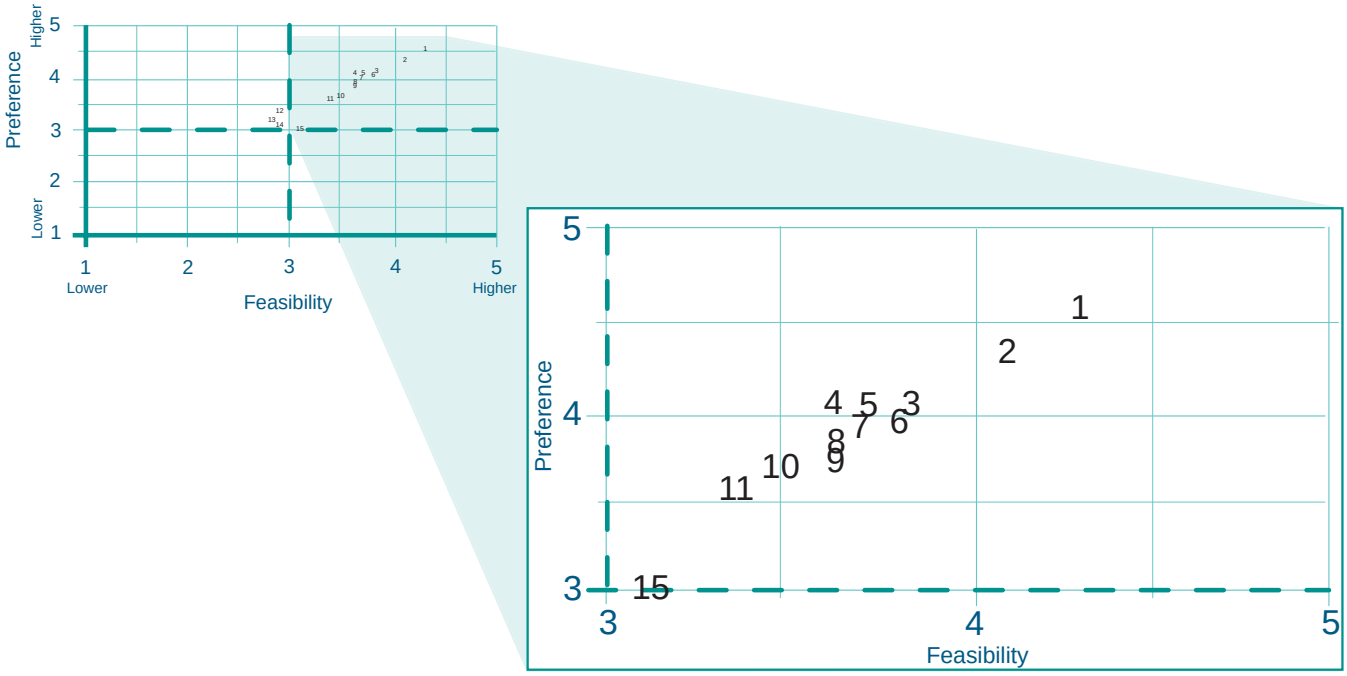


Results

The preference-feasibility analyses from the survey responses are shown on the following pages. Most of the scores are located in the upper right quadrant—Adopt. Very few were in the bottom left quadrant—Acceptable, but work on both preference and feasibility. Therefore, the upper right quadrant has been magnified, to highlight the strategies rated most preferred and most feasible in the study. Strategies with low preference or feasibility are included in the written material and scores displayed but are not plotted.

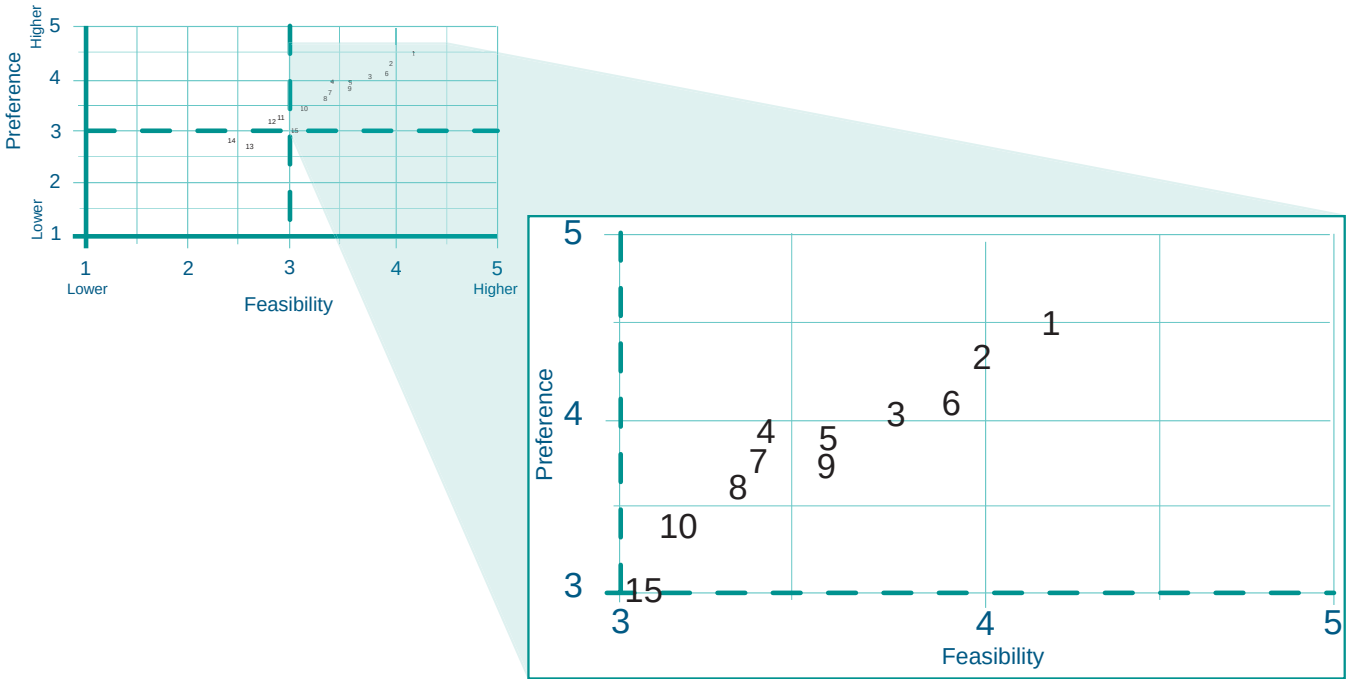


Preference-feasibility of conservation strategies–All respondents



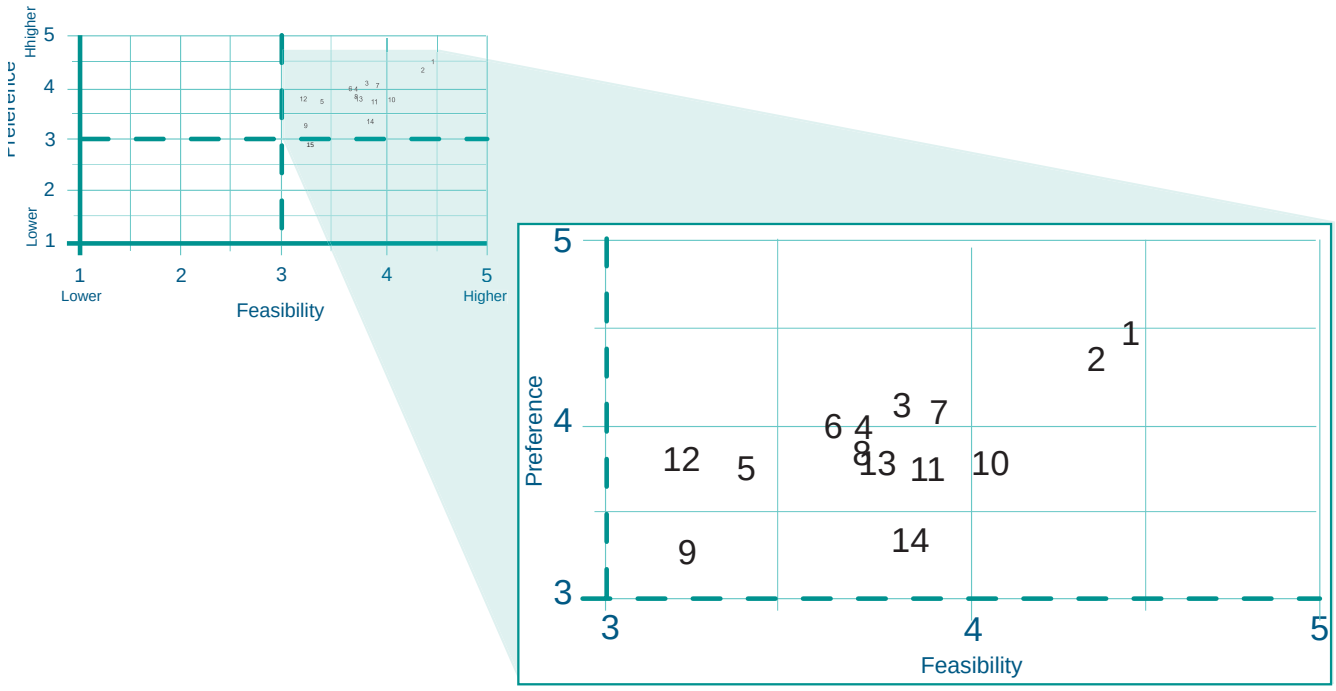
	Strategy	*Preference*	*Feasibility*
1	Encourage drought-tolerant landscapes	4.49	4.28
2	Launch a public education campaign	4.30	4.08
3	Provide residential water audits	4.08	3.80
4	Use graywater for landscape watering	4.05	3.59
5	Require drip irrigation as appropriate	4.03	3.67
6	Reuse treated municipal wastewater	3.99	3.77
7	Restrict outdoor watering	3.95	3.66
8	Restrict watering schedules	3.86	3.59
9	Establish rainwater harvest programs	3.79	3.59
10	Provide low-flow showerheads	3.59	3.43
11	Restrict water run-off	3.54	3.33
12	Detect and fix leaks in city water lines	3.37	2.93
13	Offer rebates	3.24	2.90
14	Restrict landscapes and planting	3.02	2.93
15	Increase price to reduce use	3.00	3.03

Preference-feasibility of conservation strategies–Texas respondents



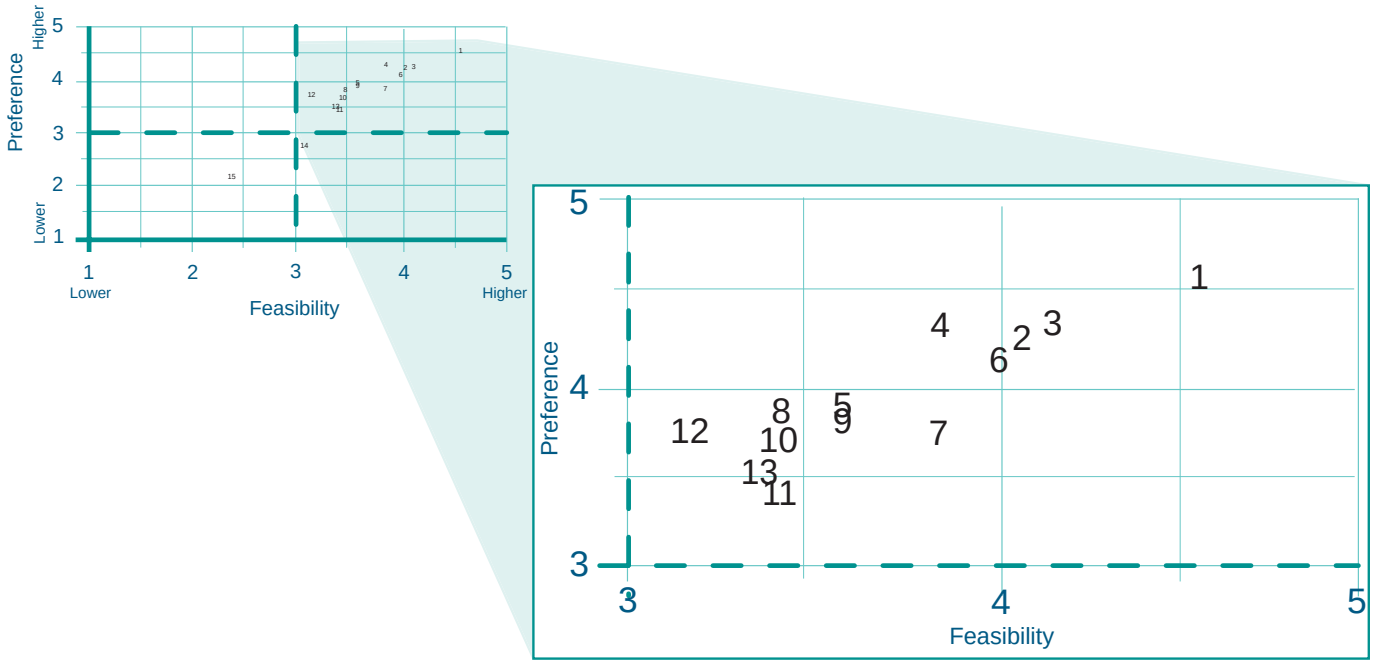
	Strategy	Preference	Feasibility
1	Encourage drought-tolerant landscapes	4.45	4.17
2	Launch a public education campaign	4.26	3.95
3	Provide residential water audits	4.00	3.74
4	Use graywater for landscape watering	3.90	3.38
5	Require drip irrigation as appropriate	3.90	3.55
6	Reuse treated municipal wastewater	4.06	3.90
7	Restrict outdoor watering	3.71	3.36
8	Restrict watering schedules	3.62	3.31
9	Establish rainwater harvest programs	3.80	3.55
10	Provide low-flow showerheads	3.38	3.07
11	Restrict water run-off	3.29	2.95
12	Detect and fix leaks in city water lines	3.14	2.81
13	Offer rebates	2.98	2.55
14	Restrict landscapes and planting	2.71	2.46
15	Increase price to reduce use	3.00	3.03

Preference-feasibility of conservation strategies–New Mexico respondents



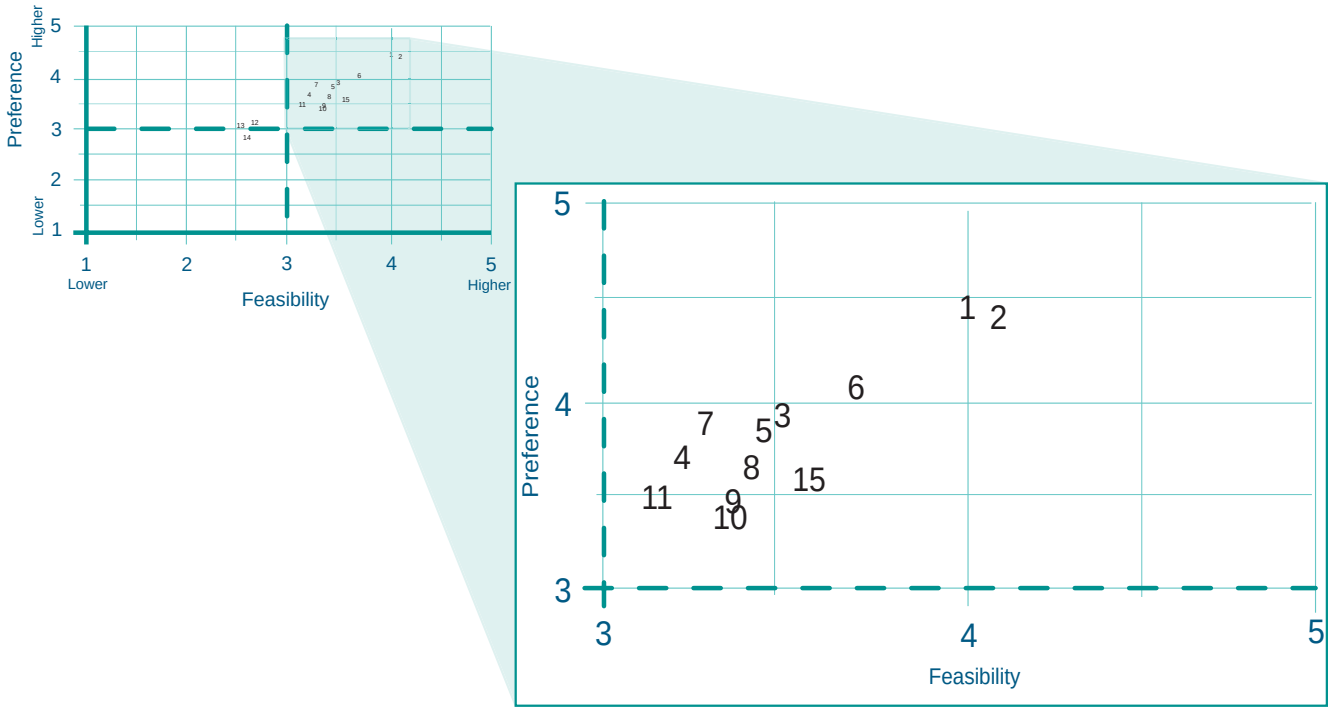
	Strategy	*Preference*	*Feasibility*
1	Encourage drought-tolerant landscapes	4.50	4.44
2	Launch a public education campaign	4.35	4.33
3	Provide residential water audits	4.10	3.78
4	Use graywater for landscape watering	4.00	3.67
5	Require drip irrigation as appropriate	3.75	3.33
6	Reuse treated municipal wastewater	4.00	3.61
7	Restrict outdoor watering	4.05	3.89
8	Restrict watering schedules	3.85	3.67
9	Establish rainwater harvest programs	3.30	3.17
10	Provide low-flow showerheads	3.80	4.00
11	Restrict water run-off	3.75	3.83
12	Detect and fix leaks in city water lines	3.80	3.17
13	Offer rebates	3.80	3.72
14	Restrict landscapes and planting	3.35	3.67
15	Increase price to reduce use	2.95	3.39

Preference and feasibility of conservation strategies–Elected officials



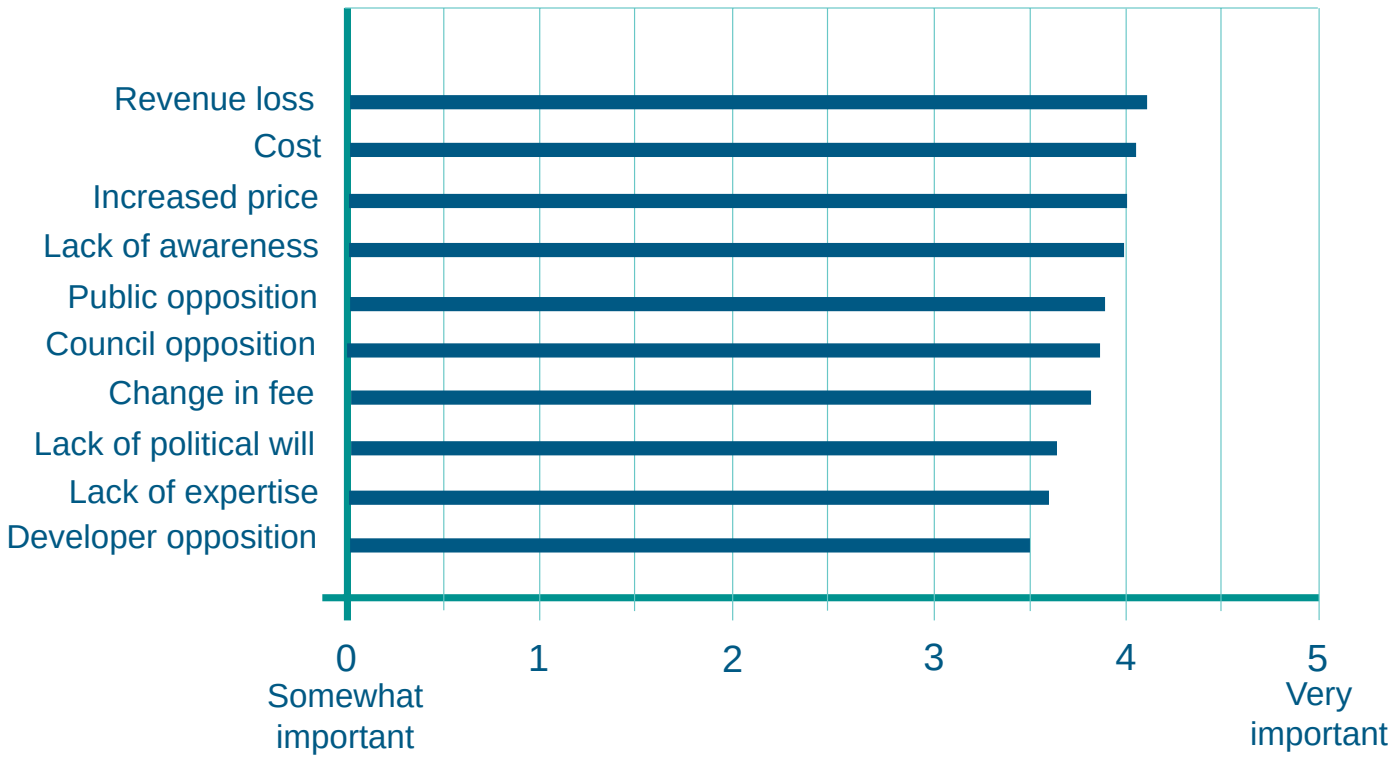
	Strategy	Preference	Feasibility
1	Encourage drought-tolerant landscapes	4.54	4.54
2	Launch a public education campaign	4.21	4.00
3	Provide residential water audits	4.25	4.08
4	Use graywater for landscape watering	4.29	3.81
5	Require drip irrigation as appropriate	3.93	3.54
6	Reuse treated municipal wastewater	4.10	3.96
7	Restrict outdoor watering	3.82	3.81
8	Restrict watering schedules	3.82	3.42
9	Establish rainwater harvest programs	3.89	3.54
10	Provide low-flow showerheads	3.68	3.38
11	Restrict water run-off	3.43	3.35
12	Detect and fix leaks in city water lines	3.71	3.12
13	Offer rebates	3.50	3.35
14	Restrict landscapes and planting	2.85	3.15
15	Increase price to reduce use	2.30	2.38

Preference and feasibility of conservation strategies–Staff



	Strategy	Preference	Feasibility
1	Encourage drought-tolerant landscapes	4.41	4.03
2	Launch a public education campaign	4.35	4.12
3	Provide residential water audits	3.85	3.50
4	Use graywater for landscape watering	3.65	3.21
5	Require drip irrigation as appropriate	3.79	3.44
6	Reuse treated municipal wastewater	4.00	3.71
7	Restrict outdoor watering	3.82	3.29
8	Restrict watering schedules	3.59	3.41
9	Establish rainwater harvest programs	3.44	3.35
10	Provide low-flow showerheads	3.38	3.32
11	Restrict water run-off	3.44	3.12
12	Detect and fix leaks in city water lines	3.06	2.76
13	Offer rebates	3.03	2.56
14	Restrict landscapes and planting	2.97	2.58
15	Increase price to reduce use	3.53	3.56

Importance of Barriers to Conservation–All respondents

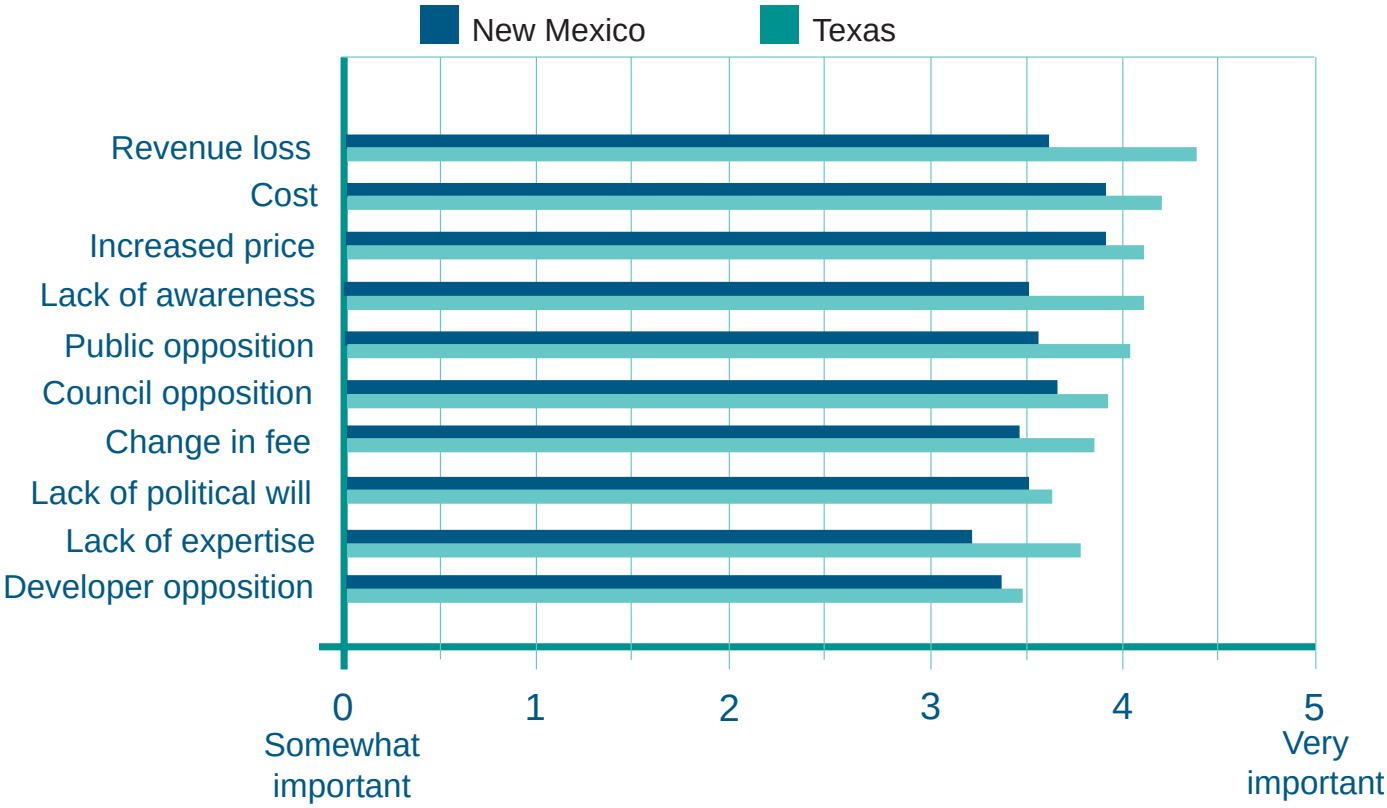


Barriers

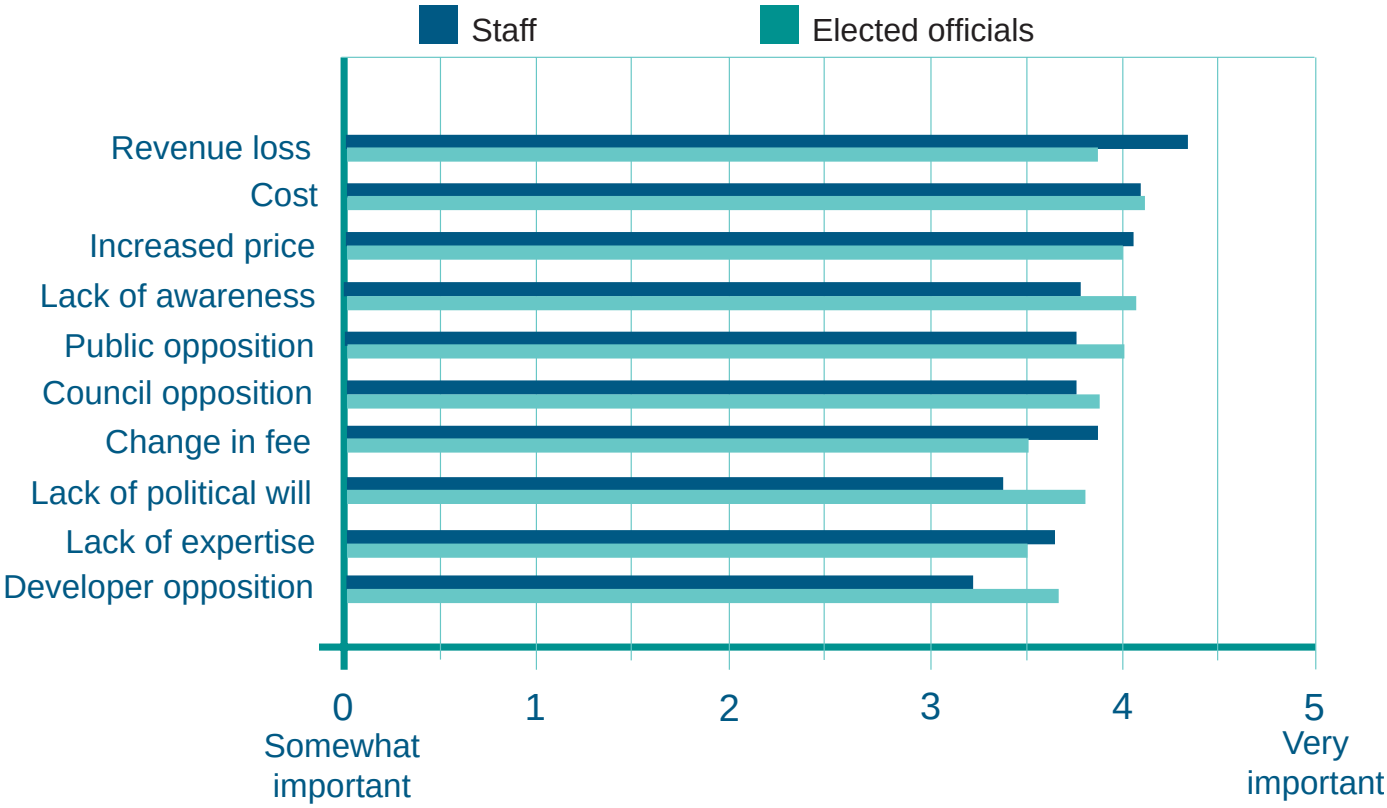
Survey respondents were asked to identify the level of importance for each barrier to the implementation of water conservation programs in their supply areas. Barriers identified were political, social or economic in character.

Economic, social and political barriers can be addressed though information, timing and political support. Technical barriers, such as the invention of new hardware, are generally handled outside the community.

Importance of Barriers to Conservation–New Mexico and Texas



Importance of Barriers to Conservation–Staff and elected officials



Summary

Although there were differences among strategies, all water conservation strategies appear to be possible to respondents. Elected officials and water managers favored voluntary efforts by homeowners supplemented by educational materials and water programs offered by cities as the most preferred and feasible water conservation strategies. These include encouraging drought-tolerant landscapes, using graywater for outdoor watering, and providing water audits to encourage homeowner conservation.

Conversely, mandated conservation requirements, programs that increase price to the homeowner or programs that resulted in a loss of city revenue were consistently ranked lowest in preference and feasibility. These included restricting outdoor plantings, raising the price of water to encourage homeowner to use less water and providing rebates from the city to homeowners for installing water efficient showers and appliances.

The barriers to water conservation programs cited most often by the officials were economic concerns, including revenue losses, costs to implement and increased prices to consumers. Lack of awareness and public opposition were also ranked as important.

Elected and appointed officials in the Rio Grande Basin are grappling with rising demands for water, decreasing supplies and increasing pressures from state authorities to address the problem of water shortages. We hope that these survey results will enable them to choose the best water conservation strategies available and thereby increase the reliability of their water supplies in the Rio Grande River Basin.

Appendix I. Water Conservation Strategies

Elected city officials and water managers were asked to evaluate these 15 strategies for conserving water:

Encourage drought-tolerant landscapes. Through education, demonstrations or replacement rebates, customers are encouraged to reduce the amount of turf and replace the existing landscape with plants or materials more adaptable to Rio Grande climate conditions.

Public education campaign. Educational materials and programs are designed for the general public, classrooms or targeted audiences on water conservation strategies.

Provide residential water audits. City utilities offer customer residences or businesses a review of existing water use, investigation for in-home leaks and suggestions for conservation.

Use graywater for landscape watering. Educational programs and/or discounts on graywater systems designed to irrigate turf and plantings.

Require drip irrigation as appropriate. Ordinances require drip irrigation on landscapes in right-of way or other appropriate landscape.

Reuse treated municipal wastewater. Municipalities' use treated effluent from run-off or point sources. Depending upon the level of treatment, water can be used for manufacturing, irrigation or water features.

Outdoor watering restrictions. Ordinances restrict water use for irrigation, car washing, water features, etc. Some may eliminate specific uses for a selected period.

Restrictions on watering schedules. Ordinances restrict landscape irrigation to selected days, times or locations.

Rainwater harvest programs. Educational programs or discounts on materials encourage rainwater harvesting usually for irrigation.

Provide low-flow showerheads. Municipal programs provide low-flow showerheads for residential customers for free or a reduced cost.

Restrict water run-off. Ordinances prohibit irrigation or condensate water from running off the landscape and into the streets, gutters or other impermeable surfaces.

Leak detection for water lines. Municipal programs identify and repair infrastructure water leaks. Leaks can be in delivery lines to customers or in major water supply lines.

Offer rebates. Municipal programs provide rebates for on the purchase of water saving appliance such as toilets, clothes washing machines and dishwashers. Rebates may also be offered for turf replacement programs.

Restrict landscape plantings. Restrictions are in place for a turf to lot size ratio to reduce the amount of turf and prioritize the use of water efficient landscaping techniques. Ordinances are often for new developments.

Increase the price to reduce use. Water is generally priced incrementally in blocks. With inverted block pricing, a higher cost is charged for higher water use.

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Photos by Jerrold Summerlin of the Rio Grande River, shot from Interstate 10 in El Paso, looking toward Mexico: Cover and pages 3, 6, 7 and 17.

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