

High Desert Community

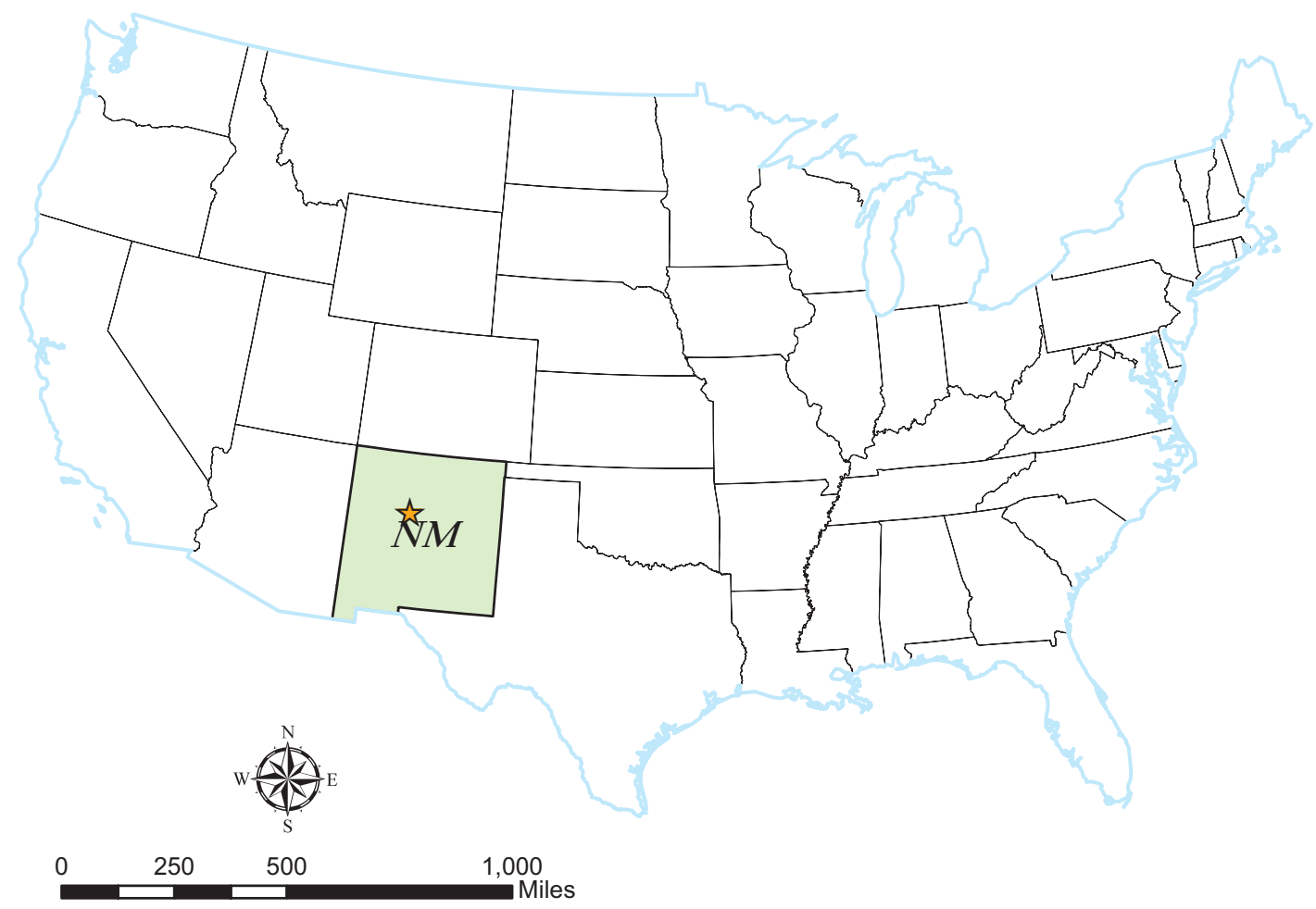
DESIGN WORKSHOP

Albuquerque, NM



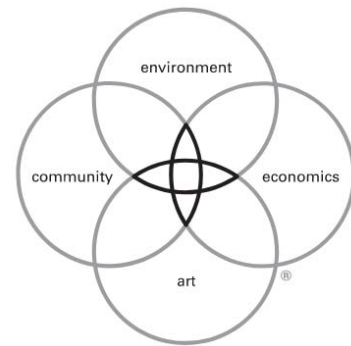
Presented by: Matt Hanson • Chris Kupka • Isaac Prudhomme

Project Location



Project Overview

- Model for **sustainable** master planned communities
- **Low-impact** design
 - > water conservation
 - > wildlife habitat restoration
 - > material recycling
 - > cultural endowment
- Altered **water-conservation** & **landscape planting** ordinances at both city & state levels
- Pioneered Design Workshop's philosophy & comprehensive approach:
DW Legacy Design® founded on balancing:
 - > environmental sensitivity
 - > community connections
 - > artistic beauty
 - > economic viability



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• **Design Workshop**

Role of Design Workshop

- Provide **leadership** for all phases of the project
- **Lead** a multidisciplinary team including:
 - > environmental consultants
 - > civil engineers
 - > architects
- **Collaborate** with officials, students, & teachers from Albuquerque Academy



Challenge

- Low-impact, diverse community
- Support local natural systems & services
- Cultivate social & cultural well-being



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Solution

- Follow the **natural landscapes** to determine form, density, & materials
- Conserve natural **stormwater arroyos**
- Avoid development in existing **hydraulic paths**
- Use **local materials, permeable paving, native & on-site transplanted vegetation, & natural hydraulic recycling**

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Solution

- Maximize **wildlife habitat** by:
 - > minimizing land disturbance
 - > enhancing ecosystems through multifunctional open space
- Cluster residential properties to:
 - > buffer existing **wildlife corridors**
 - > minimize impact closer to **wilderness boundaries**
- > maximize connectivity to **existing infrastructure & cultural resources**

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Sustainable Features

- Minimized area of disturbance on each lot
- Preserved over 62% (665 acres) of pre-development hydrology
- Uses stormwater to feed rain gardens & irrigate water-wise demonstration gardens
- Doubled biomass of critical habitat vegetation of the Juniper pinion ecotype
- Mulched public areas and open space with decomposed granite (from onsite) or recycled dam sediments
- Incorporated existing boulders into open space landscapes rather than hauling them away
- Limited street lights
- Enhanced wildlife habitat & human/wildlife connections
- Enhanced communal stewardship
- Influenced the city's Design & Construction Regulations
- Spurred regional nursery sales of native plants

Environmental Methodology

Environmental Considerations

High Dessert maintains 50% of the original prairie ecotype.

How This Was Accomplished:

Minimizing Construction Disturbance

- Limited the area of construction zones
- Analysis over areas of importance

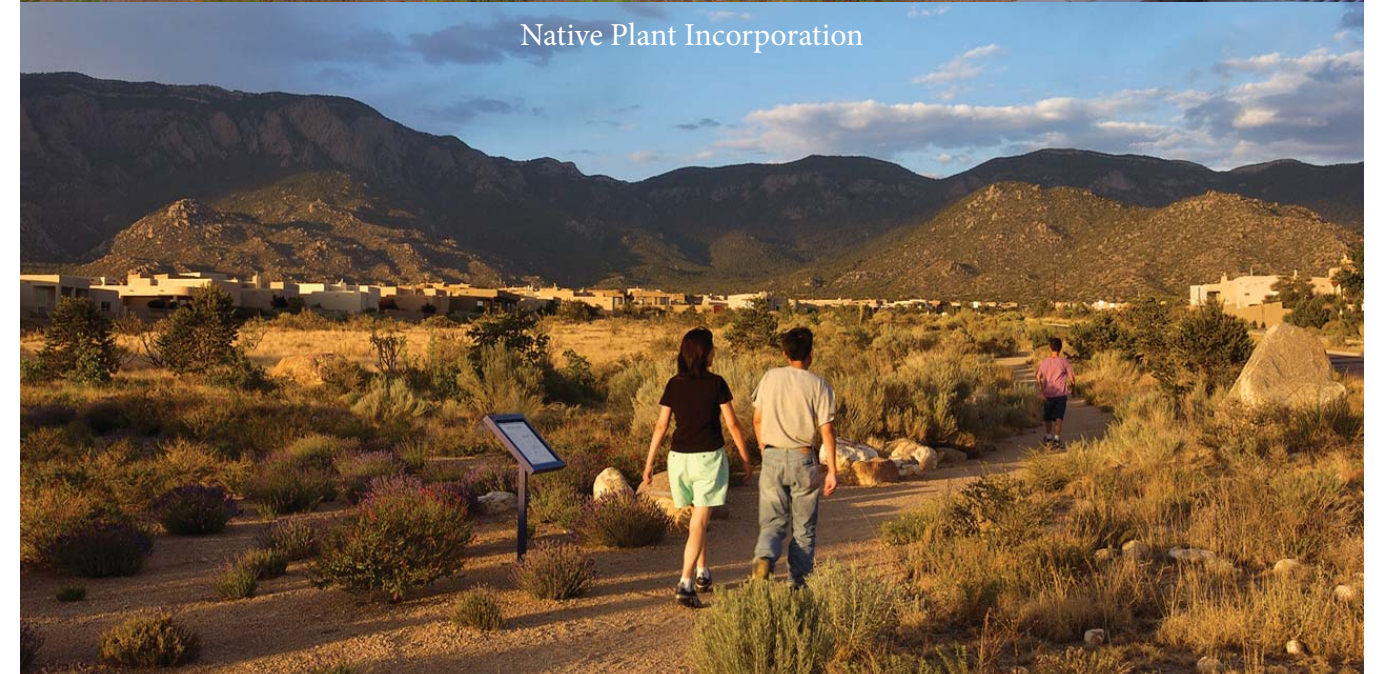
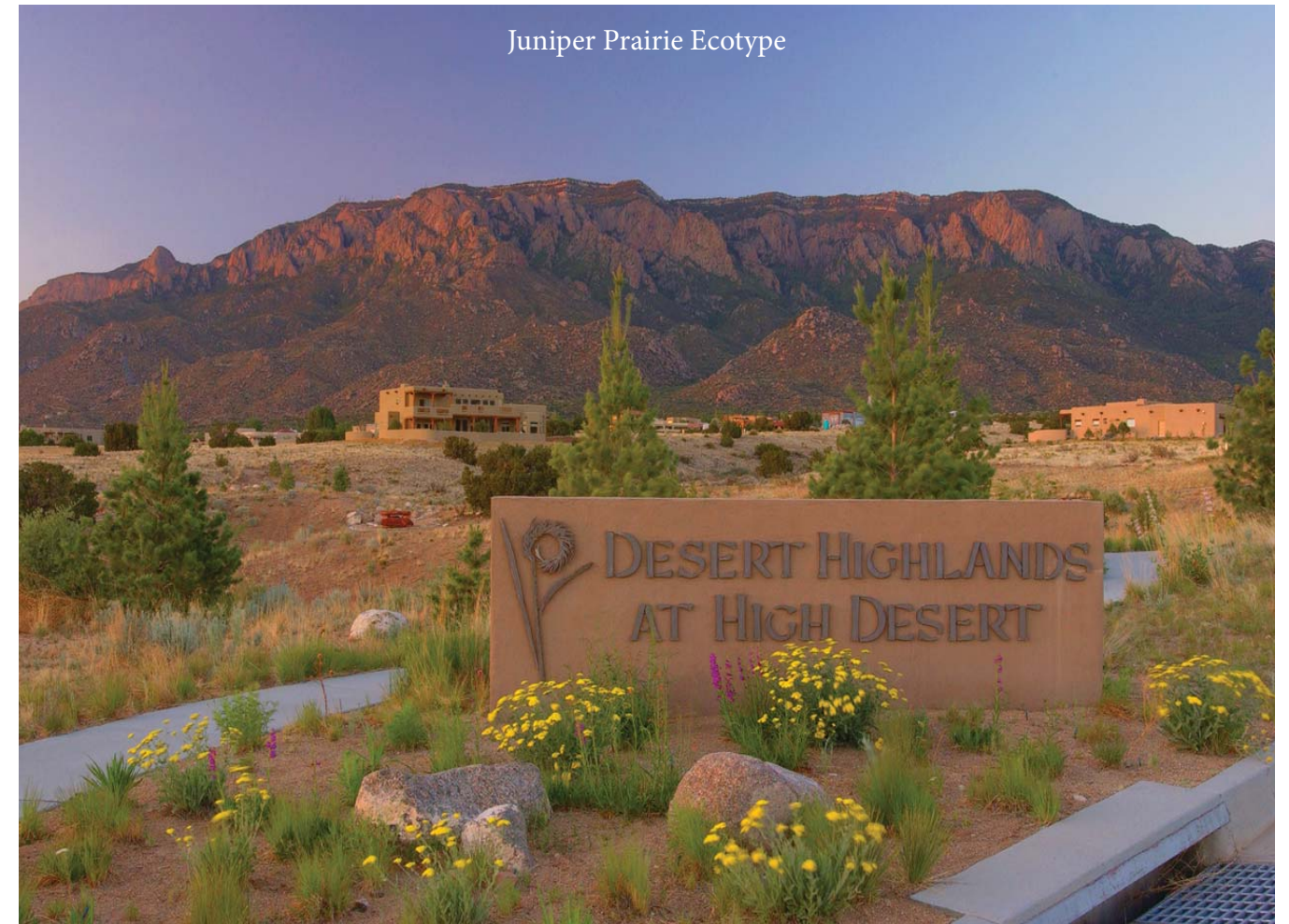
Hillside Cut Roads

- Roads were cut into the hillside to minimize mass grading
- Creates a smaller area of land that is being disturbed

Native Plant Palette

- Used plants native to the area
- Plants that are native are more water efficient and more likely to survive because of their adaption to the local climate

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Environmental Methodology

Environmental Considerations

Uses only 20% of the city's annual water allowance in landscape areas, saving as much as 28.7 million gallons or \$300,000 each year.

How This Was Accomplished:

Planting Efficiently

- Native plants to the area have a much lower water intake
- Native plants are better able to adapt to adverse conditions
- Native plant pallet

Stormwater

- Effective use of stormwater collection methods
- Across site drainage between parcels of land
- Elimination of curbs and gutters allowed for a pairing with natural stormwater arroyos
- Planting areas are fed with collected water from arroyos



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Environmental Methodology

Environmental Considerations

Increased critical bird-breeding habitat for two endangered species, the Peregrine Falcon and the Grey Vireo, by approximately 7 acres.

How This Was Accomplished:

Minimizing Disturbance Area

- Area of disturbance were calculated for each area of the juniper prairie
- Efforts were made to minimize what area needed to be disturbed
- Disturbed areas were planted with twice the amount of vegetation that they began with

Increased carbon sequestration on the site by 170,160 tons by restoring twice the volume of vegetation that was displaced bay all areas of disturbance.

How This Was Accomplished:

Strategic Planting

- Disturbance areas got twice the amount of care and consideration when they were being replanted
- Planting double the amount made the ecosystem a more cohesive form

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Environmental Methodology

Environmental Considerations

Preserves the equivalent of 15,230 trees a year, by using decomposed-granite mulch instead of traditional wood chip mulch application. At a ten year lifespan, the granite mulch can save 100,000 gallons of fuel, and reduce carbon release by an estimated 617,600 tons.

How This Was Accomplished:

Keeping It Onsite

- Onsite material recycling eliminated annual reapplication of a typical 2” mulch covering
- Tree species were researched to determine which trees would most likely be milled for mulch in the region
- Trees were researched to find their density per volume to determine how many tree would be needed to get the mulch covering
- Fuel savings were determined by subtracting the difference between the two mulching methods, and calculating the dump truck fuel efficiency (8mpg diesel)
- Carbon was reduced by limiting the importation of materials from off site locations.
- Miles saved were entered into the ALG carbon calculator



Cost Comparison

Water-efficient native plants allowed for a \$300,000 saving compared to cities annual water allowance.

- Uses less than 20% of annual water allowance
- Saves as much as 28.7 million gallons

Relocation of 3,500 trees within disturbed areas saved ~\$496,000 as compared to buying and planting new trees.

- 73% cost reduction for every tree planted
- Cost savings were determined by comparing typical balled and burlap installation prices vs transplant prices
- Cost of 6' balled and burlapped evergreen planted = \$150
- Cost of transplanted tree =\$40
- Total number of trees needed 3,545
- $\$40 \times 3,545 = \$141,800$ vs. $\$150 \times 3,545 = \$638,100$
- **Total savings \$496,300**



Cost Comparison

Using decomposed granite from on site, and dam sediment dredged from the near by damn as mulch and paths the High Desert Community was able to save ~\$2,530,000 over the next 10 years

Wood Mulch

- Average cost of wood mulch \$25/cy
- 10,250cy needed annually
- $10,250 \times \$25 = \$256,250$ annually (x 10)= \$2,562,500
- Dump truck carries 5 yards
- $10,250/5 = 2,050$ Trips
- Nearest feasible mulch source= 40 mile round trip
- $2,050 \times 40 = 82,000 \times 10 \text{ yr} = 820,000$ Trip Miles
- $820,000/8\text{mpg} = 102,500$ gals of Diesel
- $102,500 \times \$3.56 = \$364,900$ in fuel
- $\$2,562,500 + \$364,900 =$

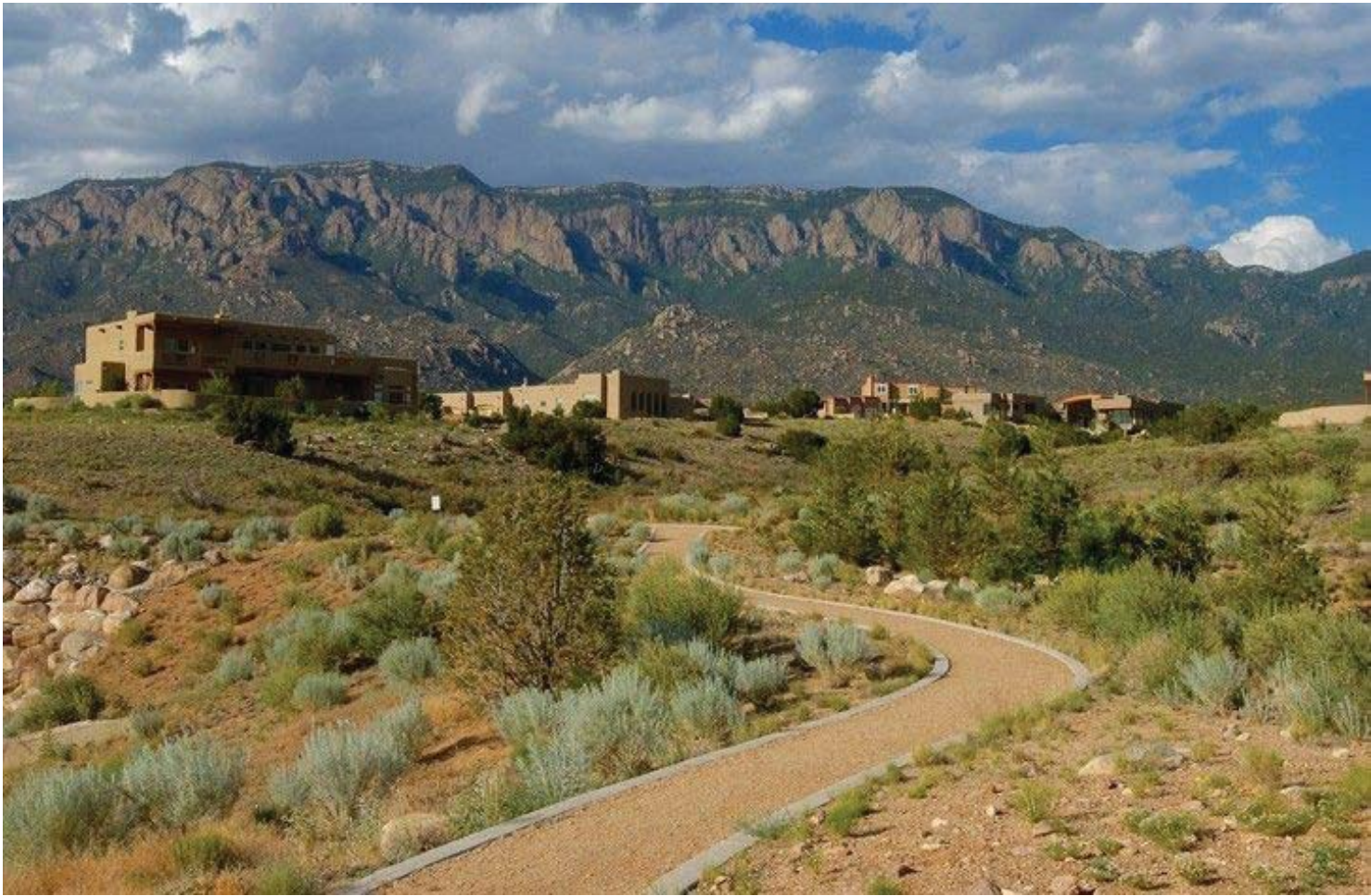
\$2,927,400 over 10 years

Granite Mulch

- 2” granite applied= \$.20/sf x 1,660,416sf=\$332,083 per app.
- Needs to be applied ever 5 years $\$332,083 \times 2 = \$664,166$ in labor
- Dredging= \$55,000
- Same amount of dump truck trips as Wood
- The dam is a 10 mile round trip
- $2,050 \times 10 = 20,500$ Trip Miles
- $20,500/8\text{mpg} = 2,562.5$ gals of Diesel
- $2,562.5 \times \$3.56 = \$9,122$ in fuel
- $\$664,166 + \$55,500 + 9,122 =$

\$397,369 over 10 years

Note: these are the numbers provided by LAF





- **Public involvement & transparency** are crucial to success
- Pioneering sustainable features is highly dependent on **relationships with reputable manufacturers & contractors**
- Must have solid **baseline data & pre-construction analysis**
- **Continuously evaluate** data calculations to test validity