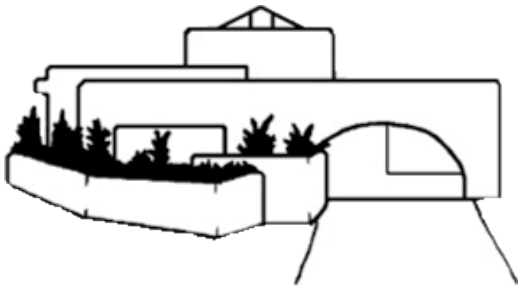
Desert Discovery Center



5 Year Development Plan 2010

- ≈ Introduction & Objectives
- ≈ Building Renovations & Upgrades
- ≈ Outdoor Classroom Developments
- ≈ Diagrams & Schedules

A partnership in Environmental Education:
Bureau of Land Management, National Parks Service, City of Barstow, Barstow Community College, Barstow Unified School District, Mojave River Valley Museum, National Parks Conservation Association, Off Limits Design, Southern California Edison, Mojave Water Alliance, Main St Murals.

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I. Introduction

A. Background

This plan outlines renovations, upgrades and new construction for the Desert Discovery Center (DDC) to develop sustainable facilities providing outdoor environmental education, interpretation and public outreach. The building was constructed in 1973 to provide interpretation for sensitive desert resources, and to house the BLM Barstow Field Office Staff. Yet for year's staff, teachers and students tried various other sites and delivery methods for outdoor nature based instruction. The same problems kept occurring: logistics, remote site, weather, safety, communications and no sanitary facilities. These improvements resolve those issues and increase program accessibility to regional students, teachers and visitors.

In 2003 the center began offering new education programs and events. The facility was open and staffed with expanded outreach and help from several partners. Staffing soon became consistent and the building open for regular hours. Several years of dedicated work by the partners succeeded in minor facility refurbishing and a series of regular programs and special events. But as use grew the facilities proved unable to support new programs and students because they are at capacity and worn out. Conflicts arise when classes, visitors and staff squeeze inside. Programs are held inside because there are no outdoor support facilities.

Today's built environment around the DDC is limited with inefficient parking, traffic circulation, and runoff patterns. Sustainable renovations are needed for water, heating, cooling, lighting, building shell, doors, windows, skylight, runoff, parking, and landscaping. This plan ties together work from the parking lot to the back lot. Related schedules and strategies identify funding requirements. Sustainable design and construction strategies are applied. Monies are available in FY2010 for building deferred maintenance and capital improvements. Monies from smaller funding streams will fund improvements and developments in phases. These actions will produce a high performance, sustainable facility, providing interpretation and nature education.

B. Goals & Objectives

Facility renovations, upgrades and new developments planned for the next five years have one over-riding purpose: to develop sustainable facilitates that support, expand, augment and take outside current interpretation, nature education and outreach programs. Building outdoor facilities has long been a DDC goal. Adjoining public land provides a natural setting for this expansion. This plan identifies the development strategy and purposes to accomplish the following goals and objectives in 5 years:

Goals

1. Create long-term setting at DDC in Barstow to provide nature based education and public interpretation, with new interpretive themes, features and displays.
2. Develop sustainable outdoor classroom facilities, amenities, and interpretive features that serve regional schools, and are open for public enjoyment.
3. Complete renovations and repairs for the existing facility to function as a high performance, sustainable building, providing a healthy work environment.

Objectives

1. Create outdoor nature education facilities on adjacent 8 acres of public land, and renovate existing facilities using sustainable design concepts.
2. Manage setting to maximize natural desert appearance for kids to get outdoors.
3. Develop a fully accessible nature trail winding around the outdoor classroom site linking the teaching stations to the building and other developed features.
4. Construct 7 teaching stations spaced out along the nature trail. Design them with themed features; trail & teaching stations open to public outside class time.
5. Develop an interpretive plan aligned with the Bureau's mission and incorporating the needs and goals of the partner organizations. Create new displays and interpretive features for the building, the outdoor classroom, and adjoining outside areas.
6. Develop support structures for a site host or temporary worker where they can stay for short periods while working on the project.
7. Improve circulation patterns with ADA compliant pathways and by removing or modifying walls, barriers, gates or doors; maintain property & building security.
8. Design work to obtain *Leadership in Energy and Environmental Design* (LEED) 2009 certification, comply with 2005 Energy Policy Act, Executive Order 13423 (sustainable facilities), and follow Bureau and GSA sustainable design guidance.
9. Apply wise water use principles; reduce use of filtered water by harvesting rain and grey water to irrigate landscaping, reducing runoff and lowering heat effect.
10. Apply best business practices and create opportunities for public participation.

C. Location & Setting

The main Discovery Center facility is a 7,000 square foot building on 12 acres of public land in downtown Barstow, Southern California. Property fronts Barstow Road and butts up to Lookout Lane in back. Property sits high with good desert panoramic views. Facility is clustered among city parks, community center, museum, government agencies, recreational facilities and traveler services. Location is central to students, parents, teachers, visitors and partners. Highway 15 is a few blocks away with easy access.

In 1970 the Bureau determined this was the best location for a permanent facility based on a site feasibility study. This site was selected because it is central to managed desert lands with good access to highways, utilities and services. Numerous highways, rail lines, pipelines and utility corridors merge here; almost all depend on rights of way issued by the BLM office. Today the Barstow Office priority is processing applications and rights of way for renewable energy projects. In addition to nature education, the DDC provides information and interpretation about the natural resources on nearby public lands and national parks.

Barstow is in the California Desert National Conservation Area, about 150 miles northeast of Los Angeles, in the Mojave Desert. The city slogan reflects the location value: "Crossroads of Opportunity". This location serves as a geographic funnel directing travel and trade through here, from coastal areas to lands in the east beyond the deserts. This was the last desert outpost with water, and served the Old Spanish National Historic Trail, Mojave Trail, Mojave Road, Mormon Road and Route 66.

II. Center Functions

A. Partners & Programs

The DDC is operated in a collaborative effort among agencies and organizations in Barstow. Together they created environment-based education programs for K-12 grade students. Two environmental education programs focus on fostering responsible stewardship in the youth of Barstow and surrounding communities. First is the Jr. Naturalist Program. This is offered throughout the school year and includes field trips to the DDC. Elementary and intermediary schools in the area travel to the DDC for half-day or whole-day programs which teach subjects like biology, botany, Leave No Trace and Closing the Loop curriculum. The DDC also offers a Jr. Naturalist Summer Day Camp.

Barstow & Silver Valley Unified School Districts are the primary audience with 20 campuses and nearly 10,000 students. We believe when students are excited about the desert – the unique ecosystem, and wildlife therein – they will grow up more responsible and motivated to protect this fragile resource. Students are treated with respect and programs correspond to California State Education Standards, they are intentionally more hands-on than traditional classroom settings. With most classes now from the High Desert the partnership is able to provide limited transportation. The partners are developing a transportation plan to increase and expand student access to ongoing programs and special outings.

A Memorandum of Understanding (MOU) among the partners is the overall guiding document explaining roles and commitments of the various partners. The agreement is flexible and was amended several times to add new partners or clarify roles. Partners contribute to facility operations, programming and funding. They include the BLM, National Park Service, Barstow Unified School District, Barstow Community College, Mojave River Valley Museum, City of Barstow, National Park Conservation Association, Off Limits Design, Southern California Edison and Main Street Mural Non-profit Corporation.

B. Facility Status

Overview: the DDC is a complete functioning building with a distinctive shape, landscaping and support facilities. Access & utilities are good, and most things work most of the time. The building was designed to permanent, but it shows wear and tear with visible broken items. Tiles & light fixtures are broken, drinking fountains & toilets don't work, rain falls through cracks in skylights, and stuff is stored everywhere. The outside walls are several tints of beige, and abandoned poles stick up from the roof. This variety of problems indicates needed repairs, the lack of a coordinated look, and poor space allocation. This brief assessment focuses on site development issues.

Parking Area: is a paved lot located and shared between the DDC and neighboring city Community Center. Vehicles enter and exit Barstow Rd. from 2 driveways; one near the DDC, the other is near the community center. The parking lot is paved, curbed, striped and lit. The asphalt surface is rarely maintained and poorly sealed. Cracks are common with weeds in light traffic areas. A 20' x 50' section is crumbling in front of the building. Built in a traditional

design, the perimeter and three islands are raised with runoff water directed into the street. Most flows to the north-west corner with too much volume for the intended drains; water pours over the curb, scours soil from the bank and rushes down the city street. There is no shade or facilities for alternative forms of transportation.

Building: originally opened in 1973 the building remains little changed, and is overall in very good condition. The entryway, public spaces, bathrooms, pond area and pedestrian traffic patterns were designed for light traffic with controlled access for security. Walls are solid and sound made from cinder block and covered with adobe plaster, as are most outside surfaces. Windows are basic single sheet glass, with Plexiglas for outer irregular shaped openings; they are not caulked, many not weatherproof, and none provide thermal insulation. Doors are warped with visible gaps. The roof is built up and leaks, so do skylights, doors and windows. The entryway and patio cement surfaces are in fair shape. Inside flooring is a mix of dark stone title in fair condition and carpet completely worn-out.

Several key components in major building systems are worn-out, outdated, and need repair or replacement. The integrated cooling, heating and ventilating systems have exceeded their useful lifespan. They are inefficient and require costly repairs to operate. Air circulation is through a combination of roof and subfloor ducts. The roof ducts are exposed, not insulated and leaking; subfloor ducts have not been inspected. A single large cooling unit on the roof feeds multiple zones. A single large heating unit built into the building supplies the same zones. Both are connected to blowers distributing air through ceiling and floor vents. Temperature controlled by six thermostats.

Many amenities are inefficient and need repair or replacing. This includes old faucets, toilets and drinking fountains which use large amounts of water. Lighting systems are in similar condition. The track lighting for displays uses 150 watt incandescent flood lamps, and the skylight is lit by 70 watt light bulbs, 48 of them. Likewise, outside lighting fixtures waste energy through old style incandescent light bulbs. Both inside and outside lights are frequently left on because the building automatic night switch is broken and too old to repair. Lights are turned on and off by the circuit breakers because switches are broken or their location is unknown. The building is protected by an alarm system and numerous phone lines are in place.

Floor configuration includes large main public room (displays & classes), reception area with public counter, 3 private offices, large classroom, and rooms for projector, lunch, utility, and tiny (non-ADA) his & her bathrooms w/shower. One corner is for puppets, another for sales to help fund building staff. With few inside storage space teaching items, unused furniture and supplies are stored where room is available. Floor and wall space is shared by mutual agreement in the public display room, both short and long term. Large displays in front of south facing windows blocks views of pond area and reduces potential daylighting; also prevents sunlight from building up solar heat in floors thermal mass. Conversely, west windows, domes and skylights all lack summer solar shading and thermal insulation protection.

Outside Features: the pond area is one of the few outside features, and is only accessed from the building. A 120volt pump circulates the water and pumps it out during changes, but does not work properly. This area is covered in decorative rock and native landscaping. A small drip

irrigation system supports the plants and a butterfly garden. Desert pond turtles and tortoises inhabit this area, secured by high adobe walls and an escape gate. Outside, a small, rock lined nature trail winds around the building with signs identifying native plants. A tall flagpole stands at the entry, but the rope works poorly and clangs loudly.

Undeveloped 8 acres: this adjacent public land is for new outdoor facilities. The west side opens to the DDC and parking, a fence & wall separate apartments on the south, houses with various fences line the north boundary. The east boundary abuts Lookout Lane with a steep slope in the center, leftover from road construction, and property access on both sides. The property was not cleared or graded and retains original contours, plants & wildlife. The site sits on the spine of a ridge running up from the river. The parking and building drain west, the back lot drains east.

Expansion work began in the summer of 2008 with clearing and grading for a new orientation area, adjacent to the existing entryway. Desert landscaping was planted with a new irrigation system. A large picnic shade ramada was built, and the new nature trail was scratched in. Next, two shade ramadas were built for the first two stations, and a contour trail was cut in to the back corner with a small dozer. In 2009 a large picnic ramada was built in the back, along with 3 more station ramadas. The final trail alignment was laid out and includes3 water crossings. A 1.5" water pipe and 2" conduit were buried from the top ramada, down to the north-east corner. A small levee was rebuilt along north boundary to control runoff and provide utility corridor access (power, gas & phone lines) from Lookout Lane.

Service Utilities: all have excellent capacity feeding into the building because they were designed when electricity and gas were insignificant costs. Large trunk phone lines enter utility room floor from conduit running to street parallel to entry. Water supplied to S.W. building corner by 2" line parallel to phone & entry. Two anti-siphon valves installed here, one to pond, one to new developments. Gas supplied by 2" pipe running north from utility room to property boundary ROW, parallel to front of building. Electric supplied by conduit from north fence to transformer adjacent to east pond wall. Service lines run from transformer to S.W. building corner. Sewage runs parallel to entry drive from S.W. building corner to street. There are no facility bins for trash or re-cycled materials.

C. Functional Relationships

Visitors arrive and depart from the parking area, which connects to Barstow Road. This area moves traffic from the street, through parking areas and next door to the community center. Pedestrian paths and clear directions safely separate and move people back and forth between parking and facilities. This setting should generate a sense of welcome, and begin to build visitor expectations for a pleasant experience. People and vehicles must be safe here. The building requires a curbside loading zone and ADA parking access.

This setting needs to be in harmony with nature and reflect the DDC mission. New features will visually demonstrate sustainable parking design concepts. Rain water will be captured and used to landscape and shade the parking area. Additional features will support fuel efficient vehicles and alternative modes of transportation. Maps and displays will show regional transportation systems and their use, including historic trade and transportation in Barstow.

Entryway and orientation plaza provide site directions, visitor information and a place to relax. Visitors develop their first site impressions here. This is a transition zone for people to pause, stretch, walk around and enjoy the views. This space serves as a temporary gathering site for classes, groups and visitors. Setting appears open and safe with clear sight lines. Pathways connect to all site features. Pathways, landscaping and lighting are intended to demonstrate good desert development practices. Entryway functions include seating, restrooms, and space for displays during events.

The building provides a controlled setting for interpretive displays, teaching nature programs, special events, public meetings, gift sales, and posting public information. Visitors see the meteorite, make inquiries, browse the displays and purchase gifts. A public counter serves as the center of operations. This is the point of contact for people entering the building. The key function is providing information. This space is staffed by a nonprofit employee with help from partners, volunteers, staff and temporary workers. Visitors are free to use the restrooms and view displays when the building is open. It is closed to the public during student programs. This is for child safety, to avoid class interruptions and for security concerns.

At the heart of the project is the building center where people work together. This space includes the reception area, classroom, kitchen, offices, restrooms and support features. Setting should inspire and encourage learning, identify goals and track accomplishments. Office rooms provide administrative and work space. Restroom serves staff and students, but need ADA access. Classroom is for teaching, meetings, and special projects. Controlled access to these spaces is limited to staff, instructors, students and guest.

Outdoor public spaces adjacent to the building house and protect displays and interpretive features. The patio and garden are secure areas with access through the building. The pond area provides a tranquil setting and demonstrates native plants. An adobe wall provides security and muffles city effects. This is home to a few desert animals injured or brought in by visitors. The setting reflects a desert spring with associated plants and animals. This area will be expanded to support education activities and scenic views. Locking gates continue to control access. ADA compliant restrooms in expanded garden area will serve the building and adjoining outside areas.

An open air amphitheater serves as the stage for outside activities. The structure is available for public events, presentations and meetings. Students, parents and teachers gather here to start and finish outdoor classroom activities. There is universal access to the orientation plaza, garden, parking and the discovery trail. A secure gate controls access into the garden area. A service road along the utility right of way provides vehicle access for stage equipment and supplies.

Starting from the garden area, a universal accessible trail winds around the back 8 acres and connects to all developed sites. The trail connects seven teaching stations to an amphitheater, the building and Old Spanish Trail interpretive features. A connecting pathway joins the orientation plaza and parking. The trail is to create a sense of discovery and provide universal access. The trail is designed to remain open for daytime public use. Each station contains theme based design features and displays about natural resources the public may view. Stations are set back from the trail with features and structures to screen classrooms from passing traffic. All outdoor features are closed at night.

In the back north-east corner, the archaeological teaching zone will look like an investigation in progress, a dig site. No types of traffic are allowed here to protect undisturbed areas with sensitive desert pavement. A trailer pad with hookups will be available for a site steward or temporary workers. Vehicle access is along boundary in utility right of way. An on-site host will greatly improve security. Restrooms will be located here for students and instructors.

Public access will be controlled into the outdoor class setting from adjoining public streets. A gate will allow access to the discovery trail from lookout road. Normally open, it will be closed during outdoor class activities. A new pedestrian walkway will be developed along the south wall. Detailed planning for this feature will require coordination with city and neighbors. In the short term the wall pathway will remain open.

III. Project Plan Design

A. Diagrams of Use Areas

B. Supporting Narration

This plan addresses three major development topics. First: to apply sustainable building practices and obtain LEED 2009 Certification for renovation of the existing building. Second: to renovate worn out, broken or inefficient building systems for efficient sustained use. Third: to develop new outside facilities for providing nature education. The desired outcome is a permanent outdoor classroom setting, with provisions for public interpretation. A safe setting with sustainable facilities that is universally accessible, inspiring, and designed for instruction.

The LEED (Leadership in Energy and Environmental Design) Green Building Rating System™ encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria. This process starts with the design and guides all building renovations, facility upgrades and new developments. The rating systems are voluntary, consensus-based, and market driven. They evaluate environmental performance from a whole building perspective over a building's life cycle.

"The green building movement offers an unprecedented opportunity to respond to the most important challenges of our time, including global climate change, dependence on non-sustainable and expensive sources of energy, and threats to human health. ... Such leadership is a critical component to achieving USGBC's mission of a sustainable built environment for all within a generation." The following sections identify design parameters for each facility, with final detailed plans and specifications resulting from the collaborative LEED design process.

1.0	Parking Area	2.0	Orientation Plaza
3.0	Building	4.0	Amphitheater
5.0	Discovery Trail	6.0	Teaching Stations
7.0	Campground Host	8.0	Support Amenities

1.0 Parking Area

Upgrade parking area by applying new sustainable design concepts. This area will be well signed and generate pleasant feelings with shade trees and universal access to building and outdoor features. The front curb has designated loading and no stopping zones. The lot will contain maps and displays showing how to use regional transportation alternatives. A series of pocket displays will interpret city ties to historic transportation and trade. Develop parking areas and secure storage to support the use of bicycles, motorcycles and similar modes.

Soften the setting to be in harmony with nature. Shift from a bare asphalt lot that magnifies summer heat, burns expensive lights, and dumps rainwater onto public streets as a waste product. Convert raised islands to sunken swales that collect and hold rain runoff. Put in desert plants and supplemental smart irrigation to produce shade and reduce the asphalt heat effect. Harvest rainfall by installing speed bumps, catch basins and drain channels to move runoff from parking lot to nearby swales with landscaping. Reuse existing light poles, but convert to energy efficient lamps. Install designated electric charging stations at 2 poles. Designate preferred parking for fuel efficient vehicles. Install solar panels on top of parking shade structures.

Redesign parking area in front of building to avoid conflicts with through traffic, drop offs, handicap parking and ADA access. Remove irregular borders and choke points. Repair curbs and a large section of broken asphalt, patch and seal the entire lot, apply new paint and stripping. Convert part of the damaged asphalt section to a drain swale and landscape. Install handicap parking in remaining space; connect with wider walkways providing ADA access. Channel rain runoff overflow from entry drive to landscaping along west side of building.

Additional Improvements:

- Construct 3 swale islands with desert trees, midway to community building.
- Construct drain swales with desert plants along west, north and east sides of parking area.
- Channel parking runoff overflow from northwest corner to landscaping west of building.
- Construct accessible storage for waste & recycling bins adjacent to parking.
- Construct wire mesh fence along east side of parking area to capture trash.

2.0 Orientation Plaza

The orientation plaza includes the driveway, loading zone, flag pole, building entryway, existing kiosk, large shade ramada, picnic tables and surrounding hardscape. Provide clear directions, site information and map at entrance. Use large block lettering and destination icons on signs by parking. Transition to artistic sign designs with diagrams and pictures farther into the plaza. Build structures and features to orient and direct visitors and students to the site, Barstow and the surrounding desert. Provide universal access with travel surfaces averaging 2% slope. Finish with cement, title, crusher fines or something recycled. Install low voltage ground lighting.

Incorporate artistic elements and features in structures and on the landscape to subtly highlight places and things in the view-shed. Similar developments are called for around the property. It is important for the long-term success of the outdoor classroom to involve students, parents,

teachers, neighbors and professionals in developing these enhancements. They function to instill in local students a sense of place and purpose about Barstow. Generically, they educate, entertain and stimulate thinking. Basic examples are sun clock, equinox alignments, and wildlife themed benches. Feature ideas from planning are in the ART appendix tool box.

Develop simple, short interpretive displays for the parking and orientation plaza. Focus on transportation, trade and community heritage. Guide viewers to compare their desert experiences to ancient ways of residents, travelers and trade. Infer simple solutions through proximity to visible green facility improvements. Another interpretive thread will explain green building concepts visibly demonstrated. This includes demonstration rain harvesting for desert landscaping, parking area shade, and alternative transportation support structures.

Reduce the use of filtered water for landscaping by installing a water harvesting system. Capture runoff flowing down the parking lot, including water from the community center and fire station. Both are uphill of the DDC. Install a series of tanks, cisterns and channels to store and distribute water to different landscape zones. Locate the first tank at highest elevation possible near south edge of property. Build gravity ditch or install open flume to transfer water down the strip between the parking and next door apartments. Design simple, low maintenance system with components that visibly demonstrate their function.

The orientation plaza fills the space between parking, the building and the outdoor classroom facilities. This area needs clear direction signing, universal access, shade, picnic facilities, and maps with information about the site and programs. Post site hours, rules and behavior in clear, easy to understand format. Separate the orientation plaza hardscape from the back lot with a short adobe wall. The wall serves to define the public space and prevent children from tumbling down the steep hillside. Maintain a light, colorful, open airy feeling here.

3.0 Building

At the heart of the property and programs is the building center. This structure continues serving the public nearly 40 years after open. Its distinctive outline is a Barstow Icon. The facility is sound from foundation to rafters. However, some of the pieces and inner workings above, below and in-between are in need of repair or replacement. This section describes what needs repairing and what is planned for building renovations. This will change the facility appearance and how people interact with the setting. Looking refreshed from the makeover, the building will continue to welcome throngs of children and travelers for another 50 years.

The building section is everything past the entryway gates, north to the property boundary. Renovations start in the breezeway with removal of the pipe wall separating the pond area. Build sitting benches in the first three gaps. Install a short swing gate in the gap closest to the building. Install new animal fencing behind the benches. Connect the patio and breezeway with a continuous travel surface. Modify the solid roof to reduce heat buildup, improve air circulation and allow rainfall to rinse the area. Two options are to replace roof with beams spaced apart like over patio; or raise every other board about 6” with trusses. Paint the space white to reflect light and illuminate corners. Install a moveable over structure to block sun’s heat and provide diffused light. Install similar device over west storage area. Replace broken light fixtures and install energy efficient lamps.

Renovate breezeway restrooms: replace amenities, toilets, urinals and faucets. Repair broken tiles, install new lighting, clean and paint. Build sink gray water systems. Install plumbing along wall from drain to window by door. Run drain pipe outside through new window opening. At same time upgrade the windows. Chip out titles running in a path across the breezeway to the pond area and cut a channel about 4" wide and 6" deep. Run drain pipe thru channel, backfill and install new art titles. Branch drain pipe to drain pits for irrigating nearby landscaping. Leave pipe ends exposed for cleaning & demonstration viewing.

Inside work starts in the back. Inside bathrooms are too small to comply with mandated ADA requirements for access. Remove wall between the bathrooms and combine them into a larger, universally accessible, unisex room. Replace broken amenities and install a new toilet, lighting, and handrails. Reuse shower stall and fixtures in good condition. Paint room bright color. Run gray water drain pipe through wall and join entryway bathroom gray water drain. Complete modifications to the utility room at the same time. Seal around the outside door, insulate and cover ceiling openings (hatch, ducts, vents, and conduit). Move stuff to cabinets in outside equip area, or the west garden. Remove broken automatic switch, old mechanical water timer, water heater, and abandoned or non-essential devices. Install building solar water heating system.

Design the large classroom primarily for that function. Strip interior; remove clutter, wall boards, water fountain, carpet, blinds, furniture and ineffective lights. Apply LEED process for wall treatments, colors, flooring, lighting and storage spaces. Vertically integrate room for open floor space. Consider room ideas from partners, students, parents and educators. With room empty clean everything. Install efficient lights. Upgrade wall windows with caulk, a second pane, and an ultraviolet reflective coating. Install cabinets and storage structures. Paint all wall surfaces possible. Install new flooring, window coverings and wall boards.

Empty, clean and repaint the three offices. Perform light maintenance and replace broken lighting, hardware, fixtures and ceiling tiles. Work with partners to assign primary functions and design themes for rooms. Determine needs and layout for furniture, office equipment, shelves and cabinets. Maximize storage capacity with shelves and cabinets in curriculum room opening into classroom. Convert projector room into arts and craft room with narrow workbench running length of room. Install cabinets above and below bench.

Improve airflow in the reception area and increase work space by removing the office and cabinets using half the floor space. Reuse the building materials for either a new outdoor restroom or storage. Install space efficient cabinet for public information and office supplies. Create new workstations for building host and volunteers. Install shelves with plants. Install new skylight framing with rectangular windows that open in north and south opposing triangles. The new windows would release hot air trapped on warmer days, and allow fresh breezes on nice days. Remove carpet and replace with light color title to avoid excessive solar heat accumulation. Apply skylight solar heat thermal glazing, second insulating layer or some type of solar heat shield. Replace nigh lighting with high energy efficient bulbs, preferably LEDs.

Two other enclosed offices are for shared purposes and interchangeable. A modular setting providing basic worker needs. Work stations, connections for power & communications, and

secure storage. Key design element is maximum available floor space. The first one is a room built inside the workspace behind the public counter. This room and storage cabinet's look like afterthoughts because they fill the space behind the counter and block movement of staff & instructors. The area behind the counter needs open space for several people to move freely about while working the front counter, sales or programs. The area should include a few shelves and small storage cabinet for supplies. Install shading to control heat from sunshine.

Kitchen room requires least amount of renovation work. Repaint wall surfaces. Remove carpet and replace with title or stone flooring. Replace old faded bubble window with new covering material; high thermal insulation rating, caulk entire opening. Modify sink drain plumping and direct gray water outside for use irrigating landscaping. Install new light switch panel for operation of display room lighting. Install shelves and storage cabinets. Install new electric stove and range for food service during special events.

Display room needs painting, window and skylight upgrades, and shell maintenance. This is a beautiful room with large open ceiling and several sources of good daylighting. However, this room is poorly insulated and does not take full advantage of natural lighting and passive solar heating. Correct this with careful display layout and outside landscaping to block sun rays from spring to fall. Paint the skylight boxes along the north wall white and consider replacement screen that reflects light better into room. Paint exposed interior roof beams white for improved reflectivity. Replace ceiling fixtures and track lighting lamps with energy efficient fixtures.

Other building renovations include replacing and upgrading the heating, cooling, ventilating and lighting systems. Prior to designing the new mechanical systems take all steps possible to reduce the need for heating and cooling through smart building and landscaping design. Insulate, ventilate, reflect, shade or expose various building surfaces and structures as needed to minimize energy use. Repair or replace and insulate all building openings. Install a drinking fountain in entryway with simple gray water drain. Create new thermal decompression zones to transition from outside high temperatures to cooler building interior.

Additional work is planned to expand the outdoor garden area, to provide additional support structures and to increase the circulation pattern. Begin by grading level the area out the back gate around the north garden wall as far west as the kitchen bubble window. Then lower the garden wall from the security gate north and west to the building. Leave wall pillars at original height. Open the three gaps where the security gate and tile pipe are located. Build a new adobe wall to encompass the expanded garden area. Minimize fortress appearance by building adobe about 2' and topping with 3' decorative wrought iron grate or chain link. Replace the large window next to the kitchen with a new door opening into the expanded garden area.

Build new ADA compliant restrooms in the expanded garden area to serve people from the building and adjacent outdoor spaces. Currently, 2 men's and 2 women's restrooms serve all visitors to the site, none are ADA compliant. Two are too tiny to comply. On busy classroom days over 150 children, parents, teachers and staff are on site and stress the bathroom capacity. Several hundred may pass through for special events. It is a disaster if 1 toilet plugs up. The new restrooms will be ADA compliant, and may be unisex. This location was selected because it has good access to sewer, water and electric utilities. Also build outdoor storage in the expanded

garden area. Install security cameras in entryway, building and garden areas.

This ends renovations & upgrades; focus shifts outback to new work:

… to create interesting and stimulating spaces, where Children explore And learn the natural world, and develop their creativity…

The Schoolyard Habitat as defined by Heidi Vasiloff, Arizona Game and Fish Department: *"are places where young people and wildlife connect. Built and planted with native vegetation to provide a home for wildlife, they serve as outdoor classrooms where students learn about our natural environments.*

…Within these interactive settings students gain knowledge and appreciation for ecology, plants, and wildlife. Through hands-on-activities within these important environments, students explore and learn about the deep connections between one's inner self, man and nature and the world around us. Our hope is that they come to appreciate the connectedness of all living things and

4.0 Amphitheater

Centrally located between property features, this facility serves two primary functions. First, this is the staging area for beginning and ending outdoor classroom activities. This function use to occur inside the building, but was shifted here to reduce space conflicts and because it is closer to new outdoor facilities. Classes assemble in the entryway on arrival, but now only the group leaders need to enter the building for check-in. Meanwhile, students and parents have access to restrooms, a drinking fountain, benches and tables. If groups split up the circulation pattern helps guide everyone in the same direction toward the amphitheater. Classes re-assemble here for orientation, instructions, presentations and when their program is complete.

Secondary uses of this facility are for special events, presentations and Community Theater. There are few public locations in Barstow for organized outdoor activities. This location helps fill this need and provides a managed setting for hosting the presentation of public meetings, events and programs. This includes Earth Day, National Public Lands Day, community fairs and special presentations for parents, sponsors and civic organizations. Theater type events include stage productions, film, musical presentations and similar. Permit or cost recover fees may be charged and all use will be scheduled through site manager.

Develop the open air amphitheater adjacent to the orientation plaza to serve as a staging area for outdoor education activities and special events. Nestle the facility in an east facing drainage and take advantage of the natural contours to build tiered seating sloping down toward the stage area. Design site for about 200 people. Include stage area and related secure storage. Include passive and active solar thermal mass heating and cooling elements. Include artistic design features highlighting natural systems and cycles. Construct an arch superstructure over the area between the stage and seating, for attaching displays, diurnal clock pieces, sound and lighting devices.

Provide universal access and low level lighting for use in all weather conditions. Install new direction signs and emergency access lighting. Provide support structures for facility sound and lighting. Use low voltage lighting for easier use of solar & wind produced electricity. Provide facility with vehicle access to back stage area from Lookout Lane for props, equipment and people. Design facility for daytime public access in a low security zone, closed to use at night. Include universal accessible pathway access to building, controlled by security gate. Design for public access to bathrooms in building entryway and garden areas during special events.

5.0 Discovery Trail

One of the key new facilities is a discovery trail because it helps set the tone and pace for movement through the setting. The trail winds around the back 8 acres in a curvilinear design, connecting the building to the amphitheater to all the teaching stations & site features. While providing access, a key function is to create a sense of being in nature and the excitement of exploration. This facility is designed to transition visitors from our mechanical daily world to a natural, intuitive and inquisitive desert setting. The layout is intended to slow people down, with support features providing opportunities for reflection, contemplation and discussion.

The trail guides site exploration and creates opportunities for young people to discover their relationship with others and nature. This pathway creates and links learning experiences while highlighting the natural environment. Trail experiences are just as important as moving people from one point to another. Because the trail is not just about the linear progression from one station to another, but rather the trail intends learning opportunities through self exploration in an outdoor setting designed to stimulate students.

Providing universal access to outdoor classroom features is the primary purpose of the trail. It also serves as an interpretive trail open to the public during daylight hours. Besides providing access to the teaching stations, the trail includes places for passing, special learning features, overlooks, nooks and crannies. Support features include landscaping, rails, art, benches, signage, lighting, drainage and retaining walls. Low voltage ground lighting will illumination site with minimum effects to dark skies. These systems reduce the risks of shock and are compatible with on site solar and wind generation systems.

Site access is a community issue because trails across the property are heavily used as pedestrian short cuts. Initial planning looked at closing the property to public and building a perimeter wall. However, it is apparent a wide variety of people use these trails going many places. This site is a pedestrian focal point because of nearby government services, businesses and the freeway. Use occurs all day, in a significant volume. Planning guidance and lessons learned advise including community needs and against closing access. Closing access does not necessarily improve security, but does antagonize affected parties. Increased vandalism results from blocking traditional access and excluding neighbors from the improved setting.

Security zones were identified to plan access, pathways, walls and lighting. The 8 acre outdoor class setting is a low security zone. Fences, walls and paths allow access by the public, but it is closed to use at night. Public access will gradually be changed during site development. Short term t-post fencing in the back will leave 2 entry points, but block vehicles. The 2 points access the path up the drainage and another by the south wall. When complete the discovery trail will

replace the drainage path. A gate will control access from the back corner, and will be closed during outdoor class. The path along the south wall will be cleaned and provide an alternative. In the long term this will be upgraded to a pedestrian walkway with fencing and lights.

6.0 Teaching Stations

Seven developed teaching stations are planned on the adjacent undeveloped 8 acres, connected by the discovery trail. The stations and trail serve as core facilities for providing long term nature education. These structures are intended to provide the framework for themed based nature and green lifestyle education. Basic functions are to provide universal access, shading, benches, secure storage, water, power, and communications. Each site includes the surrounding zone for developing site themed education features. Ex., simulated geological rock patterns built into the geological zone hillside, or a concealed drainage habitat structure in the wildlife zone.

Development of these primary facilities began current with preparation of this facility plan. The DDC partners recognized these new structures are necessary and appropriate for the basic design of the outdoor classroom site. Similarly, final subsequent detailed plans will be developed using an integrated design approach for collaborative planning. Design teams will guide development for each station. The teams will include theme subject specialist (geology, wildlife), educators, parents, students, artists, engineers and volunteers. Each team will design and direct the layout and building of structures, displays, educational features, and landscaping for their zone.

Each station starts with the same basic layout to provide a standard look and feel. Development starts with grading, then construction of a shade ramada and an adobe or rock retaining enclosure. Utilities are run to stations based on need. This work is done first because it requires heavy equipment and causes moderate surface disturbances. Disturbances caused by construction and equipment are manually restored to match the surrounding undisturbed terrain. At this point vehicles and machines are excluded from the interior.

Vehicle access to utility ROW and new outdoor site features is provided along north boundary. A dirt road is maintained here on top of a small levee running from Lookout Lane west to the amphitheater. Access into the south-west corner is also from Lookout Lane. The interior is limited to small mechanized machines that fit the trail, like wagons and utility carts.

7.0 Campground Host Site

By combining several site functions and design needs an opportunity was created for a site host camp serving educational, security and staffing needs. Initial plans included a mock dig site in the archaeology zone. The zone is designed to look like a remote archaeology investigation site amid historic ruins. Meanwhile, planning identified a security need for a site steward. But employee housing is too complicated and expensive. Combining these concepts resulted in a modified layout with facilities for a site steward, a temporary employee or guest DDC workers.

Archaeology station features were integrated to serve parallel needs for the archaeology site steward and campground host programs. The site functions were expanded so this station could support archaeology and campground stewardship training. The site layout will follow a design

pattern representing a late 20th century remote archeological field dig site. Educational design features include an old travel trailer with shade tarps, dig equipment, tools and tables.

Site host structures will support travel trailers, 5th wheels and tents. They include a trailer pad, hook ups, a septic holding tank, privacy fencing and a large shade ramada nearby. Functional solar shower and composting toilets address sanitary needs. This avoids the need for a sewer connection. They also demonstrate minimum development design by conserving energy and water. Restrooms are needed here because ones in the building are too far away. Participants may spend most of a day in the back. Partners and educators identified unacceptable problems in sending kids to the building, out of site on their own. It is also a problem for instructors to leave materials unattended.

8.0 Support Amenities

This section includes structures and features that support property functions. Their location and design is intended to draw a balance among public access and site security; night lighting and energy conservation; and developed versus undisturbed landscape. Include following:
Apply similar design elements to structures and features with a related function.
Branding will simplify site use by clearly identifying locations with themed icons and colors.
Use new interior materials, colors and design elements.
Fencing & lighting; perimeter adobe wall, interior adobe and rail, low voltage outside lighting.
Utility network linking site features; 2' water, electric & data lines along trail.
Landscaping; native vegetation, create micro settings.
New direction & site signs, freeway and large site sign facing Barstow Rd.
On site solar & wind generation.

C. Interpretive Requirements

A comprehensive interpretive plan is needed and should be developed by an interdisciplinary team. Recommend work with Project Partners and Desert Managers Group, with NPS lead. Team identifies land use, resource and visitor issues to address; selects topics, message content, location and purpose for interp. Outcome is a plan that identifies where and how interpretation will be developed, inside and out. Identify required property and building renovations, repairs, modifications or new construction. Target partner agency priorities; T&E, RE, water, waste.
Topics interpreted should be consistent inside, in displays, web & outdoor classroom topics.
Topics: natural resources, geology, paleontology, plants, animals, archaeology and OSNHT.
Old Woman Meteorite.
Display map showing regional public land uses; parks, acecs, recreation sites.
Display showing where and how to use public transportation. Map w/alternative fuel sites.
Identify options for moving people, goods and information.
Solar & wind energy generation; how it works, the permitting process, benefits & impacts.
Renewable energy demonstration projects; with partners and tied to interp.
Demonstrate green lifestyle, sustainable design.
Sustainable living project; exposed construction samples; wall material, waste, water.
Desert wise landscaping, water conservation & rain water demonstration projects.
Show how driving habits and choices affect energy consumption.

IV. Project Development Overview

A. Required Administrative Actions

Daily operations of the DDC and related programs are guided by a Memorandum of Understanding (MOU). The partnership has expanded since the original agreement and would benefit from a new detailed operating agreement. While this planning effort addresses site developments, notes and observations are being collected for a parallel effort to update and expand the MOU. A more comprehensive document will further define partner roles, responsibilities, and lines of authority, similar to a Service First Agreement. The new agreement will define in detail specifics about who, what, where, when and how work is done.

Update BLM asset management and maintenance programs with current information about the purpose and status of the DDC. Integrate the approved 5 year plan with the BLM 5 year capital improvement program. Submit funding request for facility renovations and construction of outdoor classroom structures. Submit funding request for maintenance and operations.
Consider all requirements for zoning laws, design guidelines, landscaping and codes.
Submit preliminary concept design to city for review and code compliance.
Coordinate with the city to establish trash and recycling services.
LEED actions; register, designate design team, establish building commission, more.
Add actions to determined facility status in Bureau asset management plan and update.

B. Required Interim Use Actions

Needs work:
Identify standards and codes the project will apply and conform to.
Provide direction and identify roles of organizational units, planning, design support.
Coordinate with partners to schedule time for renovations.
Schedule temporary on-site storage for building furnishings during renovation.

C. Project Phasing

The improvements will occur in phases over several years with some overlapping expected. This outline serves as a guide. Final implementation decisions will depend on changing priorities and available funding.

Phase	Actions
1)	2009 – 2010

- Prepare site plan, complete NEPA, layout trail and stations
- Complete new grading, build station framework, extend utilities
- Rough in walkways, plaza, amphitheater, and picnic ramadas
- Complete 5 year development plan

The first phase is the development of the picnic areas, teaching station one and the first leg of the interpretive trail. The next phase would include engineering, architectural design, teaching station two, and segment two of the interpretive trail

D. Development Schedule

Need final site and facility layout and plans. Identify repairs and work now funded.
Align work in the 5 year plan to meet LEED 5 year project certification time limit.
Align 5 year plan with Bureau 5 year Deferred Maintenance and Capital Improvement Plan.
Submit 5 year maintenance and improvement plan for Bureau funding.
Submit grant request for nature education facility construction funds. Include cost to repair, renovate, design, build nature ed facilities; include new displays and interpretive features.
Align grant 8 year time limit for project funding with DDC 5 year plan, and LEED.
Establish an interpretation team and develop a plan for the facility, use for preparing grant.
Identify additional sources of funding and integrate their schedule and time limits.

E. Recommended Design & Construction

Building a nature trail with teaching stations is considered a non-controversial, minimum impact action. Simple plans were prepared for the outdoor classroom, then reviewed, analyzed and approved in a 2008 environmental assessment. During planning for new facilities problems were uncovered with circulation patterns and the existing facilities. Funds are budgeted in 2010 for major building and system repairs. This work is included in the initial phase of development. New work for renovations, repairs and construction will be completed by using a combination of human resources and funding, both in house personnel and contracting.

This 5 year development plan conforms to new agency and building industry design guidelines for sustainable buildings. *The Federal Leadership in High Performance and Sustainable Buildings MOU* was approved in 2006 and established a group of guiding principles for each Federal Agency. A subsequent instruction memorandum required the development and use of the: *Interim Planning Guide for High Performance and Sustainable Buildings, 2006*. All new major construction must consider LEED certification. Sustainable facility design requirement were also integrated in the *Bureau Asset Management Plan 2009* (AMP).

The AMP manages assets using a strategic and holistic approach. This includes requirement that investments must be aligned with DOI and BLM program missions and strategic goals. Through the asset management review process, the BLM focuses on and evaluates the effectiveness of current spending, identifying "assets of interest" that are not being operated or maintained at adequate levels and those that should not be operated and maintained. The plan notes most assets have reached 25-year end-of-service life, for facilities not permanently constructed. The plan integrates facility asset and business financial management software to collect, track and report all facility cost and energy use. These actions could challenge the DDC usefulness in the future because of rising repair and utility cost, poor building performance, and underutilization.

A window of opportunity just opened for funding to renovate the building, install new interpretive displays, and build outdoor classroom facilities. On 9/01/09, California State Parks Department announced they will accept applications in January 2010 for grants funding construction and development of nature education facilities and interpretation. Funding from a successful application would make the DDC a high performance sustainable building, generating

less waste, using fewer resources, and conserving energy. In the process facility programs, displays and interpretation will be aligned with agency program missions and strategic goals.
Needs Work:
Complete design by tiered process. Initial 5 year plan, ad-hoc station design teams, subsequent engineer or architect for detailed drawings & specs. Complete work by combination. Staff, volunteers, partner labor and contracting. Youth corp., special events; npld, earth day. Piece meal staff and contract. Phases. Combined learning & building programs. Contract.

V. Preliminary Project Cost Estimates

A. Estimated Project Related Cost

Complete site development is estimated to cost about four and half million dollars. This includes all outdoor classroom facilities and features; parking; support structures; finish building renovations; installing new interpretation displays and features. Include in budget funding for artistic enhancements, provocative and interesting design features, and elements of fine art, murals, sculptures and facility design features. Preliminary sources:

Annual Take It Outside funds	$ 10,000
2010 BLM program support	$ 25,000
2010 BLM facility renovation	$ 900,000
2010 Nature Education Facility grant	$1,200,000
2010 State Parks grant	$2,000,000
2010 Ca Parks grant	$ 500,000
2011 Ca Recreation Trails Program	$ 75,000
2011 National Endowment for the Arts	$ 25,000
2011 BLM maintenance & improvement	$ unk
2012 Ca Recreation Trails Program	$ 40,000
2012 BLM Take It Outside	$ 10,000
2013 Ca Trails, Take it Outside	

Add: partner contributions, match funding, fund raising, sponsor donations, additional grants

B. Preliminary Cost Estimates by Phase

VI. Project Plan Review & Approval

VII. Appendixes

Building Renovations Appendix
Water
Install basic water fountain in entry, drain to plants
New low flush toilets & faucets
Install irrigation rain sensors
Repair roof rain down spouts
Install new pond pump and a filtration system

Lighting
Install new low energy, skylight night lights; colors
Install auto photo night switches on all night lights
Replace track lighting flood lamps with low energy lamps
Replace ceiling ambient light fixtures with low energy lamps
Install timers and motion sensors for room lights

References, Building Codes, Standards:
GSA architectural design standards, cites requirement to follow a national code
http://www.wbdg.org/ccb/GSAMAN/p100.pdf
U.S. Dept Energy Sustainable Buildings
http://www1.eere.energy.gov/femp/program/sustainable_buildings.html
Whole Building Design Guide
http://www.wbdg.org/ccb/browse_doc.php?d=5086
Examples:
Zion Visitor Center http://femp.buildinggreen.com/overview.cfm?projectid=16
U.S. Energy Management Requirements:

- National Energy Conservation Policy Act - Fully Amended
- Energy Independence and Security Act of 2007
- Executive Order 13423
- Energy Policy Act of 2005
- Executive Order 13221
- Energy Policy Act of 1992

Cuts and Edits:

Our Main Purpose Is Simple:

... to create interesting and stimulating spaces, where
Children explore and learn the natural world,
And develop their creativity...