LANDSCAPE
MASTER PLAN

September 2014

Prepared for the Community of **La Luz del Oeste**

ACKNOWLEDGMENTS

Special gratitude goes to the following members of the Common Grounds Master Plan Committee of La Luz del Oeste for their dedication and thoughtful guidance throughout this project, imbuing it with clarity and inspiration:

Heather Badal
Marianne Barlow
Anne Fitzpatrick
Kathryn Kaminsky

Special recognition goes to **Marc Hirschy**, General Manager of La Luz del Oeste, for the many improvements he has made to its landscape, his skill, knowledge and care and the detailed records he has compiled that will help make the transition to a new and sustainable landscape.

Thank you to the
La Luz Board of Directors
for their support of this project,

the
Architecture, Landscape, and **Maintenance Committees**
for their clear communication of goals

and to
the many community members
who provided thoughtful input, especially through participating in surveys and community open houses.

"Thank you for reaching out to us with your work. Antoine and I studied it carefully and were impressed with your comprehensive review of the landscape. As you may or may not know, the original design for La Luz was proceeded by a similarly comprehensive study and your study is in keeping in spirit of that rigorous pre-design planning.

Our landscape design work has progressed as we have learned more about the interaction between landscape and environment in the 40 years since La Luz was built. In the late 1960s and 1970s native and sustainable landscape was just beginning to be studied at a time when "landscape" for arid climates was typically a pile of rocks in the front. In the intervening decades climate change and the pressures of a growing population have made Albuquerque a much more arid and water-stressed city than it was 40 years ago. Our attitude toward landscape now incorporates intensive native and native adapted planting filtering out into the undisturbed native landscape - your plan seems to share this attitude. If Antoine were to be designing something like La Luz today the landscape would mostly likely look very much like the proposal you have developed.

The concept of "landscape island" is as valid now as it was in the 1970s however that lush island would by now be conceived as a higher density of native and native-adapted planting in the habited spaces - with a careful eye toward long term sustainability, lowering water use and reducing maintenance - rather than the green lawns that were originally used to develop a symbolic oasis. Every building project adapts as it travels though time with the important fundamental conceptual and structural elements (the bones) staying in place and other elements changing along with functional or environmental shifts or the inevitable maintenance requirements brought about by aging. Antoine is always happy to see buildings he designed years ago being well cared for in their passage. Your plan is an example of careful stewardship and we are delighted that the La Luz Committee has undertaken this comprehensive and careful approach to the landscape."

Paul Fehlau, Executive Senior Associate
Antoine Predock Architect PC
July 2014

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UPDATE: During the preparation of this Master Plan, landscape work at LLdO has been ongoing and some of the recommended actions included within this document were accomplished prior to its completion. Although accomplished, those recommendations remain within its content.

La Luz del Oeste's Unique Design

La Luz del Oeste is a 96 home residential community that was designed by architect Antoine Predock and developed by Ray Graham and Didier Raven in 1968. It is located east of Coors Blvd., South of Montano Road and adjacent to the Rio Grande. The building units are clustered together on the west side of the property and adjacent to Coors Road.

The clustered layout of the residential units reduces the footprint of the architecture so that a large area of the property remains undeveloped, protected and available to the residents as common open space in its natural condition. Residents refer to it as the "mesa". Each unit has its own enclosed private outdoor space. With a development density commensurate with the total property area but concentrated within a much smaller 'footprint', the architecture fosters a sense of inward privacy while maintaining an outer connection to the preserved landscape beyond it - sometimes called "the borrowed landscape".

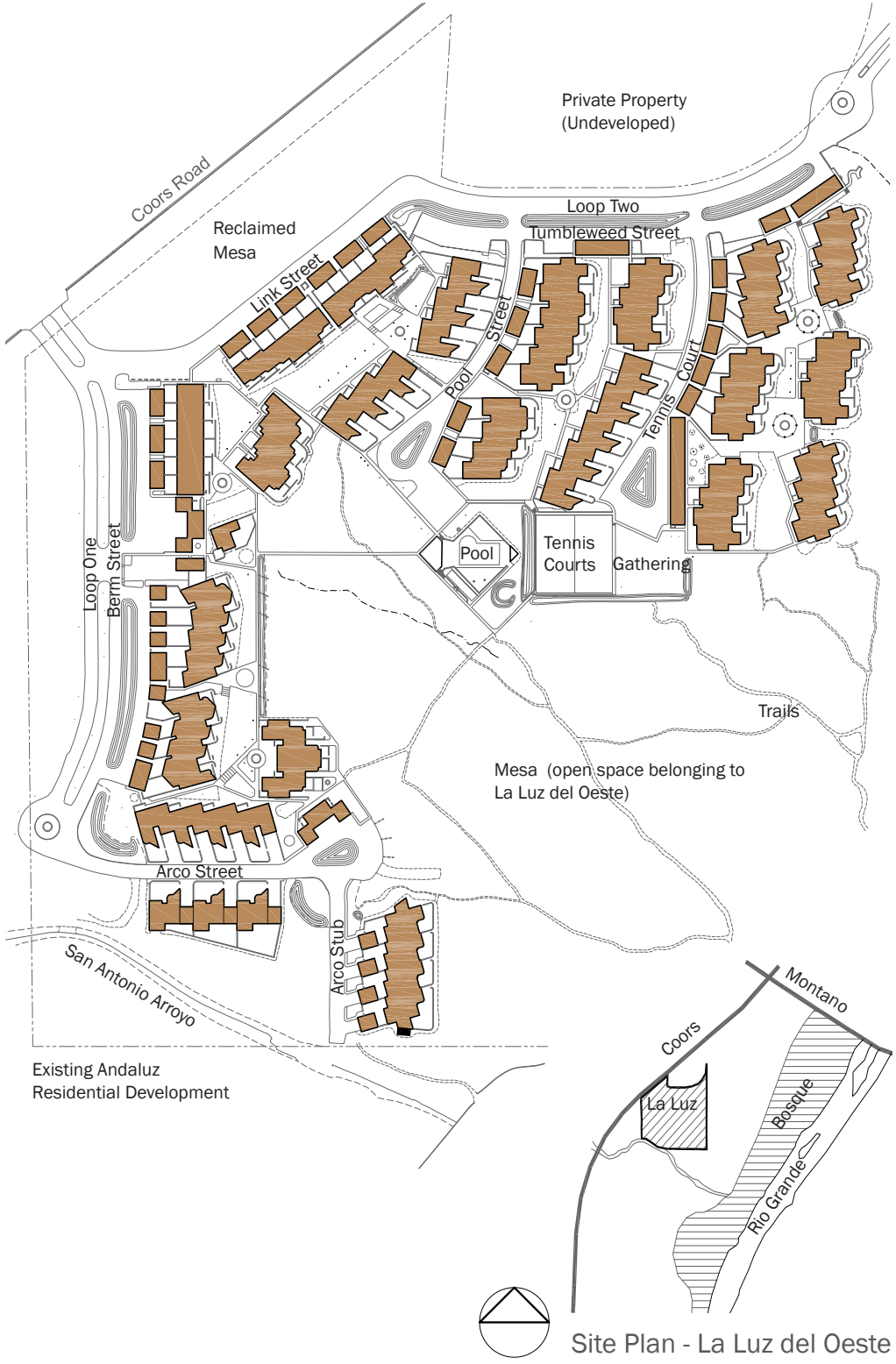
The buildings are sited to step down with the east-sloping terrain that both allows the architecture to fit the topography and provides for expansive views from all homes, each looking over its neighbors to the open space, the bosque, the city and the mountains beyond. A community pool, children's play area, tennis courts and adjacent open turf areas for resident gathering are centrally located within the complex. Outside of, but adjacent to the private outdoor space of residential units, is the "common grounds landscape". Different from the native landscape ("mesa") the common grounds landscape represents the "built" landscape of La Luz del Oeste (LLdO).

The Common Grounds Landscape

The LLdO common grounds landscape was originally conceived to be an oasis of green within the setting of a preserved west mesa scrub-land. Grass berms often separate these two landscapes. The addition of Rio Grande cottonwoods provided a visual connection to the bosque. Extensive turf provides openness within the clustered architecture, a practical surface for various uses and the oasis 'green'. This high water-use landscape of turf, exotic trees and shrubs reflects a previous time when water was not viewed as a scarce commodity. Then, native plants were what grew on the other side of the berms.

Some changes have been made. In addition to the large swaths of lawn and non-native trees and shrubs, there are now native grass berms and healthy and attractive stands of thriving native shrubs. These newer additions provide a model for an aesthetic and ecological connection to the "borrowed" landscape of the surrounding mesa with a substantial reduction in water use and required maintenance.

This Landscape Master Plan will provide a guide to converting the majority of the common grounds landscape from one that is resource intensive and apart from the surrounding native landscape to one that will require substantially less water and maintenance to embody highly functional, aesthetic and ecological values.



Site Plan - La Luz del Oeste

Existing Conditions

The common grounds landscape includes extensive bluegrass lawns with widely spaced rows of trees and areas massed with shrubs and/or ground covers. Many of the trees are in poor health and many shrubs are remnants of the original plantings. Cottonwoods growing adjacent to well-watered lawn appear healthy; others are struggling without adequate irrigation. This landscape requires significant energy input in the form of maintenance tasks and irrigation to sustain it.

Costs for water and maintenance have increased to the point where residents who value the original design of the LLdO landscape now see that changes are necessary for financial, philosophical and even aesthetic reasons. The cost of water reflects its increasing scarcity due to greater demand, exacerbated by drought. High water use landscapes are now regarded as unsustainable. Sustainability is commonly defined as the ability to satisfy current needs without impacting the ability to satisfy those same needs in the future. Of concern is to effect changes now in order that LLdO will remain a desirable place to live well into the future.

To this end, some change has occurred in recent years. The common landscape of La Luz has seen the replacement of older plantings with stands of the native shrubs of Apache plume, chamisa, sand sage and others. Berms once planted with high water-use turf are now planted with native blue gramma grass that requires less than half the water of the former. These changes represent a positive trend and account for approximately 25% of the non-turf common grounds landscape area.

Planting

The existing landscape includes some large cottonwood trees, stands of Russian olive trees added since 1970 and various other deciduous trees, most notably purple leaf plums, and crab apple trees also added since 1970. The smaller deciduous trees are all planted in areas where long distance views from patios and windows are important. Most of these trees are regularly pruned across the tops to keep them from obscuring views. This has resulted in an unnatural and odd appearance. Beds of original Japanese honeysuckle are now overgrown and irregular in form next to walks where they must be repeatedly cut back.

Irrigation

The combined irrigation system of La Luz includes 12 separate water meters. Each meter supplies a series of remote control valves that irrigate a portion of the common grounds landscape. Over time, this system has been greatly modified for improved efficiency. Repairs and modification are ongoing and consume extensive time for maintenance staff. Additionally, a significant portion of the landscape does not have an irrigation system and must be hand-watered. This plan recommends changes to the landscaping that will require little modification to the existing irrigation system so that costs can be devoted mostly to landscape renovation. Over time, improvements and additions to the system will need to be made.

Expansive turf areas - high water use and maintenance requirements - limited amenity

Entry fountains - high water use and maintenance requirements - limited amenity

Inappropriate tree species - block views if not excessively pruned

Tree planters in plazas - planters too small - trees must be hand-watered

Excessive turf - awkward transition to native landscapes

Ground covers - overgrown and too close to pavement - high maintenance requirements

Maintenance of the landscape has been excellent under difficult conditions, but the photos show examples of problems with the existing landscape that will require fundamental design changes to correct.

This Master Plan was prepared as steps in the following sequence:

Prepare a Digital Site Plan
In order to map the existing conditions during Inventory and Analysis and then show location-specific recommendations for landscape improvements, an accurate site plan was needed. It was also necessary to have a site plan in digital format that could be graphically manipulated within this document. Such a site plan was not available. A high resolution aerial photograph was made during January 2014 and was used to prepare a site plan in AutoCad format.

Respond to the Established Goals
The goals for the Master Plan were developed by members of the Common Grounds Landscape Master Plan Committee in conjunction with other members of the LLdO community and LLdO General Manager, Marc Hirschy.

Collect Information - Site Inventory and Analysis
In order to understand the physical setting of La Luz del Oeste and the many elements that would have an effect on the final recommendations, an inventory based on field observation was made of the existing conditions on site. A meeting with LLdO General Manager, Marc Hirschy, was conducted to provide the Master Plan team with an overview of the existing irrigation system. A walking survey and photographic inventory was conducted covering the entire complex on several occasions to document existing conditions such as vegetation and condition, surface materials, drainage, views, spatial analysis with regard to privacy, wildfire risk, and seating locations. Additionally, various people helped to provide a narrative of the history of LLdO, providing photographs and personal anecdote.

Develop Pertinent Design Strategies
A set of design strategies to help achieve the project goals was developed to incorporate in the recommendations.

Develop Location-Specific Landscape Design Recommendations
Recommended design treatment for various landscape areas within LLdO was developed and illustrated on a conceptual level. Actual design implementation will occur as separate projects based on a priority strategy as designated in the Master Plan.

Set Priorities for Implementing the Recommendations
Informed by a comprehensive analysis of conditions, establish a hierarchy of priorities for implementing the recommendations.

Prepare a Cost Analysis
In order that the recommendations for landscape changes be based on a rational balance between cost of implementation and current and projected costs likely to occur with no action, an analysis of current costs will aid the community in deciding which of the Master Plan's recommendations to implement and when.

Recommend a Set of Plant Materials
Compile a list of suggested plants with their attributes and specific notes to be utilized in the landscape recommendations.

La Luz del Oeste under construction ca 1968. Photo: Ray Graham

La Luz del Oeste 2014: Settled into the mesa.

At the onset of this project, a set of goals was developed for converting the landscape within acceptable cost parameters. Those goals include the following:

- ***Make changes to the existing landscape that will result in at least a 50% savings in water for irrigation.***
- ***The landscape should harmonize with the architecture.*** To remain simple and open without impeding the site's views and be an attractive setting for the architecture.
- The recommended changes to the landscape ***should be such that the existing irrigation system can remain mostly unmodified*** due to the anticipated costs for making changes to the landscape.
- ***Significantly reduce maintenance requirements.*** Maintenance staff is currently over-extended during parts of the year. This goal includes a reduction in the noise that is associated with the machinery of maintenance to provide a quieter environment.

GUIDING PRINCIPLES

Sustainability

There is a pervasive awareness of the finite supply of our resources - most particularly water. The landscape design and management of La Luz should be reflective of this fact. Recommendations within this Master Plan will be based on the wise use and best practices for achieving the conservation, functional and aesthetic goals in fostering a healthy and sustainable environment now and into the future.

Simplicity

Harmony between Architecture and Landscape

Simplicity is both a financial and aesthetic goal. La Luz's architecture is characterized by simple, repeated forms with an emphasis on horizontal. The architecture steps down with the land and its configuration reaches out to embrace near and distant views. The simplicity of the unadorned stucco walls is underplayed and intended not to be a distraction to form. In the same way, the landscape should not be a distraction from the architecture. A restrained palette of form, texture and color that harmonizes with that architecture is the guiding aesthetic.

The map at right shows various existing elements that have implications for landscape design:

View Shed
The buildings were designed to take advantage of the extraordinary views to the east, north and south. The map shows the open areas to the east as being entirely within the view shed of residences. These areas have been kept clear to permit these open vistas. Exceptions are where some trees are growing within these corridors that currently obstruct portions of the view.

Major View Corridor
Where the longitudinal buildings end, views beyond are framed and emphasized. These 'architectural windows' are oriented toward significant views beyond the complex. Examples are the distant Sangre de Cristo mountains near Santa Fe to the northeast, to the east, the bosque and city with the Sandia mountains beyond and, to the southeast, the Rio Grande Valley and Manzano mountains.

Minor View Corridor
Small areas between buildings frame a view of the landscape beyond, but of no significant features. These small view windows help to balance the mass and enclosure created by the building complex.

View Obstruction
There are features that currently block a portion of the potential view. Examples include trees and the tall berms. Large trees have amenities that may justify a lost view. Example: the row of Russian olives west of the pool area. They were intended to screen the cars from residences to the west and southwest (these trees are being replaced with New Mexican olives that have been planted adjacent).

Privacy Sensitive Zones
In certain areas, the living units of different buildings are more closely spaced. In such areas, doors and windows face one another in close proximity. These areas are identified as privacy sensitive and suggest that a landscape element can ameliorate this condition if placed to screen views.

16' Tall Tree - Potential View Screen
The property west of Loop One and east of Coors Road will eventually be developed. Planting a windrow of evergreen trees that will grow to a height of about 12 to 16 feet will help to preserve a sense of privacy, screen potentially negative views, and provide a buffer for wind blown sand (the latter having been a problem since disturbance there in recent years). This same condition exists northwest of Loop Two.

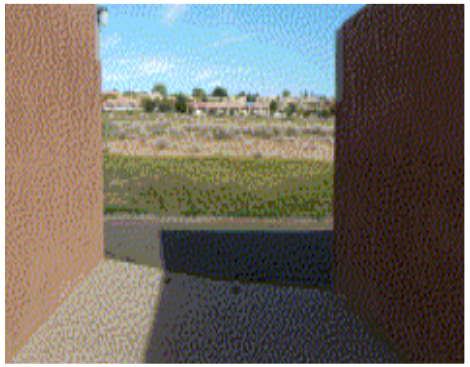
12' Tall Potential Tree Zone
In certain areas where distant views will not be compromised, some taller trees may be added for shade and wind attenuation or just the amenity of additional landscape "green".

8' Tall Potential Tree Zone
Also where distant views will not be compromised and where privacy may be provided, shorter tree species may be planted to provide foliar relief, shade and seasonal accents.

Wildfire Risk
Although most of the architecture does not offer the usual fire risk such as overhanging eaves and exposed combustible materials, certain areas were identified that have woody plant material in close proximity to structures and patio trees. In such instances, there may be some fire risk in the event of a wildfire. The community may elect to have the local fire department representatives visit the complex and determine fire risk and potential mitigation.


Buildings frame the distant Sangre de Cristos at the end of a plaza greenspace.

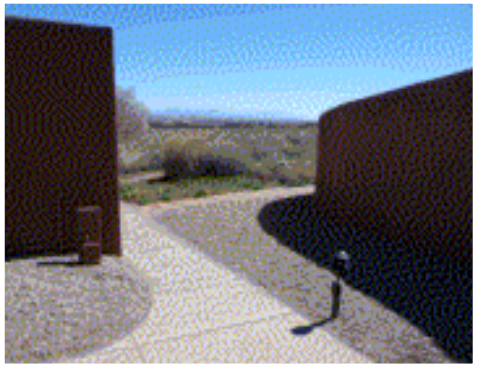

Views from taller buildings may 'look' over lower buildings as the architecture and terrain step down.


The architecture creates "view windows".


Openings between buildings adjacent to plazas provide views of the bosque.

LEGEND

- View Shed
- Major View Corridor
- Minor View Corridor
- View Obstruction
- Privacy Sensitive Zone
- 16' Tall Tree Zone (View Screen)
- 12' Tall Tree Zone
- 8' Tall Tree Zone
- Wildfire Risk (Current)
- Bench (Sitting Location)



Another "view window" afforded by the architecture.

The classic layered view of LLdO mesa, bosque, city and Sandia Mountains.

The map at right shows a variety of existing landscape types, some remaining as part of the original landscape installation, some a part of a conversion to a more xeric landscape in recent years.

Native Grass (blue gramma and buffalograss)
Occurs on the earth berms within vehicular circulation areas and was originally planted as bluegrass turf.

Bluegrass Turf
These areas are part of what remains of the original landscape installation. A gravel area between the turf and walls was extended because of irrigation over-spray damaging the stucco. It is interesting to note how extensive these high water-use lawn areas are. They represent a simplified landscape from a time when water and maintenance costs were much lower.

Mixed Xeric Shrubs (non-native)
This landscape makes up the remaining landscape component after turf and gravel. Plants within these areas include honeysuckle, Russian sage, blue mist and other shrub species that are generally considered more drought tolerant.

Native Shrub Areas
These areas represent landscape that was converted from exotic shrub species in recent years. These areas are not a part of the surrounding west mesa native scrub-land.

Mesa Landscape
These areas represent the preserved native mesa landscape of the LLdO properties.

'Reclaimed' Mesa Landscape
This portion of the native landscape was augmented with xeric plantings as part of the re-vegetation associated with the large earth berm buffer along Coors Road.

'Bandera' Hybrid Bluegrass Turf (low water requirements)
This original bluegrass turf planting was converted to a hybrid species of bluegrass turf that requires only 1/2 to 1/3 the water that bluegrass turf requires. While there are minor differences in dormant color and period, when green, this turf is indistinguishable from its high water-use neighbor. It and other recently developed hybrids offer great promise in reducing water use where a turf cover is desired for either aesthetic or functional reasons. Functionally, lawn is a durable, cool and soft surface for various activities.

Arco Maintenance Site
This area serves as a storage and staging area associated with landscape maintenance and waste materials. The storage is temporary with regular removal. Current conditions and recommendations are discussed in detail on page 35.

Gravel Areas
Significant in coverage, these areas include the irrigation buffer between turf and stucco and areas that do not contain plants but are unpaved. Gravel is also present as a mulch in some planting areas. The gravel is a gray 'pea' gravel type.

Vegetable and Herb Gardens
Originally a planting area for cutting flowers, residents in recent years have changed it to growing edible crops. There are other areas where edible plants are also grown.

Water Fountains
These are scattered throughout the complex and provide a refreshing contrast to the hot and dry mesa in summer months and 'water music' to mask the sound of off-site car traffic. Residents value the interior plaza fountains and wish to retain them.

Memorial Rose Garden
Roses are planted here in memory of residents who are now deceased.


A mix of native shrubs that have been planted to replace original exotic shrubs in recent years.


The LLdO commons landscape is in contrast with the surround native mesa landscape.


Some areas of the original landscape have been replaced with ornamental grasses.

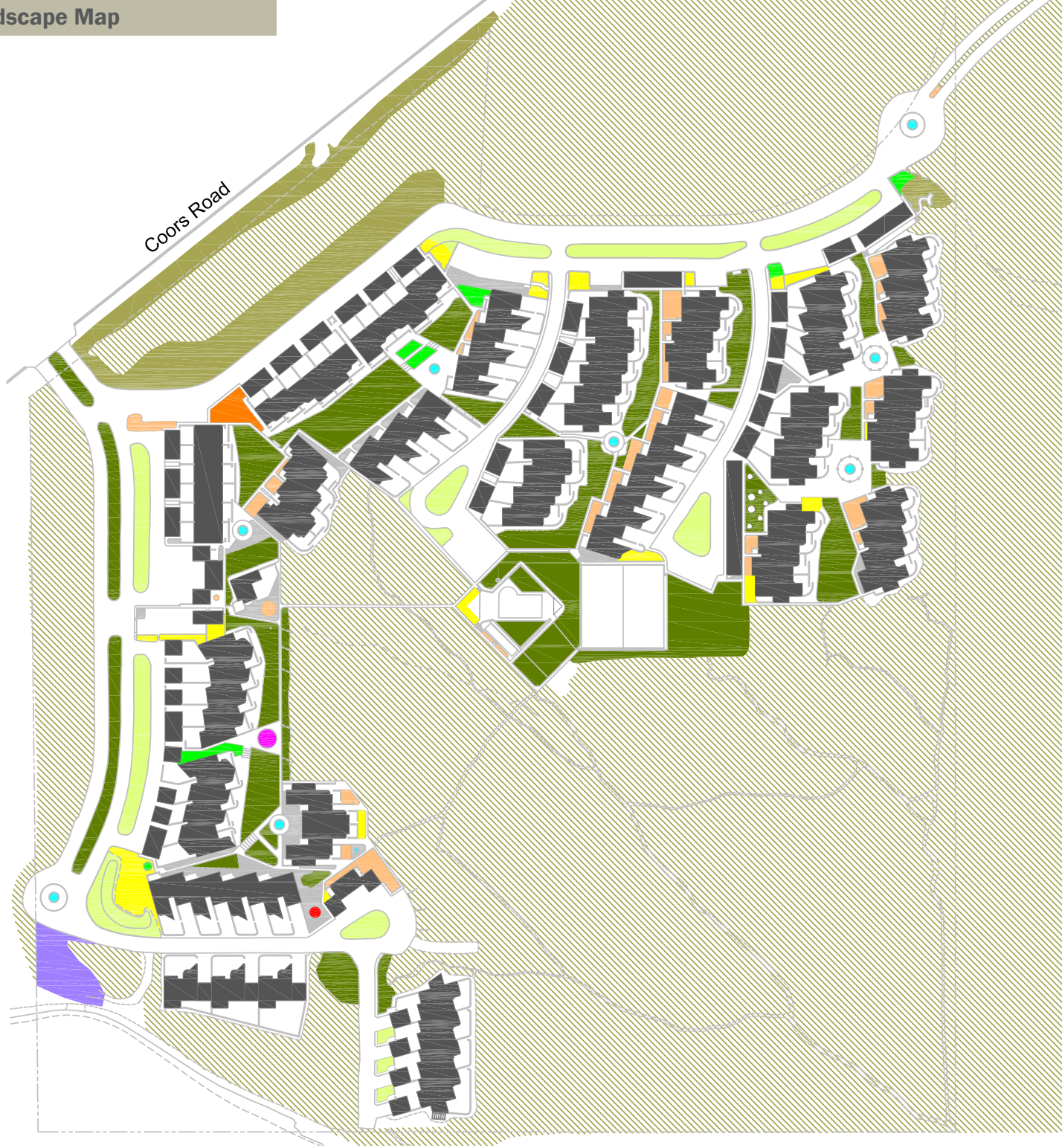

The original concept of LLdO as an "oasis" within the native mesa - grass berms delineating the oasis.

LEGEND

- Native Grass (blue gramma + buffalograss)
- Bluegrass Turf
- Mixed Xeric Shrubs (non-native)
- Native Shrubs (Chamisa, Apache plume, etc.)
- Ornamental Grasses
- West Mesa Native Landscape
- 'Reclaimed' Mesa Native Landscape
- Bandera Low Water Turf
- Disturbed Area (debris site)
- Gravel Areas (potential landscape - irrigation buffer areas not included)
- Vegetable Garden
- Memorial Rose Garden
- Water Fountain

NOTE
For plan clarity, gravel buffer areas between walls and lawn are not shown with color.

A typical example of the 'Neighborhood Greenspace' landscape between residential blocks.



The map at right shows the tree species growing at La Luz del Oeste. Although many of the trees are considered drought tolerant, this portion of the mesa does not receive enough rainfall to fully support trees. *All trees will need some irrigation but it should be separate from other irrigation zones.*

Fruit Trees - semi-dwarf size (full dwarf varieties can be added as space allows)
Located in a space between buildings known as The Orchard, the trees grow in mulched cut-outs within a bluegrass lawn. Fruit types include, cherry, apricot, peach, nectarine plum and pluot. Ample space between trees suggests there may be room for additional fruit trees if they are dwarf varieties.

Vitex (Vitex agnus-castus) - to 18' tall
These xeric exotics develop numerous water sprouts and require careful pruning to look their best. They give showy blue to purple flowers during summer.

Desert Willow (Chilopsis linearis) - to 25' tall
Good local native that only occurs in one small area of LLdO. Re-seeding can be a problem. Variety 'Art's Seedless' does not produce seed pods, has good form.

New Mexican Olive (Forestiera neomexicana) - to 15' tall
Occurs throughout LLdO. Good small tree to use where views beyond are important. A native of the Bosque, it provides a connection between the bosque and LLdO.

Rio Grande Cottonwood - to 50' tall
Originally transplanted from the Bosque, the cottonwoods served to provide a connection between that place and LLdO. While providing good shade and 'green relief' from the hot mesa, these trees are not culturally suited to the grounds of LLdO due to high water needs. Most of the trees along Loop One are in decline due to insufficient water.

Ash (Fraxinus sp.) - to 35' tall
One tree occurs and is located at the SE corner of the tennis courts. Ash trees share similar problems with cottonwoods, i.e., shallow and invasive roots, high water consumption. They do provide good shade and some have vivid fall color.

Russian Olive (Eleaegnus angustifolia) - to 35' tall
Originally planted for their drought tolerance and attractive silvery foliage, these trees have become invasive, especially in the Bosque. At LLdO, some of the current trees block views of the mesa and Bosque. These trees are slated for removal.

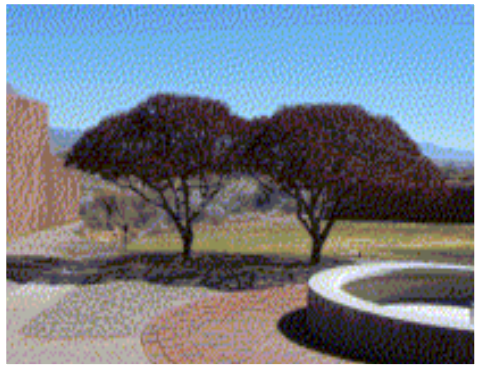
Purple Leaf Plum (Prunus cerasifera) - to 15' tall
One of the most common trees at LLdO. While not xeric, these trees produce edible fruit, have attractive Spring flowers, and in most cases, remain somewhat low to preserve views over. However, many of these trees show evidence of disease and decline where planted in surrounding pavement and still require topping to protect views.

Flowering Crab Apple (various varieties) - to 18' tall
The other most commonly planted tree at LLdO. Individuals at LLdO range between large and vigorous to stunted and languishing. They provide a showy Spring flower display and are popular with residents.

Honeylocust (Gleditsia triacanthos) - to 35' tall
Appear to do well at LLdO, provide light shade, have low water needs, and are visually compatible with native shrubs but do tend to be invasive and spread underground. The prolific seed pods provide an extra burden for maintenance. If used in the future, seedless varieties are recommended.

Chinese Pistache (Pistachia chinensis) - to 35' tall
These occur within the "modified west mesa" landscape area. This exotic species is xeric and well adapted to the hot and dry conditions of the west mesa. Due to their mature height of greater than 25 feet, they are not indicated for use where views are important. Among the native mesa plants, they appear out of place. These trees provide vivid fall color.

Yellowhorn Tree (Xanthocerus sorbifolium) - to about 15' tall
One individual exists that was planted on a trial basis. It appears healthy and growing.

LEGEND

- Ash (Fraxinus sp.) (1)
- Chinese pistache (Pistachia chinensis) (13)
- Desert Willow (Chilopsis linearis) (4)
- Flowering Crab Apple (Malus sp.) (31)
- Flowering Plum (Prunus cerasifera) (22)
- Fruit Trees (Orchard) (6)
- Honeylocust (Gleditsia sp.) (4)
- Japanese Pagoda Tree (Sophora japonica) (3)
- New Mexican Olive (Forestiera neomexicana) (30+)
- Rio Grande Cottonwood (Populus wislizenii) (32)
- Russian Olive (Eleaegnus angustifolia) (20)
- Silver Buffaloberry (Shepherdia argentea) (2)
- Smoketree (Cotinus coggygria) (1)
- Vitex (Vitex agnus-castus) (8)
- Yellowhorn (Xanthocerus sorbifolium) (1)

NOTES

1. Tree size on map reflects canopy size as taken from an aerial photo - very small trees are shown larger for clarity.

2. See page 41 for tree priorities.

The map at right shows existing drainage patterns and opportunities for water harvesting.

The site generally slopes to the southeast and drainage generally moves through the La Luz development in that direction and is then discharged into the undeveloped native areas of the mesa. Where this occurs, the native vegetation has become larger and more dense. This is evident in current aerial photos that show those areas in contrast to the rest of the mesa where vegetation has been diminished by five years of drought (LLdO precipitation records, 2014).

Flooding

In the past, there have been major storm events that have caused severe flooding within LLdO. To control flooding, there are several locations where drainage has been improved by maintenance staff. Examples include the addition of culverts through berms and drain inlets along drainage swales. In light of the drainage improvements, there still exists potential for flooding during extreme storm events.

Major Drainage Routes

North Area - stormwater is conveyed along Link and Tumbleweed streets and discharged at the east end of Tumbleweed into a shallow arroyo that flows through the mesa toward the Bosque.

Pool Street and Tennis Court - stormwater from along Pool Street flows south to the concrete sidewalk/drainage way beginning at the pool parking lot to along the north edge of the tennis courts where it joins flow from Tennis Court across the Meadow and discharges into the mesa through a gap in the berm.

Plaza Greenspace (the long landscape areas running north and south from the plazas) - drainage flows south along a central swale in the turf. For the long berm running east of the residences along Berm Street, culverts have been added that discharge flooding stormwater there into the mesa to the east. Drainage from the plaza greenspace east of the residences along Link flows north and under the wall to Tumbleweed.

Arco - flow from Arco Street and Arco Stub is discharged into the mesa at the east end of Arco Street and towards San Antonio Arroyo at the southwest end of Arco Stub.

Water Harvesting Opportunities

An important strategy for reducing the water necessary to sustain landscaping is to utilize stormwater within the landscape rather than convey it away. Water that flows off roads and parking lots often contains contaminants and plants can be effective at removing those contaminants from the water by sequestering it within their structures and then chemically breaking it down into non-toxic constituents.

Canales

These roof drains can be problematic as they often discharge a relatively large volume of water into small landscape areas with the concentrated force of an eight foot drop. This creates the potential for flooding and erosion. Canales also represent a water harvesting opportunity that can be utilized when measures are taken to offset the potential problems. Originally, all the canales had splash blocks below to intercept falling water. These were removed to prevent splash-back on stucco walls that was causing damage. Pervious fabric was installed under the gravel and in addition to controlling weed growth, the fabric and gravel combination prevents most erosion from falling water during rain. Minor raking is done to smooth the gravel after rain storms. The canales help to provide water to landscapes below where there are mostly no irrigation systems installed.

Winter drainage from roofs blocked by heavy ice dams on canales. Photo: Marc Hirschy

This sidewalk cleverly functions as a drainage channel through the tennis courts /pool area.

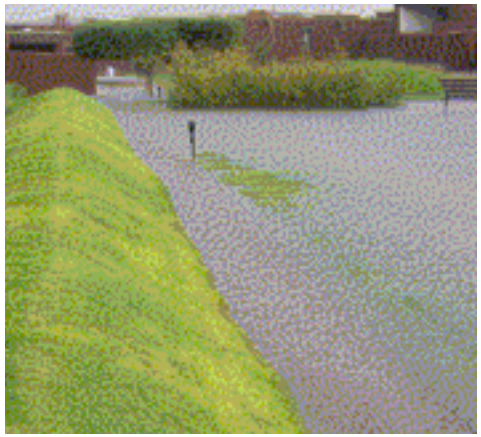
Water from canales can result in erosion and flooding if protection is not provided. Although we are in an extended drought, extreme rain events will continue to be possible. The photo shows one such event. Storms in most years do not result in such heavy runoff. Photo: Marc Hirschy

LEGEND

- Drainage Swale
- Direction of Sheet Flow
- Drain Inlet
- Canale
- Enhanced Native Vegetation In Discharge Areas

Coors Road

Drainage culverts have been added to berms to allow the escape of floodwater (photo below).



Unusual flooding before culverts were added through the berm. Photo: Marc Hirschy

The conclusions are based on the findings of the Inventory and Analysis:

Trees

Existing tree species identified as problems include those considered invasive, trees whose mature size is too large for view requirements and tree species that have not done well at LLdO. Appropriate tree heights in view-sensitive locations range from 8 feet to 12 feet. There are areas where large trees are growing that do not obstruct views. There are also locations that can accommodate additional trees up to 25 feet tall where important views will not be obstructed. LLdO is located on a treeless mesa edge of the Rio Grande floodplain so creating a tree dominant landscape would not be consistent with the natural landscape. By contrast, the bosque is a tree dominant landscape. There is a need for shade in places where people gather, such as the meadow and in places where outdoor seating is provided. Tree height is critical where those locations occur within view corridors. It should be noted that the designer's original vision for the landscape at LLdO did not include trees other than the iconic cottonwoods that provide a visual link to the bosque.

As xeric landscaping within LLdO is expanded, attention must be paid to valued existing trees so that their water sources are not diminished. Russian olive trees, originally planted for their attractiveness and drought resistance, are now known to be invasive and, in several locations, too tall. These trees should be removed, especially so because of LLdO 's close proximity to the bosque where attempts at their eradication is underway.

Shrubs and Ground Covers

LLdO started out with Lavender cotton (Santolina) which eventually succumbed to disease. More recently, Spanish broom, which was widely planted, also succumbed to disease. Currently, honeysuckle ground cover comprises the main planting within the "doorstep" landscape areas. They are overgrown and require regular pruning to keep them attractive and away from walks. Their high maintenance requirements and unattractive ranginess make them less suitable than more xeric and lower maintenance plants. Most recently, plantings of native shrubs are thriving on less irrigation and their maintenance requirements are much lower - as long as they are given the space they need based on their size at maturity.

Lawn

Where people gather or children play, a mowed lawn has optimum value for coolness, function and beauty. Current lawn area is extensive and is planted beyond areas where it offers functional value. It should be replaced in those areas with a landscape that requires much less water, lower maintenance and greater aesthetic value. Where lawn should remain, existing lawn can be replaced with a lawn variety that has the same functional attributes, but with much lower water requirements (a hybrid bluegrass or equivalent).

Sitting Areas (bench locations)

There are currently limited benches where people can sit. These are concentrated in the north portions of the site. Providing additional benches that are evenly distributed throughout the complex would encourage walking, especially as the LLdO population ages. Bench material should have low maintenance requirements and not become hot when exposed to the sun. Provisions for shade should accompany bench locations (see Appendix, page 49). All prominent view areas should offer benches.

Privacy

Where distance between facing residences is narrow, views into open doors and clear windows can create a need for some privacy. A sense of privacy can be provided or enhanced by adding additional shrubs and small trees to break up views within this areas. Even only a partial screen is enough to shift perception to one of an increased sense of privacy.

Wildfire Risk

To reduce wildfire risk, locations have been identified where woody native vegetation is in close proximity to structures. Vegetation should be reduced, either by selective removal or thinning with pruning to minimize the chance for fire to spread to structures. The architecture of LLdO does not have the usual risky elements of overhanging eaves, exposed wood, etc. so overall risk appears minimal except where dense native vegetation in close proximity to larger patio trees can provide a "bridge" for flames to structures. During the time of this writing, some clearing of the mesa - both dead brush and plants close to structures - has been accomplished. This will be an ongoing maintenance need. Additionally, the Fire Department can be contacted to identify fire risks and mitigation.

Water Harvesting Opportunities

Many areas along existing drainage swales can be minimally reshaped to allow for slower water flow and minimal ponding. This is an important strategy for conserving water use by using stormwater to more efficiently augment irrigation. Within LLdO, much of the drainage flows longitudinally through the landscaped areas along swales. This makes it relatively easy to utilize stormwater to augment irrigation within these landscapes. Minor grading can slow down the flow of water so that it can have more time to penetrate the soil. Shallow basins can be created along swales to allow for short term ponding and enhance the percolation of stormwater into the soil for use by plants. Such areas where water can collect and be concentrated can become locations for plants that require more water, such as trees. Existing canales occur throughout the complex and also provide runoff to augment irrigation. Care should be taken to route and keep water away from structures.

Hardscape

In site design parlance, 'hardscape' refers to pavement and other constructed site elements that are associated with the ground plane, most often referring to pavement. Recommendations for landscape improvements include some options that would in-

volve changes to LLdO's hardscape. Examples include adding curbs along the base of the berms adjacent to the roadways and reducing portions of existing impervious pavement within plaza areas. The former would protect the berms and vegetation from automobile damage and also help to contain soil and water. The later would help to provide more healthy growing conditions for the trees around the fountains. In some locations, the trees have outgrown the pavement planters and roots are damaging the pavement. In others, the pavement inhibits the soil's absorption of water and air to reach the tree's roots. This effect is compounded with the reflected heat of surrounding pavement and the additional stress it causes. Overall, there is a lot of site pavement throughout LLdO but it does not feel excessive. The paving supports an ordered and simple design elegance and reduces the need for maintenance that would otherwise be required with landscaping.

Gravel Areas (where no planting occurs)
Gravel areas adjacent to walls that protect the walls from sprinkler spray notwithstanding, there are various areas next to buildings that are not paved and only contain gravel. Depending on the community's desires, these areas could offer additional landscaped area to include plantings. Advantages to leaving them as gravel areas are that they do not add to maintenance, do not require irrigation, and are consistent with the apparent design intent of simplicity. Gravel buffer areas between stucco structures should be widened to provide better protection of the stucco from wind blown spray where spray irrigation will remain.

Private Property Adjacent to La Luz del Oeste
Two tracts of private property exist adjacent to LLdO. One occurs west of Loop One and the other occurs north of Tumbleweed. These two properties may eventually be developed and current views of the natural mesa landscape there will change to buildings, etc. Vegetative screening along those frontages can be added as view impacts of development become apparent.

Maintenance Office and One Loop One
The Maintenance Office building was added after completion of LLdO due to the growing awareness of its need in providing a center for maintenance operations and storage of related materials. However, its design and placement arguably has had a negative impact on that location. Its removal in the future remains an option which would hinge on the possible provision of making one residence available for the use of the General Manager and/or the transfer of ownership of One Loop One to the La Luz Land Owners Association at some future time. One Loop One could then serve as both an office and community center.

Existing Irrigation
Most of the various irrigation systems have had parts repaired or replaced over time due to failure, poor design, wear or all. Much of the original irrigation components, i.e., pipe material, etc. were of poor quality and have since failed, causing leaks and poor performance. However, there are landscape areas with irrigation zones that currently have not been fully investigated. With regard to using the existing irrigation to support new landscaping, the reliability of these irrigation zones is suspect and may require extensive repair or replacement as potential problems become known. The following landscape areas are included in this category:

- Large lawn space at the Berm Neighborhood Greenspace North
- Upper portion of the lawn area of the Pool Neighborhood Greenspace South.
- Lawn area just south of the fountain at Berm Fountain Plaza
- Lawn area at the top of Arco Stub, east side.
- Both Triangles
- Landscape area along Tennis Court Street, west side.

Conversion to Drip Irrigation
During the landscape conversion of a particular area, it may become necessary, based on the condition of the existing irrigation system, to replace it with a new system. Replacement will most likely be from a spray system to a drip system for improved water efficiency.

As-Built Irrigation Plans
During the preparation of this Master Plan, it became apparent that a site plan showing all know irrigation lines and components would be extremely helpful in both future maintenance operations and implementation of landscape conversions. To that end, a scaled drawing delineating that known irrigation will be prepared beginning in September 2014 by the General Manager of LLdO. This "as-built" irrigation plan will be prepared based on existing records of repairs, replacement and all other actions that have been recorded in the process of maintaining and improving the irrigation system.


Desert marigold (mesa native)

Conserving Water for Irrigation

The traditional approach to site drainage has been to channel storm water away from the site as quickly as possible, usually into storm drains, then arroyos and finally, the Rio Grande. This is because storms can cause flooding and commensurate damage to site structures. But, if that water can be retained within the landscape without resultant damage, it can be used by plants and that will reduce the amount of irrigation needed to sustain those plants. In examining the site of LLdO, existing drainage patterns can be seen that are shown on the map on page 12. Stormwater flows through the landscape and hardscape and eventually into the mesa at various locations. The potential of that stormwater to augment irrigation and provide for a healthier landscape can be seen in the more dense and larger mesa plants at discharge locations shown on the map at left. Fortunately, the mesa is not dependent on runoff from LLdO even though it benefits. That runoff would be better used to help sustain the 'built' landscape within LLdO.

Use of Water Harvesting to Augment Irrigation

The map at right shows the existing drainage patterns but with added basins where stormwater can be retained and flow can be slowed down. These two interventions can help LLdO save water. The more it rains and snows, the more effective water harvesting will be in reducing irrigation needs. The basins occur along existing drainage swales. These are drainage routes where water tends to concentrate. These areas then become the locations where plants that use more water, such as trees and certain shrubs, should be located. During larger storms, once the basins are filled, the excess water will simply flow through these areas as it now does and eventually, depending on the amount of precipitation, flow out of LLdO and into the mesa as usual. The re-grading for basins would be done as part of conversion to have a minimal impact on cost.

Cisterns and Rain Barrels

Cisterns can be effective in saving stormwater to augment irrigation and significantly reduce the use of city water. Rain barrels are usually much smaller and have a very minor impact on water use due to their lower capacity and the infrequency of rain here. The installation of effective cisterns can cost upwards of $15,000 depending on the needed capacity and so their practicality for use at LLdO is limited with regard to cost-effectiveness. Above-ground cisterns might have a significant aesthetic impact.

Use of Mulching Materials

Where practical, mulching should be done to conserve water, moderate soil temperature, provide a habitat for beneficial insects, suppress weeds and promote a more visually appealing landscape. Mulching materials include both organic, i.e. shredded bark, leaves, pecan shells, etc. and inorganic, gravel, crushed rock, etc. Best for planting are organic mulches because they break down and enrich the soil, provide a better habitat for beneficial insects (help to control pests) and do not create a hot microclimate along the soil surface. Mulch can be made on site from prunning operations and recycled back into the soils of LLdO. One caveat about mulch: It does tend to migrate with wind and water flow and so must be applied with that awareness. Mulches can also substitute for ground cover plants to further reduce water use.

Use of Native and Other Xeric Plants for Landscaping

The term 'native' plants can include plants within a range from any plant growing on site to those found anywhere in New Mexico even though they may be adapted to very disparate environmental conditions. Within this document, 'native' refers to those plants that occur on site and in other local areas and that are adapted to similar environmental conditions. The new approach to the landscape design is one that goes further in integrating it with its surrounding natural environment. Using the same plants that are native to the west mesa means that they will not require much more water to thrive than falls with normal precipitation. Even native plants require irrigation to become established if they are planted from containers. But they can eventually be weaned from added irrigation and so very effectively reduce overall water use. Using native plants also allows a visual and ecological integration between LLdO's common grounds 'built' landscape and the surrounding natural mesa landscape. The native plant palette includes trees, shrubs, cacti, yuccas, forbs and grasses. If planted correctly and given enough space to accommodate their mature dimensions, they will also require much less maintenance.

Additionally, other plants that may not be native, but are adapted to similar conditions or that are tolerant of those conditions, may be utilized in this landscape to serve the interests of diversity and visual variety that residents may prefer. These plants are often referred to as adapted 'exotics'. Use of such plants should be made carefully so that the bosque/mesa identity of LLdO and its "sense of place" is maintained. The native plant palette of the west mesa can be considered to be limited for the purposes of landscaping. To augment that palette, other adapted xeric plants will be recommended for use within LLdO. See the Appendix for the recommended plant palette.

Reducing Required Maintenance

The following measures can minimize the level of required landscape maintenance:

- **Plant Selection** - *choose plants that will not grow larger than the space or block views where they are located.*

- **Plant Placement** - *planting design that provides adequate space for the mature size of the specified plants.*

- **Minimize Lawn** - *lawn requires regular mowing, fertilizing, aerating and edging. Use lawn only where it is functionally needed, i.e., gathering and play spaces.*

- **Use Mulch and Permeable Fabric Where Appropriate** - *use to control and suppress weed growth. Minimize the placement of trees in lawn areas. If necessary, make a mulch ring around tree trunks to omit the need for special trimming.*

- **Minimize Planting Where There Is No Irrigation** - *investigate extending irrigation system to areas where existing landscaping may be struggling or consider un-irrigated landscaping in those areas.*

LEGEND

- Drainage Swale
- Direction of Sheet Flow
- Potential Ponding Basin
- Basin with Small Check Dam
- Canale Draining Into Commons

NOTE

1. Check dams should be kept low enough that in the event of over-topping, the volume and velocity of water will not be great enough to erode the dams. Also, dams should be constructed such that overflow will occur at the ends of the dam rather than over the middle.

Recommendations for Achieving the Project Goals

The prominent goals are to reduce landscape water use by 50% and to reduce landscape maintenance significantly. Converting the existing conventional bluegrass turf to a low water-use hybrid bluegrass type would require up to 50% less water than currently used on the existing turf. Additional changes, such as turning the water off at the loop fountains would constitute significant progress toward satisfying the goal of a 50% reduction in water use. However, the current maintenance requirements of extensive mowing, trimming and punning, etc. would remain unchanged if only the lawn type was converted. To significantly reduce landscape maintenance as a second goal, fundamental changes in the landscape design must be made.

Based on the strategies identified for making those changes, the recommendations for the existing landscape are provided on the following pages and keyed to the map at right. Recommendations are given by location, using the names designated by the community for the various places within LLdO with two new names (Arco Maintenance Site and Doorstep Landscapes coined for this document).

Previous Landscape Conversions

Some landscape locations are not included in the recommendations as they have already been converted to xeric and low maintenance landscapes. These places include the native shrub planting beds along Tumbleweed Street, the Pasture and a few other locations where there do not appear to be any problems.

Illustrated Recommendations by Location

The illustrations, sketches showing aerial and perspective views of the landscape recommendations, are intended to provide a sense of how the landscape could appear if changed as recommended. The format is intended to make orientation easy for the reader and aerial views are keyed with an arrow to the view shown in the perspective sketch. Explanations are keyed by letters to the sketches.

The sketches depict a complete conversion of each landscape area, however, the recommendations can be implemented to some lesser degree as desired by the community. The sketches show large areas depicted with native grasses. These areas can also be a combination of mulches, such as gravel and shredded bark for greater water savings. These are details that would be determined during actual design for implementation.

Some of the sketches may tend to appear somewhat ‘busy’ and so will seem to go against the guiding principle of simplicity. This is mostly due to a bias inherent in graphic representation and actual design and installation should be consistent with that principle. Additionally, the photographs upon which the sketches are based, have a wide angle view which, while an advantage for including many elements within one frame, do distort that scene by making it appear somewhat more spacious than it actually is. For the purposes of this Master Plan, the depiction of the landscapes is conceptual only. The sketches are not intended to present a particular design. Actual design would occur during a subsequent implementation phase.

Trial or Preliminary Actions

As an alternative to the conversion of entire areas as shown in the conceptual sketches and on the adjacent map, smaller, limited areas may be designated for the implementation of recommended landscape conversion on a trial basis. This conservative approach may be indicated if there is uncertainty over the projected success of a particular landscape conversion approach or location. Once converted, the location and actions can be monitored over time to determine success or appropriateness and lessons learned can subsequently be applied on to succeeding areas.

Landscape Approach

As a green alternative to mulches (organic or rock), the sketched recommendations show masses of shrubs among extensive ‘meadows’ of native grasses and wildflowers. This design approach provides both a green relief from the architecture and hardscape but also a similar texture and uniformity with the previous lawn. A meadow landscape may take longer to establish and weed growth will likely take more effort to control in the first years because meadow plantings are numerous and there will probably be less mulching. An alternative to large meadow areas is to use deep mulches in place of meadow plants in some areas. This will help to further reduce water use and possibly some maintenance, especially so if a pervious weed fabric is used under the mulch-as-ground cover areas. Consideration of alternatives can be made during implementation.

View to southwest of a younger La Luz del Oeste Photo: www.Predock.com

LEGEND

Page 19		Pool Commons
Page 20		Doorstep Landscapes
Page 21		Loop Fountains
Page 22		Fountain Plazas
Page 23		Gravel Areas (potential landscape)
Page 24		Incidental Lawn Areas
Page 25		Loop One Medians
Page 25		West Buffer Landscape
Page 26		Gathering Lawn (The Meadow and Arco Stub)
Page 27		Street Berms
Page 28		The Orchard
Page 29		Play Area
Page 30		Link Neighborhood Greenspace (Typical)
Page 31		Tennis Court Neighborhood Greenspace (Typ.)
Page 32		Transitional Landscape (Next to Mesa)
Page 33		Tennis Court (street) Lawn
Page 34		The Triangles
Page 35		Arco Maintenance Site
Page 36		Coors Entrance Median
Page 37		Loop Two Entrance Median
Page 38		Ornamental Grass Landscapes
Page 38		Native Shrub/Xeric Landscapes

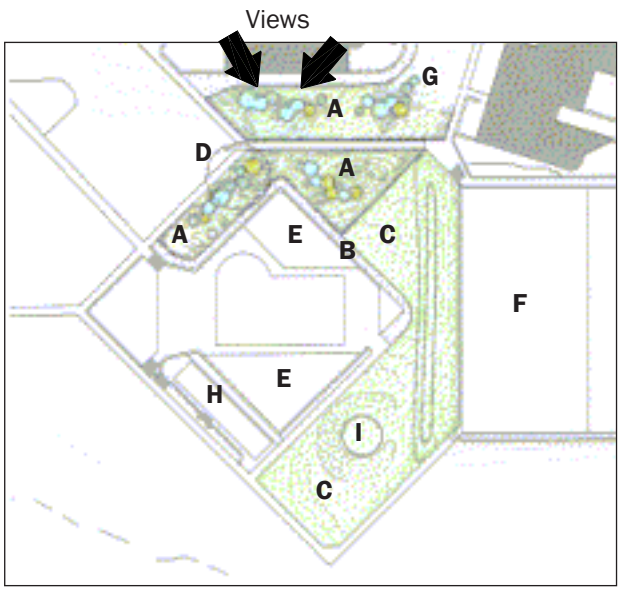
NOTE
The term "Neighborhood Greenspaces" was coined for this Master Plan as a way to differentiate these linear landscape areas from the plazas located within them. Thus, the neighborhood greenspaces are further differentiated by being either "north" and "South" relative to their plazas, i.e. "Berm Neighborhood Greenspace North". Link and Tennis Court Neighborhood Greenspaces are shown above as having typical recommendations as the others not illustrated.

Two triangular lawn areas *within* the pool area are highly functional as lawn. This lawn can remain as is or be converted to a hybrid bluegrass as recommended for The Meadow to save water.

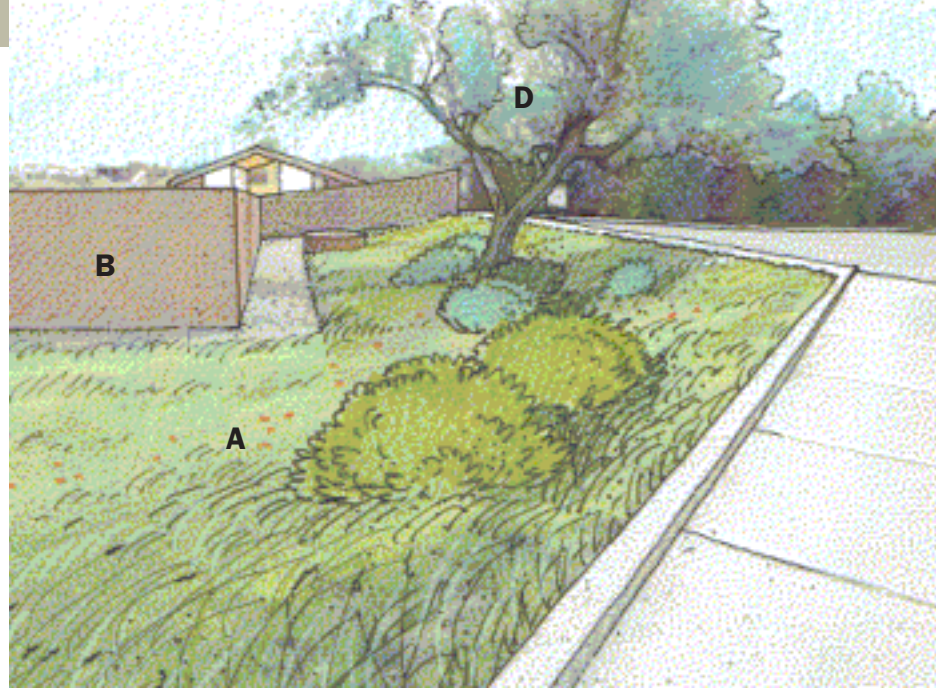
Outside the pool enclosure is a landscape of extensive lawn. Most of this lawn area can be converted to native grasses and shrubs as shown in the perspective drawings at right. However, the large lawn area east of the pool enclosure is used for community functions, i.e. gathering, play, tennis observation. Given the steep slopes and functional attributes, removal of the lawn may not be indicated. This lawn area could remain and be converted to hybrid bluegrass. It could also be converted to more native grasses and shrubs. If the latter option is taken, some grading would be necessary so that slopes would be made less severe. See Playground on page 29 for recommendations within the SE portion of this area.

Keyed Notes

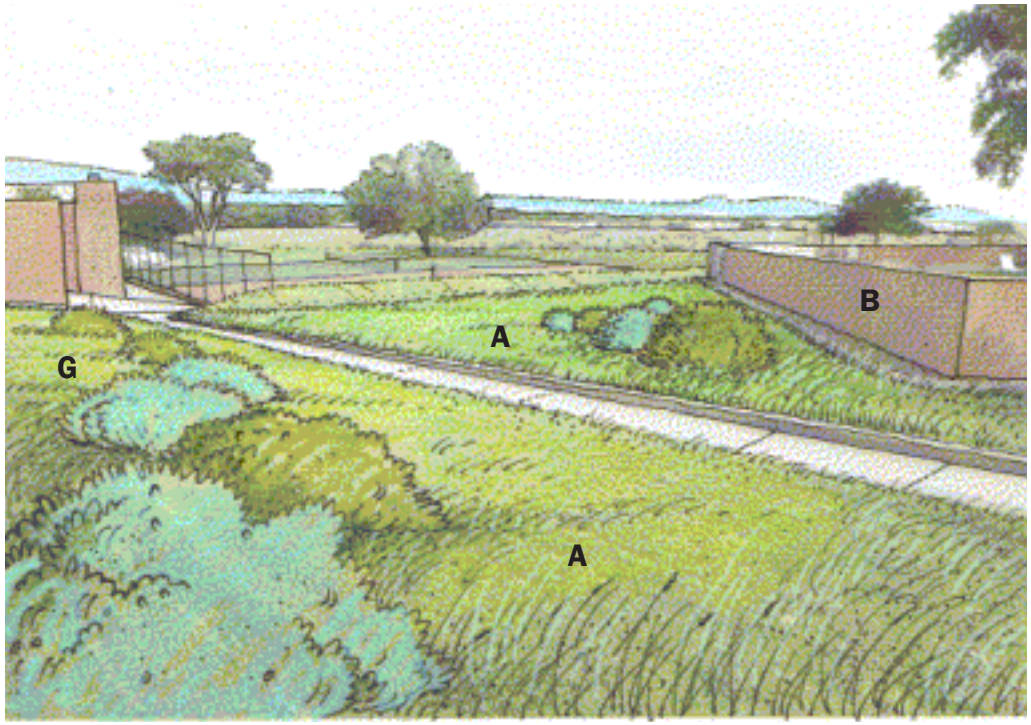
A Native grasses and shrubs conversion.
B Pool enclosure wall.
C Existing lawn area.
D Existing Russian olive tree to be replaced.
E Existing lawn areas within pool area.
F Tennis courts.
G Landscape extension of south Pool Greenspace.
H Bocce Ball Court.
I Play structure.



Aerial View



Perspective View - pool area looking toward pool house



Perspective View - pool area and tennis courts in the distance

RECOMMENDATIONS: Doorstep Landscapes

'Doorstep' landscapes are those that occur between the sidewalk and the front door or facade of residences. Originally considered private and belonging to the residents, these landscape areas are now within the LLdO common grounds landscape.

Currently, most of these areas have no irrigation systems and plantings there are hand-watered if at all. By now, many of the older plants have extended their roots under the walk and into the lawn areas to tap that moisture. The plantings vary from the original plants installed by residents to honeysuckle vines and sometimes just gravel. Within the past decade, maintenance staff have installed permeable landscape fabric under the gravel to suppress weed growth (this ended the need for three full-time staff to pull weeds). The fabric also helps to stabilize the gravel and soil underneath during times when stormwater pours down from canales.

As mentioned elsewhere, the honeysuckle vine ground cover requires high maintenance in trimming away from sidewalks and periodic shearing down to improve its appearance. Most of the time between shearing it is considered unattractive.

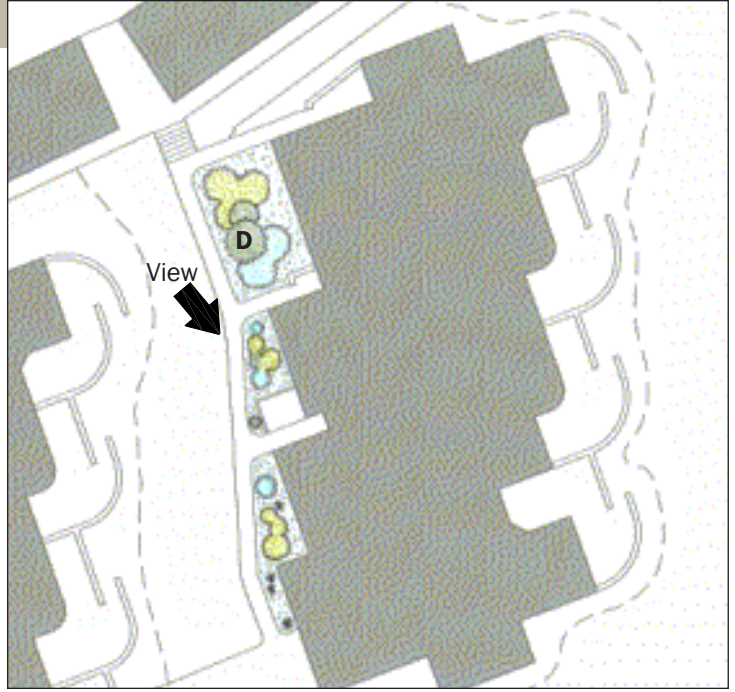
Because there is no irrigation system, planting within these areas should be made with plants that can flourish with very little water beyond natural precipitation. This suggests the use of site natives - shown in the sketch at right.

Another important aspect to consider is that since these areas are within the common landscape, there should be some continuity of a landscape theme. This is reflective of the guiding principle of "simplicity". Therefore, changes to these landscapes should be made from a site-wide perspective.

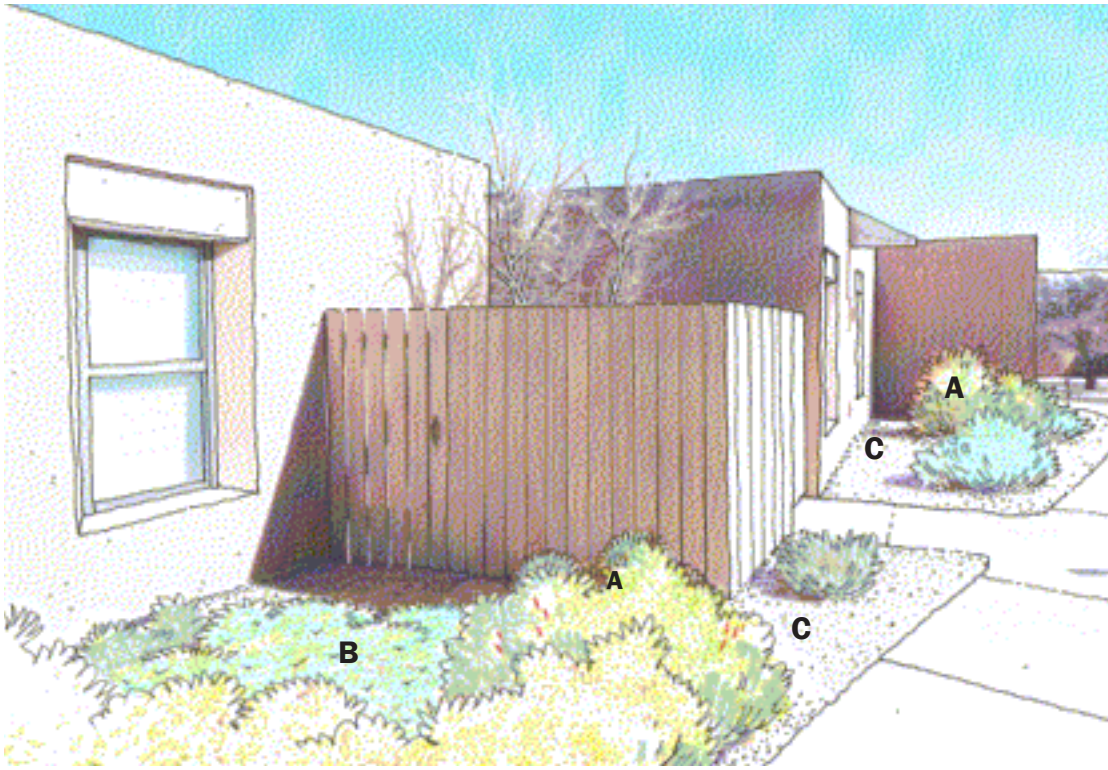
When these areas are re-landscaped, shallow basins where the shrubs are located (away from the building) can be graded to retain some stormwater for irrigation purposes.

Keyed Notes

A Taller shrubs or small trees - shade windows, add privacy.
B Low plants or ground covers - mitigate extensive gravel.
C Existing gravel.
D Existing xeric landscape.



Aerial View - North Tennis Court Greenspace Area



Perspective View

Unlike the plaza fountains within LLdO, the Loop fountains are much more exposed to winds and the resultant water loss due to evaporation and blowing is significantly greater. An important amenity for the plaza fountains is the sound of falling water that helps to mask the sound of distant auto traffic. The amenity of that sound at the Loop fountains is superfluous as people are usually inside autos when in proximity to the fountains.

The higher water loss results in a greater cost for water and increased maintenance because hand-filling is required. This water-waste is inconsistent with the guiding principle of sustainability.

Following are two options for conversion of the fountains:

1 Demolish the concrete fountain and convert the area within the remaining curb to a landscape of native plants, needing only occasional hand-watering to remain healthy and attractive.

2 Leave the fountain wall intact and remove a portion of the concrete fountain floor to allow drainage and root extension. Fill the fountain with soil to become a planter with native mesa plants - also needing only occasional hand-watering. ***This option is recommended*** because leaving the fountain wall in place retains the fountain as a strong entry monument that relates to the plaza fountains within. These fountains are also historical structures and retaining them preserves their part of LLdO's overall design.

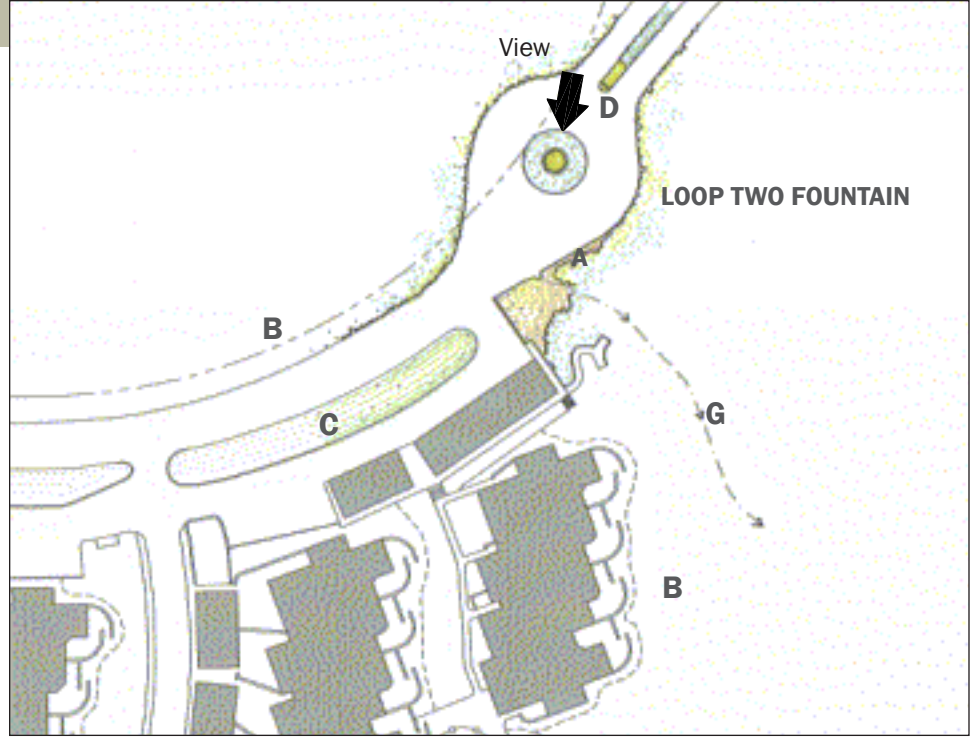
The recent addition of irrigation improvements by maintenance staff to the area northwest of the Loop Two fountain allows for the option of irrigating the fountain landscape if a future line was extended under the pavement from that irrigation system. The Loop One fountain does not yet have an adjacent irrigation line.

Entry Median and Sign Near Loop Two Fountain

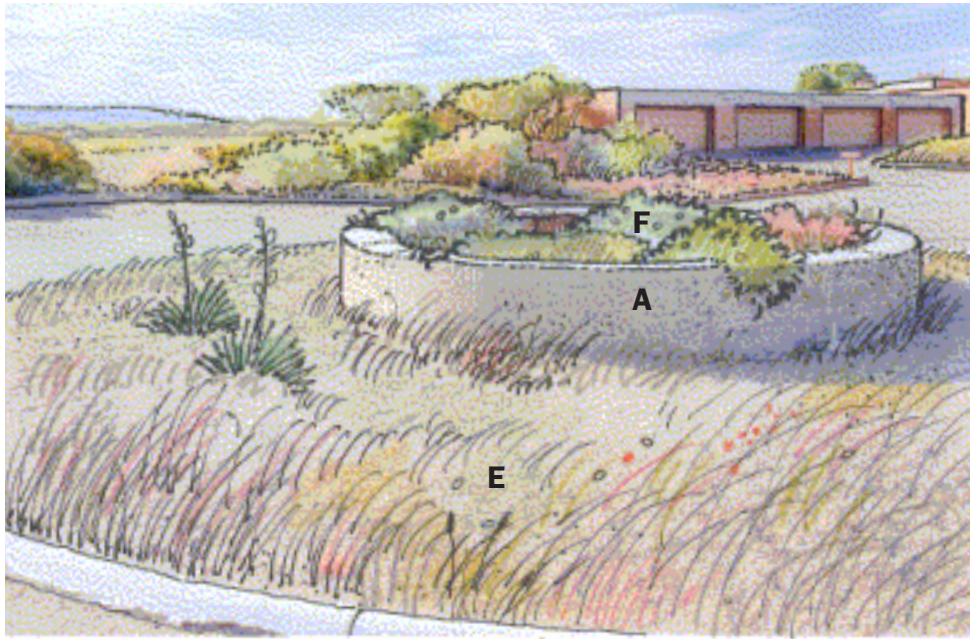
Currently, this median contains a mixed planting of native shrubs. This median is located beyond the LLdO property line. Landscape improvements there are subject to approval of that property owner. See North Entry, page 37.

Keyed Notes

A Loop Two - same treatment intended for Loop One Fountain.
B Property Line - approximate location.
C Berm - existing native grass.
D La Luz sign (signs need renovation).
E Native grasses and yucca (mesa plants) - un-irrigated (may remain as gravel to lower cost of conversion).
F Selection of colorful and cascading shrubs - intermittently hand-watered or add drip irrigation (existing stub for Loop Two fountain).
G Drainage Arroyo.



Aerial View - showing Option 2



Perspective View of Loop Two Fountain - showing Option 2

RECOMMENDATIONS: Fountain Plazas

Each of the six fountain plazas are unique, however, three of the plazas (Link and Tennis Court North and South) share a common problem. The original planter spaces for the trees were sized too small to allow for adequate air and water to penetrate the soil and reach the tree roots. Additionally, two of these plazas are planted with trees whose mature size puts them in conflict with views if they are not routinely topped. Also a problem is that the trees do not have an irrigation system and so must be hand-watered - added maintenance that most likely results in the trees not getting adequate water. Inadequate irrigation has made them susceptible to disease and poor growth which they exhibit.

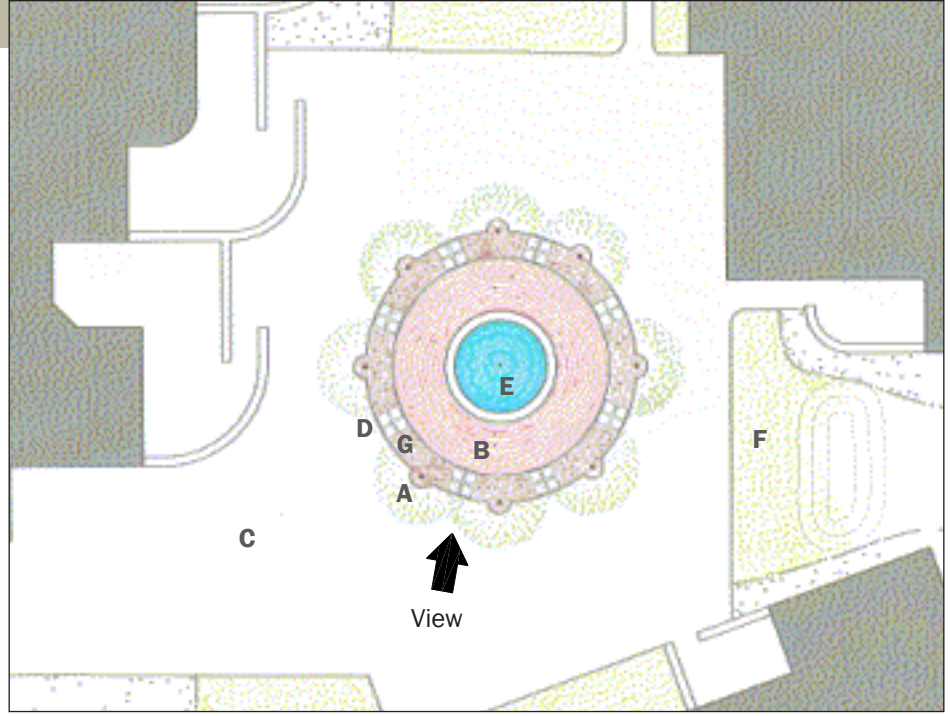
A recommended solution to the above problems is to remove some brick pavers to create a larger tree planter. Depending on community desires, the trees can be replaced with more suitable trees that will get off to a healthier start. Adjacent irrigation may be modified to extend a drip irrigation line to the trees to ensure adequate water.

The sketch shows one possible design revision removing some brick and adding 18 inch square concrete step stones between surrounding concrete pavement and the brick around the fountain. This is a minimal and relatively inexpensive intervention. There are other possible design options, including shade pergolas and arbors in lieu of trees, albeit expensive.

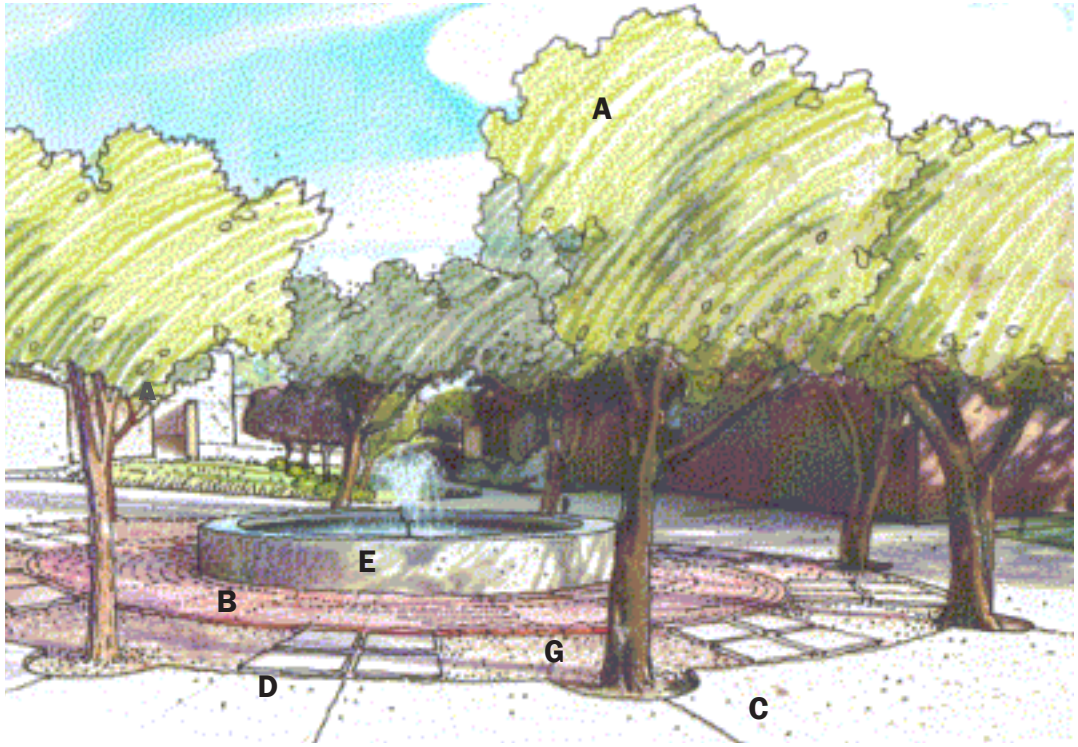
The addition of a bench in a shady location within the plazas would be a worthwhile amenity.

Keyed Notes

A New trees.
B Existing brick pavement.
C Existing concrete pavement.
D New concrete step stones.
E Existing fountain.
F Irrigation system source for new drip irrigation to trees.
G Enlarged tree planter.



Aerial View - South Tennis Court Plaza



Perspective View - South Tennis Court Plaza Fountain

There are numerous areas of gravel (gray “pea gravel”) throughout LLdO. Most of the gravel areas occur adjacent to walls and buildings. Gravel areas between structures and lawn were widened to protect the stucco from sprinkler spray. Other gravel areas occur in narrow areas between pavement and buildings. Where the pea gravel provides an irrigation buffer between buildings and spray irrigation, the gravel width could be extended to span twelve feet to provide better protection to stucco from wind-blown spray when the landscape there is converted to xeric.

With the exception of a very few locations, the gravel-only landscape promotes simplicity and helps reduce maintenance and water use without seeming to be excessive.

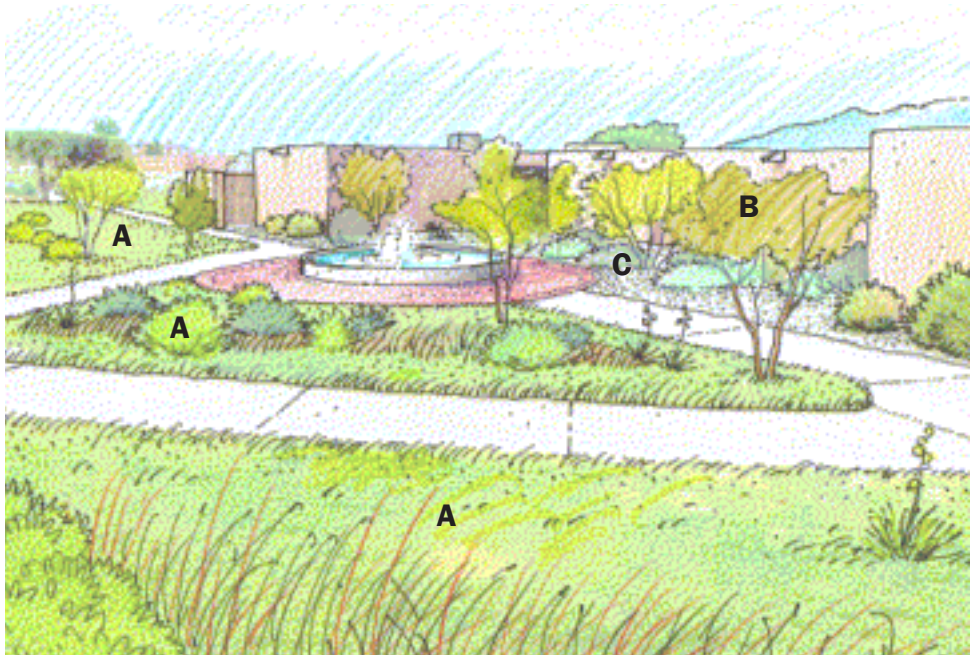
Recommendations are to keep most of these areas unchanged. Most of these areas are not covered by the current irrigation systems. If the community desires, plantings could be added in a few locations but would need to be plants that require little to no maintenance or irrigation.

The photo and sketch at right shows one gravel area that was once landscaped but plants there died and were replaced. This area includes the adjacent South Berm neighborhood greenspace that could be enhanced with additional plantings as shown in the sketch below. The sketch shows recommendations for converting the adjacent lawn to a meadow-shrub landscape with scattered small trees.

Keyed Notes

A Meadow-shrub landscape conversion of greenspace.
B Addition of small trees.
C Enhanced landscape of gravel area.

Existing landscape - South Berm Fountain Plaza



Sketch showing potential landscape conversion

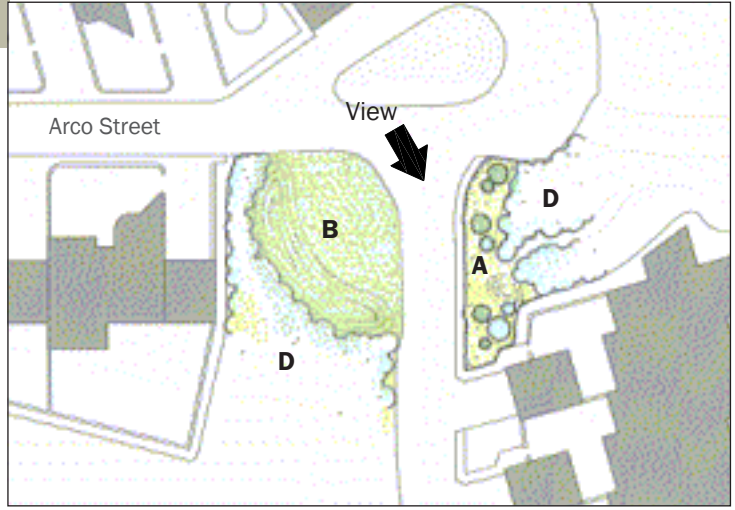
RECOMMENDATIONS: Incidental Lawn Areas

There are various places (usually with a berm) where lawn is growing that are adjacent to and could easily be converted to a native mesa landscape. These areas include the northeast corner of Arco Stub and two bermed lawn areas between buildings adjacent to Tennis Court Plaza greenspace south (page 32). The lawn in these locations is mostly gratuitous and could be eliminated with savings in maintenance and water use.

The existing lawn and berm area on the northwest corner of Arco Stub serves as a neighborhood gathering space. This area should remain turf but could be converted to a low water-use turf.

Keyed Notes

A New native mesa plantings - extension of native landscape.
B Existing bluegrass berm neighborhood gathering space.
C Existing bluegrass berm adjacent to native landscape.
D Existing native mesa landscape.



Aerial View

Existing landscape - Arco Stub

Sketch showing potential landscape conversion

Loop One Medians and Cottonwoods

The Loop One medians were intended to be the main entrance into LLdO with an 'alameda' of cottonwoods along the medians and along the west edge of Loop One. As less irrigation water has been used, especially since the berms were converted to native grasses, the cottonwoods have been in decline. The trees in the median benefit by irrigation to the median lawn and the adjacent berms. Still not receiving adequate water, their decline has been slow, albeit steady. The cottonwoods to the west are not able to receive as much water and so their decline has been more rapid.

As identified under Strategies, the lawn in the medians could be removed and the grading changed to create a series of water harvesting basins and small check dams (low earth mounds) to prevent runoff and make that water available to the trees. Curbing should be added for protection from traffic and to help retain water and soil.

The cottonwoods within the medians can remain in place under observation to see if the water harvesting has a positive effect. Even though they are not as vigorous as other cottonwoods (i.e. within the bosque) they still have a functional canopy and presence. The trees west of the roadway should be removed as their poor condition conveys a negative impression. A mix of native grasses can replace the current lawn within the medians but the irrigation schedule must be set with the cottonwoods in mind. Replacement of the cottonwoods can be one of two options: a mixed landscape without trees; a closely or a replacement species of trees similar to the existing cottonwoods. These are the preferred options.

West Buffer Landscape

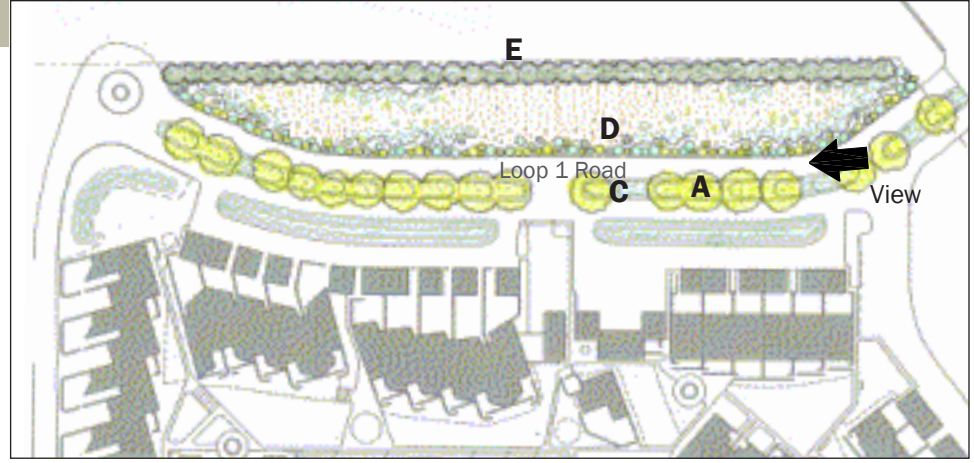
The property west of LLdO will eventually be developed. In recent years, the land was cleared of vegetation prior to development. Development was postponed and the land was sold. The resultant cleared land became a source for blowing sand that collects along the medians and berms, burying the grasses there. In order to prevent this problem from continuing or becoming worse, larger shrubs are recommended to be added along the west edge of Loop One to block the blowing sand. Also, when development does occur, it may create a negative view from LLdO. To both remedy this and to attenuate the wind and sand, a windrow of evergreen trees or large shrubs can be placed along the property line. Establishing this new vegetation has a high probability for success similar to the 'reclaimed' mesa along Link. The irrigation system used for the cottonwoods there can be used for the new windrow and shrubs.

Keyed Notes - Berm Medians

A Existing median cottonwoods.
B Dying cottonwoods on the west site of the road will be removed.
C Median regraded for water harvesting with basins and earthen check dams.

Keyed Notes - West Buffer Landscape

D Add taller shrubs along roadside to increase density to block blowing sand.
E Evergreen visual screen and wind attenuation along property line.



Aerial View (west at top)

Perspective View

Tennis Courts Berm

To satisfy the goal of reducing water use, the lawn berm south of the tennis courts can be converted to native mesa planting and once plants are established, a non-irrigated landscape. The lawn slope west of the tennis courts and the lawn of the meadow offer ample seating for viewing tennis games. The aerial view and sketch at right show how this berm can be converted from lawn.

The Meadow

The Meadow is the primary gathering space for the LLdO community. A mowed lawn with shade trees is probably the optimal landscape setting, both functionally and aesthetically. For this reason, the meadow lawn area should remain as it is. However, the current water-needy lawn can be replaced with a low water-use lawn ("Bandera" has been used elsewhere at LLdO) that will look and function the same but would require half the water that the current lawn needs to remain healthy. The berm that "keeps the mesa at bay" along the south and east sides of the meadow offers a place to sit and watch. It could either become a native grass transitional planting between lawn and mesa or remain as is in lawn depending on community preference. When replanted, the low spot should be slightly raised to spread drainage more evenly as it appears that some ponding there is interfering with lawn health.

Shade

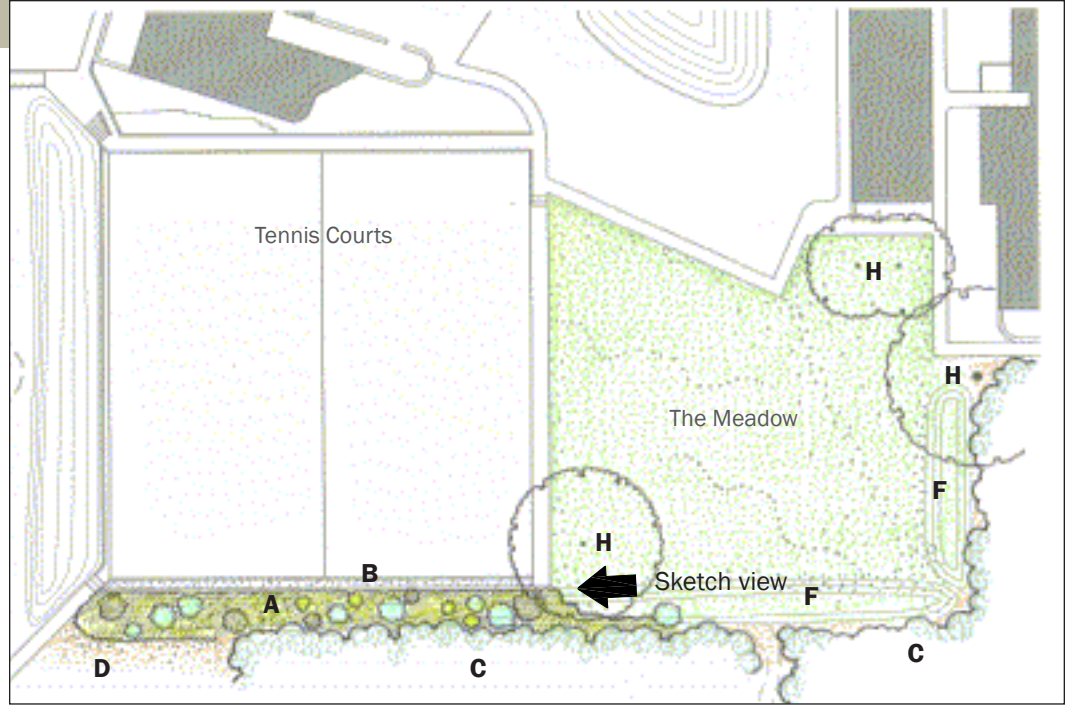
The need for additional shade in the meadow (currently provided by one ash tree) has been expressed. New shade trees can be added as shown without substantially impacting views. Adding more shade trees would be effective, although being fixed in place, they make the space somewhat less flexible and can affect views. Portable or movable shade structures can allow for some additional flexibility see Appendix, page 49. These options are open to community preference.

Keyed Notes - Tennis Courts Area

A Existing berm replanted with mesa natives and allow native vegetation to extend to berm.
B Existing turf blocks protect soil of drainage route.
C Mesa natural area.
D Play area.

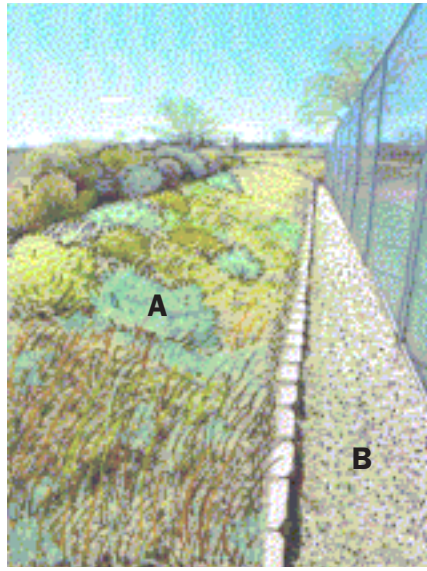
Keyed Notes - The Meadow

E Current meadow lawn area (can be replaced with a low-water use turf).
F Meadow lawn berm.
G Raise low spot to spread out drainage if turf is replaced.
H Existing shade trees - consider removal of ash (surface roots problems).
I Potential new shade trees (not shown - locations determined during the implementation phase of work after study of potential view impact). See Appendix for shade structure alternative to trees.



Aerial View - Tennis Courts and Meadow Lawn

The Meadow - looking east



Sketch of berm conversion at tennis cts.

Originally planted in high-water use lawn, the berms have subsequently been converted to a mix of blue gramma and buffalograss by maintenance staff. The original lawn sod was taken up, replaced with the lawn side down and over seeded with the native grass seed mix. This was both innovative and successful, but the following problems remain:

1 At the time of conversion, maintenance staff attempted to lower the berms so that slopes were less severe and would therefore better retain moisture. It was discovered that the berms contain original construction debris fairly near the surface. Therefore, the berms cannot be lowered without removal of substantial debris.
2 Most of the berms do not have curbs or edging to retain soil and water. This allows cars to drive over the edges in places and erode the soil and compact the grasses.
3 The irrigation heads (original system) only pop-up 4 inches - an adequate height for mowed turf but too low for the taller native grass. Therefore, the grass must be regularly mowed, increasing maintenance and preventing the grass from developing its attractive seed heads in fall. The steep slopes of the berms also prevent optimal coverage by the irrigation spray heads. Without adequate water and with regular mowing, the native grasses cannot reseed and generally cannot be as attractive as they potentially could. The resulting thin coverage contributes to the establishment of weeds.

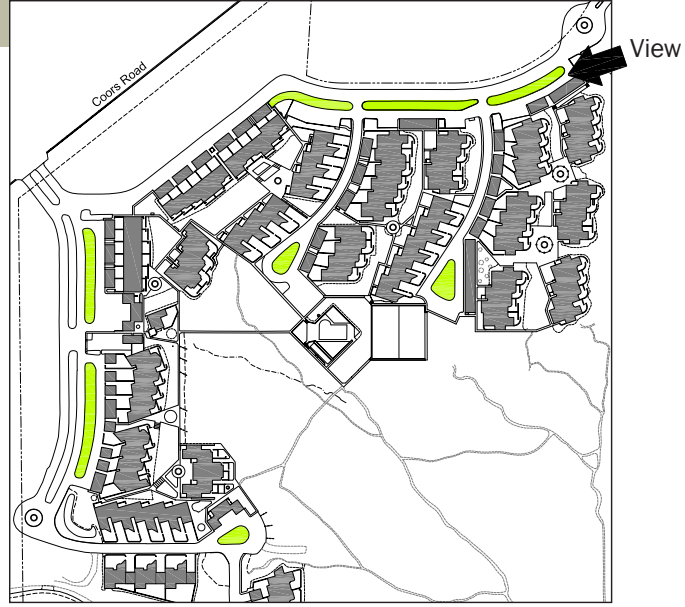
There has been discussion about potential replacement plants for the berms. These range from a mix of native shrubs to sedums and other ground covers. Each alternative plantings will encounter the same problems. The preferred current planting of native grasses provides a very attractive transition between the native mesa and the built landscape of LLdO if the above problems can be ameliorated.

Recommendations

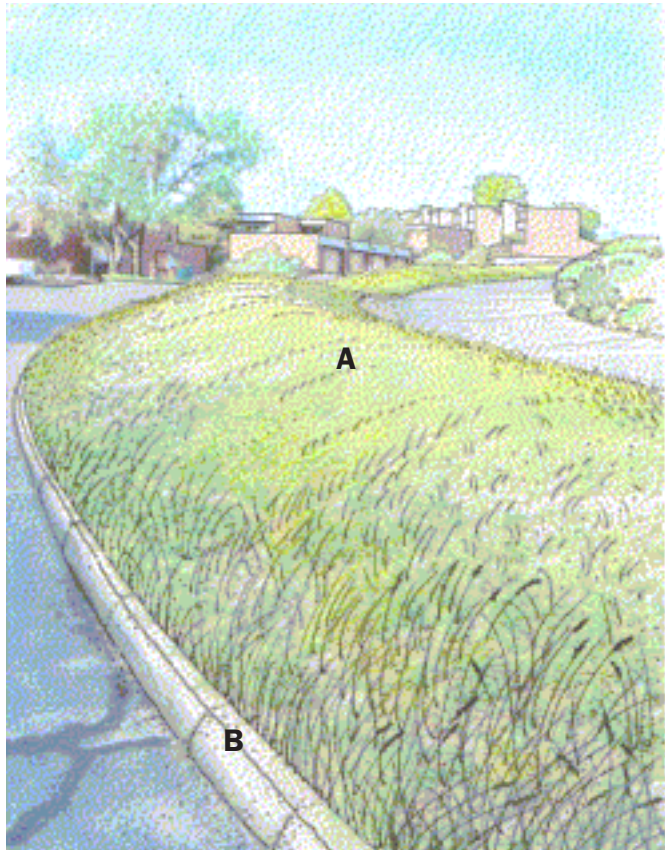
Although there are significant costs involved, the following appear to be the best actions to take in order to correct the above problems and allow the native grass berms to be the resource-conserving and attractive landscape elements originally intended:
1 Install curbing where it does not currently exist. Concrete or asphaltic concrete curbs are the most durable against car traffic, best looking and will fit with those that are existing (consider using the same company as those curbs were well constructed).
2 Renovate the existing irrigation system by lowering pipe and changing irrigation heads to 12 inch pop-ups using flexible extension pipe.
3 Re-seed and re-contour the berms as much as possible where they are eroded and provide a 12 inch level shoulder adjacent to the curb where needed.
4 Re-seeding with buffalograss only should be investigated to allow for the existing irrigation system to remain effective and to be dense enough to compete with weeds.

Keyed Notes

A Existing berm planted with native grass (an alternative is to let the berms “go wild” with a combination of grasses and wildflowers that may should maintenance and perhaps end the struggle of “going against nature”.
B Curb - most of the berm edges do not currently have curbing.



Aerial View - street berms shown in green



Perspective View

Lawn in this area is optional. The mulched circular areas where the turf is cut out around the trees is positive for both ease of maintenance and tree health. It is likely that the trees benefit from the lawn irrigation. To reduce water use, there are two options for landscape conversion:

Option One

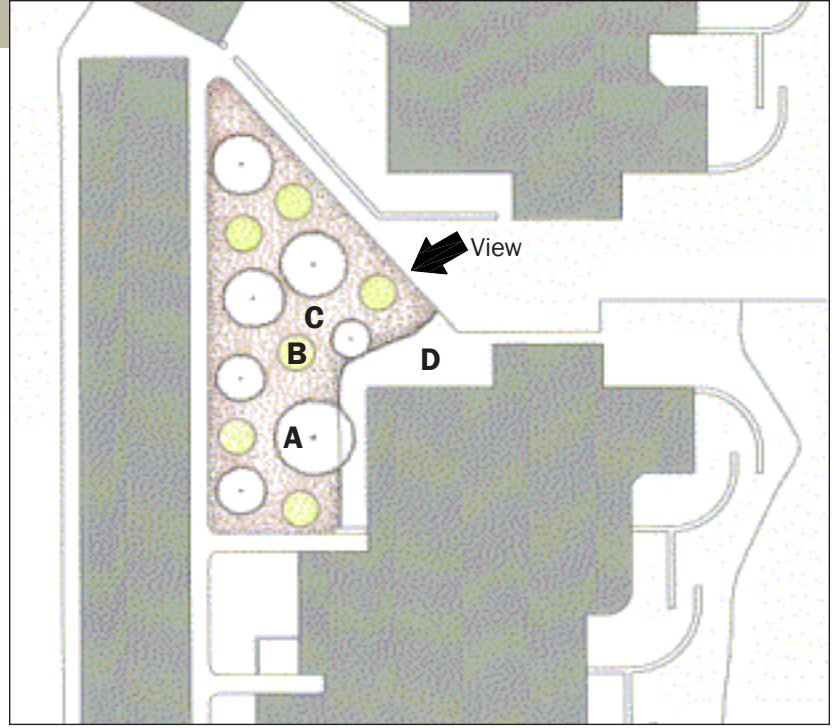
The existing bluegrass lawn can be removed and replaced with buffalograss. The buffalograss requires much less water, retains the mowed lawn aesthetic, and may allow for better air and water infiltration to the fruit tree's roots (it is not as dense as the existing bluegrass). This is easily accomplished as there are two irrigation systems - one each for the lawn and trees. One potential problem is regular foot traffic from the garages. Buffalograss has a lower tolerance for concentrated foot traffic than bluegrass. "Desire lines" - paths worn in the grass may be made into gravel paths through a buffalograss lawn. The mulched circles should always extend to the edge of the tree's dripline (out edge of branches - where the feeder roots are located). One caveat is that if the fruit trees grow too large, the mulched circles may create a 'Swiss cheese' effect on the lawn. In that case, Option Two may be considered.

Option Two

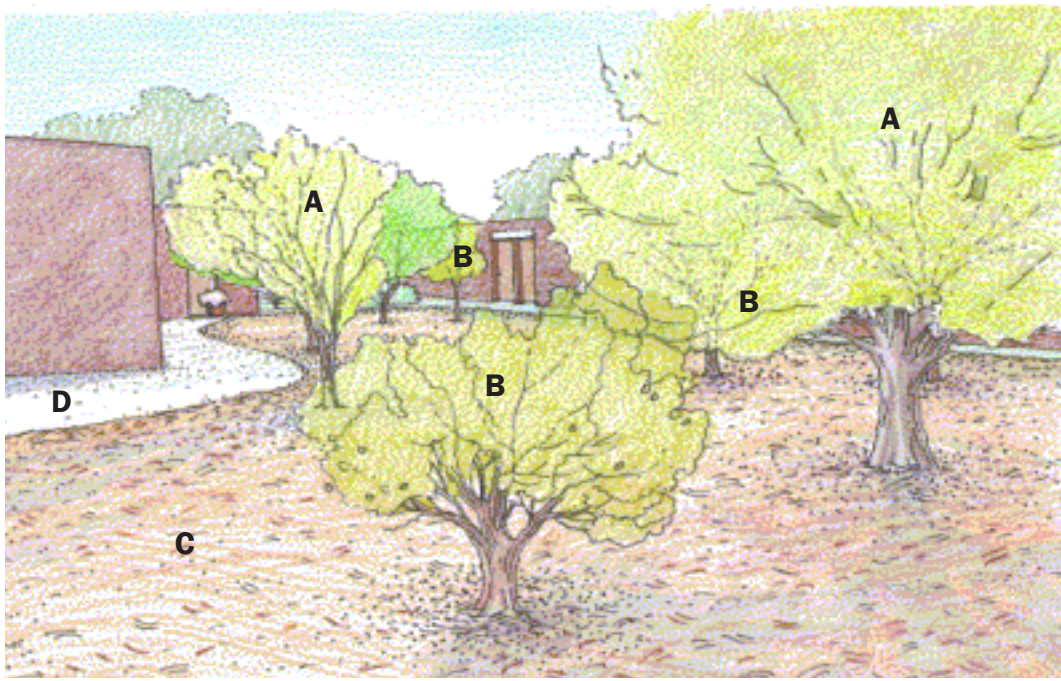
The lawn can be removed and replaced with a medium sized shredded bark mulch. This will provide a healthy soil medium for the trees, absorb fallen fruit, blossoms and leaves and provide a neat and uniform surface cover. There is room for additional fruit trees if they are of dwarf or semi-dwarf rootstalk. Irrigation heads for the lawn can be converted to drip irrigation and heads not needed can be capped. This will significantly reduce flow demand during irrigation and overall water use. This option also reduces maintenance requirements - no mowing or trimming of grass.

Keyed Notes

A Existing fruit trees.
B Potential additional fruit trees.
C Bark mulch area (or buffalograss to replace existing bluegrass).
D Existing gravel area.



Aerial View



Perspective View

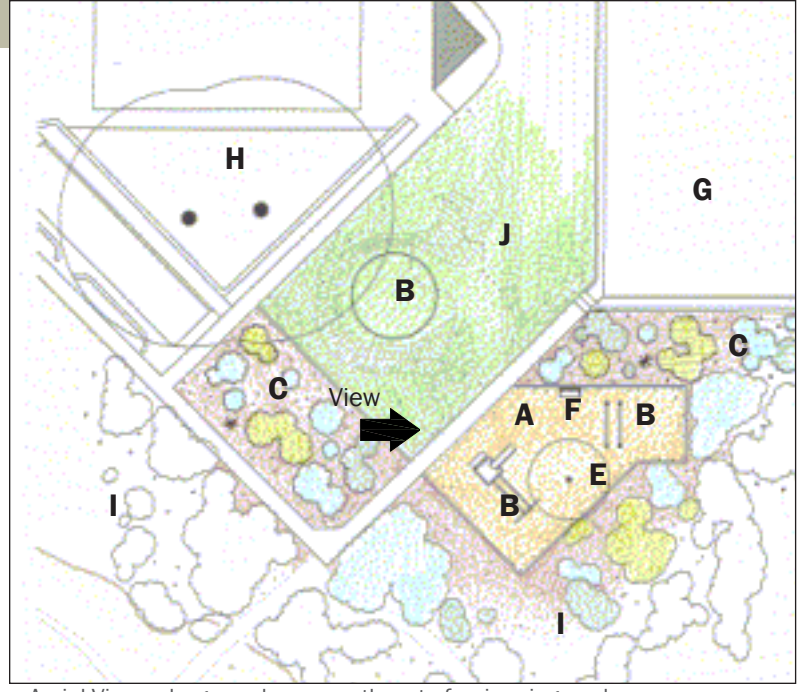
Existing - two existing play areas are distinctive from each other: the steel geodesic climbing structure is surrounded by lawn and the other two play structures across the sidewalk are surrounded by sand, soil and native mesa shrubs. One existing tree provides shade for that space.

Recommended - the plan shows a rectangle of lawn removed and replaced with mesa native shrubs. Existing irrigation heads would determine where the edge between new and existing lawn would occur. Across the walk, 'Engineered wood fiber' could be placed around the play equipment. It currently offers the softest impact surface for playgrounds in the event of falls ('rubber mulch' is an acceptable alternative if wind is a problem). The fiber/mulch area reflects recommended clearances for the play equipment. There are 6 feet on either side of the swing supports and 15 feet both forward and behind in the direction of swinging.

Removal of the lawn around the geodesic climbing structure is made difficult due to the steep slopes that the lawn very effectively protects. If the lawn were removed here, this area would need regrading in order to reduce the steepness of the slopes for protection against erosion. This would also require that the geodesic structure be raised. It is recommended to retain the lawn in this area as it also functions well for play.

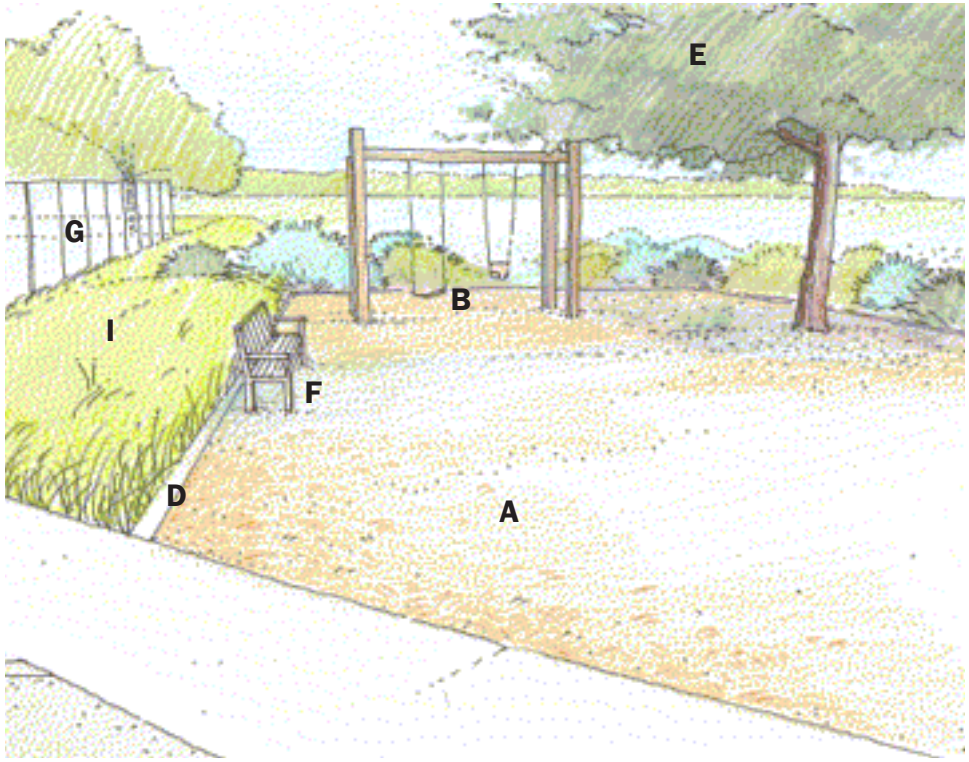
Keyed Notes

A 'Engineered wood fiber' or 'rubber mulch' safety surface material.
B Existing play equipment.
C Remove lawn and re-landscape with native mesa plants.
D Edging to contain safety surface material.
E Existing tree.
F Bench placed in shade of tree.
G Tennis courts.
H Pool area.
I Native mesa landscape.
J Existing lawn and berms to remain.



Aerial View - playground area southeast of swimming pool

Playground with engineered wood fiber



Perspective View

Lawn within this area is not functionally necessary. In place of the lawn, a mixture of meadow grasses could be added to provide a rich visual tapestry to reduce water use and maintenance. A mix of large and small shrubs could be added along the central drainage swale to take advantage of the increased moisture in the area. Minor regrading could allow for limited ponding within this drainage swale and allow more water to be available for groups of small trees and shrubs. A slight meander would be possible and can be added for aesthetic appeal.

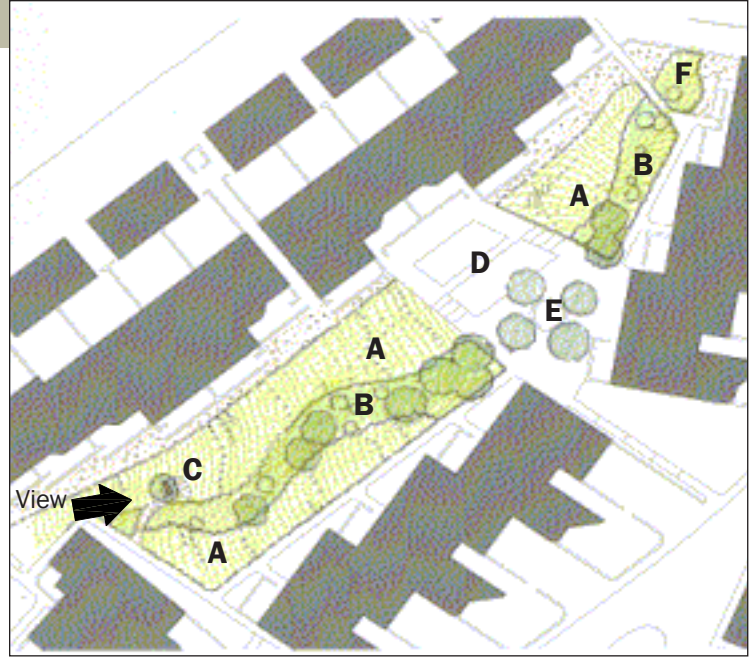
Trees in this area can be about 10 to 12 feet tall at maturity without impacting distant views over buildings to the east. This would provide a 'green' filter between residential blocks within the greenspace. The shrubs could be a mix of native shrubs and food producing varieties such as berries, and flowering accents for seasonal interest, etc. In this way the landscape could provide both aesthetic and productive values. Care must be taken in species selection so that fruit type does not attract undesirable wildlife. However, with conversion from lawn to a more diversified landscape, residents should see a much greater variety of bird life.

This space provides one of LLdO's most compelling views: looking north across the Sandia alluvial plain to the very distant Sangre de Cristos. Views of the Sandias extend over the tops of the buildings. A seating location here and oriented toward these views would enhance this space.

Similar improvements are suitable for the other Neighborhood Greenspaces.

Keyed Notes

A Comprising much of the landscape here would be a mixture of native and xeric ornamental grasses. Where irrigation heads occur, lower grasses would be planted or grasses would be mowed along the pavement edge so as not to interfere with spray angles. That way the existing irrigation could remain in place.
B Shrubs would mostly be placed along the central drainage swale where some shallow ponding could occur. These shrubs would be a mix of different foliage colors and textures for visual interest. Small trees or large shrubs would also be located here.
C Seating location with a weather resistant bench and gravel or mowed pathway connection.
D Existing planting of ornamental grasses - add additional grasses to fill in planter.
E Link Fountain Plaza.
F Add additional plant material here within drainage basin as it is a focal point for the space. Drainage exits through culvert in wall. Keep plantings low.
G Small tree or large shrub for shade near bench.



Aerial View - Link Neighborhood Greenspace and fountain plaza

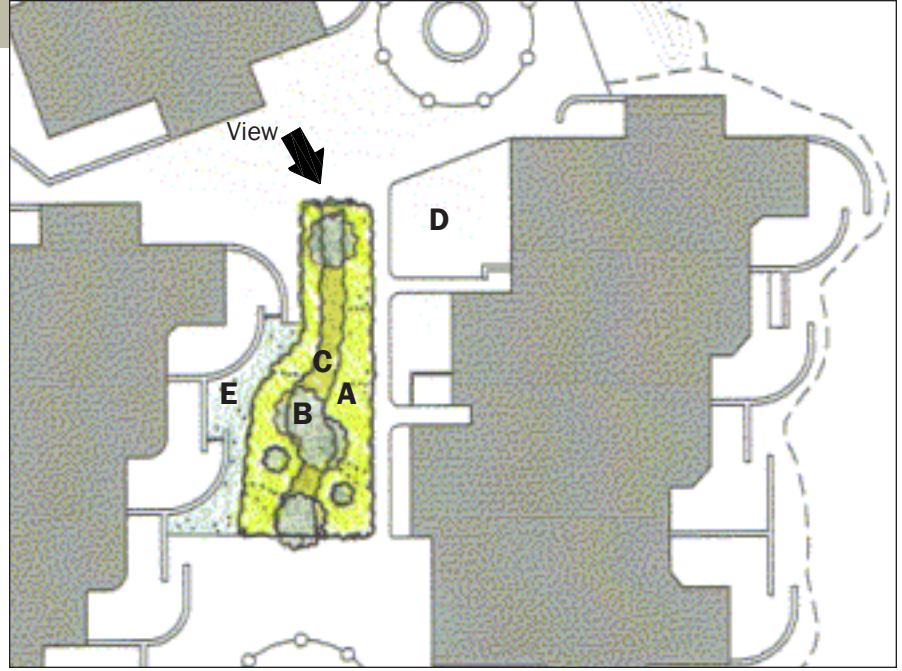
Perspective View

As in other greenspaces within LLdO, lawn within this area is not functionally necessary. Instead of lawn, a much richer and more varied landscape can be created that would include low native grasses along the periphery to allow for the existing sprinklers to spray over with a central 'spine' that would include a mix of taller grasses, shrubs and small trees. The larger plant material would benefit from the concentrated moisture along the central drainage swale there.

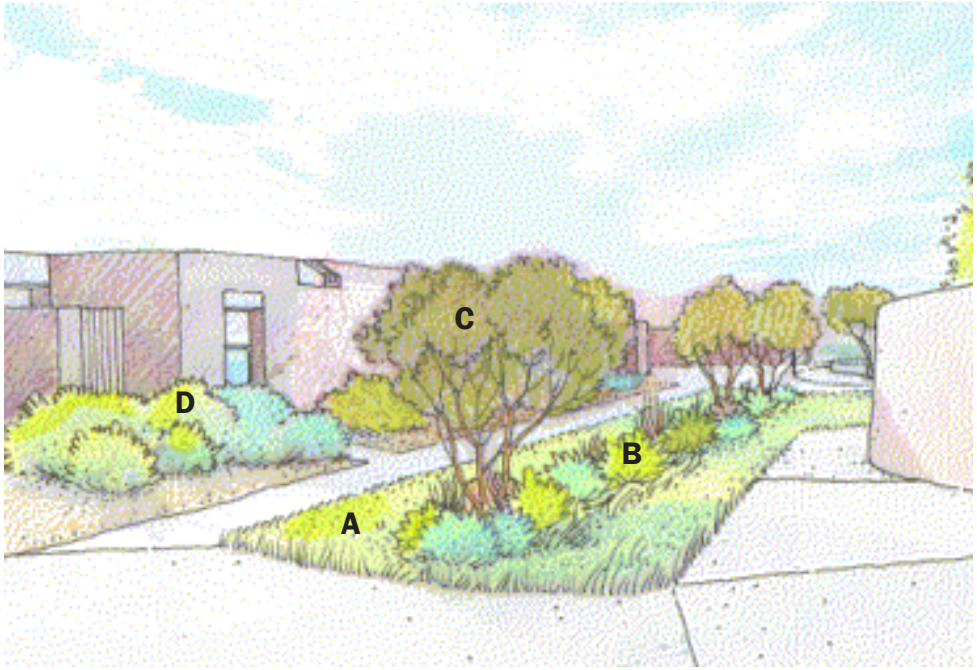
This landscape approach could also be applied to the north and soulth areas of this greenspace (page 32, lower left).

Keyed Notes

A Mixed native grasses - outer edge mowed or buffalograss to allow irrigation pop-up heads to reach middle of planting.
B Small trees/large shrubs and shrubs located along drainage swale where moisture is concentrated.
C Small trees/large shrubs stay below views to east. Also, help to provide visual screening for enhanced privacy where greenspace is narrow.
D Massing of native shrubs in 'doorstep' planting areas.
E Existing gravel.



Aerial View - Middle Tennis Court Neighborhood Greenspace



Perspective View - Middle Tennis Court Neighborhood Greenspace looking south

There are areas where lawn comes up against the native mesa landscape. Where the lawn will be converted to native grasses, native shrubs species matching those growing in the mesa, i.e. sand sage, fourwing saltbush, various grasses, and some others for variety can be scattered as a transition between LLdO's built landscape and the native mesa. Instead of an abrupt edge to either landscape, there would be a softer interface or transition. This would better integrate the two landscapes as LLdO acquires a new landscape that will be more resource efficient and aesthetically in harmony with its natural surroundings.

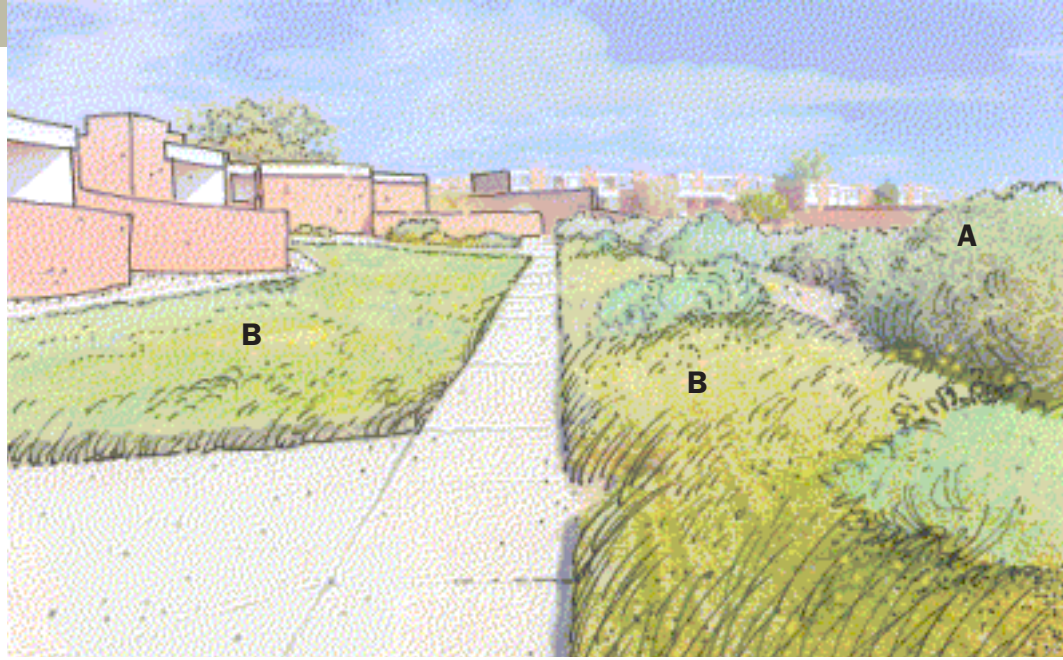
The lawn currently covering the berms in the drawings shown at right protects the steep slopes of the berms. Replacing that lawn with less dense native grasses and some shrubs would most likely not be as effective in protecting the berm. It is recommended that the berms be lowered to lessen the slope before converting the lawn to native grasses. Establishment takes time and erosion in the interim would be a concern.

Keyed Notes

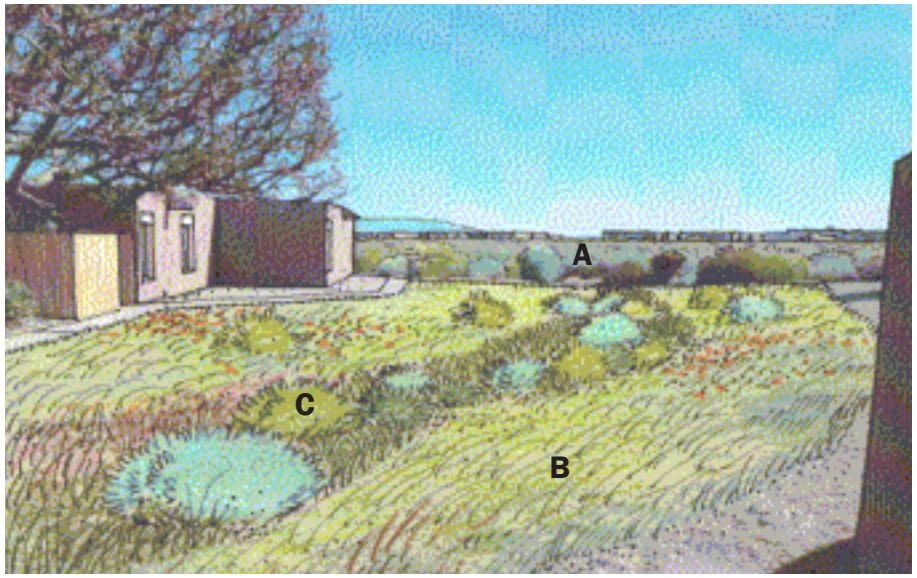
A Existing native mesa vegetation.

B Recommended native grasses and scattered native shrubs. The shrubs are widely scattered so as to be transitional. The built landscape remains more open and simple.

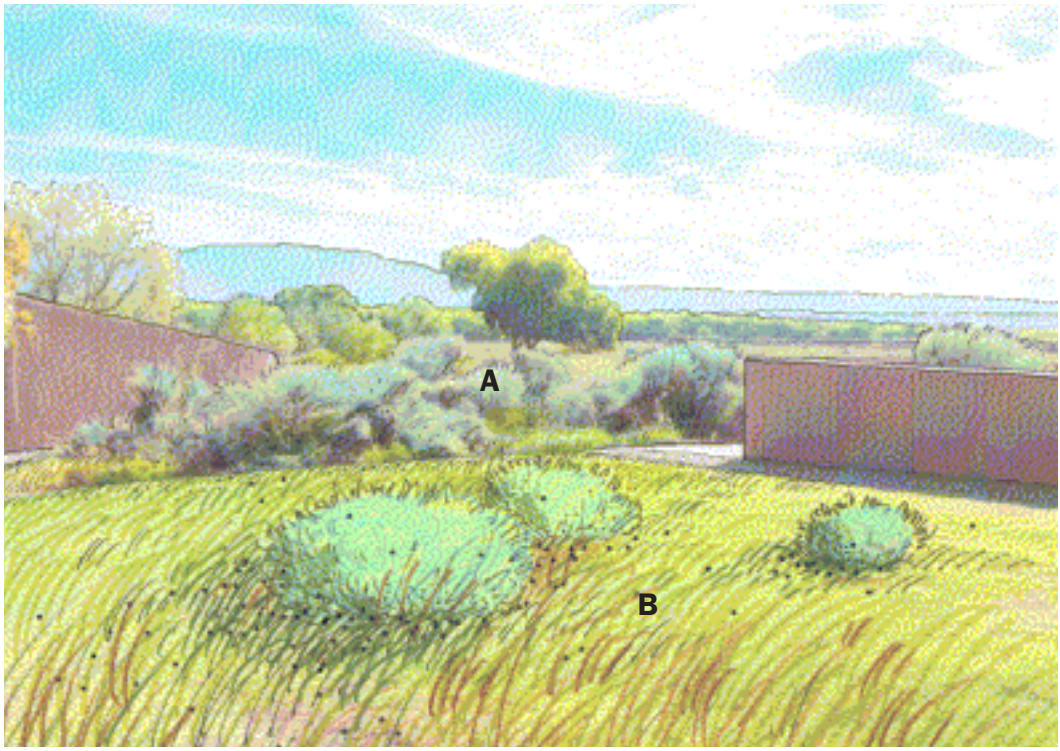
C Shrubs and taller grasses are concentrated along the center drainage swale where water harvesting basins can be located.



Perspective View - North Berm Neighborhood Greenspace, mid area looking north



Perspective View - South Tennis Court Neighborhood Greenspace



Perspective View - From Putting Green looking east

It is recommended to convert the lawn in this area to a mix of native grasses, wildflowers, some masses of native shrubs and a few small trees. If a lawn area is desired, a part of the native grass could be regularly mowed to provide an area for infrequent use. A few small trees or large shrubs will help to 'soften' the tall stucco walls there. The existing pea gravel buffer between the grass and walls could be widened during conversion to 12 feet to protect the stucco from over-spray.

With the new landscaping creating a barrier of sorts, a gravel pathway should be added so that those residents have a walking route to take to either the mailboxes or garage if desired.

The trapezoidal shaped landscape area at the south edge of this greenspace has some runoff directed to it from the concrete pavement to the west. A small basin can be created near the lower portion to retain some of that runoff for use by the plants there. This area is also suitable for a bench location.

Keyed Notes

A Tennis Court (street).
B Recommended lawn conversion to native grass meadow with groupings of native shrubs and small trees.
C Gravel path.
D Water harvesting basin.
E Potential bench location.
F Widen gravel buffer.
G Drainage swale adjacent to paved surfaces to prevent drainage onto pavement.

Aerial View - Tennis Court Street landscape area

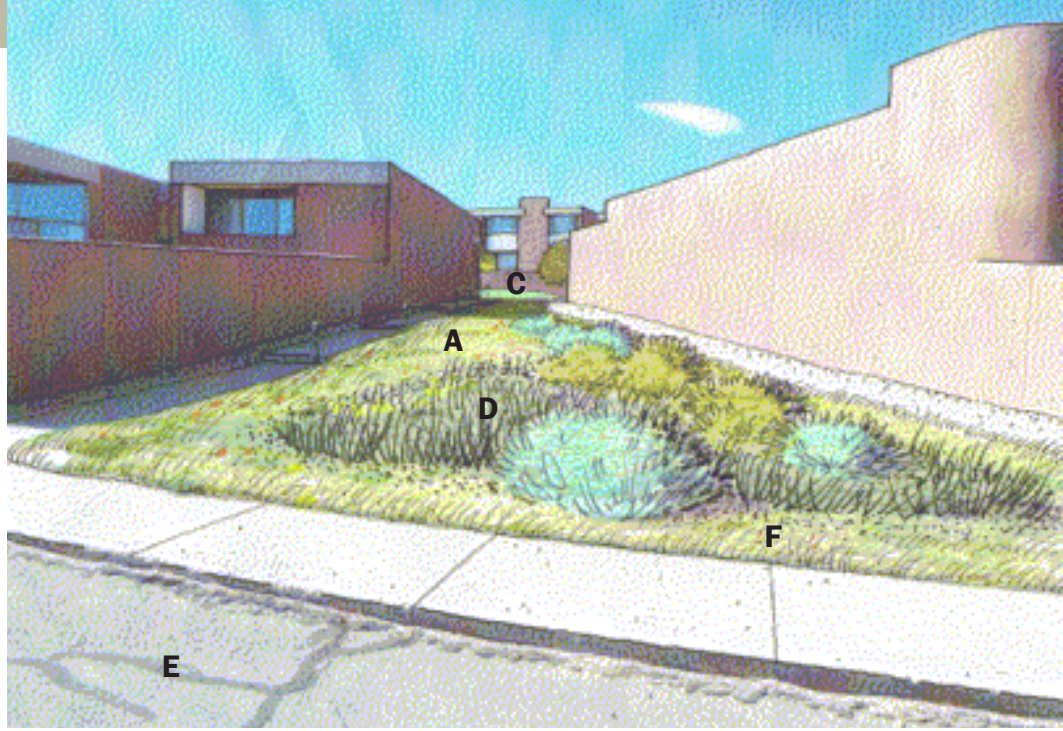
Perspective View - Tennis Court (street) landscape area

These lawn areas can easily be converted to mixes of native grasses, masses of low native shrubs and, in the east triangle, some small trees. The important issue with these two spaces is that they are view corridors and any plantings should not obscure views. The small trees can be placed just south of the walk in the east triangle to soften the stucco walls and provide some shade for pedestrians using the sidewalk. The trees would be just outside the view corridor as shown.

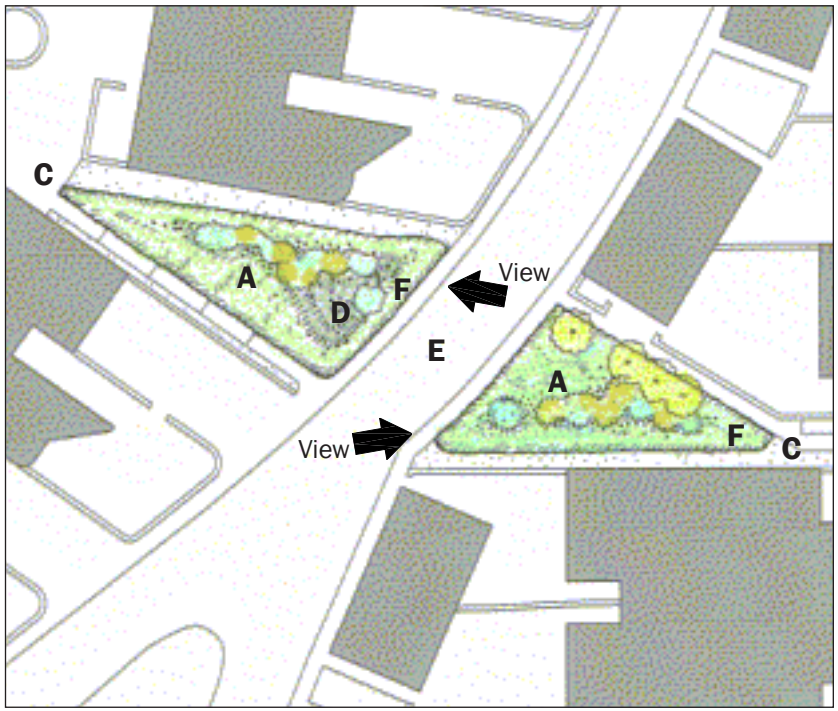
Water harvesting basins can be placed at the bottom of the slope in each triangle, most effectively in the west triangle (it is wider there) to prevent runoff in addition to holding water for plants.

Keyed Notes

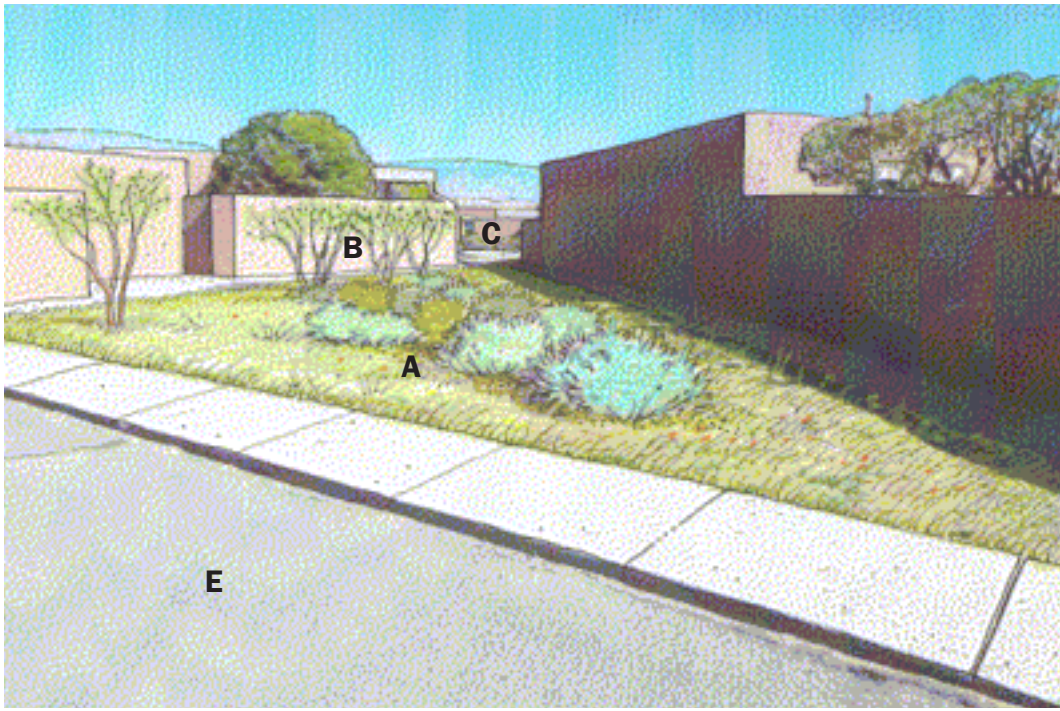
A Lawn converted to mixed native grasses and shrubs.
B Small trees placed out of view corridor soften stucco walls and provide some shade to pedestrians along walk.
C View corridor remains open.
D Water harvesting basin at base of slope.
E Pool Street.
F Drainage swale adjacent to paved surface at lower elevation of area to catch runoff and prevent minor washout.



Perspective View - west triangle



Aerial View



Perspective View - east triangle

Site Maintenance

Maintenance operations require that there be a storage area for waste debris generated by on-site maintenance and construction operations. The debris is placed on an almost daily frequency and is stored for varying amounts of time, usually based on amount of debris generated. To minimize hauling costs, removal off site occurs infrequently.

The Current Location

There were previous sites where waste debris was placed with the principal site being the junction at roads Link and Loop One. Those sites are no longer used. The current debris site was established in 1997-98 and is located south of intersection of Loop One and Arco Street. It serves now as the only place to store refuse, such as pruning and mowing waste, sod and other vegetative materials ('green' waste) and construction materials and debris.

Access to the Site

There is a narrow unpaved road adjacent to 2 Arco that is used for tractor and truck access. Additionally, materials are dumped from Loop One down the slope from a portable cart. Sometimes, materials are stored for short periods and piled at the edge of Loop One above the dumping location below. When these materials are hauled off-site, the unpaved access road is used for the required truck.

Problems

- Unattractive and spoiled landscape at dump site.
- Potential noise (maintenance equipment).

Suggested Remedies

The following policy is suggested:

- Designate a specific and limited area for debris storage to be smaller than the current area. This will require more frequent off site hauling (may increase hauling expense). This site should be moved to be as far west as possible to better conceal it from LLdO views.
- End top of slope dumping and require cart dumping to use the unpaved access road (may require that cart be used with lighter loads).
- The access road may be marked with steel "T" bar stakes or similar so that it remains only as wide as needed and native vegetation can fill in.
- All green waste should be taken to locations that will compost and recycle it. Other debris can be taken to city convenience centers managed by COA Solid Waste. Receipts for dump fees should be required prior to paying haulers to prevent illegal dumping.

Site Screening should not be necessary if the debris is kept to a minimum amount and stored adjacent to the west property line at the foot of the slope. This location is not visible from the road and is obscured by the existing native shrubs between it and Arco residences. The sketch shows an evergreen screen if desired by residents.

Keyed Notes

A Existing vegetation.
B Proposed evergreen plantings to screen view of debris from Arco residences.
C Access road.
D Remove concrete pads that were used for dumping from top of slope.
E Backup area for vehicles.

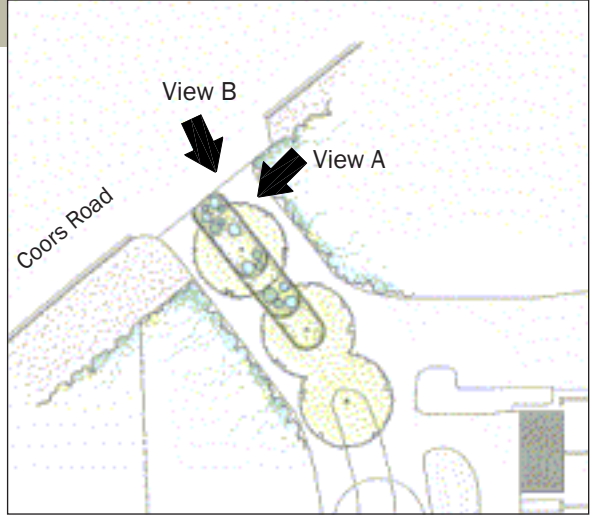
Note: A sketched plan (2006) was prepared by General Manager, Marc Hirschy that shows a well organized maintenance area that includes provisions for on-site mulch production and composting that would allow organic waste produced on-site to be recycling back into the landscape of LLdO, saving the cost of export and the loss of useful materials.

Arco Maintenance Site looking southeast from Loop One

RECOMMENDATIONS: Coors Entry Median and Sign

The Coors Road Entry median is a prominent landscape and the public face of LLdO. As such it should convey a sense of the community. The sign is of a style reminiscent of the late sixties when LLdO was designed and constructed. It is unique, understated and elegant. That is the sense of this community that the sign conveys.

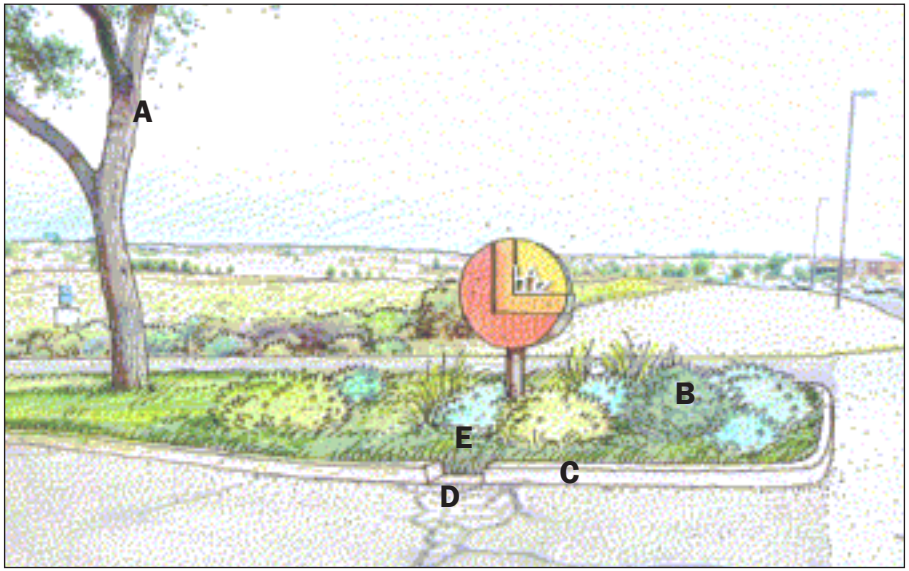
The recommended design approach is refinement and enhancement. First, the median needs to be contained by the addition of a curb. This will prevent the existing soil erosion and provide a more refined aesthetic. Secondly, the curb will help to contain water to augment irrigation of the median's landscape. Slots can be incorporated in the curb to allow for runoff to enter the median as water harvesting. The curbs can also provide a terraced series of basins to contain the runoff from the adjacent pavement and hold runoff within the median. Finally, the plantings within the median need to be enhanced with native grasses and shrubs to provide a healthy and vibrant appearing landscape and that is visually in harmony with the native mesa. This last approach sets the LLdO entry apart from others that, while xeric, are visually and ecologically at odds with the mesa landscape.



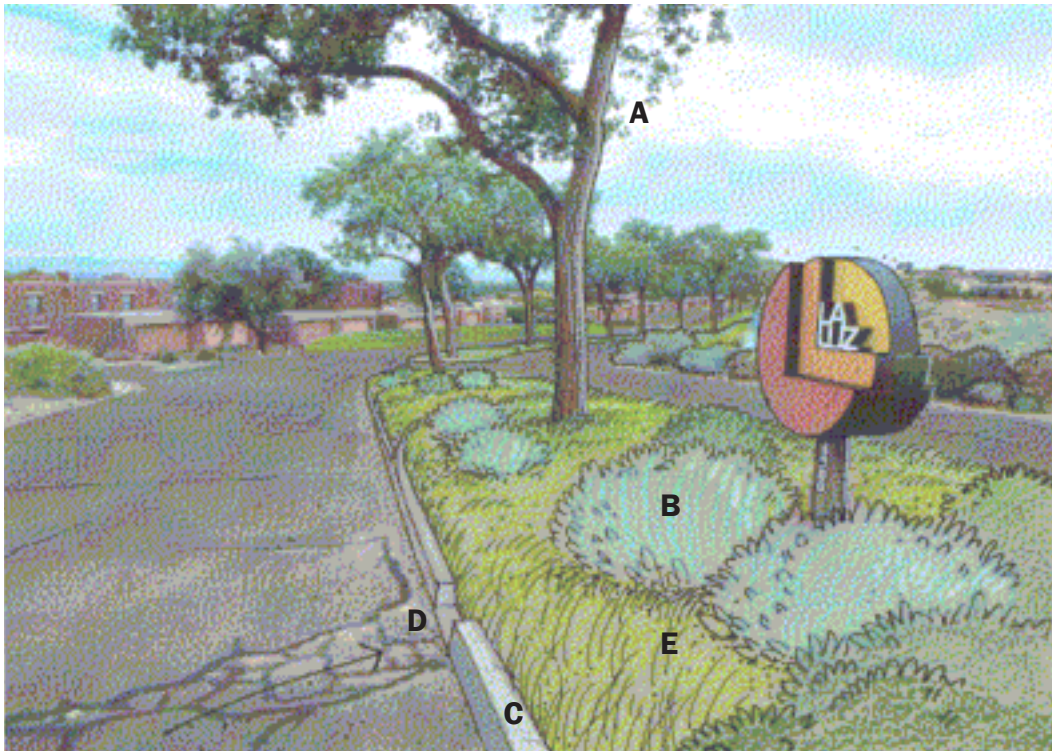
Aerial View - Coors Road Entry Median

Keyed Notes

A Existing cottonwood trees (to remain initially).
B New plantings (should not exceed a 36 inch height above roadway surface).
C New curb and curb terraces.
D Curb slot.
E Water harvesting basin (must be deep enough so that collected water does not exit back through curb slot).



Perspective View A - Coors Road Entry and Sign - Looking South



Perspective View B - Coors Road Entry and Sign

Potential Impact

With the increase in traffic on Coors Road and the resulting dangerous condition in turning left from the Coors Exit, this North Entry point has become more heavily used in recent years.

The LLdO sign, masonry planter, and portion of the median and roadway, are within the LLdO Property. The remaining roadway, median and a portion of the fountain circle are outside the LLdO property boundary. Any improvements to areas outside the property would necessarily need approval by that property owner. The probable impact on this roadway by future development is unknown.

Under certain scenarios of development adjacent to LLdO, some through-traffic could occur. In that scenario, residents may elect to install controlled access into and out of LLdO at this entry and/or others.

The Existing Entry

As it now exists, this entry offers an understated and pleasing sense of arrival to LLdO. Attractive native shrubs and grasses grow within the median and on both sides of the roadway. These provide a strong sense of LLdO's setting within the mesa.

A very low incidence of traffic in and out of LLdO does not indicate the need for a separate pedestrian access. The roadway without curbs and the wild nature of the landscape convey a rural character that recalls earlier days when LLdO was the only development in the area. Traffic running into or over the median and roadsides here does not appear to occur.

Recommendations

This area is outside LLdO; the configuration of future development is unknown; the current entry is attractive (arguably) - *these facts suggest that no substantial changes should be made at this time.* Minor recommendations include straightening the reflector at the median's end and enhancing the planter at the base of the La Luz sign with additional plants.

Keyed Notes

A Existing desirable native shrubs and grasses.
B Straighten reflector.
C Augment planting within planter.

Loop Two Fountain and Entry Sign

View South - Loop Two Entry Median and Distant Sign

Trees - Existing and New

Dryland (xeric) shrubs and grasses have low water requirements. As mentioned elsewhere in this document, the natural precipitation of the west mesa is only enough to support very drought tolerant shrubs, grasses and forbs. Trees require significant supplemental moisture to survive in a healthy state. Many trees become stressed and sometimes die when the landscape around them is converted to xeric and the subsequent reduction in irrigation denies them adequate water. New trees within a new xeric landscape will also need more water than the surrounding xeric plants. This is best accomplished by providing a separate irrigation system for trees. During the implementation (design) phase of landscape conversion at LLdO, a different irrigation system for trees will need to be provided whether that is a modification of the existing system or a new drip system that provides for greater water distribution to trees than the surrounding xeriscape.

Excluded Landscape Areas

A few of the landscape areas are identified on the Recommendations Map but are not included in the set of illustrated recommendations. The following are those landscapes and the reasons for exclusion:

The Ornamental Grass Planting Areas

There are six planters where the previous landscape has been replaced with clumps of ornamental grasses, among other plants. These planting areas are attractive and are popular with residents. While many ornamental grasses (differentiated from 'native' grasses by their provenance and reduced hardiness within this environment) are fairly easy to grow, many prefer moist soils, a preference that is at odds with the approach to a more xeric landscape. To address this, maintenance staff at LLdO uses fabric and deep mulch to maintain optimal soil moisture. Recommendations for these landscapes are to plant these grasses closer together (add additional plants as a retrofit) so that the soil is less exposed to wind and sun. The increase in plant density will be more attractive and afford the grasses a healthier growing environment. Some grasses tend to die out in the middle so this approach varies by grass type. As has happened, occasionally a clump of grass may die. These should be replaced to maintain an attractive density. Annual cutting-back should be delayed until just before growth begins in Spring.

Existing Native Shrub and Xeric Planting Areas

Within the last decade, several planting areas have been replaced with various native shrubs and, sometimes, trees. Though limited, these areas require much less water and maintenance than other plantings and are visually harmonious with the adjacent mesa landscape. Native plants that are being used are Apache Plume, Sand Sage, Sand Cherry, and New Mexican Olive. Exotic xeric shrubs include Vitex, Russian Sage, Blue Mist, etc.

The following areas are successful xeric landscapes or are specialty plantings and are not included in the recommendations:

- Arco Patch
- Arco Fountain and adjacent xeric planters
- Planters along Tumbleweed parking
- Planters at NW Link
- Xeric landscape and seating area south of Loop Two Fountain
- Memorial Rose Garden
- Color Garden (adjacent to The Pasture)
- Maintenance Office Parking Area Landscaping
- Vegetable Garden
- Herb Garden
- One Loop One (not a part of LLdO common grounds)

Conclusion

The recommendations for changing the landscapes of LLdO are extensive and will take time and expense to implement. Constructed 46 years ago, LLdO is relatively young. Many residential developments within Albuquerque are much older and continue to provide desirable places for people to live. Some of those neighborhoods range in age between 80 and more than 120 years of age.

LLdO has a long future ahead in continuing to provide a very desirable residential community. As time passes, there will be adjustments that the residents will need to make to ensure that LLdO remains progressive, desirable, safe, healthy, attractive and affordable. Converting its common grounds landscape to meet current and likely future standards for water and energy conservation will help to maintain LLdO as a viable and desirable community in which to live.

Rationale for Priority Designation

The extensive LLdO common grounds landscape, conversion improvements must be phased over a protracted time frame. Setting a hierarchy of priorities is necessary so that areas deemed more important can be converted first. The priorities were determined by discussion among the CGMPC members and Marc Hirschy, General Manager. Priority is based primarily on the two project goals: 50% reduction in irrigation and significant reduction in required maintenance. Some recommendations are based on aesthetic improvements, but these are designated as lower priority.

High Priority improvements were distributed evenly across LLdO so that they were not concentrated in one area. An effort was also made to make the various priorities similar in total area, although there is necessary variability. Larger sized areas were designated as Medium Priority so that any lessons learned could be applied during subsequent phases of implementation (the exception is Tennis Court Greenspace South because of its adjacency to the mesa).

The following are explanations of the priority designations:

High Priority Areas

Based on the goals of a quick reduction in water use and significant aesthetic impact.

- *Make one native grass berm at the top of Loop Two a prototype for the remaining grass berms.*
- *Conversion of the two Loop fountains to landscape planters.*
- *Conversion of a mid-size area within each 'neighborhood' greenspace.*
- *The Triangles.*

Medium Priority Areas

High visibility areas that will not result in a significant reduction in water use.

- *Coors entry median landscape*
- *Three of the fountain plazas where recommendations include pavement improvements, new trees and irrigation.*
- *Remaining larger turf areas within Neighborhood Greenspaces.*

Low Priority Areas

The remainder of the lawn areas, taken together, that will have a significant reduction in water use.

- *Remaining Neighborhood Greenspaces, Doorstep Gardens, etc.*

For clarification of specific recommendations, see the **Recommendations Key Map** on page 18 and the illustrations that follow it for specific locations.

Lowest Priority Areas

Includes existing landscaping that would probably remain but could be augmented or enhanced with additional plants, etc.

Some of the turf at LLdO provides a more functional purpose than aesthetic. While goal -based improvements directly apply to these areas, their functional importance to the community suggests a variable priority where extenuating circumstances will determine the timing of goal-related improvements. Those areas are as follows:

1. Turf Areas To Remain

Currently planted in bluegrass turf, these are areas where turf is functional. To reduce water use, these areas can be replanted with a low water-use turf, such as a hybrid bluegrass that will require only 30% of the current water use to appear and function the same.

- *These areas include The Meadow and the Arco Stub Grass Berm gathering places.*
- *Additionally, some of the turf adjacent to the pool and tennis courts could also receive similar treatment if residents prefer more turf in this area.*

Improvements within the following areas remain outside the goals for this project but are important to maintenance operations and site appearance (aesthetic improvements). Specific improvements and priority would be determined by residents.

1. Arco Maintenance Area

Various improvements to be determined.

2. Potential Buffer Landscape

Landscape parcels adjacent to LLdO will result in development that is in close proximity to LLdO and will impact views. A buffer landscape would consist of a row of evergreen trees or large shrubs that would help to mitigate potentially negative views. Can be implemented as development occurs and impacts are assessed.

- *Property line west of Loop One including some augmentation of native vegetation along Loop One.*
- *Property line north of Loop Two.*

3. Existing Landscape - No Change

There are several landscape areas (see map) that have plantings that are consistent with the goals of this project and do not need intervention or are singularly unique.

- *Various native planting beds including The Pasture.*
- *Mesa landscape west of Link*
- *Various small areas, i.e., rose and herb gardens, Arco patch, etc.*

4. Existing Gravel Buffer Areas

These include all the gravel areas adjacent to walls that protect the walls from spray irrigation. These areas should be widened to about 12 feet when the adjacent lawn areas are converted if existing spray irrigation is retained.

IMPLEMENTATION STRATEGY: Conversion Priority Map

LEGEND

- 1 High Priority
- 2 Medium Priority
- 3 Low Priority

- Improve Existing Landscaping (Very low priority)
- Arco Maintenance Area (No Set Priority)
- Potential Buffer Landscape (No Set Priority)
- Existing Landscape - No Change
- Existing Gravel - No Change (gravel buffer areas along walls not shown)

- A Lawn conversion to xeriscape
- B Lawn conversion to low water-use turf
- C Renovate existing landscape
- D Renovate existing landscape - add curbing
- E Renovate existing landscape
- F Fountain conversion
- G Add various improvements
- H Trees and/or pavement improvements
- I Remove lawn - add mulch groundcover
- J Safety improvements to playground
- K Leave as low water turf or convert to xeriscape

NOTES

1. Priority is based on the projects goals: A) achieve at least a 50% reduction in irrigation B) achieve a significant reduction in current maintenance levels.

2. The designated priorities shown on this map can be modified based on community desire, budget and other determinants, such as degree of success. Priority may also be adjusted based on level of success .

3. "Improve Existing Landscaping", in most cases, means adding additional plants to those that are existing.

4. Within the Neighborhood Greenspaces that would be converted to a xeric landscape, an area of low water use turf could be provided for informal gathering/children. Size and location would be determined at implementation. These areas are designated with an added 'B'.

Existing Trees

Although many of the tree species are not xeric and could be replaced by species with attributes better suited to the functional and maintenance constraints of LLdO, the majority can be left in place if conditions and tree health remain unchanged. However, a number of trees do have problems significant enough that removal is recommended. These trees have been categorized by priority of removal:

High Priority

This category includes the following trees and problems:

1. Cottonwood Trees - West Side of Loop One

These trees are growing where there is inadequate irrigation and moisture to sustain them. They have be in decline for several years. Exhibiting die-back, many have already died and been removed. The remainder of these trees should be removed for both safety and aesthetic considerations.

2. Russian Olive Trees Throughout LLdO

These are an attractive species but have numerous problems. They represent one of two of the most invasive species that are troubling the Bosque. Growing at LLdO in close proximity to the bosque where their seeds can be spread is counter productive to recent efforts to rid the bosque of Russian olives and tamarisk. In recent years, porcupines coming to LLdO from the bosque have shown a preference for feeding on their bark and have caused extensive damage. Additionally, several trees obstruct views.

3. Honeylocust - (1D), North Berm Residential Entry, west side

This large tree has outgrown its planting space. Its roots are doing damage to the adjacent pavement, both concrete and asphalt. This damage will continue and worsen if this tree remains in place.

4. Purple Leaf Plums - Tennis Court Fountain Plazas

These trees are diseased and in decline. They require regular topping to keep views open but have branches that are so low that they interfere with pedestrian circulation around and to the fountain. They are currently hand-watered.

Low Priority

This category includes trees that are languishing, are in decline or will not be appropriate when landscape conversion is implemented. This category includes the following trees and problems:

1. Cottonwoods - Loop One Medians

While these trees are not as robust as normal cottonwoods due to less available irrigation, they still have a presence along this very visible community entrance. Recommended water harvesting improvements may help to sustain these trees. They currently benefit by tapping the irrigation in the adjacent native grass berms so any improvements to watering there will help the cottonwoods. These trees can remain with observation of there ongoing condition.

2. Flowering Crabapple - Various Neighborhood Greenspaces

The majority of these trees are growing within the Neighborhood Greenspaces of Link and Berm with two others in the Tennis Court South Neighborhood Greenspace. The trees at Link and Berm tend to be disease-prone and stunted. Where not stunted, they must be topped to keep views open. These trees are popular among residents when in Spring bloom, but are less attractive during the other seasons. They can be left in place until these landscape areas are converted to xeriscape. When that occurs they should be replaced with more appropriate xeric species. Species with Spring flowers can be selected to replace that seasonal preference.

3. Honeylocust - Upper Amphitheater Lawn Area

This tree was identified as problematic in that it drops significant pods (maintenance), and hangs over the tops of adjacent buildings. While mature and tall, this tree's location does not cause it to block views. Its leaves are probably small enough not to represent a threat to blocking roof scuppers at canales for drainage. This species also tends to be tolerant of drought. Xeric conversion of this area could be designed to hide the dropping pods.

4. Purple Leaf Plum - (2H) Middle and North Tennis Court Neighborhood Greenspace

These trees will require topping in the future (one tree does currently). They currently help mitigate privacy sensitivity due to the narrow space between facing windows and doors. They should be replaced with a smaller xeric species when this landscape is converted to xeriscape.

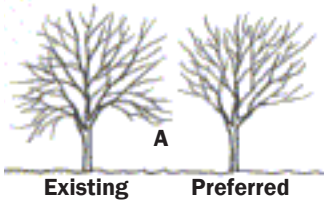
5. Silverberry - North and South Pool Neighborhood Greenspace

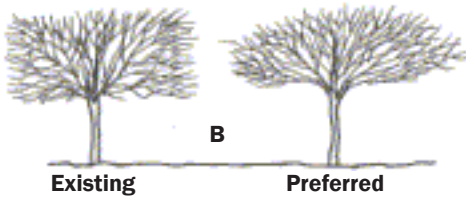
These are usually appropriate xeric species for this region. These are noted in the tree survey as "prone to late summer die-off and sunburn. These trees can remain in place until this area is converted to xeriscape. At that time, they are small enough to transplant and should do much better afterward. Their status would be considered on a trial basis.

Tree Pruning

(A) Branches are too low at fountain plazas and block access and views to the fountains.
(B) Some trees are pruned in unnatural forms to accommodate views.

The following sketches show existing pruning and preferred alternatives.





LEGEND

Trees that are currently acceptable with minimal maintenance

PRIORITY TREES - Removal / Replacement

- Flowering Crab Apple (Malus sp.)
- Flowering Plum (Prunus cerasifera)
- Honeylocust (Gleditsia sp.)
- Rio Grande Cottonwood (Populus wislizenii)
- Russian Olive (Eleaegnus angustifolia)

(1) HIGH PRIORITY
Shorter Term Removal

- A Cottonwoods (10) - continual drought stress and decline.
- B Russian Olive (20) - invasive species, various problems.
- C Purple leaf plums (13) - disease, poor structure, unsuitable for location.
- D Honeylocust (1) - damaging pavement, maintenance.

(2) LOW PRIORITY
Longer term Removal / Replacement

- E Cottonwoods (18) - may need eventual removal.
- F Flowering crabapples (27) - disease, height problems, unsuitable for location.
- G Honeylocust (1) - overhanging roofs, maintenance
- H Purple leaf plums (5) - consider removal with xeric species at conversion.
- I Silver buffaloberry (2) - Leave in place on trial basis with conversion.

NOTES

1. Some of the designations on this map are based on information from the "La Luz Tree Survey" prepared by Marc Hirschy, dated February 2014.

2. See page 10 for existing trees map.

3. See page 38 for notes on irrigation - "Trees - Existing and New".

Square Foots Costs for New Landscaping

AREA PER LANDSCAPE TYPE CONVERSION

LLdO Landscape Type	Area (s.f.)	Landscape Converted To...	Area (s.f.)
Bluegrass Turf + Trees	**102,683**	Native Grasses, Shrubs/Trees	**102,683**
Bandera Bluegrass Turf	**2,286**	Native Grasses, Shrubs/Trees	**2,286**
Bluegrass Turf *(change turf)*	**18,046**	*Seed with Bandera (See Table B)*	
Doorstep' Landscapes	**8,500**	Native Shrubs/Trees/Gravel	**8,500**
Native Shrubs and Trees	**94,696**	*No Change (See Table C)*	
TOTAL	**226,211**	**TOTAL**	**113,469**

(Total reflects areas included under priorities 1, 2 and 3, Table B on page 42)

(The cost per s.f. for areas with seeding only is not included above, however it is included in Table B on page 42)

COST OF CONVERSION FROM LAWN TO XERISCAPE

Landscape Conversion Item	Cost per square foot	
		(Cost for areas with seeding only not included)
Clearing	$0.85	
Soil Preparation	$0.10	
Grading (for water harvesting)	$0.70	(rises 2x-3x if restricted access requires hand work)
Planting	$2.00	
Mulching w/ Fabric	$1.80	
Total Cost (Exist. Irrigation Remains)	**$5.45**	/s.f. (existing irrigation unchanged)
Clearing	$0.85	
Soil Preparation	$0.10	
Grading (for water harvesting)	$0.70	(rises 2x-3x if restricted access requires hand work)
Drip Irrigation Installation	**$2.00**	< (this cost can be reduced by 75% if a rebate for
Planting	$2.00	landscape/irrigation is awarded by the ABCWUA)
Mulching w/ Fabric	$1.80	
Total Cost	**$7.45**	/s.f. (Includes new drip irrigation)

CONVERSION COST APPLIED TO LANDSCAPE AREAS THAT WOULD BE CONVERTED

Total Landscape Conversion Cost		
$5.45 X 113,469 s.f. =	**$618,406.05**	(cost of landscape conversion w/o changing irrigation)
	$533,304.30	with rebate of $0.75 /s.f. ($5.45-0.75/s.f.)=$4.70
	$85,101.75	**Savings** (water credit)
$7.45 X 113,469 s.f. =	**$845,344.05**	(landscape conversion + new irrigation)
	$646,773.30	with avg. rebate of $1.75 /s.f. ($7.45-$1.75)=$5.70
	$198,570.75	**Savings** (water credit)

NOTES:

1) ABCWUA calls the incentive they award for water use reduction a "rebate" however, rather than an actual rebate (cash back) the award is actually a credit toward future water bills.

2) Budgeting should probably not be based on rebates as there may be uncertainties regarding elgibility.

Landscape Conversion Costs

The upper left column of Table A shows total square footage for each landscape type at LLdO. To its right are shown the landscapes for which conversion is planned or those for which no change is intended. The middle portion of Table A shows the costs for each common component of a new landscape installation - one set utilizing the existing irrigation and one set assuming the installation of a new drip irrigation system and its added cost. The lower portion of Table A shows how a rebate, where applicable, as applied to future water use will offset a portion of the costs of the landscape conversion over time. The various rebates are offered by the Albuquerque Bernallilo County Water Utility Authority (ABCWUA) (effective date: January 2015).

Additional Costs and Credits

Rebates for Landscape Conversion

Beginning in January 2015, ABCWUA will offer the following rebates for conversion of high water use landscapes to xeric landscapes for commercial, institutional and industrial customers:

$0.75 / s.f. for conversion of high water use turf to low water use turf (spray irrigation systems are allowed)
$1.50 / s.f. for conversion landscapes (level terrain).
$2.00 / s.f. for slopes and small areas.
$2.00 / s.f. for any landscapes solely irrigated with harvested stormwater.
$50.00 / tree credit when irrigated with dedicated tree irrigation system.

In addition to large areas with level terrain for which a $1.50/s.f. rebate is given, several of the landscapes within LLdO may be considered small areas and/or contain sloped terrain. To account for this, an average rebate of $1.75 was applied over all areas in the calculations to the left.

Cost for Seeding

Where seeding of native grasses and wildflowers may be specified, a square foot cost of $0.50 may be used. If the landscape contractor is requested to ensure establishment of seeding, i.e., re-seeding thin areas as needed, watering, weeding, the cost becomes about $1.00 / s.f.

Design Fee (Implementation Phase)

Fees for landscape architecture can be budgeted for projects with construction costs up to $50,000 at 6%-8% of the cost of construction. This is for basic design services that include the following phases and percentages:

Schematic Design @ 15% (conceptual design alternatives)
Design Development @ 25% (refinement of design)
Construction Document @ 40% (prep. of plans for construction)
Bidding @ 5% (clarifications, selection of contractor/bid)
Construction Phase @ 15% (construction observation, administration)

Cost comparison by Area Per Priority of Implementation. Maintenance costs are for a one year duration.

Landscape Location and Priority for Conversion (colors are keyed to Priority Map)	Main Criteria	Area (s.f.)	Existing Landscape Type	Converted Landscape Type	Converted Landscape Cost (varies / s.f.)	Irrigation Conversion Cost ($2.00 / s.f.)	Current Water Use (gallons)	Projected Water Use (gallons)	Estimated Cost of Add. Imprvmts. (Hdsp, Trees)	Current Maintenance Cost/Year See (3) below
1 High Priority										
Arco Stub Lawn	Water/Maint.	1,606	Bluegrass	Xeric	8,752.70	*3,212.00*	69,058	32,120	NA	803.00
Berm Greenspace North	Water/Maint.	4,606	Bluegrass	Xeric	25,102.70	*9,212.00*	198,058	92,120	NA	2,303.00
Berm Greenspace South	Water/Aesthetic	5,304	Bluegrass	Xeric	28,906.80	*10,608.00*	228,072	106,080	NA	2,652.00
First Berm, Loop Two (trial) (4)	Aesthetic/Maint.	3,801	N Grass	NC	1,900.50	2,850.75	79,821	NC	1,228.50	722.19
Link Greenspace North	Water/Maint.	3,555	Bluegrass	Xeric	19,374.75	*7,110.00*	152,865	71,100	NA	1,777.50
Loop One Fountain	Water/Maint.	139	NA	Xeric	757.55	278.00	20,300	2,780	1,288.00	NA
Loop Two Fountain	Water/Maint.	139	NA	Xeric	757.55	278.00	20,300	2,780	1,288.00	NA
Pool Greenspace North	Water/Maint.	4,920	Bluegrass	Xeric	26,814.00	*9,840.00*	211,560	98,400	NA	2,460.00
Tennis Court Greenspace South	Water/Maint.	6,718	Bluegrass	Xeric	36,613.10	*13,436.00*	288,874	134,360	NA	3,359.00
Triangles	Water/Maint.	3,364	Bluegrass	Xeric	18,333.80	*6,728.00*	144,652	67,280	NA	1,682.00
Total		**34,152**			**$167,313.45**	**$63,552.75**	**1,413,560**	**607,020**	**$3,804.50**	**$15,758.69**
2 Medium Priorty										
Parking Area Triangular Berms (4)	Aesthetic/Maint.	7,883	N Grass	NC	3,941.50	5,912.25	NC	NC	2,015.00	472.98
Berms, Loop One + Loop Two (4)	Aesthetic/Maint.	20,512	N Grass	NC	10,256.00	15,384.00	NC	NC	4,644.25	1,230.72
Gathering Lawn, Arco Stub (6)	Water/Maint.	3,961	Bluegrass	Hybrid Turf	3,961.00	NA	170,323	99,025	NA	1,980.50
Median, Coors Entry	Water/Aesthetic	1,404	Bluegrass	Xeric	7,651.80	2,808.00	60,372	28,080	NA	702.00
Tennis Court Fountain Plazas (N+S)	Aesthetic	720	Trees	Xeric Trees	4,800.00	1,260.00	NC	NC	3,900.00	NA
Tennis Court Greenspace Middle	Water/Maint.	1,830	Bluegrass	Xeric	9,973.50	*3,660.00*	78,690	36,600	NA	915.00
Tennis Court Greenspace North	Water/Maint.	2,562	Bluegrass	Xeric	13,962.90	*5,124.00*	110,166	51,240	NA	1,281.00
Tennis Court Street Landscape	Water/Maint.	7,037	Bluegrass	Xeric	38,351.65	*14,074.00*	302,591	140,740	NA	3,518.50
The Meadow (6)	Water/Maint.	14,085	Bluegrass	Hybrid Turf	14,085.00	NA	605,655	352,125	NA	7,042.50
Total		**59,994**			**$106,983.35**	**$48,222.25**	**1,327,797**	**707,810**	**$10,559.25**	**$17,143.20**
3 Low Priorty										
All 'Doorstep' Landscapes (5)	Aesthetic/Maint.	8,500	Shrubs	Xeric	39,950.00	NC	NA	NC	NA	1,700.00
Link Fountain Plaza	Aesthetic	NA	Trees	Xeric Trees	NA	NA	NC	NC	1,400.00	NC
Medians-Loop One	Water/Maint.	9,976	Bluegrass	Xeric	54,369.20	*19,952.00*	428,968	199,520	5,000.00	4,988.00
Orchard (for buffalograss under trees)	Water/Maint.	2,920	Bluegrass	N Grass	2,920.00	NC	125,560	61,320	NA	1,460.00
Pool Area Perimeter	Water/Maint.	8,479	Bluegrass	Xeric	46,210.55	*16,958.00*	364,597	169,580	NA	4,239.50
Pool Greenspace-South	Water/Maint.	6,900	Bluegrass	Xeric	37,605.00	*13,800.00*	296,700	138,000	NA	3,450.00
Putting Green	Water/Maint.	2,850	Bluegrass	Xeric	15,532.50	*5,700.00*	122,550	57,000	NA	1,425.00
Berm Greenspace Far North Area	Water/Maint.	2,286	Hybrid Turf	Xeric	12,458.70	*4,572.00*	57,150	45,720	NA	1,143.00
Sm. Turf Areas South of Berm Plaza	Water/Maint.	2,722	Bluegrass	Xeric	14,834.90	*5,444.00*	117,046	54,440	NA	1,361.00
Tennis Court Berm (south of courts)	Water/Maint.	2,700	Bluegrass	Xeric	14,715.00	*5,400.00*	116,100	54,000	NA	1,350.00
Tennis Court Greenspace Middle	Water/Maint.	1,830	Bluegrass	Xeric	9,973.50	*3,660.00*	78,690	36,600	NA	915.00
Tennis Court Greenspace North	Water/Maint.	2,562	Bluegrass	Xeric	13,962.90	*5,124.00*	110,166	51,240	NA	1,281.00
Two Turf Berms East of Tennis Crt. Plz.	Water/Maint.	792	Bluegrass	Xeric	4,316.40	*1,584.00*	34,056	15,840	NA	396.00
Total		**52,517**			**$266,848.65**	**$82,194.00**	**1,851,583**	**883,260**	**$6,400.00**	**$23,708.50**

(1) Abbreviations: *NC = No Change NA = Not Applicable N = Native Hdsp. = Hardscape, i.e. curbs, pavement, etc .*

(2) Irrigation Conversion Costs: *Italics denote conversion is optional (some modification of irrigation for optimal performance may be necessary)*

(3) Water use and Maintenance cost derived from LLdO records: *Bluegrass = 0.50 / s.f. Honeysuckle = 0.20 / s.f. Xeric Landscape = 0.15 / s.f. Native Grass = 0.19 / s.f.*

(4) Native grass berms: *assumed re-seeding and modification of irrigation system (head replacement)*

(5) Currently some hand-watered, most not: *Potential new xeric with no change in water use.*

(6) Seeding only landscape conversion: *Cost per s.f. for total seeding only with hybrid bluegrass $1.00 / s.f.*

COST ANALYSIS: Summary of Cost Data from Table B

Area of LLdO Landscape

Total Area of LLdO Common Grounds landscape (CGL)	238,273 s.f.
Total Area of LLdO CGL to be converted to xeric landscapes	146,663 s.f.

Cost of New Landscaping

New landscape (without new irrigation)	$5.45 / s.f.
New landscape (with new irrigation)	$7.45 / s.f.
Seeding (turf, native grasses, wildflowers)	$1.00 / s.f.
Replace existing irrigation with new (valves, laterals, heads)	$2.00 / s.f.

Rebates Applied To Future Water Bills:

Conversion of high water use turf to low water use turf (exist. irrig.)	$0.75 / s.f.
Conversion to xeric landscape	$1.50 / s.f.
Conversion to xeric for slopes and small spaces	$2.00 / s.f.
Per tree when irrigated by a dedicated irrigation system	$50.00

Savings From Rebates Per Conversion Cost (irrigation not included)

% savings from conversion to low water use turf	13% (total area)
% savings from conversion to xeric landscape	27% (total area)
% savings from conversion to xeric on slopes and small areas	37% (total area)

Measurement of Areas

Square footage provided by LLdO Maintenance Staff (elongation of sloping terrain included in calculations)

Summary of Water Use per Landscape Type (derived from LLdO records - 2011)

Bluegrass @ 126,285 s.f. (53%) = 43 gallons /s.f./ year
Bandera @ 2,286 s.f. (1%) = 25 gallons /s.f./ year
Honeysuckle @ 7,148 s.f. (3%) = 25 gallons /s.f./ year
Native Grass @ 42,889 s.f. (18%) = 21 gallons /s.f./ year
Xeriscape @ 26,210 s.f. (11%) = 20 gallons /s.f./year

Summary of Maintenance Costs - 2011

Bluegrass = $0.50 /s.f./ year
Bandera = $0.50 /s.f./ year
Native Grass = $0.19 /s.f./ year
Xeric (shrubs, trees, mulch) = $0.15 /s.f./ year

Questions of the Cost Effectiveness of Landscape Conversion Against Future Water Costs: Comparison of current water costs versus the cost to convert bluegrass landscapes (high water use) to xeric landscapes (low water use) shows that the current cost of water is substantially lower than costs of conversion and does not begin to offset conversion costs with water savings. However, as current water costs have risen substantially in recent years, it appears this trend will continue indefinitely and as water becomes less available, the cost can reasonably be expected to rise dramatically as an ongoing process. It is conceivable that water for landscape irrigation may be unavailable at some future time, given projected supply vs. demand.

Summary Of Total Cost and Water Savings For Main Priority Groups
(Cost assumes no new irrigation if optional - rebate not included)

High Priority	**Cost**	**Water Use Reduction**
Arco Stub Lawn	$8,753	53%
Berm Greenspace North	$25,103	53%
Berm Greenspace South	$28,907	53%
First Berm, Loop Two	$3,129 */**	No change
Link Greenspace North	$19,375	53%
Loop One Fountain	$758	86% (may be lower)
Loop Two Fountain	$758	86% (may be lower)
Pool Greenspace North	$26,814	53%
Tennis Court Greenspace South	$36,613	53%
Triangles	$18,333	53%
Medium Priority		
Parking Area Triangular Berms	$11,868 */**	No change
Berms Loop One + Loop Two	$30,284 */**	No change
Gathering Lawn, Arco Stub	$3,960	53%
Median, Coors Entry	$7,652	<53%
Tennis Court Fountain Plaza, N+S	$9,960 *	No change
Tennis Court Greenspace Middle	$9,973	53%
Tennis Court Greenspace North	$13,962	53%
Tennis Court Street Landscape	$38,352	53%
The Meadow	$14,085	42%
Low Priority		
All Doorstep Landscapes	$39,950	25%
Link Fountain Plaza	$1,400	No change
Medians, Loop One	$59,369 **	<53%
The Orchard	$2,920	51%
Pool Area (outside walls)	$46,210	53%
Pool Greenspace South	$37,605	53%
Putting Green	$15,533	53%
Berm Greenspace Far North Area	$15,533	53%
Small Turf Areas - Berm Plaza South	$14,834	53%
Tennis Court Berm - South of Courts	$14,715	53%
Tennis Court Greenspace Middle	$9,974	53%
Tennis Court Greenspace North	$13,963	53%
Two Turf Berms East of Ten. Ct. Plz	$4,316	53%

* Includes modification to irrigation
** Includes new asphalt curbs

Landscape areas where recommendations are not based on the Project Goals or no changes are recommended.

Landscape Location and Priority for Conversion (colors are keyed to Priority Map)	Main Criteria	Area (s.f.)	Existing Landscape Type	Converted Landscape Type	Converted Landscape Cost ($2.00 / s.f.)	Irrigation Conversion Cost ($2.00 / s.f.)	Current Water Use (gallons)	Projected Water Use (gallons)	Estimated Cost of Add. Imprvmts. (Hdsp, Trees)	Current Maintenance Cost/Year
Very Low Priorty										
Improve Existing Landscaping	Aesthetic	8,250	Varies	NC	$16,500.00	$16,500.00	UK	M+	NA	NC
Total		**8,250**			**$16,500.00**	**$16,500.00**				

Abbreviations: *M+ = Minimal Increase* *NC = No Change* *NA = Not Applicable* *2X = Slight Increase* *UK = Unknown*

Priority TBD			
Arco Maintenance Area	Aesthetic/Maint.	8,250	Utility
Potential Buffer Landscape (Loop One)	Aesthetic	22,760	Mesa
Potential Buffer Landscape (Loop Two)	Aesthetic	9,260	Mesa
Total		**40,270**	

No Change Recommended			
Arco Fountain Landscape Area	Low Water Use	1,630	Xeric
Arco Patch	Low Water Use	2,107	Xeric
Color Garden	Low Water Use	125	Orn. Grass
Existing Gravel Only Areas	Low Water Use	13,520	Gravel
Link Street Reclaimed Mesa	Low Water Use	33,770	Mesa
Loop Two Entry Median	Low Water Use	1,580	Mesa
Pasture	Low Water Use	10,275	Xeric
Pool Fountain Plaza	Low Water Use	NA	Gravel
Rose Garden	Functional	210	Roses
Turf (Pool Enclosure)	Functional	1,600	Bluegrass
Turf (Pool/Playground Area)	Functional	3,055	Bluegrass
Various Native Trees/Shrubs Planters	Low Water Use	26,209	Xeric
Vegetable and Herb Garden	Functional	615	Crops
Total		**94,696**	

Priority - To Be Determined

These areas include the Arco Maintenance Area and the property edges adjacent to probable future development.

Arco Maintenance Area - The Recommendation section of this Master Plan prescribes improvements to this area and some of those improvements have recently been made. However, the exact programing for operations is currently in flux and improvements or changes have not been prioritized.

Potential Buffer Landscape - During the preparation of this Master Plan, it was decided that landscape treatment of these areas should wait until the nature and extent of adjacent development was known. Therefore, these areas have not been prioritized.

Cost Figures

Costs for landscape maintenance and installation are variable and, at best, represent an educated guess. The cost figures for converting the existing landscape to one that is xeric or a new landscape will vary depending on what company is doing the work, etc. The costs listed here were provided by an Albuquerque landscape construction company that many consider to do the highest level of landscape and related construction work in Albuquerque. As such, those cost figures may range on the higher side of average.

The costs given for landscape maintenance were derived from the cost records compiled by LLdO. The landscape at LLdO receives an optimum level of maintenance and may also be considered to range on the higher side of average. Additionally, LLdO also provided water use records for the various landscape areas on site. In comparing the amount of water used to support the bluegrass turf at LLdO with City of Albuquerque figures for bluegrass, it appears that the bluegrass at LLdO receives approximately 25% more water than what might be applied locally elsewhere. The dense and uniformly green lawn at LLdO would seem to confirm this. However, irrigation water at LLdO is applied in a very efficient manner, taking into consideration evapotranspiration rate and employing syringe irrigation when needed. This also is likely a reason for the lawn's good condition.

Maintenance costs and projected water use for converted landscaping have been kept conservative. Actual experience is anticipated to indicate less water use and lower maintenance costs with xeric landscape conversion.

New Landscape Establishment Period

Maintenance costs and water use will remain high for the first one to three years while the new landscape is becoming established. Weed abatement will be the primary maintenance task along with replacement of dead plant material (there is a normal mortality rate of about 10%). Frequent watering will be needed until new plants can develop sufficient root systems that can sustain them between irrigation and drought. Eventually, new plants will fill in and be able to compete successfully with weeds, and weeds will have gone through their growth cycle initiated by the disturbance of landscaping.

TREES	Evergreen	Deciduous	Large tree >20'	Small tree <20'	Large shrub >3'	Small shrub <3'	Shade tree	Wind Attenuation	Erosion Control	Low - Spreading	Visual and Physical Barrier	Fall accent	Flowering accent	Fruiting Accent	Folliar accent	Fragrant	Wildlife - cover	Wildlife - food	Site native	Regional native	Adapted Exotic	Will naturalize	Preferred Native (sense of place)	Use Sparingly	Need Rabbit Guard	View Friendly (<10 feet tall)	Alergen Potential		Comments
Amelanchier utahensis (serviceberry)		○			●			○				○	●					○		○				○				L	
Cercis reniformis *(Oklahoma redbud)*		○		○								○	●								●							L	Spring accent, magenta flowers
Cercocarpus ledifolius *(curl leaf mtn. mahogany)*	●		●								●		●							○							○	L	
Chilopsis linearis *(desert willow - seed bearing)*		○		○			●	○					●					○	●	○		○		○				L	Purple flowers
Chilopsis linearis *'Art's Seedless' (no seed pods)*		○		○			●	○					●					○		○		○	●				○	L	Purple flowers
Forestiera neomexicana *(New Mexican olive)*											●							○									○	L	
Juniperus monosperma (one-seed juniper)	●			○				○			●				●		●	○	●			○	●				○	L	Female plants only
Koelrueteria panniculata (goldenraintree)		○	●				●	○				○	●	○				○			●							L	Spring yellow flower, fall seed pods
Lagerstroemia indica (crape myrtle)		○		○								○	●								●						○	L	Summer accent, flower colors vary
Pistachia chinensis (Chinese pistache)		○					●					○									●							L	Fall color accent
Platanus wrightii (Arizona sycamore)		○					●					○									●							H	Replacement tree for cottonwood
Prosopis glandulosa (honey mequite)		○		○			●	○			●				●		●							○	●	○		L	
Prosopis torreyana (Western honey mesquite)		○		○			●								●						●					○		L	
Quercus turbinella (desert live oak)	●	○		○				○	●					○				○		○								M	Good in groves
Robinia neomexicana (New Mexican locust)		○		○								○	●							○								L	Good in groves
Vitex agnus-castus (chaste tree-several existing)		○		○									●								●			○		○		L	Blue flowers
FRUIT/NUT TREES - Aridity Adapted																													
Carrya illinoinensis (pecan tree)		○	●				●														●			○				M	Drought tolerant
Diospyros kaki (persimmon)		○	●									○		○														L	Drought tolerant
Ficus carica ('Celeste' edible fig)		○		○			●					○									●			○				L	Most cold tolerant fig
Punica granatum ('Wonderful' pommegranate)		○		○								○	●								●			○		○		L	Drought tolerant
Ziziphus jujuba (Chinese jujube - many varieties)		○	●				●							○		○					●							L	Drought tolerant

Microclimate

The existing landscape is composed of large areas of turf. This high-water use turf has a commensurately high evapotranspiration rate. As such, the high rate of evaporation provides a noticeable cooling effect which is part of the attraction of lawn areas during hot days. Plants that require significantly less water (xeric plants) do so because they do not give up their moisture in a high rate of evapotranspiration. Less evaporation means less cooling. Therefore, one effect of replacing high-water-use plants with xeric plants is that the immediate area will not be noticeably cooler as it was when the landscape consisted of lawn. The loss of cooling can be offset to a limited degree by providing shade producing plants. At LLdO, these should be large shrubs and small trees that can provide some shade but remain low enough so as not to impede views.

Plant Selection

This selection of plants is not intended to be a complete list of plants that might be successful at LLdO, nor are varieties given (with some exceptions). Additional plants and varieties may be considered during actual design. Beyond adaptation to site conditions, the plants are mostly drawn from a local southwestern palette in order to maintain and convey a sense of place.

SHRUBS	Evergreen	Deciduous	Large tree >20'	Small tree <20'	Large shrub >3'	Small shrub <3'	Shade tree	Wind Attenuation	Erosion Control	Low - Spreading	Visual and Physical Barrier	Fall accent	Flowering accent	Fruiting Accent	Folliar accent	Fragrant	Wildlife - cover	Wildlife - food	Site native	Regional native	Adapted Exotic	Will naturalize	Preferred Native (sense of place)	Use Sparingly	Need Rabbit Guard	View Friendly (<10 feet tall)	Alergen Potential		Comments
Amelanchier utahensis (serviceberry)		●			●			●				●	●					●		●				●				L	Edible berries / attracts birds
Artemisia filifolia (sand sage)	●				●										●		●		●			●	●					L	
Artemisia fridgida (fringed sage)	●					●									●		●		●			●	●					L	
Atriplex canecsens (four wing saltbush)	●				●			●	●		●			●			●	●	●			●	●	●				H	Showy fall seeds (use judiciously)
Atriplex confertifolia (shadscale)	●					●			●	●					●					●							●	H	
Buddleia sp. (butterfly bush)	●	●			●								●		●						●		●				●	L	Summer flowers - colors vary
Caryopteris x clandonensis (blue mist)		●			●								●								●				●			L	Summer blue flowers
Cercocarpus montanus (true mountain mahogany)		●			●				●											●							●	L	
Chamaebatriaria millefolium (fernbush)		●			●				●				●							●							●	L	Spring white flowers
Cotinus coggyria (smoke bush)		●			●						●	●		●	●						●						●	L	Smoke-like inflorescense
Dalea scoparius (broom dalea)	●				●				●				●		●		●					●	●				●	L	Very desirable site native
Ephedra torreyana (Torrey joint fir)	●					●									●			●	●		●	●			●			L	
Ericameria laricifolia (turpentine bush)	●				●			●					●				●			●								●	L	Good in masses
Ericameria nauseosus (Chamisa)					●				●				●		●		●			●			●				●	H	Can be invasive, wood is brittle
Falugia paradoxa (Apache plume)		●			●			●					●		●		●	●				●						L	Spring-summer white flowers
Gaura sp.		●				●							●							●					●		●	L	Summer white and pink flowers
Juniperus sp. (Juniper)	●			●	●	●			●	●	●			●							●			●				L	Female plants only
Krasheninnikovia lanata (winterfat)		●			●			●				●	●		●		●	●	●	●		●	●					L	Fall white flowers, des. site native
Larrea tridentata (creosote bush)	●				●								●					●		●				●				L	Spring yellow flowers
Mahonia haematocarpa (red mahonia)					●			●			●		●		●		●	●		●				●				L	Spring yellow flowers
Parthenium icanum (mariola)	●					●		●					●		●					●								L	
Philadelphus microphyllus	●				●				●				●			●	●			●									L	White flowers
Potenilla fruiticosa (shrubby cinquefoil)		●				●				●			●							●							●	L	White or yelllow flowers
Prunus besseyi (sand cherry)		●				●						●	●		●		●	●		●			●	●				L	White flowers
Psorothamnus scoparius (broom dalea)	●				●			●					●		●			●			●	●						L	Summer-blue flowers
Purshia standsburyana (cliffrose)		●			●								●							●			●					L	Spring-summer yellow flowers
Rhus trilobata (threeleaf sumac)		●			●							●					●	●		●			●					L	
Rhus microphylla (littleleaf sumac)		●			●				●			●								●								L	
Ribes aureum (golden currant)		●			●					●		●	●	●				●		●		●		●		●	●	L	Spring yellow flowers
Sphaeralcea ambigua (apricot globemallow)		●				●							●					●	●			●		●				L	Hybrids are available
Vaquelinia californica (rosewood)	●			●				●			●						●				●							L	Does well at LLdO
VINES																													
Lonicera japonica halliana (Hall's honeysuckle)		●								●		●								●			●					L	Summer yellow flowers
Vitis arizonica (canyon grape)		●								●	●		●				●			●								L	Native grape (edible fruit)
Wisteria chinensis (Chinese wisteria)		●								●		●								●			●					L	Blue flowers

	Evergreen	Deciduous	Height >24-36 inches	Height 12-24 inches	Height <12 inches	Low - spreading widely	Erosion Control	Barrier Plant	Fall accent	Flowering accent	Fruiting Accent	Foliar accent	Fragrant	Wildlife - cover	Wildlife - food	Site native	Regional native	Will naturalize	Preferred Native (sense of place)	Use Sparingly	Need Rabbit Guard	Takes Heavy Traffic	Takes Light Traffic	Allergen Potential		
GROUND COVERS																										**Comments**
Anemopsis californica (yerba mansa)		○				○				○						●				●				L	Summer white flowers - best in shade
Artemisia ludivichiana (praire sage)	●					○						○						○		○				L	
Cerostigma plumbaginoides (dwarf plumbaga)		○		○		○	●		●	○										●		●		L	Summer blue flowers
Cotoneaster dameri (bearberry cotoneaster)	●					○	●						○	●										L	
Mahonia repens (creeping mahonia)	●					○	●		●					●		●								L	Best in shade under trees
Mirabilis multiflora (desert four o'clock)		○				○				○						●	○		○	●				L	
Prunus besseyi 'Pawnee Buttes' (spreading s.c.)		○				○			●	○				●		●								L	
Rhus aromatica 'Gro-Low' (prostrate sumac)		○				○	●		●				○			●								L	
NATIVE AND ADAPTED GRASSES (for meadows)																										
Andropogon saccharoides (silver beardgrass)				○			●		●			○				●	○			●		●		L	
Andropogon scoparius (little bluestem)				○			●		●			○				●	○			●		●		L	
Aristida purpurea (purple threeawn)					●		●		●			○			○	●	○	●		●		●		L	
Bouteloua curtipendula (sideoats gramma)				○			●		●			○		○	○	●	○	●		●		●		M	
Bouteloua eriopoda (black gramma)				○			●		●						○	●		●		●		●		M	
Bouteloua gracillis (blue gramma)				○			●		●			○		○	○	●	○	●		●		●		L	Very desirable regional native
Eragrostis trichodes (sand lovegrass)				○			●		●			○				●	○			●		●		L	
Hilaria jamesii (galleta grass)				○			●					○			○	●	○	●		●		●		L	
Lycurus setosus (wolftail)				○			●		●			○				●	○			●		●		L	
Muhlenbergia dubia (pine muhly)			●				●					○				●	○			●		●		L	
Muhlenbergia rigens (deer grass)			●				●					○				●	○			●		●		L	
Oryzopsis hymenoides (Indian rice grass)				○			●		●			○		○	○	●	○	●		●		●		L	Very desirable site native (sand only)
Stipa neomexicana (NM threadgrass)				○			●		●			○		○		○	●	○		●		●		L	
CACTI, YUCCA and DESERT ACCENTS																										
Echinocereus triglochidiathus (claret cup)										○						●	○	●						L	
Hesperaloe parviflora (red yucca)	●			○						○		○				●				●				L	
Opuntia imbricata (cane cholla)	●				●					○					○		○	●						L	
Opuntia phaeacantha (plains prickly pear)	●									○		○		●	○		○	●		●				L	
Nolina macrocarpa (beargrass)	●			○			●			○		○				●								L	
Yucca glauca (narrowleaf yucca)	●									○		○			○	●	○	●						L	
Yucca bacata (banana yucca)	●							○		○		○				●			○					L	
Yacca elata (soaptree yucca)	●		●					○		○		○			○			●						L	

PERENNIALS	Evergreen	Deciduous (or winter dieback)	Height >24-36 inches	Height 12-24 inches	Height <12 inches	Low - spreading widely	Erosion Control	Barrier Plant	Fall accent	Flowering accent	Fruiting Accent	Folliar accent	Fragrant	Wildlife - cover	Wildlife - food	Site native	Regional native	Will naturalize	Preferred Native (sense of pla	Use Sparingly	Need Rabbit Guard	Takes Heavy Traffic	Takes Light Traffic	Allergen Potential		Comments
Achillea sp. (Yarrow - many varieties)		●			●					●						●			●						L	Many varieties / colors
Asclepias nyctaginifolia (Mojave milkweed)		●		●						●					●		●	●			●				L	Native milkweed for Monarch butterflys
Datura meteloids (sacred datura)		●		●		●				●						●	●		●						L	Night blooming
Penstemon ambiguus (bush penstemon)		●		●						●						●			●						L	Very desirable site native
Mirabilis multiflora (giant four-O'clock)		●			●	●				●							●								L	Summer deep pink flowers
Sphaeralcea spp. (globemallow)		●		●			●			●						●	●		●						L	Many varieties / colors (native species is ambigua)

TURF GRASS (for lawn)	Evergreen	Deciduous (or winter dieback)	Height >24-36 inches	Height 12-24 inches	Height <12 inches	Low - spreading widely	Erosion Control	Barrier Plant	Fall accent	Flowering accent	Fruiting Accent	Folliar accent	Fragrant	Wildlife - cover	Wildlife - food	Site native	Regional native	Will naturalize	Preferred Native (sense of pla	Use Sparingly	Need Rabbit Guard	Takes Heavy Traffic	Takes Light Traffic	Allergen Potential		Comments
Andropogon smithii (western wheatgrass)		●		●			●		●			●											●		L	Can be mowed as turfgrass
Poa pratensis 'Bandera' (hybrid Kent. bluegrass)		●			●		●														●		●		L	
Buchloe dactyloides (buffalograss)		●			●		●										●						●		L	
Bouteloua gracillis (blue gramma)		●		●			●		●			●		●	●	●	●	●	●				●		L	
Blue gramma / Buffalograss mix		●		●			●		●			●					●						●		L	More uniform coverage

WILDFLOWERS	Evergreen	Deciduous (or winter dieback)	Height >24-36 inches	Height 12-24 inches	Height <12 inches	Low - spreading widely	Erosion Control	Barrier Plant	Fall accent	Flowering accent	Fruiting Accent	Folliar accent	Fragrant	Wildlife - cover	Wildlife - food	Site native	Regional native	Will naturalize	Preferred Native (sense of pla	Use Sparingly	Need Rabbit Guard	Takes Heavy Traffic	Takes Light Traffic	Allergen Potential		Comments
Baileya radiata (desert marigold)		●		●			●			●						●	●	●	●						L	Very desirable site native
Berlandier lyrata (chocolate flower)		●		●						●						●		●							L	
Eschscholtzia californica (California poppy)		●		●			●			●							●	●							L	
Gaillardia pinnatifida (blanket flower)		●			●		●			●						●			●						L	Very desirable site native
Oenothera caespitosa (white evening primrose)		●			●					●						●			●						L	
Psilostrophe tagetina (paperflower)		●		●						●						●			●						L	Very desirable site native

RESTRICTED PLANTS	Reason
Ailanthus altissima (tree of heaven)	Invasive
Caesalpinia gillesii (desert bird of paradise)	Invasive
Elaeagnus angustifolia (Russian olive)	Invasive
Genista hipanica (Spanish broom)	Disease
Imperata cylindrica 'rubra' (Japanese blood grass)	High water needs
Nesella tenuissima (Mexican threadgrass)	Invasive
Santolina chamacyparissus (santolina)	Disease
Shepherdia argentea (silver buffaloberry)	Poor performance
Tamarix aphylla (athel tree)	Invasive
Tamarix chinensis (saltcedar)	Invasive
Ulmus pumila (Siberian elm)	Invasive

Allergenic Plants

In addition to the discussion of plants on page 15, the recommendations shown in the drawings mention native plants, xeric and adapted 'exotic' plants, and native and exotic grasses. The later are often referred to as 'ornamental grasses'. Some plants produce high levels of pollen to which some people of allergic. The incidence of pronounced plant allergies (hay fever) within the general population is about 8%. An ordinance within the city of Albuquerque prohibits the use of certain plants known to be especially allergenic. Most native and ornamental grasses have varying degrees of allergenic potential and are included within this document as potential replacements for the existing lawn areas within LLdO. Consideration of specific plants and their locations will be done during the subsequent phase of implementation.

Shade Structures for Seating and Gathering Areas

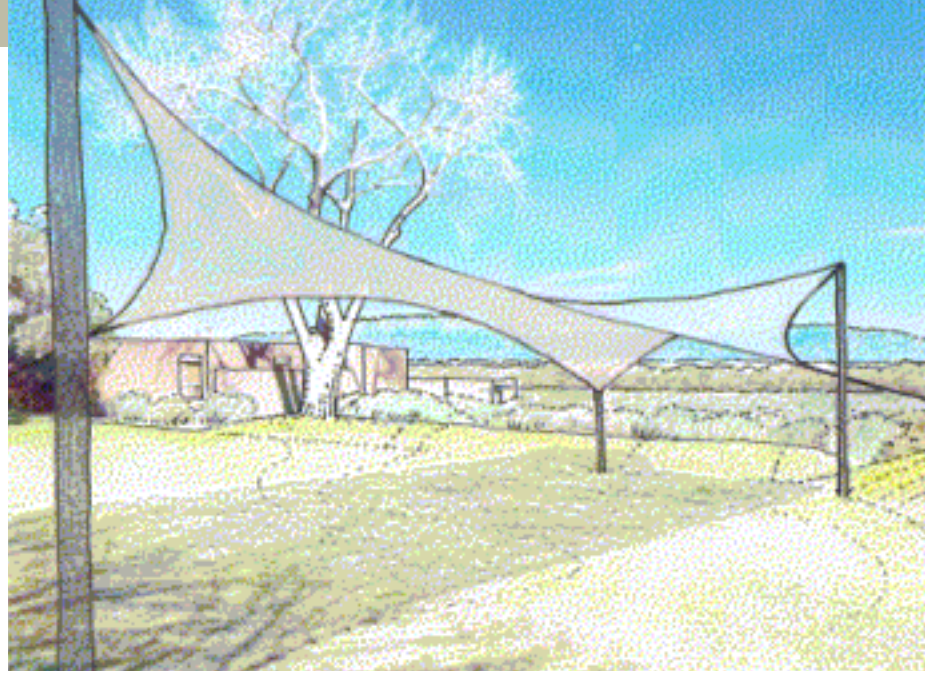
There is a need for shade at LLdO where people can gather outside or wish to sit quietly and observe the view. Trees are good shade providers but also can block the many views at LLdO. The following are some strategies for provide shade:

The Meadow

Annual gathering by large groups create a need for a large footprint of shade. One solution is a temporary tensile shade structure. The support poles would be permanent but the canopy could be taken down between events. These structures are light and airy, providing an attractive contemporary form. Between events, the permanent poles would have a negligible impact on views.

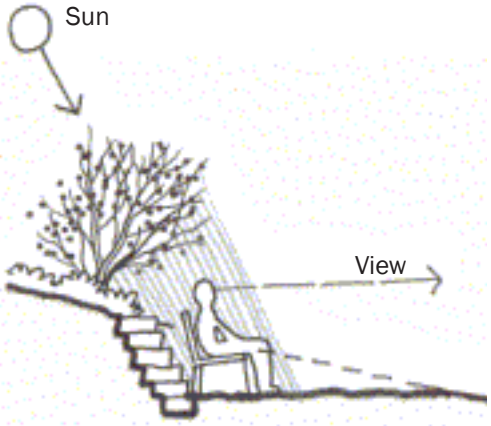
Seating Areas

A wide option for providing shade at benches exists. These range from small trees or large shrubs places near benches, to small pergola structures, to small tensile structures. These would all need to be kept under 10 feet in height so views are not compromised. One strategy for making seating areas less obtrusive is to lower them a couple of feet below the surrounding grade, resulting in an overall lower profile of whatever shade method is employed. The following sketches show options.

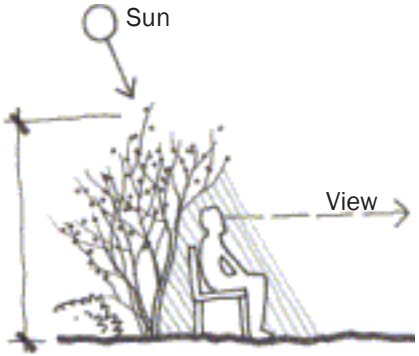


The Meadow shown with a temporary tensile shade canopy

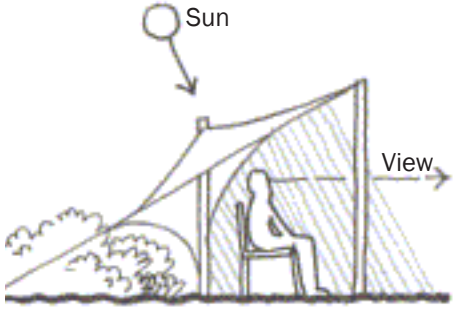
The following sketches show a few of the many possible ways to provide shaded seating with benches:



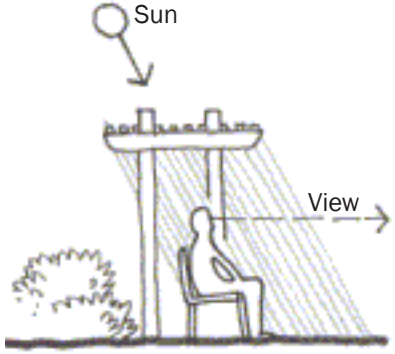
Shade by a Slope Nook



Shade by a Small Tree or Large Shrub



Shade by a Small Tensile Structure



Shade by a Small Pergola