

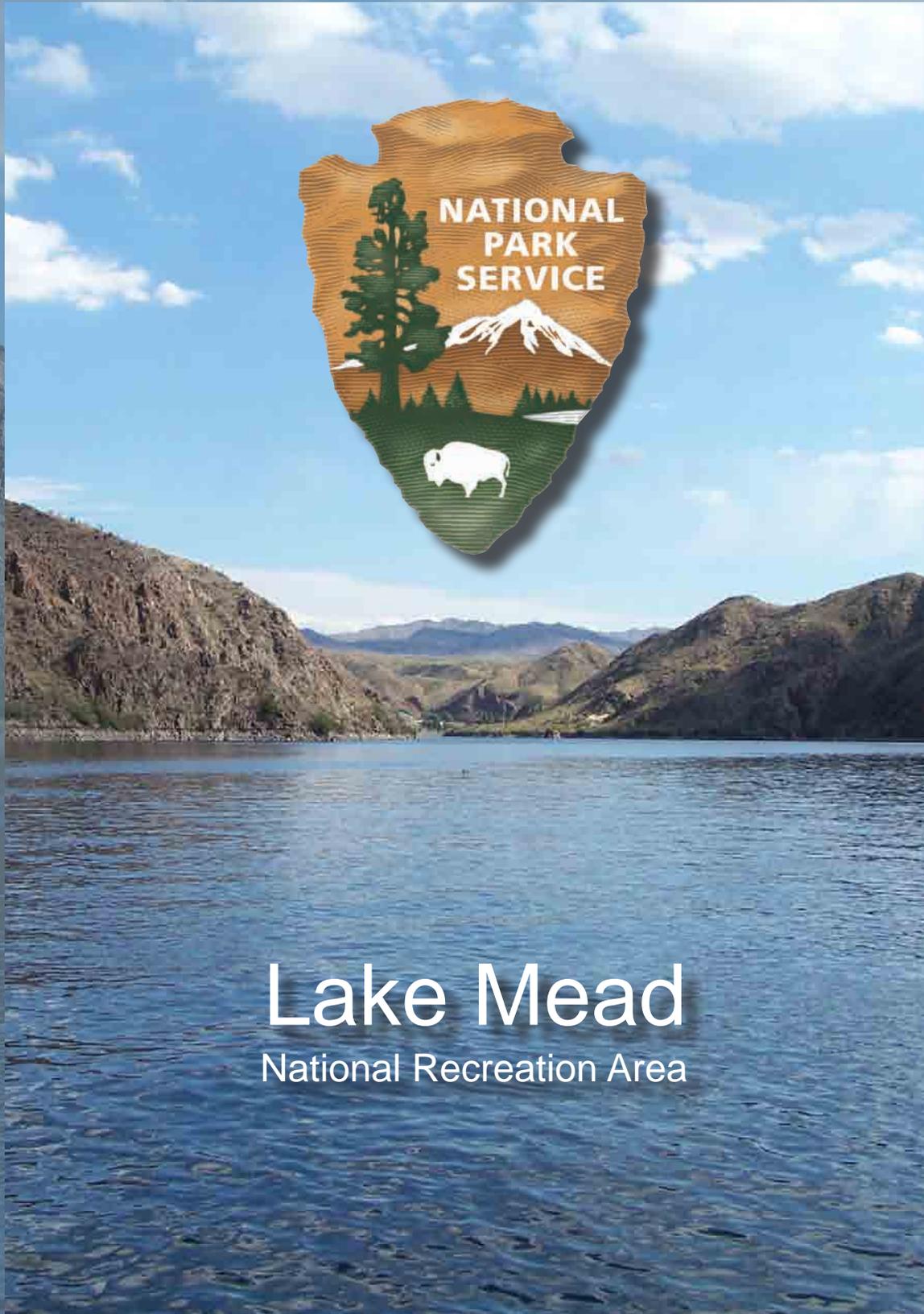
Lake Mead

National Recreation Area
U.S. Department of the Interior



Capital Improvement Projects





Lake Mead

National Recreation Area

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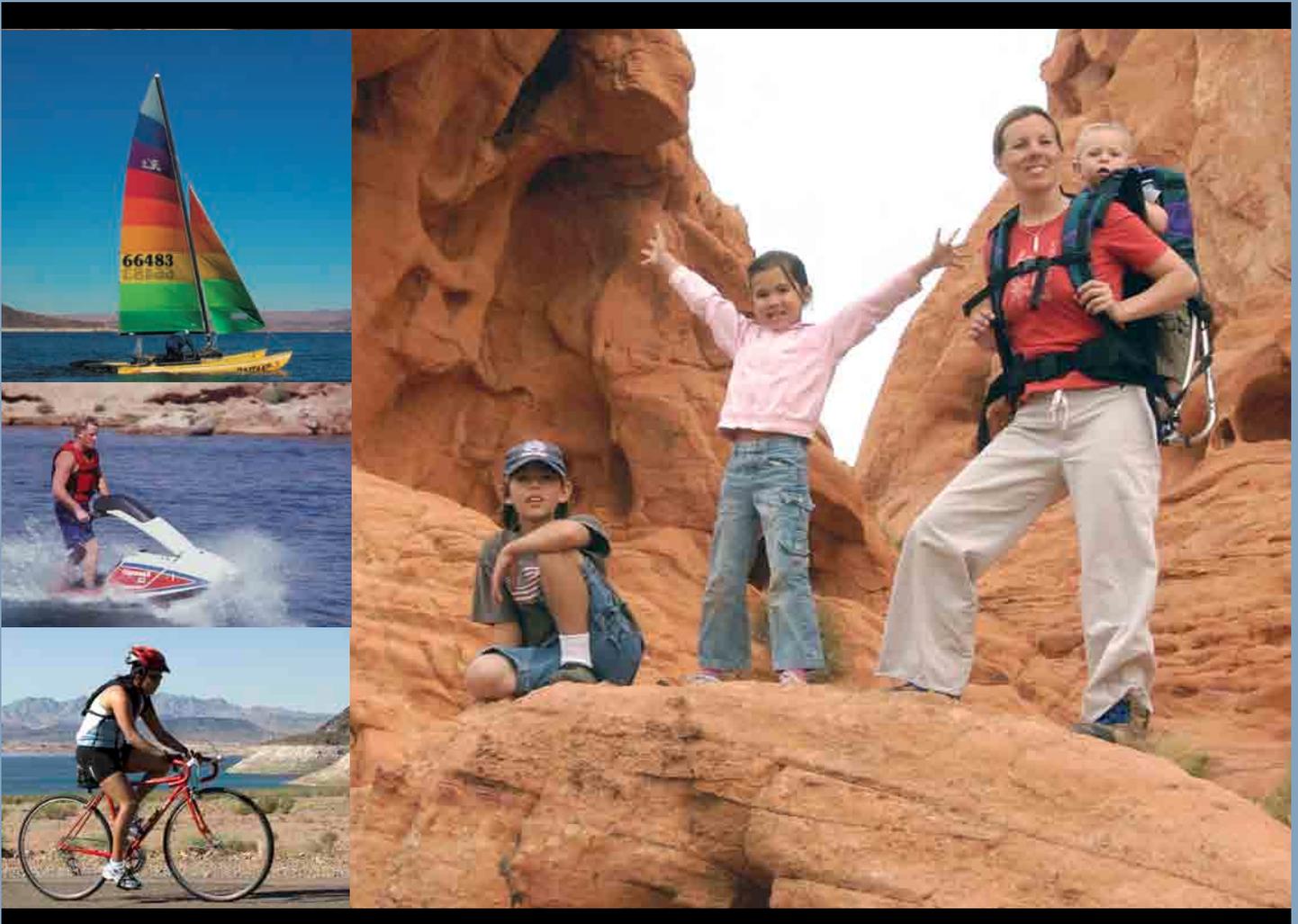
ABVC	Alan Bible Visitor Center	KA	Katherine Landing
ADA	Americans With Disabilities Act	LIC	Line Item Construction
API	Asset Priority Index	LVB	Las Vegas Bay
ATON	Aids to Navigation	NDOW	Nevada Department of Wildlife
AZBAF	Arizona Boating Access Fund	OB	Overton Beach
BB	Boulder Beach	ORV	Off Road Vehicle
BH	Boulder Harbor	PAMP	Park Assest Management Plan
BOR	Bureau of Reclamation	PV	Photovoltaic
CB	Callville Bay	R/R	Repair/Rehab
CG	Comptroller General	Rec Fee	Recreational Fee
CRV	Current Replacement Value	RMLT	River Mountain Loop Trail
CWC	Cottonwood Cove	RS	Redstone Picnic Area
DM	Deferred Maintenance	SC	South Cove
EB	Echo Bay	SNPLMA	Southern Nevada Public Lands Management Act
FCI	Facility Condition Index	SP	Stewarts Point
FLHP	Federal Land Highway Program	TB	Temple Bar
GW	Government Wash	WB	Willow Beach
HDPE	High-density Polyethylene	Abbreviations Key	
HH	Hemenway Harbor		
HQ	Headquarters		

Introduction

Lake Mead National Recreation Area (NRA) is the oldest and largest National Recreation Area in the country, and with approximately 8 million visitors per year is one of the most visited units in the National Park System. Lake Mead includes 1.5 million acres of land and 850 miles of shoreline, is located at the convergence of three of the four North American deserts and stretches for 135 miles from Laughlin, Nevada to the Grand Canyon. Park elevations range from 500 feet to 7000 feet above sea level offering habitats for over 900 different plant species and 500 different animal species. Lake Mead NRA includes nine designated wilderness areas, 1.8 million years of geological occurrences and 10,000 years of human presence. It is an amazing and diverse resource offering a wide variety of recreational opportunities.

Like many units of the National Park System, Lake Mead NRA is significant because of its natural, cultural and recreational resource values. It is also a highly complex unit of the National Park System including uses not traditionally found in most other parks. The engineering icon and terrorist threat of Hoover Dam and the water collection and treatment facilities for Las Vegas are within the park's boundary, as are both state and federal fish hatcheries. Hunting and grazing are authorized and occur within the park. Personal watercraft, all terrain vehicles, and amphibious aircraft are allowed and popular uses.

Located within one half day's drive of over 25 million people in Southern California, and adjacent to



LAKE MEAD



Las Vegas, one of the fastest growing areas in the country, Lake Mead receives more visitors in a single holiday weekend than over 40 percent of the National Park System units receive in an entire year. Visitors are often involved in high-risk water-based recreation, with fast boats, alcohol, and 115 degree average summer temperatures. The park is used 24 hours a day, 7 days a week, 365 days a year.

In response to the high visitor demand, the park manages nine major developed areas.

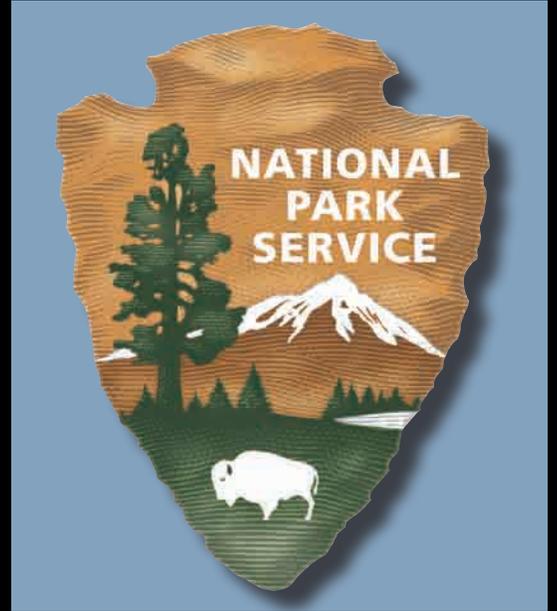
- Nine major water and wastewater systems
- 340 buildings
- 240 miles of paved roads
- 850 miles of unpaved roads
- Nine campgrounds with 1,172 sites
- Nine major marinas

In response to fluctuating lake levels, the park has to relocate many of the developed area facilities and infrastructure. The park relocates nine small cities with each 20-40 foot fluctuation in the lake level.

Fluctuating lake levels can require:

- The complete relocation of marinas and anchoring systems
- Launch ramp extensions
- New launch ramp developments
- Upgrading of lift stations, pumps, and power
- Extension of water, sewer, and gas lines
- Relocation and installation of new reef markers, buoys and other navigational warning devices
- Replacement of anchors for courtesy docks and breakwaters
- Relocation of water intake barges to ensure adequate depth with power and cable extensions
- Grading of new areas below the high water line for parking and the extension of backcountry roads for continued lake access

Responding to fluctuating lake levels adds a level of complexity to overall park management.



Mission and Vision

The mission of Lake Mead NRA is “To provide inland water recreation opportunities in a spectacular desert setting for present and future generations.”

Our vision and standard for the park is “To be the premier inland water recreation area in the West...Best in the West.” In order to achieve the park vision, the park has identified the following areas of emphasis:

- Protection of the park’s natural and cultural resources and spectacular desert setting
- Accessible information for all visitors
- Respectful and helpful visitor services
- Safety and security at shoreline access areas and on the water
- A diverse range of quality experiences, services and facilities

This document highlights the progress made by the park in providing quality facilities. The following list represents the park’s high priority assets:

- Marinas
- Launch ramps/courtesy docks
- Bathrooms
- Shaded picnic areas
- Roads/parking
- Water/wastewater
- Campgrounds

Park marinas are managed by private concessionaires. Marina improvements are completed through the concession contracting process as required or authorized facility improvements. Similarly, designated campground improvements have been planned through the transfer of campground operations to concessionaires, along with contractually required campground upgrades. Therefore, the focus of this document is primarily on the other priority assets noted above.



Prioritization and Strategy for Facility Improvements

The primary focus of the park's facility improvement program has been on:

- Enhancing existing facilities
- Addressing deferred maintenance
- Reduction of operations and maintenance costs
- Increased sustainability

New facilities, while not the park's first priority, are at times prioritized for construction for the following sources:

- Growing/changing visitor needs and demands
- Low water mitigation

The strategy for obtaining funding for facility improvements initially included targeting the following sources:

- Line Item Construction for major infrastructure (water-wastewater)
- Federal Lands Highway Program for major roads and highway projects
- Alternative funding sources and fees for recreation enhancement projects

Alternative funding sources include:

- Arizona State Lake Improvement Fund
- Arizona Boating Access Fund
- Bureau of Reclamation Title 28 Funding
- Wallup-Breaux Sports Fish Restoration Program
- TEA-21 Highway Enhancement Grants
- Entrance and use fees
- Southern Nevada Public Lands Management Act



In 1998, Congress passed the ***Southern Nevada Public Lands Management Act*** (SNPLMA), an innovative law that is setting a new standard for cooperative conservation. The Act provides for the sale of certain federal lands within a “grow-out” boundary in and around Las Vegas, supporting the area's demand for growth and development. The revenues generated from the land sales are available for the acquisition by federal land management agencies of environmentally sensitive lands, the protection and development of parks, trails and natural areas by local government, and development of capital improvements by the four federal land management agencies in Southern Nevada, including Lake Mead NRA, among other purposes.

By 2000, funding from SNPLMA had grown in availability to a point that it became a more appropriate and logical source for Lake Mead NRA capital improvement projects than line item construction and other alternative funding sources. Major road and highway projects still required Federal Lands Highway Program funds since they were not envisioned as an eligible project for SNPLMA funding and therefore do not compete well under the funding criteria and project selection process.



Project Review Process

Lake Mead NRA capital improvement projects go through an extensive screening process including both in-park and external reviews prior to funding and construction.

Internal/Park Review includes:

- Confirmation of project being in Project Management Information System
- General Management Plan/General Management Plan Amendment review
- Asset Priority Index score (See Asset Portfolio on page 34)
- Facility Condition Index score (See Asset Portfolio on page 34)
- Deferred maintenance benefit
- Impact/benefit in reducing Operations and Maintenance costs
- Contribution to safety and health improvements
- Natural or cultural resource impacts/benefits
- Visitor demand
- Consistency with park's vision
- Status of project as a new project or previously initiated project
- Ability/capacity of park to implement project if approved
- Special/unique consideration (flood damage/hazard, new invasive threat, etc.)

Southern Nevada Public Lands Management Act project evaluation criteria includes:

- Improves safety and environmental health
- Responds to visitor demand
- Improves operations/maintenance/sustainability
- Protects integrity of significant resource value/improves quality of the environment

SNPLMA review process includes:

- Public review via posting on Bureau of Land Management (BLM) web page
- Public review via BLM Resource Advisory Committees
- Subgroup review/prioritization
- Executive Committee review/recommendations
- Congressional notification
- Secretary of the Interior review/decision

For Lake Mead NRA internally reviewed projects and for SNPLMA projects, additional project reviews can include:

- Pacific West Region Review
- Denver Service Center Review
- NPS Development Advisory Board Review

Accomplishments

Consistent with the park vision and facility priorities, between 1993 and 2009, Lake Mead NRA made the following investments in capital improvements:

- Water and wastewater \$41 Million
- Roads and highway \$68 Million
- Recreation enhancements \$25 Million

Total \$134 Million

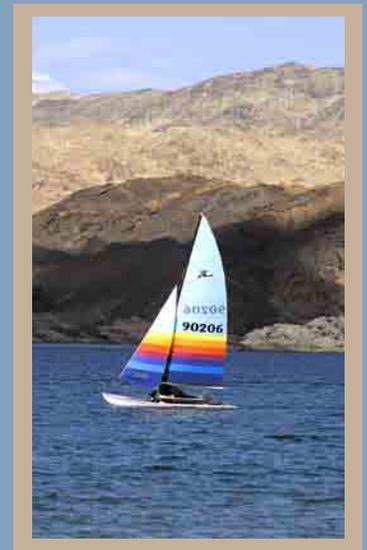
Note: Approximately 80% of the above total was expended on deferred maintenance projects.

Over the next 2-5 years, programmed/funded projects include the following investments:

- Water and wastewater \$17 Million
- Roads and highways \$34 Million
- Recreation enhancements
 - Launch ramps \$25 Million
 - Campgrounds \$6.8 Million
 - Picnic Areas \$4.5 Million
 - Bathrooms \$2.0 Million

- Flood Protection \$4.2 Million
- Other \$24 Million

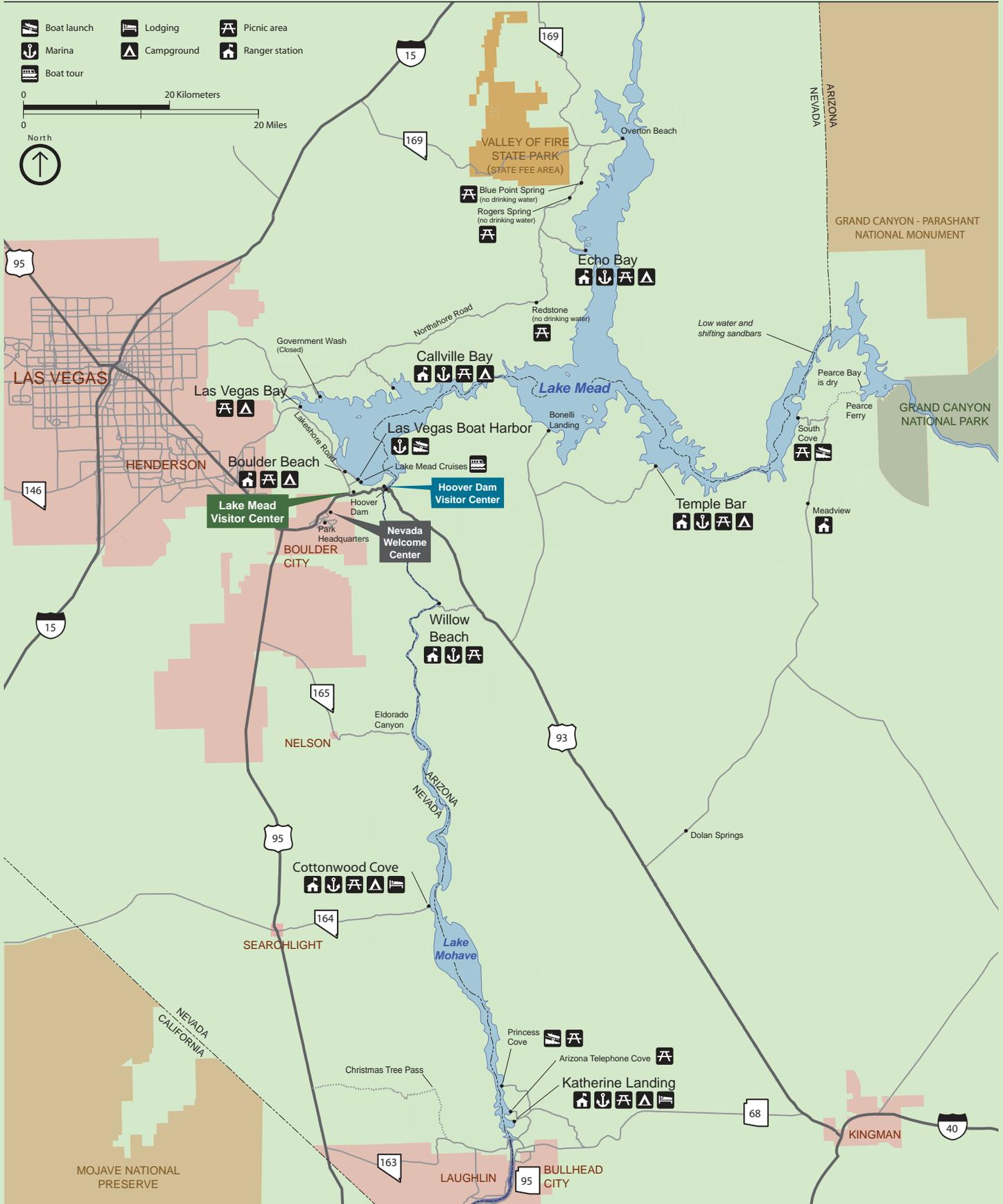
Total \$117.5 Million



Conclusion

Lake Mead NRA has made significant progress in the enhancement of park facilities and will continue to make similar progress in the future. Capital improvements are being prioritized and funded consistent with agency policy, the park’s vision to be the premier inland water recreation area in the west and to address the deferred maintenance backlog. While Lake Mead NRA has made outstanding progress in the upgrade of priority park assets, the documented backlog of unfunded capital improvements exceeds \$118 million. Within the attached appendix is a map showing the park’s major developed areas, a detailed listing of completed capital improvement projects including funding source and year completed, a listing of the documented unfunded capital improvement projects funded under the repair/rehab program; and a summary of the park’s asset portfolio.

LAKE MEAD



Summary of Capital Improvements (1992-2009)

Launch Ramp/Courtesy Docks

FY	Project	Cost	Fund Sources
92	Princess Cove	\$264,363	SLIF
92	Lake Mohave Courtesy Dock	\$66,518	SLIF
92	Lake Mohave Access	\$50,000	SLIF
94	SC (Ramp/Toilet/Dock)	\$270,103	SLIF
94-07	Reconstruct Launch Ramp	\$1,700,000	R/R
95	GW/CB Launch Ramp	\$150,000	NDOW
95	CB/LVB Launch Ramp	\$50,000	BOR
96	Rehab EB Courtesy Dock	25,000	NDOW
97	Katherine (Ramp/Dock/Parking)	\$326,400	SLIF
97	TB Launch Ramp	\$232,800	SLIF
00	WB Courtesy Dock	\$55,000	AZBAF
00	TB Courtesy Dock	\$55,000	AZBAF
01-02	CB Launch Ramp	\$500,000	NDOW
02	NP 13 EB Launch Ramp	\$348,700	SNPLMA
03	NP 35 EB, OB, CB, BB Ramps	\$3,443,540	SNPLMA
03	NP 30 Solar Lights	\$72,587	SNPLMA
03	OB Launch Ramp	\$269,639	REC Fee
03	Hemenway Launch Ramp	\$475,597	REC Fee
03	SC/TB Launch Ramp	\$492,717	REC Fee
03	Lake Mead Marina Launch Ramp	\$348,545	REC Fee
03	LVB Launch Ramp	\$317,100	REC Fee
03	CB Launch Ramp	\$229,404	REC Fee
03	EB Launch Ramp	\$96,850	REC Fee
03	GW Launch Ramp	\$188,150	REC Fee
04	NP 43 OB, Hemenway, CB ramps	\$1,914,614	SNPLMA
04	TB Launch Ramp	\$350,000	AZBAF
04	SC Launch Ramp	\$100,000	AZBAF
07	SC Launch Ramp and Parking	\$787,837	AZBAF/REC Fee/ SNPLMA
07	TB Launch Ramp	\$662,000	AZBAF/REC Fee
07	BH Launch Ramp	\$452,000	SNPLMA
07	HH Launch Ramp	\$947,449	SNPLMA
07	EB Launch Ramp	\$686,667	SNPLMA
07	CB Launch Ramp	\$307,312	SNPLMA
08	EB Launch Ramp and Parking	\$333,715	SNPLMA
08	HH Launch Ramp	\$279,035	SNPLMA
08	OB Launch Ramp	\$804,745	SNPLMA

Summary of Capital Improvements (continued)

FY	Project	Cost	Fund Sources
08	BH Launch Ramp	\$377,055	SNPLMA
08	SC Launch Ramp	\$94,893	SNPLMA
08	CB Launch Ramp	\$205,000	SNPLMA
08	TB Launch Ramp	\$564,153	SNPLMA
08	Fishing Dock Rehab	\$19,000	SNPLMA
08	Courtesy Docks	\$268,144	SNPLMA
TOTAL		\$19,181,632	

Funded (Planned)

FY	Projects	Cost	Fund Source
	NP 67 Launch ramps	\$4,004,000	SNPLMA
	NP 76 New ramps (SP,CB,GW)	\$15,587,000	SNPLMA
	NP 79 Launch Ramp	\$5,060,000	SNPLMA
09	EB Launch Ramp	\$250,000	SNPLMA
09	HH Launch Ramp	\$250,000	SNPLMA
09	BH Launch Ramp	\$250,000	SNPLMA
09	SC Launch Ramp	\$50,000	SNPLMA
09	CB Launch Ramp	\$50,000	SNPLMA
09	TB Launch Ramp	\$250,000	SNPLMA
09	ADA Boat Ramp	\$25,000	SNPLMA
TOTAL		\$25,776,000	

Picnic Area

FY	Project	Cost	Fund Source
92	South Cove Picnic	\$50,000	SLIF
95	Telephone Cove Picnic	\$80,000	SLIF
95	Princess Cove Picnic	\$70,000	SLIF
96	Temple Bar Picnic	\$232,000	SLIF
96	Replace Picnic Tables & Grills	\$40,000	BOR
97	Rehab BB Shoreline Picnic	\$107,000	BOR
01	Temple Bar Picnic	\$105,000	AZBAF
01	South Cove Picnic	\$102,400	AZBAF
01	South Telephone Cove Picnic Area	\$74,800	AZBAF

Summary of Capital Improvements (continued)

FY	Project	Cost	Fund Source
01	Princess Cove - Picnic Area	\$67,070	AZBAF
01	NP 01 Pullouts on Lakeshore	\$390,000	SNPLMA
01	NP 04 BB, LVB Picnic	\$299,000	SNPLMA
02	Princess Cove Picnic Area Phase 2	\$108,835	SLIF
02	TB Picnic Shelters - Phase 2	\$71,500	SLIF
03	NP 16 CB picnic	\$222,431	SNPLMA
08	NP 16 CWC picnic	\$222,370	SNPLMA
TOTAL		\$2,243,306	

Funded (Planned)

Project	Cost	Fund Source
NP 24 Redstone, Blue Pt., Roger Springs	\$475,281	SNPLMA
NP 52 Upgrade Picnic Parkwide	\$3,828,000	SNPLMA
NP 46 WB Picnic Facilities	\$280,000	SNPLMA
TOTAL	\$4,583,281	

Campgrounds

FY	Project	Cost	Fund Source
92	NP 25 Replace Picnic Tables/Grills	\$530,200	SNPLMA
TOTAL		\$530,200	

Funded (Planned)

Project	Cost	Fund Source
NP 23 CWC Install campground irrigation system	\$150,000	BOR
NP 23 Campsite pads CWC	\$737,836	SNPLMA
NP 50 Upgrade campground LVB, BB	\$2,558,160	SNPLMA
NP 73 WB campground	\$2,950,000	SNPLMA
NP 74 Parkwide W/WW rehab TB campground irrigation systems	\$500,000	SNPLMA
TOTAL	\$6,895,996	



Summary of Capital Improvements (continued)

Water/Wastewater

FY	Project	Cost	Fund Source
94-07	W/WW Upgrades	\$4,000,000	R/R
99	BB- Waste Water Improvements	\$1,833,476	LIC
99	CB/OB/EB/LVB-Upgrade WTP	\$6,515,981	LIC
00	KA Replace WTP	\$3,911,996	LIC
04	WB- Rehab Wastewater System	\$3,648,966	LIC
08	Horse Power Cove W/WW	\$705,654	SNPLMA
07-09	NP 74 Parkwide W/WW	\$20,799,300	SNPLMA
TOTAL		\$41,451,373	

Funded (Planned)

Project	Cost	Fund Source
NP 56 BB Water Tank	\$1,000,000	SNPLMA
NP 73 WB Water/Wastewater	\$6,160,000	SNPLMA
NP 78 CB Lagoons	\$4,053,000	SNPLMA
Remove Arsenic from Drinking water at TB and CC	\$5,000,000	SNPLMA
Improve Solids/Screening Removal to restore efficiency to Treatment system, CC, CB, KA	\$876,980	R/R
Stabilize Sewage Pond Slope	\$320,000	R/R
TOTAL	\$17,409,980	



Summary of Capital Improvements (continued)

Roads/Parking

FY	Project	Cost	Fund Sources
92	South Cove Parking	\$300,000	SLIF
92	Lake Mohave New Parking	\$180,707	SLIF
92	Lake Mohave Parking 2	\$481,989	SLIF
93	Lakeshore (2.3 miles)	\$3,264,000	FLHP
94	Lakeshore (3.3 miles)	\$3,407,000	FLHP
94	Princess Cove Phase 2	\$249,235	SLIF
94-07	Rehab Roads, Curbing, Flood Damage	\$820,000	R/R
95	South Cove Parking	\$450,500	SLIF
96	Princess Cove Access Road	\$671,300	SLIF
96	South Cove Parking, Lighting	\$48,000	SLIF
97	Lakeshore (3.4 miles)	\$4,800,000	FLHP
98	Lakeshore (2.4 miles) Realignment	\$6,322,000	FLHP
00	Lakeshore (2.2 miles) Realignment	\$4,638,000	FLHP
00	Northshore (7.8 miles)	\$4,641,000	FLHP
01	LV Wash	\$3,158,000	FLHP
02	Callville Bay (4 miles)	\$5,332,000	FLHP
02	NP 11 Shoreline Access Stewarts Pt.	\$275,000	SNPLMA
03	NP 36 Horsepower Cove	\$362,000	SNPLMA
05	Northshore (13 miles)	\$13,906,000	FLHP
08	Northshore Rd. and Bridge	\$13,040,557	FLHP
08	Princess Cove Road	\$2,435,300	Rec Fee
TOTAL		\$68,782,588	

Funded (Planned)

Project	Cost	Fund Source
Northshore	\$24,000,000	FLHP
NP 21 and 26 BB Shoreline Road	\$1,082,000	SNPLMA
NP 22,28,32,34 EB Parking Lot	\$2,107,568	SNPLMA
NP 46/73 WB Roads/Parking	\$5,720,000	SNPLMA
Wall Stabilization/Accessibility - Lakeview Overlook	\$1,055,640	SNPLMA
Parking and Accessibility Hemenway Harbor	\$704,000	SNPLMA
TOTAL	\$34,669,208	

Restrooms

Summary of Capital Improvements (continued)

FY	Project	Cost	Fund Sources
92	Lake Mohave Restrooms	\$30,908	SLIF
94-07	Rehab Restrooms	\$230,000	R/R
95	Telephone Cove Restrooms	\$100,000	SLIF
95	Princess Cove Restrooms	\$75,000	SLIF
96	Rehab 2 Restrooms	\$75,000	NDOW
96	Rehab 3 Restrooms	\$100,000	BOR
97	Replace 16 Vault Toilets	\$179,000	SLIF
97	Launch Ramp Restrooms (EB)	\$68,000	NDOW
97	Launch Ramp Restroom (LVB)	\$82,000	NDOW
97	Launch Ramp Restroom (HH)	\$87,250	NDOW
97	Rehab 5 Floating/ 6 Shoreline Restrooms	\$87,250	NDOW
97	Rehab 2 Restrooms (BB)	\$176,500	NDOW
98	Rehab Restroom (WB)	\$65,000	BOR
00-01	Construct Floating Restrooms (Mead)	\$350,000	NDOW
00	Restroom Replacement	\$804,000	20% Fee
01	NP 02 BB Mobile Restrooms	\$495,000	SNPLMA
02	NP 07 ADA Rehab Parkwide	\$264,000	SNPLMA
02	NP 08 ABVC Restrooms	\$63,800	SNPLMA
03	NP 15 Floating Restrooms Mead	\$546,121	SNPLMA
03	NP 38 Floating Restrooms Mead	\$538,560	SNPLMA
03	NP 20 Back Country Toilets	\$147,222	SNPLMA
05	NP 57 Floating restrooms Mohave	\$650,000	SNPLMA
09	NP 20 Back Country Toilets	\$337,500	SNPLMA
09	KA Restroom Demo	\$35,000	R/R
TOTAL		\$5,587,311	



Funded (Planned)

Summary of Capital Improvements (continued)

Project	Cost	Fund Source
NP 68 Campground Restrooms	\$1,887,600	SNPLMA
NP 57 Porta Potty Dump Station	\$25,000	SNPLMA
TOTAL	\$1,912,600	

Buildings/Others*

FY	Project	Cost	Fund Source
99	Entrance Stations BB,KA,Drive,Blvd	\$3,000,000	Rec Fee
01	Rehab Entrance Stations	\$778,741	Rec Fee
03	NP 06/37 Water Safety Center	\$1,049,874	SNPLMA
08	Safety Boats	\$427,697	SNPLMA
09	NP 31 ATON facility	\$958,065	SNPLMA
09	New Entrance Stations (CWC,TB)	\$3,144,000	REC Fee
TOTAL		\$9,358,377	

Funded (Planned)

Project	Cost	Fund Source
NP 46/73 WB Facilities	\$9,750,000 *	SNPLMA
NP 60 Dispatch Center	\$5,148,000	SNPLMA
NP 64 CB Visitor Contact Stations	\$795,080	SNPLMA
NP 65 ABVC	\$2,230,800	SNPLMA
NP 71 Maint Facilities	\$1,000,000	SNPLMA
09 HQ Window Rehab	\$200,000	SNPLMA
New Entrance Stations (OB,CWC,TB,WB,SC)	\$6,650,000	REC Fee
TOTAL	\$24,541,880	

***Flood Control**



Unfunded Capital Improvement Projects

Project	Cost
Echo Bay Access Road Rehabilitate Entire Road 4 miles	\$7,434,000
Katherine Landing Access Road - Rehabilitate 4 miles	\$6,042,000
Overton Beach Road - Rehabilitate Entire Road 3 miles	\$3,770,000
Reconstruct Eldorado Canyon Road	\$5,525,000
Improve Access Roads and Launch Areas Six Mile/CC East	\$2,000,000
Rehab Campground Roads at KA	\$650,000
Rehab CC Access Road, 6.8 miles	\$6,890,000
Rehab WB Access Road, 4 miles	\$6,930,000
Temple Bar Access Road - Rehabilitate 17.5 miles	\$22,750,000
Rehab/Overlay Hemenway/BB Access Roads and Parking Areas	\$5,361,378
Rehab LVB Campground Irrigation System	\$385,180
Upgrade Campground KA	\$2,415,000
Replace Amphitheater/New Exhibits KA	\$128,000
Replace and Expand Picnic Area KA	\$482,973
Upgrade Campground CB	\$1,336,000
Construct Lake Mead Wild Land Fire Base Facility	\$3,922,000
Renovate ABVC - Phase 2	\$2,876,000
Structural Flood Mitigation KA	\$7,443,385
Structural Flood Mitigation CC	\$22,016,800
Structural Flood Mitigation BB	\$1,902,000
Structural Flood Mitigation TB	\$1,680,000
TOTAL	\$111,939,716



Premier Facility Standards

Launch Ramps/Courtesy Docks

- Replace existing asphalt ramps with “V” - grooved concrete over recycled asphalt aggregate base course
- When slope is less than 8% provide side launch capability with minimum of 10% slope
- Use Clark County standard 4,500 psi concrete mix
- Use recycled plastic/composite lumber



Restrooms

Permanent structure with utilities

- Meet or exceed minimum accessibility standards
- Use materials and fixtures that require minimum maintenance and incorporate sustainability in all design (water and energy conservation)
- Permanent buildings with flush toilets: slump block construction with clay tile roof, steel framed doors and windows, security glazing, utility chase with storage area for maintenance equipment and supplies
- Interior - block partition walls with heavy duty stall doors, ceramic tile flooring with coved base, wall hung plumbing fixtures, pipe chase with above ground plumbing



Restrooms

Permanent structure without utilities

- Precast concrete construction with solar lighting and ventilation
- Sited to facilitate pumper truck access
- Meet or exceed minimum accessibility standards
- Use materials and fixtures that require minimum maintenance and incorporate sustainability in all designs



Restrooms

Mobile

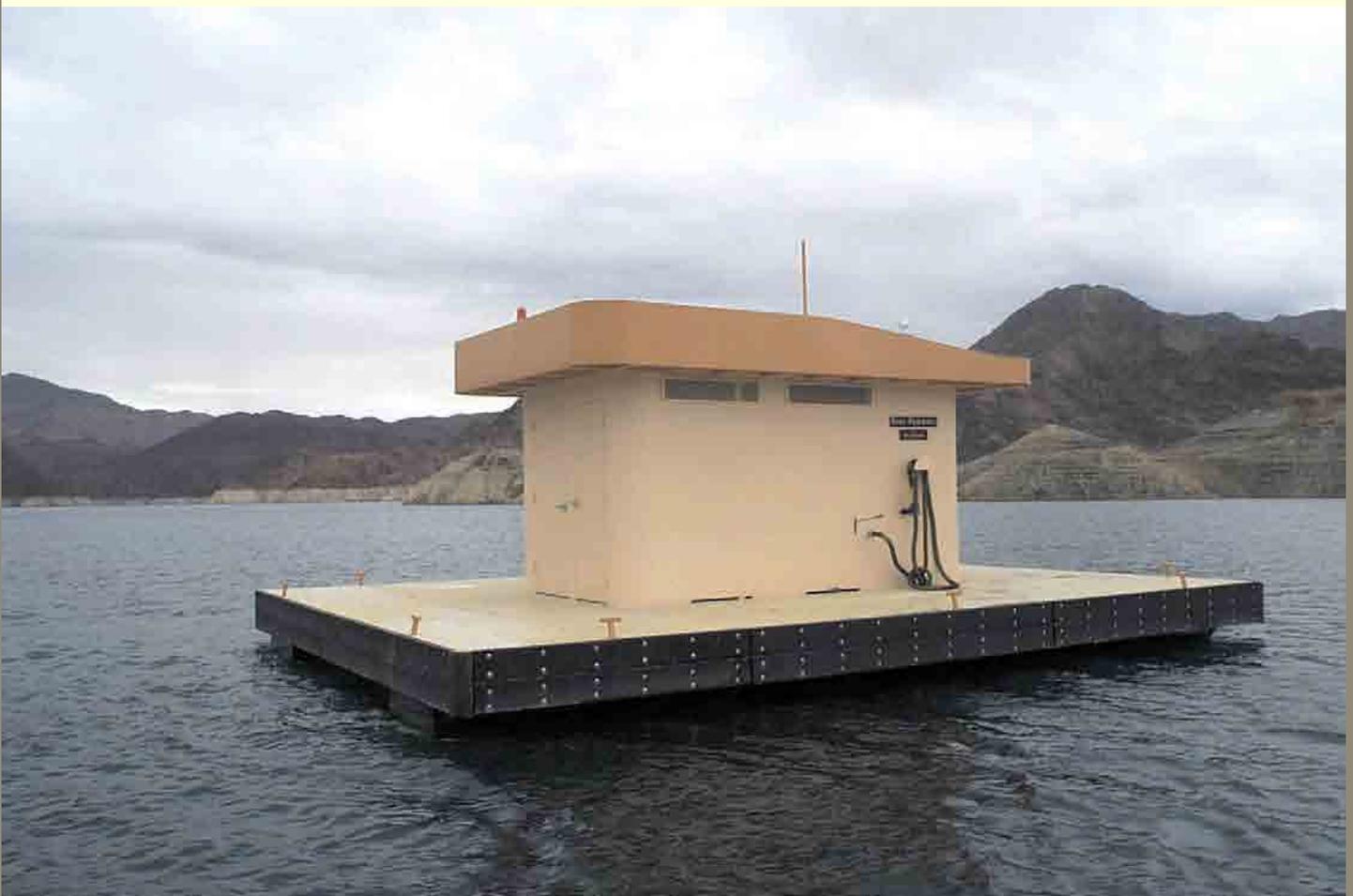
- Meet or exceed minimum accessibility standards
- Use materials and fixtures that require minimum maintenance and incorporate sustainability in all designs
- Solar powered flush toilets
- Easily relocated to accommodate lowering lake levels



Restrooms

Floating

- Meet or exceed minimum accessibility standards
- Use materials and fixtures that require minimum maintenance and incorporate sustainability in all designs
- Houseboat/individual pump out and dump stations
- Solar powered flush toilets



Roads

- Road construction shall preserve the integrity of the environment, minimizing grading and visual impact to the resource and blending harmoniously into the terrain
- Rounded/gradual cut/fill slopes that blend in surrounding landscape salvage and stockpile topsoil and place on roughened and contoured cut/fill slopes. Place rocks and stain to harmonize with surroundings
- Use 12-foot wide travel lanes with 4-foot wide shoulders to accommodate traffic pulling large boats and bicycle traffic
- Clark County/Federal Highway asphalt mix standards
- Concrete to be stained, colored or chemically aged to achieve an appropriate shade that blends with the surroundings
- Use longer lasting thermoplastic material for striping
- Use weathered steel guard rails to blend with surroundings
- Use randomly placed surface-weathered stone to provide texture on constructed slopes
- Rock cuts to be roughened and stained to minimize visual contrast with surrounding undistributed terrain



Picnic Areas

- Meet or exceed minimum accessibility standards
- Use materials and fixtures that require minimum maintenance
- Durable and attractive shade structures with PV panels where applicable
- Concrete tables on paved surfaces
- Grills
- Drinking fountains
- Litter receptacles conveniently located to encourage use
- Plant materials should be considered design elements that provide a variety of aspects such as shelter, screening, shade and use of native plants



Water/Wastewater

- State of the art
- Connect to municipal systems where possible
- Meets federal and local regulatory standards
- Waste water lagoons
 - provide odor control
 - provide screening if visible from the road/developed area
- Water treatment plant - use building standards - slump block, clay tile roof
- Sophisticated treatment systems (micro and nano-filtration)
- Provide remote operation of plants with computer backup systems
- Lift stations - above ground, over a dry well seated next to the wet well, accessible modular stations to avoid confined spaces where possible and pumps shall be horizontally mounted
- High-Density Polyethylene (HDPE) pipe should be specified for all new and replacement water and wastewater lines where possible



Campgrounds

- Meet or exceed minimum accessibility standards
- Use materials and fixtures that require minimum maintenance and incorporate sustainability in all designs
- Accommodate both RV and tent camping in separate zones wherever possible
- Provide water/sewer/electric hookups to all except walk in sites
- Provide concrete parking pad, concrete picnic table and steel fire ring for all sites
- Plant materials should be considered design elements that provide a variety of aspects such as shelter, screening and the use of native plants
- Irrigation systems should be designed for water conservation and minimum maintenance



Buildings

- Site must be accessible
- Incorporate solar and sustainability in the design
- Provide shade at entrances
- Flood control and drainage structures should echo the materials, colors and textures of the built environment
- Utilities shall be placed underground
- Screen all dumpsters with a six foot high solid wall
- Highly used recreational areas require some directional lighting for public safety and security, however, use of high levels of light or flood lights should be avoided
- Lighting should follow the night sky standards
- Roof - "S" shaped clay tile in colors to match the surrounding landscape - minimum pitch 3:12 and max pitch of 4:12
- Stucco or slump block walls
- Colors are to be slightly darker than surrounding land coloration with shades ranging from light tan, brown, red-brown to dark grey



SNPLMA Funded Projects

Project Name	Funded	Project Status	DM
NP01 (Rnd 1) - Enhance Facilities at Pullouts along Lakeshore Drive	\$390,000	Construction Complete	\$78,000
NP02 (Rnd 2) - Improve Shoreline Sanitation - BB (mobile restrooms)	\$495,000	Construction Complete	\$495,000
NP04 (Rnd 1) - BB/LVB Picnic Area Improvements	\$399,000	Construction Complete	\$289,784
NP06 (Rnd 2) - Construct BB Water Safety Center	\$409,437	Construction Complete	\$0
NP37 (Rnd 3) - Construct BB Water Safety Center	\$640,437	Construction Complete	\$0
NP07 (Rnd 2) - Convert Visitor Facilities to Comply with Universal Access Standards	\$264,000	Construction Complete	\$0
NP08 (Rnd 2) - Rehab Public Restrooms at ABVC	\$63,800	Construction Complete	\$47,840
NP09 (Rnd 2) - RMLT BOR Segment at ABCV Garage	\$728,223	Construction Complete	\$0
NP11 (Rnd 2) - Enhance Shoreline Access at SP	\$275,000	Construction Complete	\$247,500
NP12 (Rnd 2) - Wayside Exhibits	\$223,177	Construction Complete	\$71,456
NP13 (Rnd 2) - Replace Failing Public Use Boat Ramp - EB	\$348,700	Construction Complete	\$321,185
NP25 (Rnd 3) - Replace Picnic Tables & Grills	\$536,192	Construction Complete	\$281,218
NP35 (Rnd 3) - Failing Boat Launch Facilities	\$3,433,540	Construction Complete	\$3,350,289
NP36 (Rnd 3) - Mitigate Lake Level Impacts	\$1,070,284	Construction Complete	\$860,400
NP41 (Rnd 3) - Stabilize Hist. RR Tunnels	\$315,556	Construction Complete	\$238,500
NP15 (Rnd 3) - Replace Floating Sanitation Facilities	\$546,121	Construction Complete	\$514,080
NP38 (Rnd 3) - Replace Floating Restrooms	\$538,560	Construction Complete	\$0
NP39 (Rnd 3) - Construct Interp. Displays- Lake Mead Fish Hatchery	\$627,329	Construction Complete	\$0
NP45 (Rnd 4) - Interp. Displays at Lake Mead Hatchery-Phase 2	\$605,000	Construction Complete	\$0
NP05 (Rnd 1) - Enhance Shoreline Fishing at BB	\$296,093	Construction Complete	\$146,510
NP16 (Rnd 3) - Rehab Picnic Shelters - CWC, LVB, CB, BB	\$437,131	Construction Complete	\$378,000
NP17 (Rnd 3) - Protection of Resources - Illegal ORV	\$225,618	Construction Complete	\$112,809
NP30 (Rnd 3) - Provide Solar Lighting at Launch Ramps	\$72,587	Construction Complete	\$0
NP43 (Rnd 4) - Reconstruct Failing Ramp-Phase 2	\$2,392,720	Construction Complete	\$1,677,100
NP55 (Rnd 4) - Refurbish Original Hoover Dam Exhibit Center	\$592,020	Construction Complete	\$0
NP61 (Rnd 5) Boat Wash Stations	\$377,520	Construction Complete	\$0
NP49 (Rnd 4) - Mitigate Emergency Lake Level Impacts - Phase 2	\$792,000	Construction Complete	\$792,000

SNPLMA Funded Projects (continued)

Project Name	Funded	Project Status	DM
NP44 (Rnd 4) - Reconstruct Failing Ramps- Phase 3	\$2,574,000	Const. Complete	\$2,574,000
NP66 (Rnd 5) - Reconstruct Failing Launch Ramps - Phase 4	\$2,574,000	Const. Complete	\$2,574,000
NP03 (Rnd 1) - Construct RMLT Segment 21	\$450,000	Const. Complete	\$45,000
NP40 (Rnd 3) - Construct RMLT Segment 22	\$574,015	Const. Complete	\$98,100
NP59 (Rnd 5) - RMLT Segment 18	\$2,762,848	Const. Complete	\$0
NP70 (Rnd 5) - Replace Courtesy Docks	\$314,600	Const. Complete	\$283,140
NP14 (Rnd 2) - Improve Trailheads to Wetlands Trail & RMLT	\$345,411	Const. Complete	\$260,100
NP19 (Rnd 3) - Trailhead Kiosks - Phase 2	\$223,608	Const. Complete	\$190,000
NP85 (Rnd 6) - Office Consolidation Study	\$230,000	Completed	\$0
NP20 (Rnd 3) - Replace Deter. Backcountry	\$452,446	Under Construction	\$444,891
NP69 (Rnd 5) - Emergency Improvements for Low Water- Phase 3	\$9,376,848	Under Construction	\$3,100,000
NP74 (Rnd 6) - Parkwide Water & Waste Water System, OB Waster Water	\$21,299,300	Under Construction	\$21,299,300
NP75 (Rnd 6) - Boat Wash Station - Phase 2	\$620,837	Under Construction	\$0
NP21 (Rnd 3) - Pave BB Shoreline Rd - Phase 1	\$555,500	Under Construction	\$506,950
NP26 (Rnd 3) - Pave BB Shoreline Rd - Phase 2	\$526,900	Under Construction	\$0
NP51 (Rnd 4) - Upgrade Primary Power EB & OB	\$825,000	Under Construction	\$412,500
NP46 (Rnd 4) - Flood Protection WB - Phase 1	\$12,083,143	Under Construction	\$12,083,143
NP73 (Rnd 6) - WB - Phase 2	\$15,778,400	Under Construction	\$15,778,400
NP31 (Rnd 3) - Construct ATON Building	\$958,065	Under Construction	\$0
NP48 (Rnd 4) - Install Barriers to Prevent Illegal ORV Use	\$620,400	Under Construction	\$310,200
NP62 (Rnd 5) - Bat Gate Installation	\$303,228	Under Construction	\$0
NP67 (Rnd 5) - Reconstruct Failing Launch Ramps - Phase 4	\$4,004,000	Under Construction	\$4,004,000
NP83 (Rnd 6) - Habitat Mgmt Fences for LAME	\$956,780	Under Construction	\$765,424
NP84 (Rnd 6) - Fencing and Interpretive Signage	\$460,200	Under Construction	\$460,200
NP57 (Rnd 5) - Implementation of Lake Sanitation Program	\$2,701,876	Under Construction	\$0
NP63 (Rnd 5) - Shoreline Road & Vegetation Enhancements	\$972,400	Under Construction	\$972,400
NP54 (Rnd 4) -Waysides, Kiosks & Interpretive Panels	\$212,200	Under Production	\$0
NP22 (Rnd 3) - EB Parking Lot -Phase 1	\$558,234	Design Complete	\$0
NP28 (Rnd 3) - EB Parking Lot- Phase 2	\$490,034	Design Complete	\$0
NP32 (Rnd 3) - EB Parking Lot -Phase 3	\$528,000	Design Complete	\$0
NP34 (Rnd 3) - EB Parking Lot- Phase 4	\$531,300	Design Complete	\$0
NP23 (Rnd 3) - Replace Campsite Pads at CWC	\$737,836	Under Design	\$590,269

SNPLMA Funded Projects (continued)

Project Name	Funded	Project Status	DM
NP24 (Rnd 3) - Rehab Picnic Facilities at Redstone, Rogers Springs & Blue Point Springs	\$475,281	Under Design	\$475,281
NP65 (Rnd 5) - Rehabilitate ABVC	\$2,230,800	Under Design	\$2,230,800
NP71 (Rnd 5) - Construction Maintenance Area	\$2,705,560	Under Design	\$1,182,500
NP78 (Rnd 6) - Upgrade Utilities at CB	\$3,850,500	Under Design	\$3,850,500
NP29 (Rnd 3) - Replace Inner Sec. Gov. Dock	\$539,027	Under Design	\$539,027
NP50 (Rnd 4) - Rehab & Upgrade Campgrounds at LVB & BB	\$2,558,160	Under Design	\$2,558,160
NP53 (Rnd 4) - Improve Safety of Facilities	\$1,980,000	Under Design	\$1,980,000
NP56 (Rnd 4) - Upgrade Park Infrastructure	\$2,376,000	Under Design	\$2,376,000
NP52 (Rnd 4) - Rehab & Upgrade Parkwide Picnic Fac	\$3,828,000	Under Design	\$3,828,000
NP60 (Rnd 5) - Interagency Public Safety Comm Center	\$5,148,000	Under Design	\$0
NP64 (Rnd 5) - CB Visitor Contact Station	\$795,080	Under Design	\$0
NP68 (Rnd 5) - Replace Campground Restroom	\$1,887,600	Under Design	\$1,887,600
NP72 (Rnd 5) - Energy Conservation for Park Fac.	\$2,046,616	Under Design	\$1,023,308
NP76 (Rnd 6) - Construction of New Launch Ramps at Stewarts Point, GW and CB	\$15,587,000	Under Design	\$0
NP80 (Rnd 6) - Native Plant Nursery Improvements	\$654,720	Under Design	\$458,304
NP81 (Rnd 6) - Wayside and Information Kiosks-Phase 2	\$684,640	Planning	\$0
NP82 (Rnd 6) - Replace Exhibits at CC	\$396,000	Planning	\$360,000
NP86 (Rnd 6) - Capital Improvements at Overton Beach (Possessory Interest Buyout)	\$8,431,500	Planning	\$0
PP01 (Rnd 9) - Prepare Cottonwood Cove and Katherin Landing Development Concept Plans	\$466,000	Planning	\$0
PP02 (Rnd 9) - Perform Condition Assessments and Appraisals for Marina Capital Improvements at 5 Locations	\$775,000	Planning	\$0
PP03 (Rnd 9) - Perform Assessment of Energy Neutral Options for the NPS, FWS, and NFS in Southern Nevada	\$44,000	Planning	\$0
NP88 (Rnd 9) Boulder Beach Visitor Facility Enhancement	\$1,935,340	Compliance	\$1,776,800
NP77 (Rnd 6) - Emergency Improvements for Low Water - Phase 2	\$3,250,500	Future	\$0
NP79 (Rnd 6) - Reconstruct Failing Launch Ramps - Phase 4	\$4,950,000	Future	\$2,530,000
Total	\$170,290,978		\$103,709,968

Rehab/Repair Projects 1994

Rehab Sewer System	\$70,000
Waste Water Compliance	\$94,000
Rehab HVAC System (ABVC/HQ)	\$50,000
Rehab Electrical System- Warehouse	\$40,000
Engineering Study (OB Water Treatment plant)	\$43,434
Water Well Drilling- Callville Bay	\$24,289
TOTAL	\$321,723

Rehab/Repair Projects 1995

LAME- Surface Water Corr. Boulder Area	\$300,000
TOTAL	\$300,000

Rehab/Repair Projects 1996

Willow Beach Road Repairs	\$6,625
Filter Media Replacement	\$217,596
Rehab Water Intakes	\$193,800
Reconstruct Potable Water Systems	\$115,000
TOTAL	\$533,021

Rehab/Repair Projects 1997

Repair Water Systems	\$104,000
Rehab Water Intake Systems	\$228,000
Install PV System at Shivwits	\$8,000
TOTAL	\$340,000



Rehab/Repair Projects 1998

Rehab Electrical System - Warehouse	\$139,980
Rehab ABVC for New Exhibits	\$302,361
TOTAL	\$442,341

Rehab/Repair Projects 1999

Rehab Electric - Warehouse	\$167,000
Rehab ABVC for New Exhibits	\$40,652
Rehab Flammable Storage - Warehouse	\$66,495
Flood Damage Repair	\$58,790
TOTAL	\$332,937

Rehab/Repair Projects 2000

Rehab Venting & Dust Recovery System	\$85,000
Deteriorated Flood Dikes - Northshore	\$188,000
Improve Unsafe Runways at Echo Bay	\$224,534
Consent Order for Wastewater	\$39,463
Replace Boat Ramp - Las Vegas Wash	\$175,020
Failing Boat Ramp - Willow Beach	\$139,884
Failing Boat Ramp - Cottonwood Cove	\$314,176
Replace Public Boat Ramp - Echo Bay	\$202,900
Replace Public Boat Ramp - Overton Beach	\$239,640
TOTAL	\$1,608,617

Rehab/Repair Projects 2001

Lift Station- Katherine Landing	\$57,298
Install Fall Protection at Water Tanks	\$13,575
Water Intake Rails - EB, CB and KA	\$21,961
Inspect Hydraulic Analysis Water Dist.	\$142,353
Waste Water Compliance State of AZ	\$30,000
Replace Boat Ramp - Las Vegas Wash	\$112,640
TOTAL	\$377,827

Rehab/Repair Projects 2002

Replace Backcountry Vault Toilets	\$231,600
Rehab Hydropneumatic System	\$24,371
Analysis Water Distribution System	\$6,400
Rehab Two Sewage Lagoon Cells	\$42,500
Rehab Lift Stations Force Main	\$18,500
TOTAL	\$323,371

Rehab/Repair Projects 2003

Rehab Hydropneumatic System	\$388,602
Rehab Two Sewage Lagoon Cells	\$530,559
Rehab Lift Stations Force Main	\$507,108
Assess Condition of Backflow	\$15,000
Install Early Warning System	\$5,750
TOTAL	\$1,447,019

Rehab/Repair Projects 2004

Emergency Roof Repair - Echo Bay	\$38,211
Install Early Warning System	\$99,025
Replace Curbing - Katherine Access	\$5,218
Assess Condition of Backflow Device	\$8,330
Las Vegas Bay & Callville Bay	\$49,195
TOTAL	\$199,979

Rehab/Repair Projects 2005

Replace Curbing - Katherine Access	\$301,653
Rehab Abandoned Roads in The Desert Rose Sub	\$7,400
Emergency Repairs to FY05 Storm Damaged Rds.	\$33,275
Construct New Domestic Supply	\$223,750
Perform Design Analysis	\$23,389
Reconstruct Failing Boat Ramp	\$480,522
TOTAL	\$1,069,989

Rehab/Repair Projects 2006

Replace Restrooms - Cottonwood Cove	\$20,000
Rehab Abandoned Roads in the Desert Rose Sub.	\$118,272
Emergency Repairs to FY05 Storm Damaged Rds.	\$98,401
Assess Condition of Backflow	\$157,490
Rehab Sewer Systems Flow Monitoring	\$75,369
Rehab Two Sewage Lagoon Cells	\$53,623
TOTAL	\$523,155

Rehab/Repair Projects 2007

Rehab Damaged Electrical Systems at CWC	\$91,168
Rehab Chlorinator and Fence at Water Tank	\$18,600
Replace Lift Station at Templar Bar	\$280,000
Stabilize Sewage Pond Slopes	\$32,000
TOTAL	421,768

Rehab/Repair Projects 2008

Improve Solids / Screenings- BB	\$268,790
Improve Solids / Screenings- CWC	\$306,290
Replace Restrooms- CWC	\$175,000
TOTAL	\$750,080

1994	\$321,723
1995	\$300,000
1996	\$533,021
1997	\$340,000
1998	\$442,341
1999	\$332,937
2000	\$1,608,617
2001	\$377,827

2002	\$323,371
2003	\$1,447,019
2004	\$199,979
2005	\$1,069,989
2006	\$523,155
2007	\$421,768
2008	\$874,980
TOTAL	\$9,116,727

Asset Portfolio

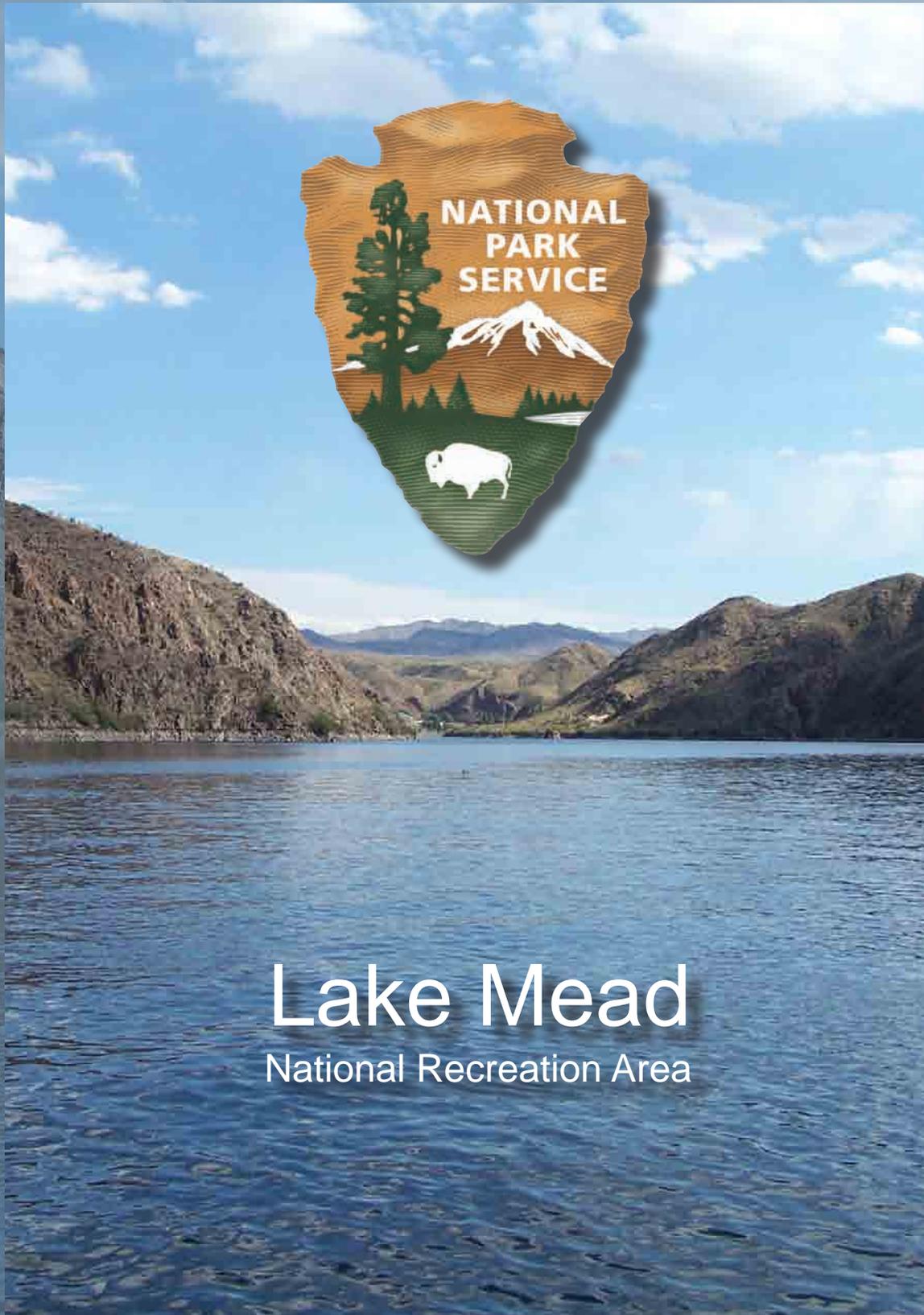
The National Park Service and Lake Mead NRA commitment to stewardship and the sustainability of assets is based on effective asset management. Lake Mead NRA has indentified all park assets and given them each a numeric rating called an API (Asset Priority Index) which reflects the park’s asset priority. This number, ranging from 1 to 100, is based on factors such as cultural/natural resource impacts, visitation, park operations and substitutability. In addition, all assets are assigned an FCI (Facility Condition Index) rating which is a measure of an asset’s relative condition at a particular point in time and is calculated by taking the Deferred Maintenance (DM) divided by the Current Replacement Value (CRV).

The chart below represents the park’s asset portfolio along with the respective FCI, DM, and CRV.

Asset Type	# of Assets	FCI	DM	CRV
Buildings	278	0.187	\$6,881,481	\$36,868,549
Housing	54	0.148	\$1,265,737	\$8,537,439
Trails	20	0.048	\$285,687	\$5,891,515
Wastewater Systems	10	0.335	\$11,754,817	\$35,099,872
Water Systems	11	0.425	\$14,888,763	\$35,003,100
Roads	265	0.190	\$115,023,573	\$548,849,032
Marina/Waterfront Systems	10	0.398	\$14,570,442	\$29,550,442
Other Assets	166	0.245	\$18,768,445	\$137,626,735
TOTAL	814	.0247	\$183,434,525	\$837,426,684

Lake Mead has made significant improvements over the past decade in addressing deferred maintenance and improving the overall FCI for park assets as outlined in this capital improvement document, however, there is still a large amount of deferred maintenance needed to bring the high priority assets to good/fair condition. Remaining deferred maintenance needs will be addressed and facilities enhanced through many of the projects identified in the document. Lake Mead is in the process of developing a Park Asset Management Plan (PAMP) that will outline a 10-year strategy to manage the park’s assets with emphasis on deferred maintenance, sustainability and allocation of limited resources.

FCI Range	Condition
< .10	Good
.11 - .14	Fair
.15 - .49	Poor
> .5	Serious



Lake Mead

National Recreation Area



Lake Mead

National Recreation Area

