



Padre Island National Seashore Park Asset Management Plan

December 2008





Signature Page

I have read and understand the objective and content of the PAIS Park Asset Management Plan.

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Executive Order 13327 and Directors Order #80 require the NPS to develop a comprehensive asset management strategy down to the individual park level

EO 13327 (February, 2004)

Purpose: To “promote the efficient and economical use of Federal real property resources in accordance with their value as national assets in the best interest of the nation”

Mandate: Every Federal agency is required to create an asset management plan (AMP)

Director’s Order #80

An asset management strategy includes:

- Asset inventory and condition assessment (API ratings)
- Asset valuation (current replacement value (CRV))
- Real property asset management planning processes (AMPs)
- Implementation and execution of AMP (using life cycle principles)

Implications for NPS and Individual Park Units

- Each park will create a Park Asset Management Plan (PAMP) generating a strategy and road map to efficiently allocate limited resources
- Drive FCI down over time, improving overall condition of the NPS’ and parks’ asset portfolios
- Strategically budget for O&M base funding and special project funding to position the Park to secure NPS / Congressional funding
- Park Directors, Superintendents, and facility managers and staff are all responsible, at various levels, for the development and implementation of PAMPs

Overview

The Challenge:

- Since the advent of EO13327 and DO#80, NPS has made significant gains in implementing robust asset management principles and practices
- Parks are now able to identify their asset portfolios and the condition and value of those assets
- The responsibility and challenge that parks face today is to take the next step, to bring their portfolio up to acceptable conditions and sustain their assets over time under significant budgetary constraints while meeting legislative goals

The Solution:

- A PAMP provides a snapshot of a park's current asset portfolio that will enable park staff to understand and articulate the current state of its asset portfolio and the funding requirements of those assets
- Ultimately, the PAMP outlines a dynamic 10-year plan for successful management of all Park facilities and is designed to satisfy federal asset management requirements outlined in EO 13327 and DO#80

Introduction to the Park

According to the park’s founding legislation, Public Law 87-712, Padre Island National Seashore was founded in 1962 “...in order to save and preserve, for purposes of public recreation, benefit, and inspiration, a portion of the diminishing seashore of the United States that remains undeveloped...”

Encompassing 130,434 acres, the National Seashore has approximately 650,000 visitors annually. The majority come to camp and/or fish along the park’s 65.5 miles of primitive shoreline along the Gulf of Mexico. Other significant attractions to the park include windsurfing (one of the top-rated windsurfing areas in the nation), bird watching, launching (sport-fishing) boats at the park’s only boat ramp on the Laguna Madre, and observing the park’s sea turtle hatchling releases.



Introduction to the Park: Maintenance Challenges

In addition to the usual maintenance tasks of maintaining campgrounds, roadways, the visitor center facilities, and all other park support and administrative facilities, the park also faces the following maintenance challenges:

- The highly saline environment causes highly accelerated corrosion of most metals.
- Maintaining approx. 28 heavily-used UTVs (used in the sea turtle restoration project)
- Care and maintenance of the park's radio system and fleet, which are crucial for any operations at the extreme southern end of the park (55 miles into the park's four-wheel-drive-only area)
- Maintaining the remote cabin used by the Sea Turtle Division (35 miles into the park's four-wheel-drive-only area)
- The Laguna Shore asset was not included in this PAMP, even though funds are spent to clean it of HAZMAT waste and other debris. However, it will be included in future PAMPs.



Rusting exterior metal vent



UTV undergoing repairs



Sea Turtle Division Cabin

Executive summary

Objective:

PAIS's PAMP is designed to allow park management to demonstrate an understanding of what is required to bring the asset portfolio to an acceptable condition and sustain it over time, as well to identify where to spend their limited resources

Goal:

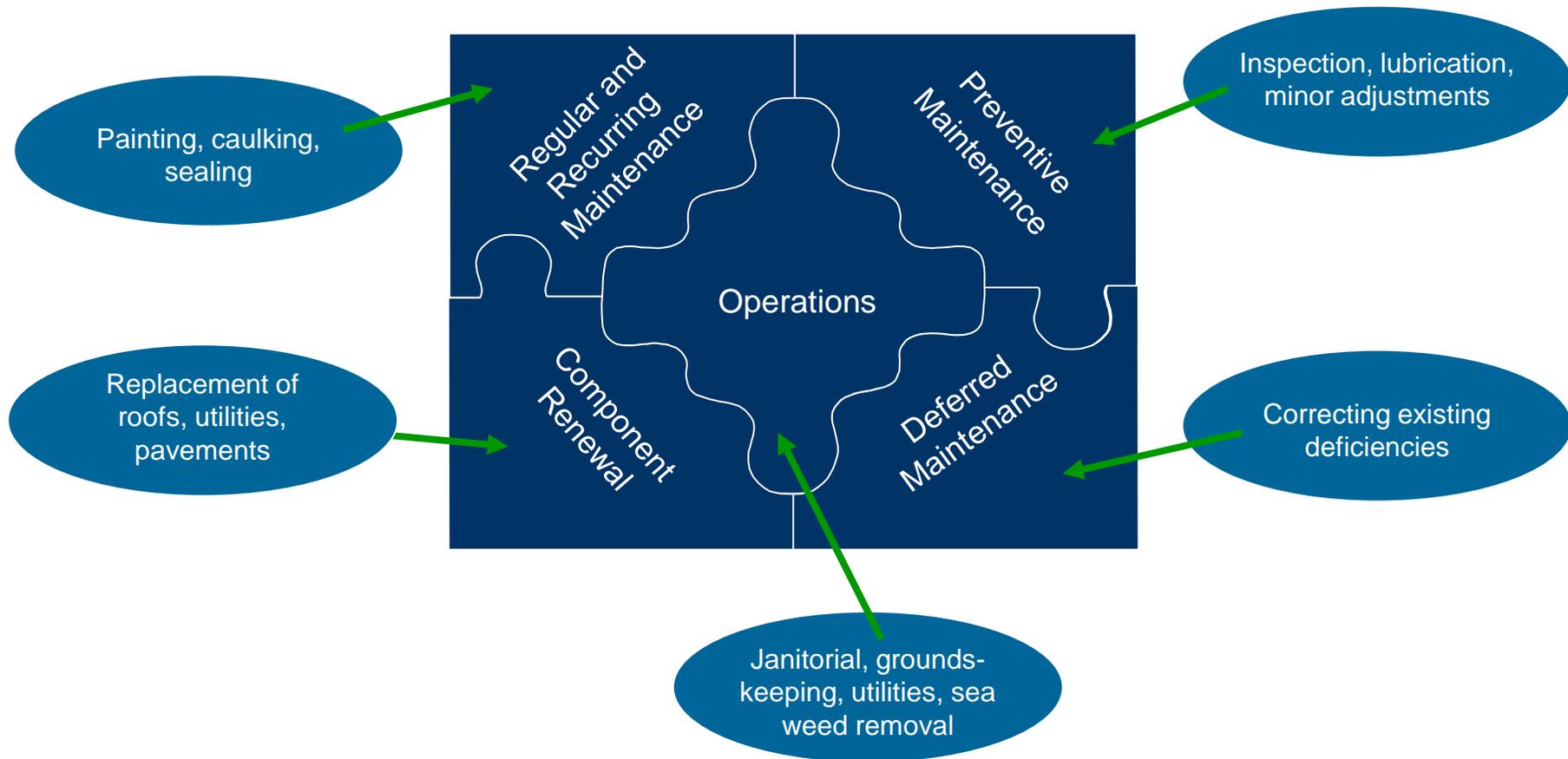
The goal of the PAIS PAMP is to demonstrate:

- How PAIS currently maintains its assets
- What is required to maintain its assets
- The gap between current funding and current requirements
- The strategy to manage the funding gaps

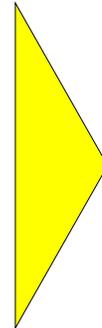
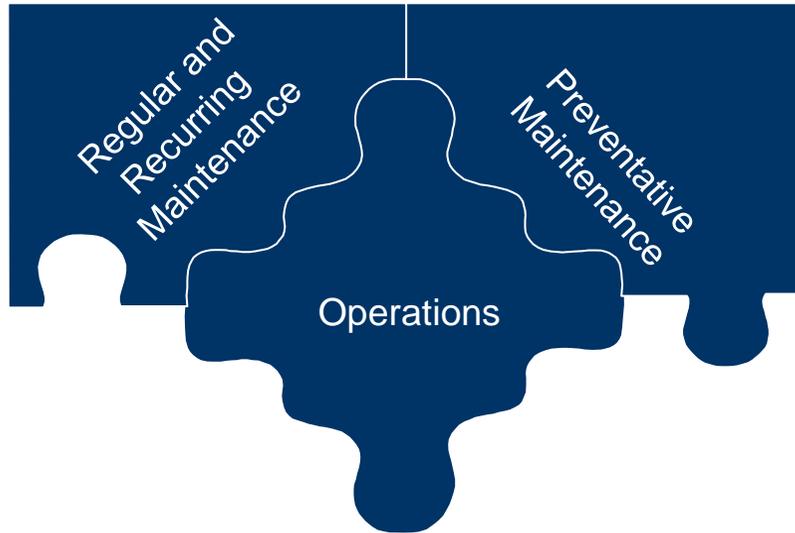


The Sea Turtle Science and Recovery Division Laboratory

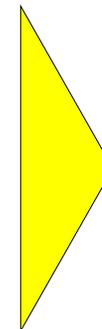
PAIS's maintenance expenses include all five life-cycle maintenance elements, each of which must be factored into the PAMP



Analysis of PAIS maintenance work is facilitated by splitting that work into base- and project-funded activities



Critical examination of base funding allows a park to plan and prioritize spending of its annual operations and maintenance (O&M) budget



Critical examination of current and forecasted project funding helps the park identify strategies for reducing deferred maintenance (DM) balances while planning for recurring replacement of equipment and creating useful PMIS projects for future funding



PAIS’s base funding covers only a portion of the Park’s total annual operations and maintenance (O&M) needs

Annual O&M Benchmark Requirements	\$ 2,659,204
Annual Budgeted Available Funding	\$ 778,292
GAP	\$ 1,880,912

Solution: Develop tiers of O&M funds and spend those funds based on priority and condition of assets

Asset Priority Level	Asset Count	Operations	RM	PM	Total	Benchmark Totals
(1) Highest Priority	10	\$172,365	\$64,175	\$31,051	\$267,592	\$373,212
(2) High Priority	31	\$208,721	\$30,369	\$15,225	\$254,314	\$615,303
(3) Medium Priority	23	\$187,146	\$34,505	\$32,175	\$253,826	\$1,047,028
(4) Lower Priority	9	\$2,560	\$0	\$0	\$2,560	\$92,928
(5) Lowest Priority	6	\$0	\$0	\$0	\$0	\$530,733
Total O&M Allocation	79	\$570,793	\$129,049	\$78,451	\$778,292	\$2,659,204
Total O&M Requirement	79	\$956,503	\$337,613	\$256,622	\$1,880,912	
% Coverage of Requirement		60%	38%	31%	29%	

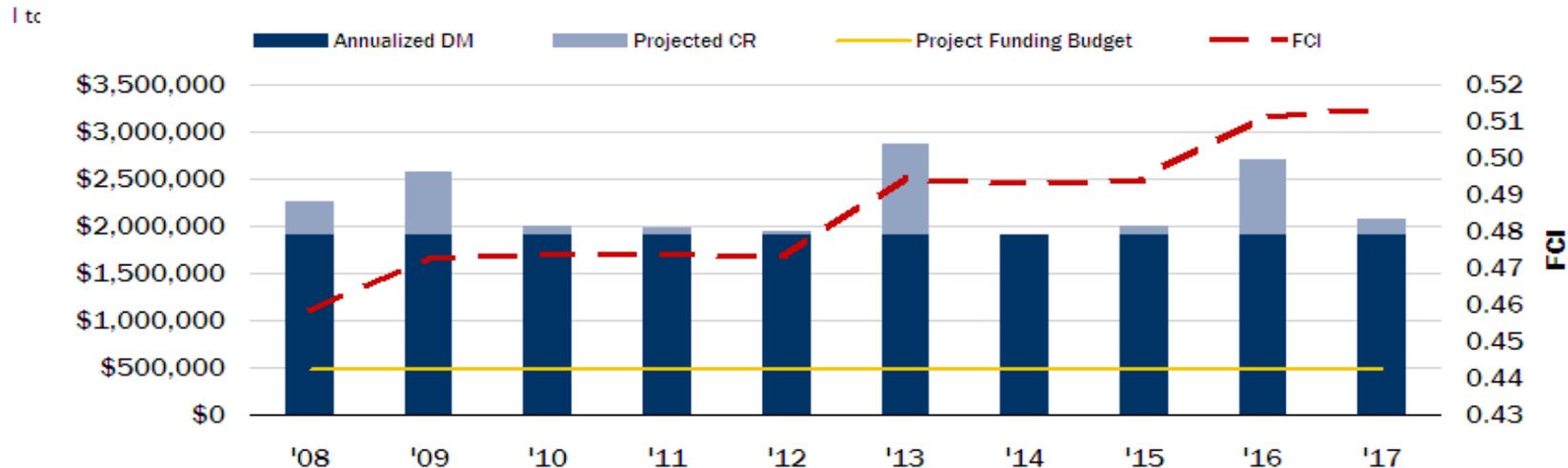
Result: The Park can target its funds strategically to priority assets, manage O&M spending using models, and prevent future deterioration through implementation of this strategy for O&M spending



PAIS's annual special project funding covers only a portion of the Park's total annual backlog requirement

Project Funding Gap	
Annualized Requirement	\$2,224,337
Annual Project Funding Available	\$480,606
Total Project Funding Gap	\$1,743,731

Requirement to spend down DM in 10 years



Solution: Bundle high priority work including critical systems DM into projects targeted for near term funding (e.g., FY08, FY09, etc.)

Result: FCI will improve over time for those highest priority assets even though total portfolio condition may not show significant overall improvement

To develop its PAMP, PAIS explored four key topics



The size and condition of the large, diverse asset base of PAIS is documented	The main funding sources for PAIS are split between annual base O&M and special project funding	Industry models are used to determine O&M benchmarks and identify required project funding for PAIS assets	Different approaches are examined to help PAIS prioritize allocation of funds for its assets
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- PAIS has conducted a thorough review of the Park’s asset portfolio, its available funding, and existing PMIS projects and work orders in FMSS
- Developing the PAMP required park managers to complete the complex process of prioritizing assets, bundling work orders into PMIS projects, estimating operating and maintenance (O&M) requirements, demonstrating funding gaps, and identifying techniques to manage these funding gaps

Section 1: Current Footprint



- This section explores PAIS’s existing asset portfolio, highlighting its varied and sizeable nature



The Novillo Line Camp, one of the few remnants of the island’s ranching era

PAIS's asset portfolio consists of 80 assets.

- The vast majority of assets are buildings.
- All assets are owned by the NPS.
- Some areas of the park are designated maintained landscapes for HAZMAT removal.

Asset Type	Count	Quantity	Units
Road Assets	14	91	MI
Trail Assets	4	3,724	LF
Maintained Landscapes	10	57	AC
Buildings	34	48,358	SF
Housing	2	2,794	SF
Water Systems	1	6,300	GPD
Wastewater Systems	2	12,007	GPD
Other Assets*	13	n/a	-
Grand Total	80	-	-



* Other Assets include: communications system, fuel system, heating system, parking lots, docks and boat ramps, and an amphitheatre



Occupancy

- One NPS asset is concession-occupied.
- The remainder are NPS-occupied.

Park Asset Occupant Count

NPS
78



Concessions
1

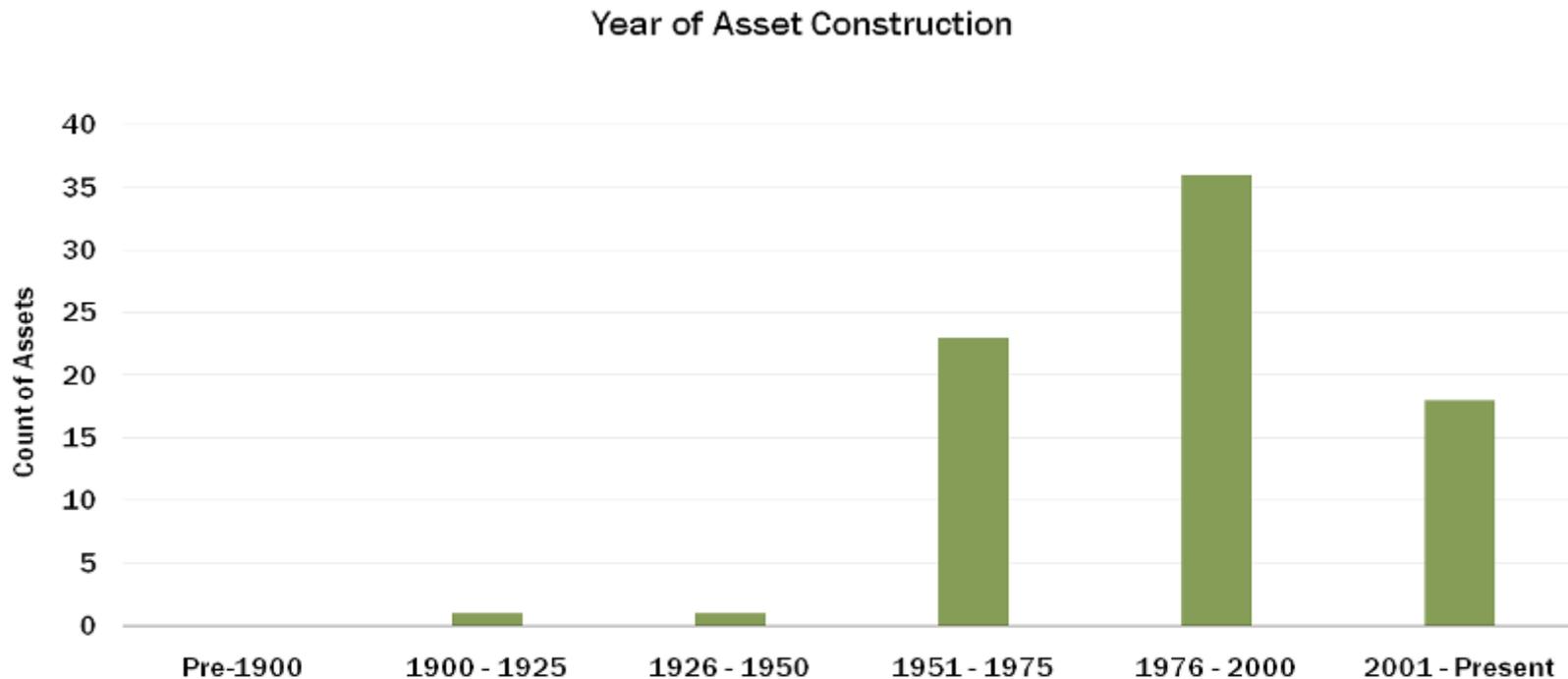


Exterior and interior of the park's concessions stand



PAIS's portfolio consists of several aging assets; almost half of which are over 30 years old

- Because of the aging inventory, the Park faces a wave of expiring systems
- Accordingly, the Park needs tools to plan for substantial out year costs
- Because the saline environment causes metal to deteriorate at an accelerated rate, assets deteriorate faster than they would normally.





PAIS's asset portfolio is valued at over \$42 million

- PAIS's assets have total deferred maintenance of nearly \$19 million.
- Using the facility condition index (FCI) metric as a guide, the relative condition of each asset and asset type can be determined.
- The overall FCI for PAIS ranks as poor.

Asset Type	DM	CRV	FCI
Road Assets	\$9,154,506	\$16,842,636	0.54
Trail Assets	\$89,184	\$617,139	0.14
Maintained Landscapes	\$498,825	\$2,414,477	0.21
Buildings	\$3,010,754	\$10,018,400	0.28
Housing	\$37,771	\$370,363	0.10
Water Systems	\$843,401	\$2,546,197	0.33
Wastewater Systems	\$96,122	\$689,798	0.14
Other Assets*	\$5,165,454	\$8,763,029	0.59
Grand Total	\$18,896,017	\$42,262,039	0.45

* Other Assets include: communications system, fuel system, heating system, parking lots, docks and boat ramps, and an amphitheatre. Please note that the majority of the DM and CRV for "other assets" is due to the inclusion of parking lots, which have significantly higher CRVs and far more DM than the other assets included under this category.

FCI is a metric calculated by dividing the deferred maintenance by the current replacement value.

$$\text{FCI} = \frac{\text{Deferred Maintenance}}{\text{Current Replacement Value}}$$

The FCI is used by facility managers to better understand the relative condition of assets within a portfolio. A score closer to 0.0 reflects better condition.

FCI Range	Condition
< 0.11	Good
0.11 - 0.15	Fair
0.15 - 0.50	Poor
> 0.5	Serious



Asset Removal

- PAIS removes assets that are not core to the park’s purpose or that are in unusable condition.
- Removing these assets not only restores the park’s beauty, but also frees up O&M and project funds for higher priority assets.
- In addition to the residence below, the park has also recently removed approximately four acres of the Visitors Center parking lot, which were seldom used.
- The park’s seldom-used 20-mile long Back Island Road will be removed within the next few years in order to restore the landscape.

Asset	Type	Status	CRV	Quantity	Units
LE Residence 502	Housing	Removed	\$199,901	1122	SF
Back Island Road	Road	Slated for Removal	\$847,567	20	miles



Planned Assets

- The new law enforcement facility is the park’s most expensive planned asset. It will replace a temporary facility used since the previous facility was destroyed by fire several years ago.
- In addition, some assets (such as the Malaquite VC auditorium, the VC First Aid Station, and the Facility Management headquarters) will be expanded.

Asset	Type	Status	CRV	Quantity	Units
Law Enforcement Facility	Building	Planned	\$997,937	6800	SF
LE Residence to replace #502	House	Planned	\$103,576	2000	SF
Malaquite Vault Toilet	Building	Planned	\$14,927	72	SF
Malaquite Assembly Pavilion	Building	Planned	\$32,545	666	SF
Malaquite Rinse-off Showers #2	Building	Planned	\$20,634	385	SF
VIP Trail	Trail	Planned	\$10,541	1100	SF
Malaquite Meeting Area	Landscape	Planned	\$35,555	3.2	AC

Section 2: Current Funding



- This section discusses PAIS’s current base and special project funding situation
- Understanding which fund sources are stable and those that vary from year to year is important for successful asset portfolio management



PAIS’s annual funding stream consists of base (operating) and special project funding

- During development of PAIS’s PAMP, indirect costs were included in the total O&M amount directed towards operating and maintaining assets (model or ‘Optimizer’ goal)
- While these costs do factor into the total cost of park ownership, indirect costs are typically excluded for modeling and understanding direct costs associated with maintenance
- Going forward, PAIS must exclude these indirect costs to more accurately reflect its maintenance budget relative to industry requirements;
- PAIS has a very complex fleet operation, which accounts for 25% of the ONPS budget. The fleet amount was subtracted from the ONPS amount available for operations and maintenance. In addition, indirect costs were also subtracted.

Source	Details	Annual Budget
Operations and Maintenance (O&M)	Total funding directed towards operating and maintaining all PAIS managed assets	\$ 778,292
Project Programs	Includes the following funding programs: Rec Fee, Regular Cyclic, Repair/Rehab, FLHP, LIC, Cultural Cyclic, etc.	\$ 480,606
Total Annual Direct Maintenance Funding		\$ 1,258,898

Reconciliation of O&M to Total ONPS Budget	
Base Funding	\$ 1,485,567
+ Utility & Housing income	\$ -
- (Less indirect costs)	\$ (340,275)
- (Less fleet costs)	\$ (367,000)
Total Direct O&M	\$ 778,292





Current Funding O&M Related Work Types

Work Type	Description	Examples
Operations (Ops)	Direct facility operations (FO) work activities performed on a recurring basis throughout the year that are intended to meet routine daily park operational needs	Custodial services, utility (electricity, water, or fuel) costs, grounds keeping, pest control, refuse removal, soil/sand/debris removal, plant operations, activation/deactivation, operate plant/system, etc.
Preventive Maintenance (PM)	Regularly scheduled (at least once per year) periodic maintenance activities on selected equipment	Inspection, lubrication, minor adjustments, etc.
Recurring Maintenance (RM)	Work activities that recur based on normal wear patterns on a periodic cycle of greater than one and less than 10 years	Painting, caulking, sealing, carpet replacement, roof repairs, etc.
Unscheduled Maintenance (CM)	Breakdown maintenance or corrective maintenance repairs that are not part of a park's scheduled O&M plans	Broken windows, plumbing leaks, temporary system failures, power outages, etc.
Indirect Overhead	Operational costs related to park business (personnel costs associated with the operations and maintenance staff time used outside of maintenance labor or mobilization) and management (activities associated with the general administration, overhead, and support functions of the other direct FO activities)	Work scheduling, FMSS data management, project management, maintenance budgeting, etc.
Fleet Operations	Maintenance and fuel costs associated with all leased or owned vehicles or specialized equipment	Regular engine servicing, inspections, part replacement, fleet breakdown maintenance, fuel costs, etc.



PAIS's O&M funding is spread across the Park's major asset types and work types

Asset Type	Operations	Recurring	Preventive	Total
Buildings	\$253,596	\$108,178	\$34,436	\$396,210
Maintained Landscapes	\$96,680	\$41,241	\$13,128	\$151,049
Road Assets	\$71,718	\$30,593	\$9,739	\$112,050
Trail Assets	\$54,779	\$23,367	\$7,439	\$85,585
Housing	\$17,053	\$7,264	\$2,306	\$26,623
Water Systems	\$3,469	\$1,480	\$471	\$5,420
Wastewater Systems	\$867	\$370	\$118	\$1,355
Grand Total	\$498,162	\$212,493	\$67,637	\$778,292

Note: Parking lot funds have been included under road assets. Funds for minor assets are insignificant and therefore have not been listed.

O&M Budget by Asset Type



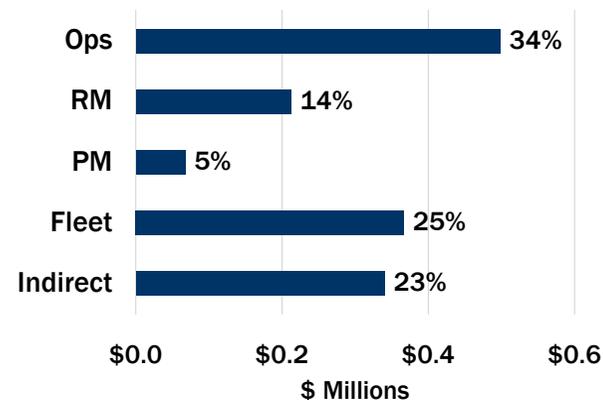
Of the 3 basic work types, most of PAIS's O&M budget is directed towards Operations

- 34% of PAIS's O&M funding is allocated to operations, 14% is directed to recurring maintenance and 5% toward preventive maintenance
- PAIS directs limited O&M funding to high API assets and those that receive the most visitor use



HAZMAT removal is a routine part of PAIS operations.

Allocation of Total O&M Funding by Work Type





PAIS has received approximately \$481k annually in Past project funding to address DM and CR

- On average the project funding PAIS has received on an annual basis is \$481K. This funding is directed to all assets.
- Typical projects include; pavement chip-sealing, roof and siding replacement, campground rehab, trail re-construction/stabilization and ADA compliance.
- Does not include Vanishing Treasures, NRPP, and Cultural Cyclic Maintenance .
- These figures were calculated using data from previously funded projects and projects formulated for the future.

Fund Source	Annual Budget	Budget as Percentage of Total
Repair / Rehab	\$270,629	56.3%
Rec Fee Demo	\$152,468	31.7%
Other	\$51,213	10.7%
Regular Cyclic	\$6,296	1.3%
Total Project Funds	\$480,606	

**Other includes Concession Franchise Fees, Environmental Management Program, and Equipment Replacement - Radios*



Housing Income is able to satisfy current Park Housing Needs

- PAIS receives approximately \$10,200 annually in Housing income.
- Housing income received is fed back into the 692 and 693 accounts.
- Usually, there is no significant carry-over (however, see the next slide).
- If there is no carry-over, the park is able to meet any housing needs.
- Housing is 3% of the total PAIS budget (excluding indirect costs).

Housing Funding

Operations	Recurring	Preventive	Total
\$17,053	\$7,264	\$2,306	\$26,623

PAIS Housing Income Carryover

- PAIS has approximately \$4,056 in FY07 Housing Income Carryover.
- Figures for FY08 were unavailable as of the writing of this PAMP.

PWE	FUND	Description	FY07 Authorized	Expenditures/UDO	FY07 Carry over
692	34	Permanent Housing	\$3,814	(1,347)	\$2,467
693	34	Seasonal Housing	\$384	\$1,205	\$1,589

- Current carryover will be used for DM projects and punch list items over the course of next 10 years until exhausted.



Residence #503: Required housing for Law Enforcement officers.

Section 3: Current Requirements



- This section reviews PAIS’s operating and project requirements
- Understanding industry requirements can assist park managers with determining the appropriate level of funding necessary for park assets





Application of industry standard metrics indicates that PAIS’s portfolio requires \$2.7 million annually for O&M

- All Other includes communications systems, fuel system, heating system, an amphitheatre, parking lots, docks, and a boat ramp.
- O&M requirements are modeled from RS Means and other relevant sources. Some asset type estimates (i.e., utility systems, maintained landscapes, etc.) are based on a percentage of CRV and are considered a current, reasonable benchmark for budgeting and out-year planning by the Federal government.

Asset	Operations	RM	PM	Total
Road Assets	\$701,203	\$120,612	\$78,712	\$900,527
Trail Assets	\$2,652	\$16,916	\$812	\$20,381
Maintained Landscapes	\$656,076	\$38,592	\$19,207	\$713,875
Buildings	\$525,489	\$108,798	\$66,148	\$700,435
Housing	\$473	\$11,587	\$4,433	\$16,493
Water Systems	\$30,554	\$61,109	\$30,554	\$122,217
Wastewater Systems	\$8,278	\$16,555	\$8,277	\$33,110
Other Assets*	\$103,764	\$30,045	\$18,358	\$152,167
O&M Benchmark Totals	\$2,028,488	\$404,214	\$226,501	\$2,659,204



The gap between PAIS’s budget and estimated total O&M requirement exceeds \$1.8M per year.

Asset	Budget	Requirement	Variance	%Funded
Road Assets	\$396,210	\$900,527	\$504,317	44%
Trail Assets	\$151,049	\$20,381	(\$130,668)	741%
Maintained Landscapes	\$112,050	\$713,875	\$601,825	16%
Buildings	\$85,585	\$700,435	\$614,850	12%
Housing	\$26,623	\$16,493	(\$10,130)	161%
Water Systems	\$5,420	\$122,217	\$116,797	4%
Wastewater Systems	\$1,355	\$33,110	\$31,755	4%
Other Assets*	\$0	\$152,167	\$0	0%
Totals	\$778,292	\$2,659,204	(\$1,880,912)	29%

* Other Assets include: communications system, fuel system, heating system, parking lots, docks and boat ramps, and an amphitheatre

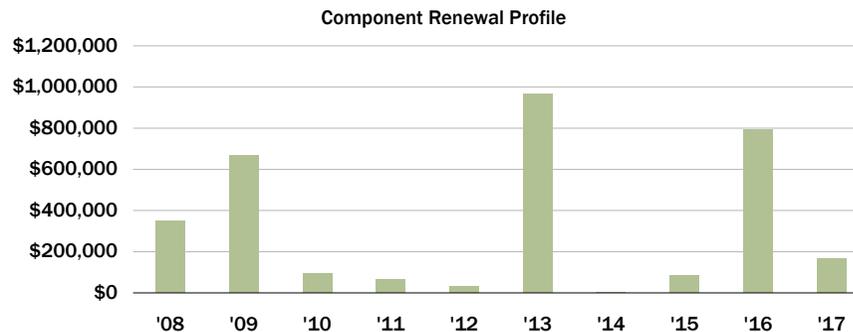
- PAIS’s current funding covers 29% of the required O&M activities
- Trail assets appear over requirements is because the park has just completed a project that has been in the process for four years; housing appears over requirements because of completion of long-standing need to storm-proof housing.
- The large O&M requirement under “Other Assets” is due to the inclusion of parking lots, which require significantly more maintenance than the other assets in this category.
- The condition of PAIS's portfolio will worsen over time if basic operating and maintenance activities are not accomplished regularly

Over the next 10 years, approximately \$22.2 million is required to reduce deferred maintenance and address component renewal (CR) requirements

- Currently, the total deferred maintenance for the portfolio is approximately \$21 million
- The component renewal requirements of \$3.1 million were forecast using the estimated life for all PAIS equipment along with the year of last replacement.
- Unlike other parks, the lifespan of equipment at PAIS is much shorter than normal because of the highly saline environment.
- Spikes in the CR profile are caused by equipment coming up for replacement at the same time by chance.



Rust on vents on exterior of metal building.



Requirement	Amount
DM - FMSS work orders	\$14,414,134
DM - FHWA road data	\$4,672,416
Component Renewal	\$3,156,824
Total Ten-Year Requirement	\$22,243,374



Yearly O&M Housing Requirements vs. Rental Income Funding Summary

Overall, the housing portfolio for PAIS has an FCI of 0.10.

FY08 rental income, income carryover, and project funds applied to the DM backlog are not enough to improve conditions of housing units

- **The Housing Program faces an annual program funding gap (between requirements and rental income) of more than \$5,693 per year**

Annual O&M Benchmarks Requirements	\$ 16,493
Annual Rental Income Available Funding	\$ 10,200
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PAIS GAP	\$ 6,293

Result: Using industry standard models, quantify rental income available and identify gap to be covered by other fund sources

Housing Deferred Maintenance

- Total current deferred maintenance for Housing is \$37,771.
- Spread over a ten year period, this produces an annual requirement of \$3,777.
- If added to the annual gap between benchmark requirements and rental income, the gap increases from \$6,293 to \$10,070.
- Additional project money will be needed to decrease the annual gap.



Residence #503 – Required housing for law enforcement officers

Section 4: Managing the Gap

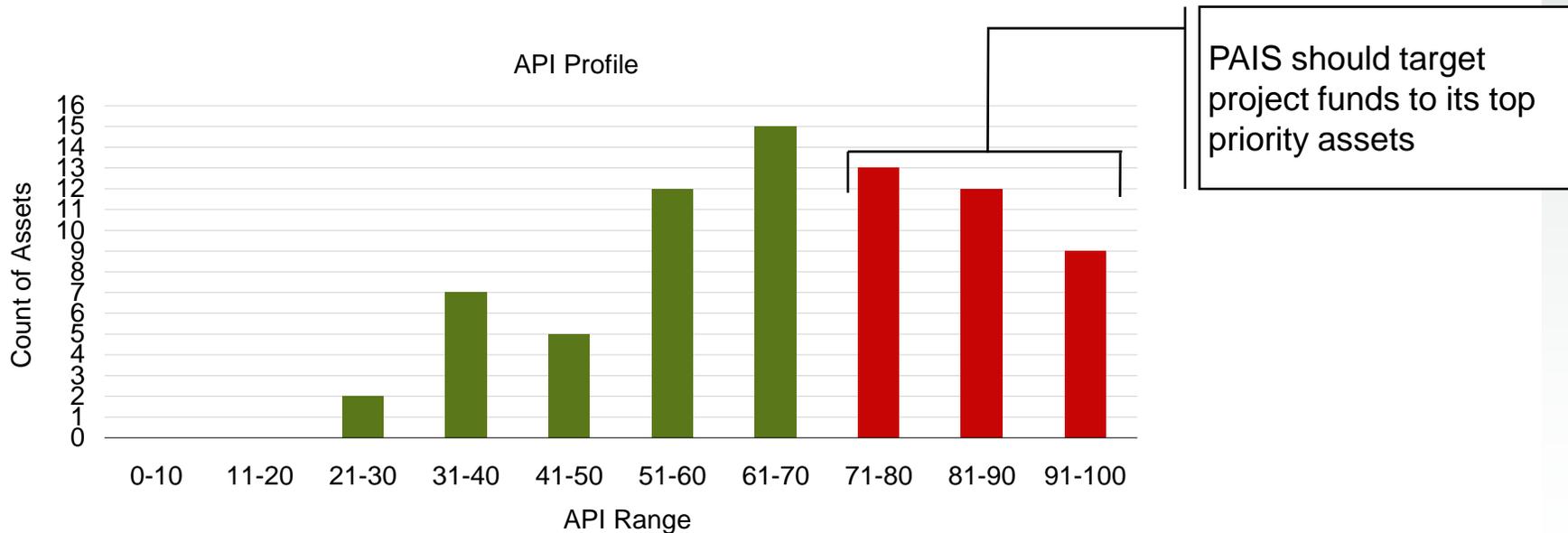


- Park managers at PAIS must proactively manage the gap between current funding and both O&M and project funding requirements
- Incorporating an asset's condition and relative importance to the Park can help park managers prioritize and direct available funding
- Disposal and mothballing are also options for certain non-mission critical, poor condition assets



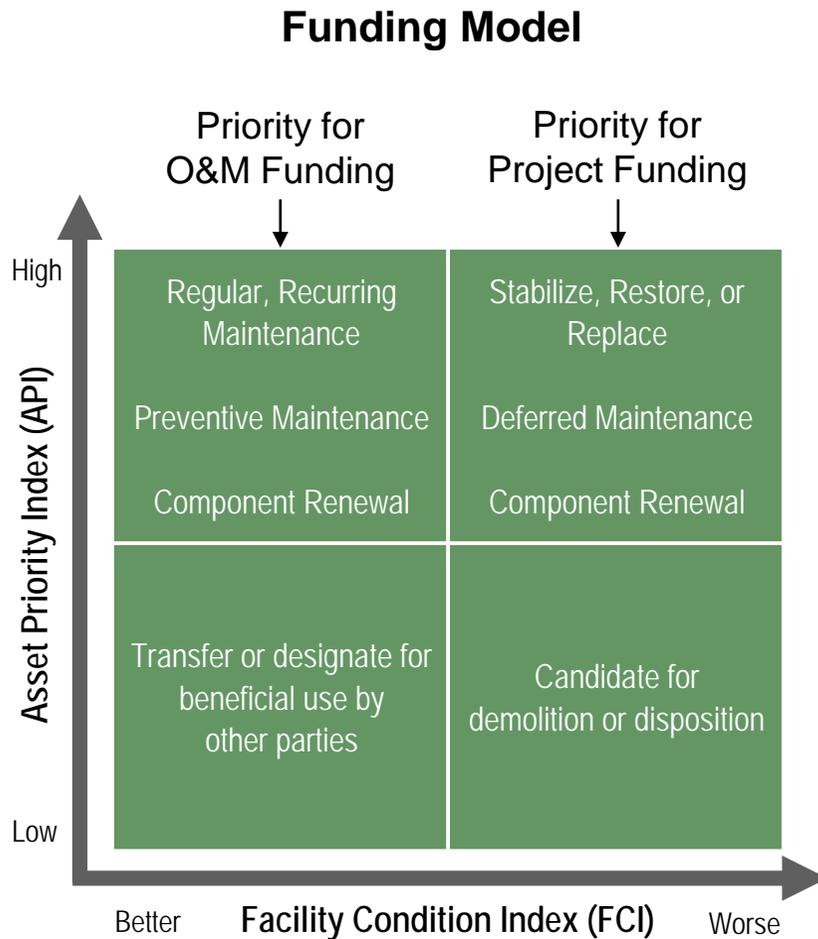
Because PAIS faces huge requirements for both deferred maintenance and component renewal, the Park should focus on funding high priority assets

- Asset management techniques, such as API, can assist Park management in identifying funding priorities based on the Park's most important assets
- PAIS has assets with both low, medium, and high priority
- Focusing limited resources on high priority assets is the cornerstone of PAIS's PAMP
- This graph depicts PAIS assets, grouped by API rating





Both API and FCI help PAIS target operating and project funding streams on all key work types



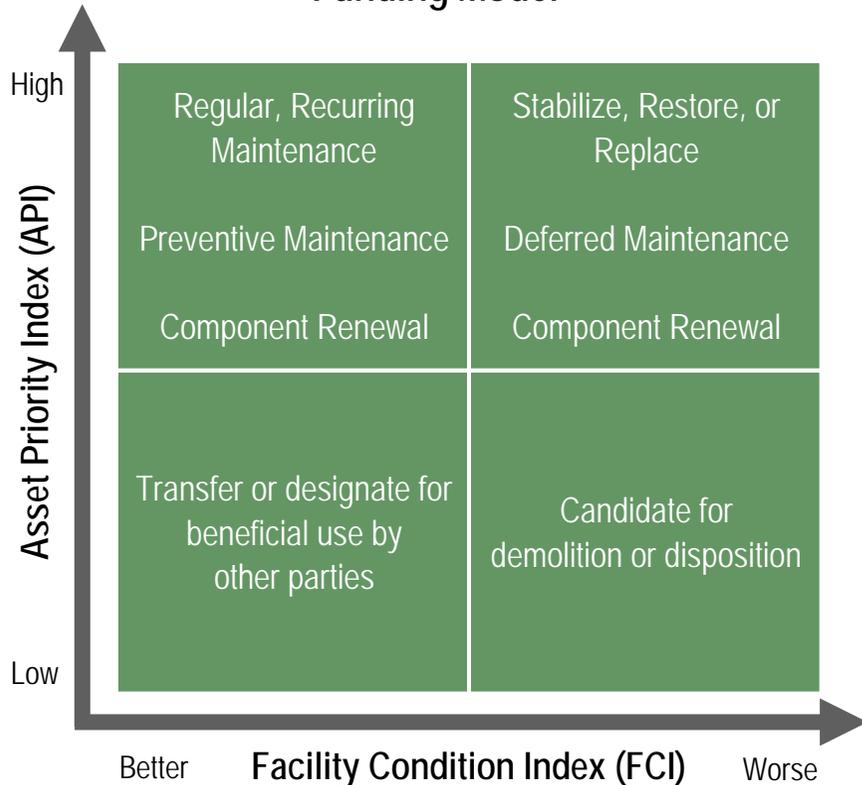
- The basic management principle behind this diagram is simple: a park should take care of its most important assets
- By incorporating FCI, a park can target operating funding to its most important assets in the best condition to prevent further deterioration
- Park managers can target deferred maintenance and component renewal project funding to their most important assets in the worst condition to decrease deferred maintenance
- Maintaining assets in the bottom quadrants requires some, if not limited, operating funding (primarily for IPH and basic operating costs such as utilities)



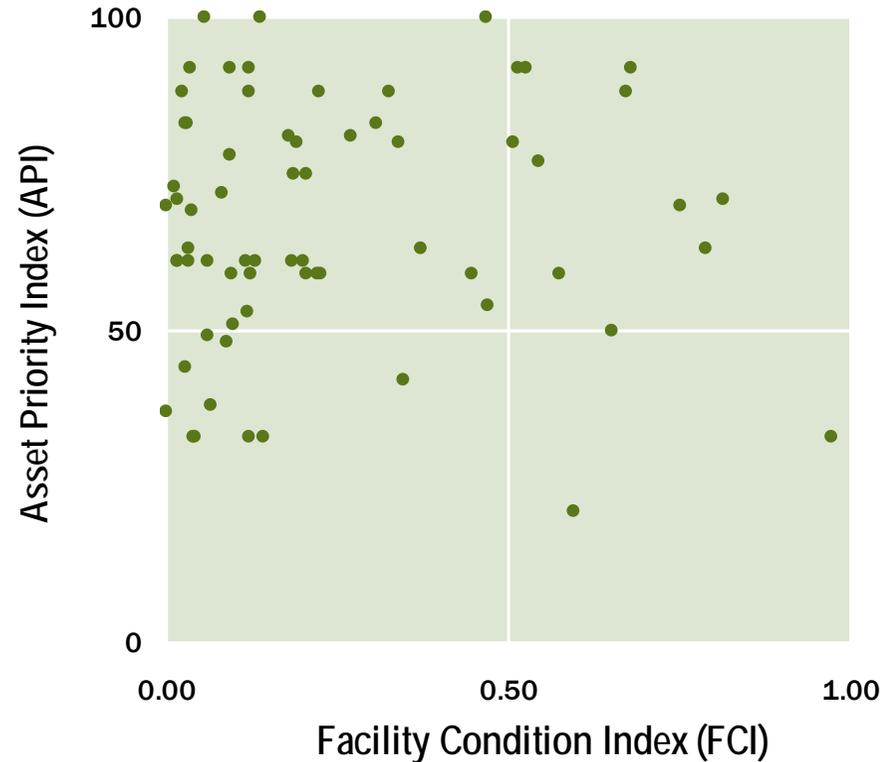
Plotting PAIS's assets on this matrix enables Park managers to visualize their distribution of assets

- PAIS assets vary widely in condition and currently lack a strong correlation between API and FCI¹

Funding Model

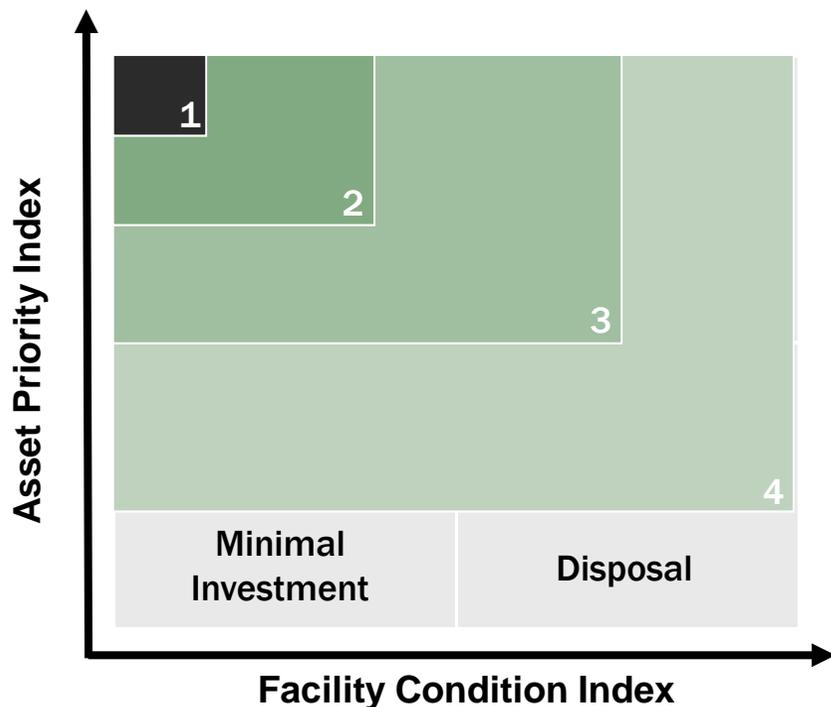


PAIS API/FCI Distribution



¹ Analysis excludes assets with an FCI >1

Prioritization techniques help to allocate O&M funding



- API and FCI thresholds were initially set to provide a baseline for facility management
- Actual thresholds will be adjusted over time as new data is gathered
- Assets that fall in the lowest priority should and will receive minimal O&M funds

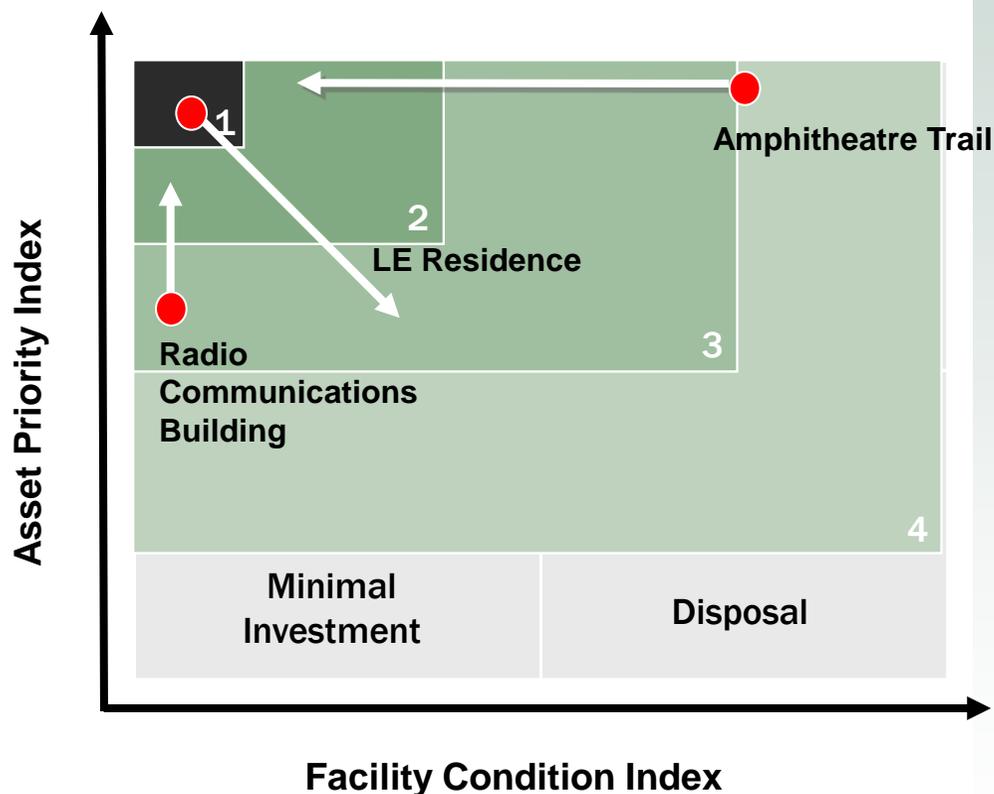
Priority	API	FCI	N
1. Highest	88	0.150	10
2. High	75	0.300	31
3. Medium	50	0.750	23
4. Low	21	1.000	9
5. Lowest	<21	>1.000	6
Total Asset Count			79

This prioritization technique can be slightly modified to account for special Park and asset circumstances

- Manual prioritization resulted in changing the priority ranking of 43 assets (57%).
- PAIS focused on upgrading visitor facilities, making facilities more ADA compliant, and increasing visitor and employee safety when prioritizing.
- The Park downgraded administrative facilities due for disposal or replacement.



Radio
Communications
Building





PAIS designed O&M funding tiers customized to the Park’s current budget environment once it documented recommended industry standard maintenance costs

- Industry standard requirements can be broken down, by dollar amount, according to work type activities, and by asset priority level
 - In this manner, the Park can identify the ideal amounts it should spend on its assets
 - Typically, it is expected that the highest priority assets will receive a greater percentage of recommended funding
- If PAIS had unlimited funding, models indicate that the Park should be spending \$2.7 million annually on its asset portfolio

Industry Standard Benchmarks for O&M Funding

Asset Priority Level and Description	Asset Count	Operations	RM	PM	Total
(1) Most Important; Best Condition	10	\$254,188	\$80,431	\$38,593	\$373,212
(2) Important; Best/Good Condition	31	\$470,174	\$96,681	\$48,448	\$615,303
(3) Supporting; Best/Good/Fair Condition	23	\$758,987	\$138,019	\$150,022	\$1,047,028
(4) Lower Priority	9	\$51,209	\$29,111	\$12,608	\$92,928
(5) Lowest Priority; Disposition Candidates	6	\$493,931	\$18,074	\$18,728	\$530,733
O&M Industry Standard Benchmark Totals	79	\$2,028,489	\$362,316	\$268,398	\$2,659,204



PAIS's budget overall covers 29% of requirements and the Park has allocated future spending accordingly, focusing on high priority assets

- PAIS had to make decisions about how to allocate its \$778k budget across all assets as the Park does not receive the \$2.7M industry standards indicate it needs.
- The chart to the right shows how ONPS dollars were allocated by work-type and asset priority as a percentage of modeled O&M requirements
- The Chart below shows the resulting dollar figure allocation by work-type and in total compared to requirements by asset priority level

O&M Allocation as a % of Required

Priority	Ops	RM	PM	Total
1	70%	50%	50%	64%
2	50%	5%	15%	40%
3	38%	2%	0%	28%
4	5%	0%	0%	3%
5	0%	0%	0%	0%
Total	74%	14%	10%	50%

Comparing Industry Standard Benchmarks to Final O&M Allocations, by Priority Band

O&M Optimizer Priority Band Level	Asset Count	Operations	RM	PM	Base Funding Totals	Benchmark Totals
(1) Highest Priority	10	\$177,932	\$40,215	\$19,297	\$237,444	\$373,212
(2) High Priority	31	\$235,087	\$4,834	\$7,267	\$247,188	\$615,303
(3) Medium Priority	23	\$288,339	\$2,760	\$0	\$291,099	\$1,047,028
(4) Lower Priority	9	\$2,560	\$0	\$0	\$2,560	\$92,928
(5) Lowest Priority	6	\$0	\$0	\$0	\$0	\$530,733
Total O&M Base Funding Allocation	79	\$703,918	\$47,809	\$26,564	\$778,291	\$2,659,204
O&M Industry Standard Benchmark Totals	79	\$956,503	\$337,613	\$256,622	Gap: \$1,880,912	
% Coverage of Benchmark Totals		74%	14%	10%	Total Coverage: 29%	



Base funding for all assets at PAIS covers \$778K of \$2.7M of the Park's O&M requirements, yielding a 71% gap

O&M Optimizer Results – All Assets

Asset Priority Level	Asset Count	Operations	RM	PM	Total	Benchmark Totals
(1) Highest Priority	10	\$177,932	\$40,215	\$19,297	\$237,444	\$373,212
(2) High Priority	31	\$235,087	\$4,834	\$7,267	\$247,188	\$615,303
(3) Medium Priority	23	\$288,339	\$2,760	\$0	\$291,099	\$1,047,028
(4) Lower Priority	9	\$2,560	\$0	\$0	\$2,560	\$92,928
(5) Lowest Priority	6	\$0	\$0	\$0	\$0	\$530,733
Total O&M Allocation	79	\$703,918	\$47,809	\$26,564	\$778,291	\$2,659,204
Total O&M Requirement	79	\$956,503	\$337,613	\$256,622	\$1,880,912	
% Coverage of Requirement		74%	14%	10%	29%	

Gap between funding and requirements is 71%

Highest Priority Assets: These assets are critical to the operations and mission of the Park and have high visitor use, such as water systems, visitor centers, comfort stations, and select picnic areas

High Priority Assets: These assets are very important to Park operations, such as mandatory, occupied housing and select ranger station assets, amphitheatres, and fee stations

Medium Priority Assets: These assets are important to Park operations, such as non-concession campgrounds and select buildings, housing, and grounds

Low Priority Assets: These assets are important but not critical to Park operations or do not require much maintenance funding, such as stabilized backcountry shelters or seldom-used assets

Lowest Priority Assets: These assets were targeted as concession operated assets or assets that are not required for the operations and mission of the Park, such as inactive assets



O&M Allocation by Priority Band

- Even with priority banding, the top three bands of assets will receive \$1.3M less in O&M funding than required.
- Some of the gap in the O&M funding for higher priority assets can be made up by using volunteers to perform maintenance tasks and projects.
- Even with volunteer help, the gap cannot be completely addressed without an increase in the O&M budget. Without an increase, O&M of assets will be deferred. This will eventually lead to deterioration of assets.

O&M Optimizer Priority Band	Asset Count	Base O&M Allocations	O&M Benchmarks	Percent Coverage	O&M Funding Gap
(1) Highest Priority	10	\$237,444	\$373,212	64%	\$135,768
(2) High Priority	31	\$247,188	\$615,303	40%	\$368,115
(3) Medium Priority	23	\$291,099	\$1,047,028	28%	\$755,929
(4) Lower Priority	9	\$2,560	\$92,928	3%	\$90,368
(5) Lowest Priority	6	\$0	\$530,733	0%	\$530,733
Totals	79	\$778,291	\$2,659,204	29%	\$1,880,912

Gap for Bands 1-3
\$1,259,812

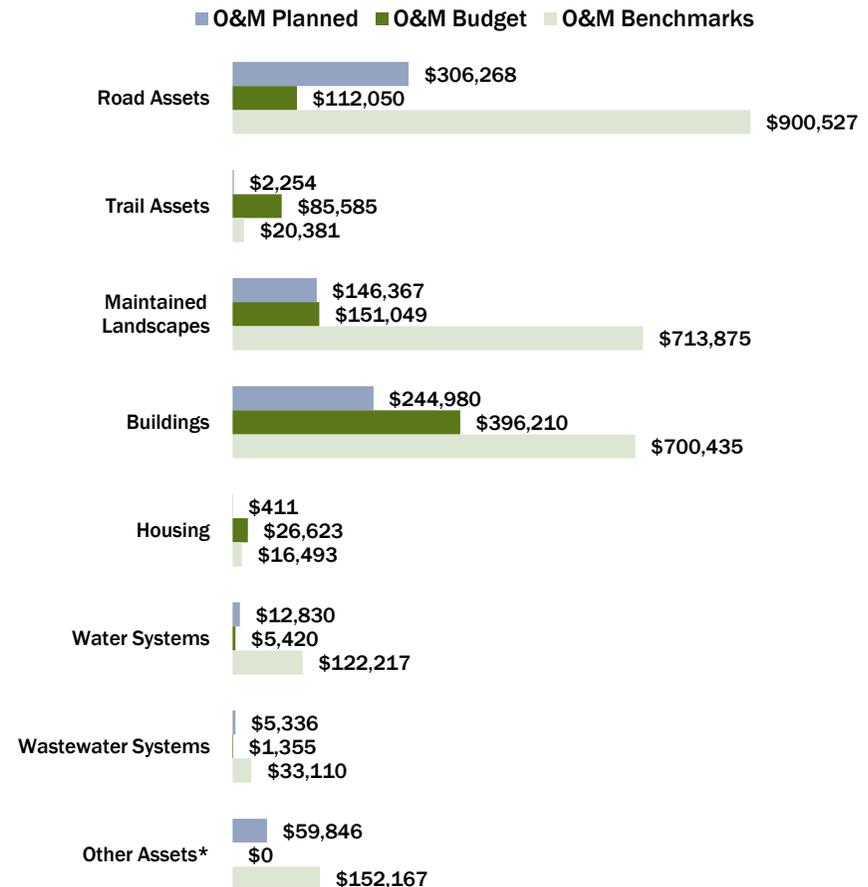


Strategic allocation of O&M funds resulted in some changes for how the Park will manage each asset class

- PAIS allocated O&M by asset type to most effectively manage its \$778k gap
- Park staff considered each asset's unique challenges when making decisions about how to allocate its \$778k of budgeted O&M funds
- Shift in budgeting priorities is because roads and other assets have been neglected in the past and need work.
- Large benchmark under "other assets" is due to the inclusion of parking lots in this category.

Asset	O&M Budget	O&M Planned	O&M Benchmarks	O&M Gap by Asset Type
Road Assets	\$112,050	\$306,268	\$900,527	\$594,259
Trail Assets	\$85,585	\$2,254	\$20,381	18,127
Maintained Landscapes	\$151,049	\$146,367	\$713,875	567,508
Buildings	\$396,210	\$244,980	\$700,435	455,455
Housing	\$26,623	\$411	\$16,493	16,082
Water Systems	\$5,420	\$12,830	\$122,217	109,387
Wastewater Systems	\$1,355	\$5,336	\$33,110	27,774
Other Assets*	\$0	\$59,846	\$152,167	92,321
Total	\$778,292	\$778,292	\$2,659,204	\$1,880,912

* Other Assets include: communications system, fuel system, heating system, parking lots, docks and boat ramps, and an amphitheatre





Comparing Allocations to Benchmarks on a per SF basis

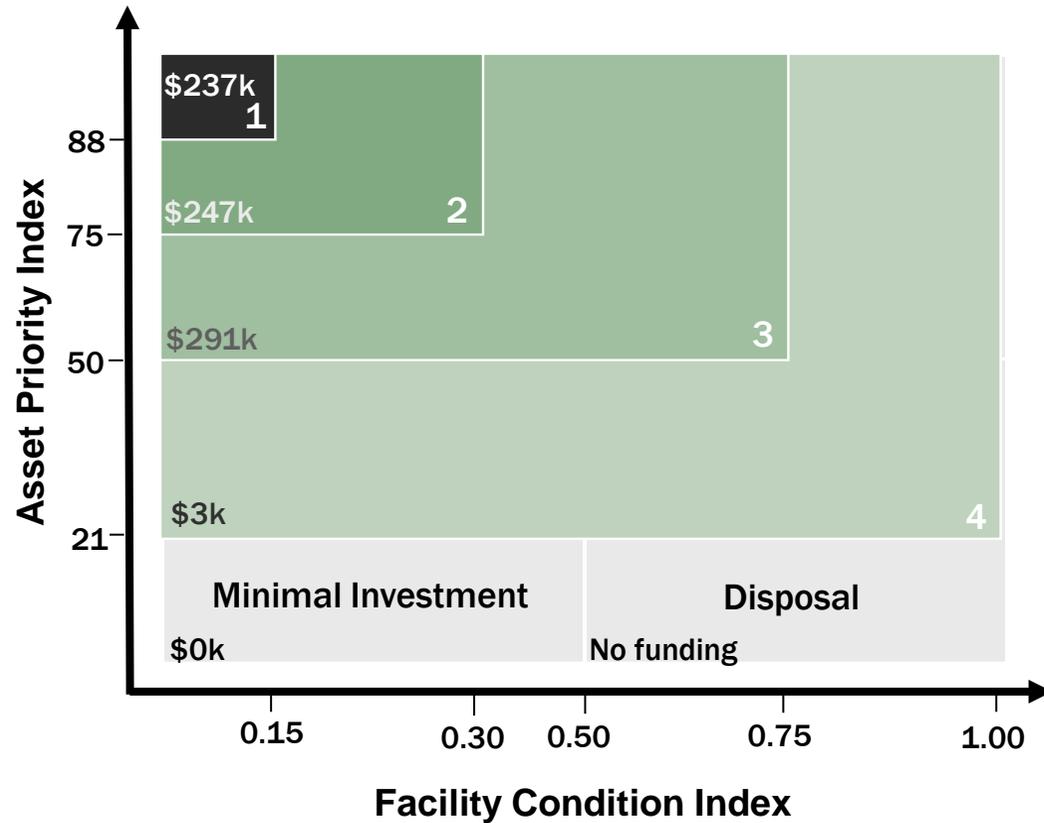
Asset Type	Quantity (SF)	O&M Benchmark		O&M Allocation	
		Total	\$ / SF	Total \$	\$ / SF
Buildings	48,286	\$695,573	\$14.41	\$374,306	\$7.75
Housing	2,794	\$16,493	\$5.90	\$4,084	\$1.46
Total	51,080	\$712,066	\$13.94	\$378,390	\$7.41

- All totaled, on a per-square-foot basis, O&M allocations are 54% of the O&M benchmarks.
- Housing allocations are 24.7% of the O&M benchmark.
- Building allocations are 53% of the O&M benchmark.



Using the O&M prioritization method, PAIS will be able to spend its \$778k base budget more effectively

- As mentioned earlier in this section, higher priority assets receive the essential O&M funds needed to maintain those assets in good condition
- Lowest priority assets receive few operating dollars for anything other than basic services (e.g., utilities)
- Any asset that is a disposal candidate will receive limited operating dollars; savings realized from cost avoidance can be redirected to higher priority assets





Over time PAIS must also improve asset condition, which requires effective use of limited project funding

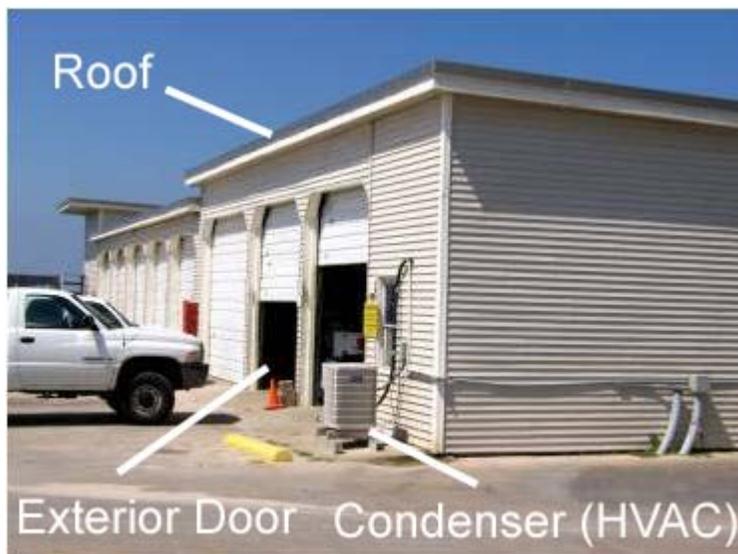
- Developing a strategic annual O&M program is just one piece of an effective asset management program at a Park
- In effect the Federal Real Property Council in conjunction with EO 13327 requires parks know the condition of all their assets and aim to align asset conditions to target levels
- The goal is for each park to drive down FCI over time to targeted levels, thus improving the overall condition of its total asset portfolio
- The challenge is how to most efficiently allocate their limited special project funding resources to address deferred maintenance and component renewal needs
 - As a starting point PAIS must focus all project funding on its most important assets in order to make the most out of limited resources
 - To target these high priority assets, PAIS analyzed nearly 450 work orders to develop logical projects intended to improve the condition of high priority assets
 - Future component renewal needs were reviewed by PAIS in conjunction with project needs

Process flow for work order management during PAMP development



With total deferred maintenance (DM) at nearly \$19 million, PAIS has a substantial amount of critical systems DM.

- The criticality of each system and sub-system for each asset type has been defined by a panel of experts using the Work Breakdown Structure (WBS) hierarchy
 - Each system and sub-system must be defined as either critical or non-critical
 - For a building, these critical systems would include roofing, HVAC, exterior doors and windows, etc.
 - A building's non-critical systems would include floor finishes, interior walls, fixtures, etc.



Asset WBS Hierarchy Report

4000 Buildings				
4100	AC	SF	Building	
A10	CM	SF	Building - Foundation	Critical? Y
A1010	S1	SF	Foundation - Standard	Y
A1020	S1	SF	Foundation - Special	Y
A1030	S1	SF	Foundation - Slab on Grade	Y
A20	CM	SF	Building - Basement	
A2020	S1	SF	Basement Walls	N
B10	CM	SF	Building - Superstructure	
B1010	S1	SF	Floor Construction	N
B20	CM	SF	Building - Exterior	
B2010	S1	SF	Exterior Walls	Y
B2020	S1	EA	Exterior Windows	Y
B2030	S1	EA	Exterior Doors	Y
B30	CM	SF	Building - Roofing	
B3010	S1	SF	Roof Covering	Y
B3020	S1	EA	Roof Opening	Y
C10	CM	SF	Building - Interior	
C1010	S1	SF	Interior Windows	N
C1020	S1	EA	Interior Doors	N
C1030	S1	EA	Fittings	N
C20				



PAIS's critical systems deferred maintenance currently in FMSS totals \$16.43 million

- By addressing an asset's critical systems, the integrity of that asset can be sustained and the accrual of DM can be avoided
- Based on the work orders in FMSS, 87% of all DM at PAIS is related to critical systems
- PAIS's non-critical systems DM is approx. \$2.5M, representing 13% of total DM

CSDM	\$11,687,484
FHWA CSDM	\$4,672, 416
Non-CSDM	\$2,461,480
Undetermined	<u>\$74,637</u>
Total	\$18,896,017



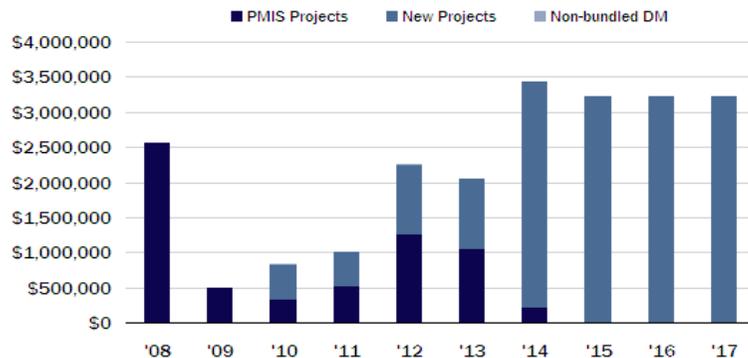


For PAIS to eliminate all DM in a 10-year period, it requires annual average project funding of \$2.2M

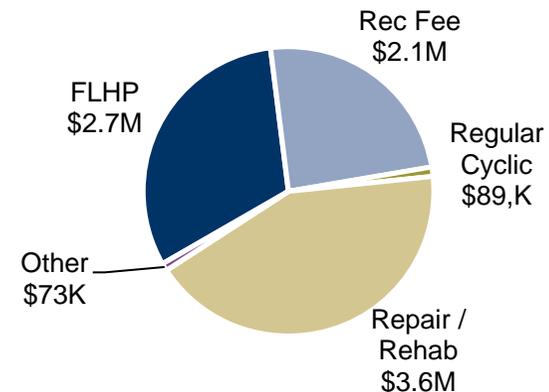
PAIS formulated a 5-year plan for most funding sources, so most new work order packages are scheduled for out-years.

Project Funding Gap	
Annualized Requirement	\$2,224,337
Annual Project Funding Available	\$480,606
Total Project Funding Gap	\$1,743,731

- Of the \$19M DM, \$147K still needs to be formulated into projects.
- Repair/Rehabilitation and Recreational Fee Demo will be the primary funding sources for DM in the future.
- **The lack of funding for PM and RM will produce more DM in the out years.**



Totals by Fund Source for Projects in PMIS / WO Bundles (\$ millions)

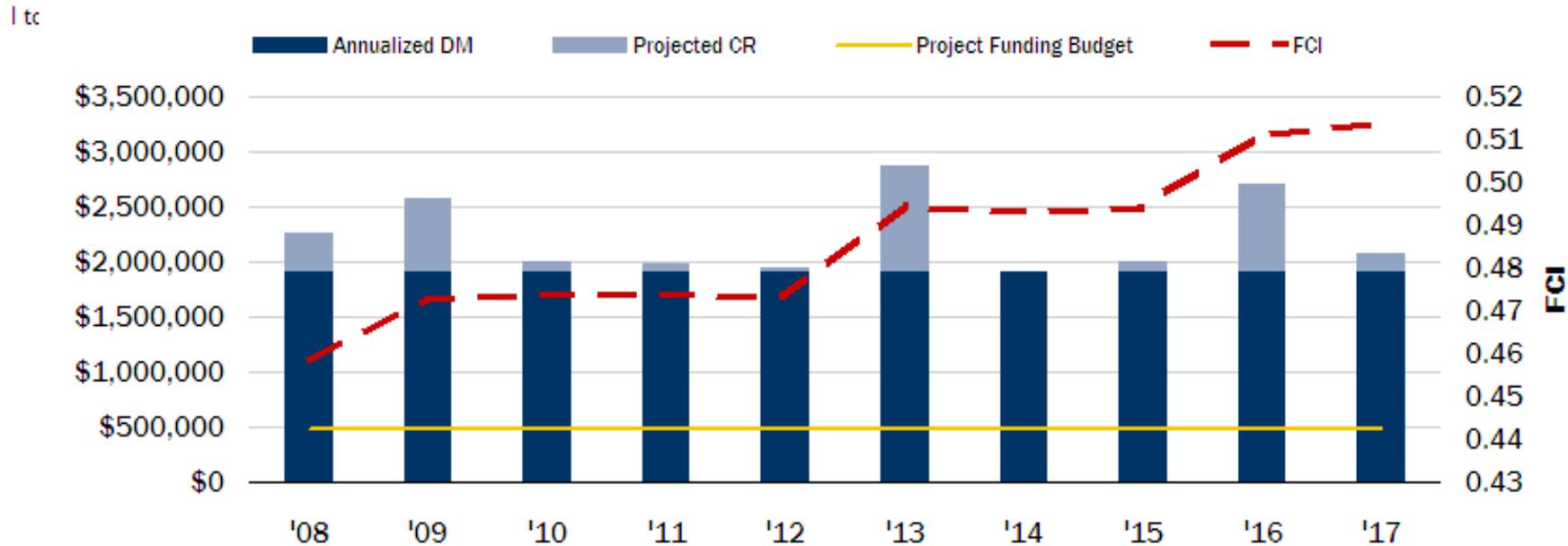




Projected Change in Portfolio Condition

- With \$481k in average annual project funding, PAIS will not be able to address deferred maintenance and component renewal needs adequately. Add this to the natural deterioration of assets over time, and the FCI at PAIS will increase.

Requirement to spend down DM in 10 years

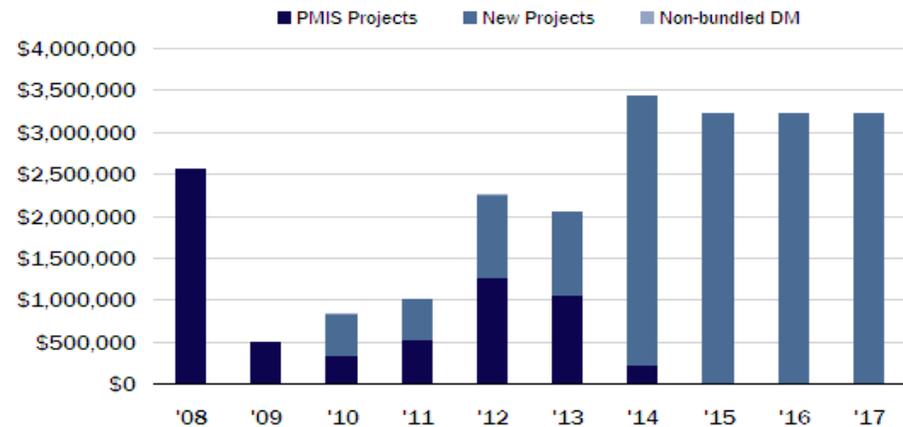




10-Year Project Funding Plan

- PAIS currently has \$6.4M in projects in PMIS formulated for funding.
- Approximately \$26M worth of deferred maintenance work has been bundled into new projects to be entered into PMIS.
- New projects will be spread out over the ten year period to average almost \$1.6M in new projects per year.
- \$46k in DM Work Orders were identified as small projects that could be handled using park maintenance staff. These work orders will be accomplished using ONPS funds as the park maintenance staff is available to perform this work.

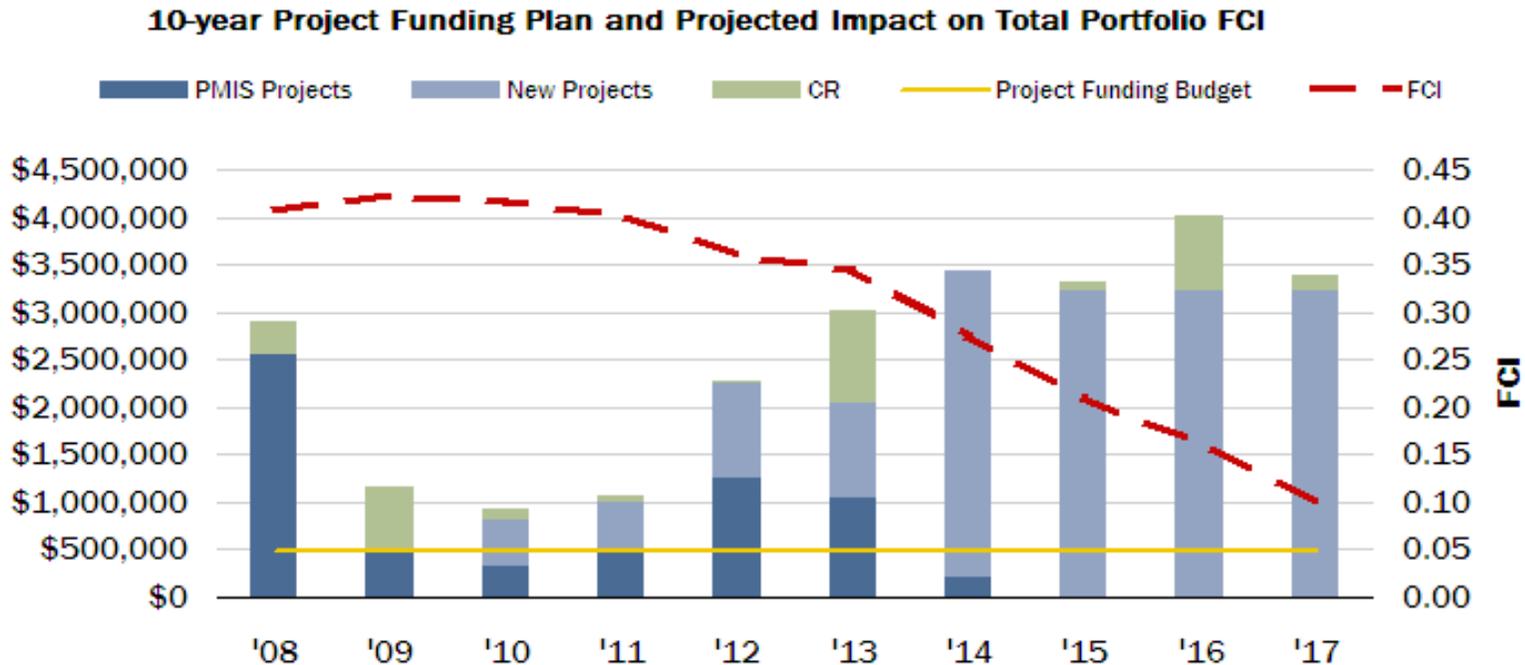
PMIS and Bundled Projects	
PMIS	\$6,360,814
Bundled WOs	\$15,896,805
Non-bundled DM	\$45,808
Total	\$22,303,427



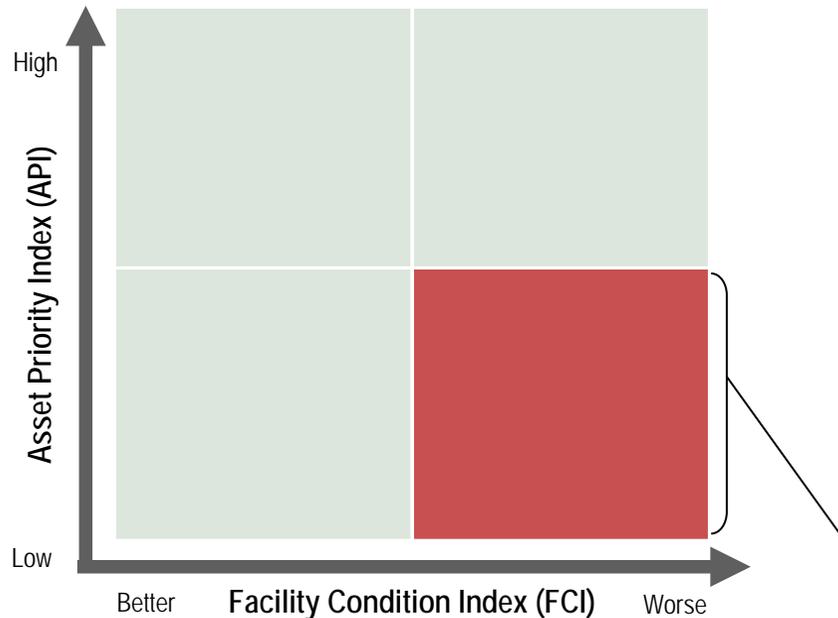


Using its ten-year plan for projects, PAIS's portfolio FCI will decrease.

- By submitting additional projects to average a total of approximately \$2.3M per year, the park would decrease its deferred maintenance, and lower its FCI. The condition of assets would improve.
- This amount of funding however, is unlikely, with the average amount of project money received being somewhat less.



Disposing, mothballing and reassignment of assets are options for low priority assets in poor condition



- Assets that receive initial consideration for disposal display the following characteristics:
 - Are identified in FMSS
 - Have measurable DM
 - Have CRV
 - Have sufficient data for basic analysis
 - Are eligible to be marked as “excess”

Assets in the lower right hand quadrant are good candidates for disposal, mothballing (e.g. stabilization); these assets are low priority assets in poor condition



The Park must continue to think and act strategically to effectively deal with base and project funding gaps

- Several strategies for managing assets in a fund constrained environment have been identified by PAIS staff:
 - Prioritization of assets and allocation of base O&M to assets based on priority is a key first step
 - Work order clean-up, project bundling based on asset importance and work activity, and careful scheduling of resulting projects over a 10-year period is also needed to improve the Park's ability to manage its DM backlog
 - Increased use of Volunteers and increased staff efficiency within the Facility Management Division.
- Additional approaches and concepts exist that the Park needs to integrate into its asset management practices. Discussions will follow on the following:
 - Incorporating a critical systems approach in future project management will help the Park develop even more competitive projects for funding
 - Disposal of assets would free up funds to allocate to higher priority assets
 - Various other Park and asset specific strategies that relate to the GMP or Core Ops planning processes

Other available fund sources can be used to help meet the much needed O&M requirements for housing and manage the housing funding gap

Rental Income Carryover

- Rental income carryover, or rental income not expended or obligated in the previous fiscal year, can be used to address current year O&M requirements.

ONPS Base Funding

- Allocating a portion of the Operation of the National Park Service (ONPS) appropriated funds to cover housing O&M shortfalls.

Other Funding Sources : Housing Improvement funds (HIP); cyclic maintenance; repair/rehab; cultural cyclic; PMIS housing projects; punchlist; and others

Note: The PAIS housing gap exists because few law enforcement officers have been available to occupy park housing. However, with the anticipated increase of five officers to the park staff, park housing is expected to be occupied continuously beginning in the near term. After that, the housing gap will diminish and PAIS will be able to manage the remaining gap with ONPS funds.

Closing Summary

- This PAMP articulates a clear path forward for Park management in terms of what techniques and tools they should use to help manage their funding gap
- More specifically the PAMP provides the Park with a detailed executable work plan to use as a guide for their day to day work management decisions
 - The Park will continue to update this plan and revisit priorities to ensure they are being strategic with their limited dollars
- Through this process the Park has developed strategies for most efficiently spending their limited resources in support of maintaining the Park assets at an acceptable level
 - **Deferred Maintenance** – The Park has prioritized projects based on bundled work orders in order to improve the condition of high priority assets
 - **O&M** – The Park has developed a strategy of how to allocate the limited O&M budget in order to support the operational needs of the Park as well as focus RM and PM dollars on high priority assets currently in good condition
 - **Disposal** – The Park has developed a list of disposal candidates in support of decreasing deferred maintenance and reducing the size of the portfolio

Appendix I Annual Project Funding List



Note the rust on these air conditioning units outside the park headquarters building.



Projects

Project Name	Priority	Rank	Year	Fund Source	Total Est Project Cost	Count of WOs
PMIS Entrance Station Roadway Rehab	High	12	1999	Rec Fee	\$175,745	2
PMIS Extend BIB Boat Ramp	Medium	1	2001	Rec Fee	\$22,987	2
PMIS Rehabilitate Park Entrance Station Site	High	29	2004	Rec Fee	\$160,595	2
PMIS Rehabilitate and Expand Campground	Medium	n/a	2004	Rec Fee	\$22,027	1
PMIS Rehab Malaquite Auditorium	Medium	17	2005	Rec Fee	\$8,752	2
PMIS Replace Signs park wide	Medium	5	2005	Rec Fee	\$26,883	1
PMIS Repair and upgrade Yarborough Pass	High	71	2007	Rec Fee	\$0	1
PMIS Rehab Turtle Cabin	High	70	2007	Rec Fee	\$83,514	5
PMIS Rehabilitate Main Park Road (Route 10)	Low	78	2008	FLHP	\$1,677,115	1
PMIS Rehab Malaquite VC Interpretive Center	Medium	96	2008	Rec Fee	\$234,427	2
PMIS Restore BIB Shoreline	High	66	2008	Rec Fee	\$300,000	2
PMIS Rehab HQ Visitors Parking	Medium	145	2008	Rec Fee	\$40,295	2
PMIS Repair Park Road Shoulders	High	61	2008	Rec Fee	\$83,450	3
PMIS Upgrade Surface of Park Headquarters Parking Lot	Medium	120	2008	Rec Fee	\$150,000	2
PMIS Rehabilitation of Amphitheater in Order to Enhance Visitor Education and Experience	Medium	30	2008	Rec Fee	\$68,289	7
PMIS Firing Range Decontamination	High	32	2009	Env. Mgmt. Prog.	\$73,638	2
PMIS Repair Anchors Malaquite VC	Medium	94	2009	R/R	\$28,572	3
PMIS Repair/Replace Piers at H.Q.	Low	127	2009	R/R	\$7,760	2
PMIS BIB Road Repair	Medium	84	2009	Rec Fee	\$53,400	2
PMIS Stabilize Bird Island Basin Beach Shoreline to Prevent Loss of Recreational Improvements	Medium	82	2009	Rec Fee	\$87,800	1
PMIS Replace Park Wayside Exhibits	Medium	80	2009	Rec Fee	\$178,800	1
PMIS Replacement of Park Trash Cans for Visitor Use	High	35	2009	Rec Fee	\$59,867	1
PMIS Rehab Headquarters Bldg.	Medium	102	2010	R/R	\$77,695	6
PMIS Replace Damaged Siding On Park Buildings To Improve Visitor Viewshed	High	63	2010	Rec Fee	\$32,267	3
PMIS Replacement of Picnic Tables at Parks Developed Campground for Visitor Enjoyment	High	34	2010	Rec Fee	\$152,648	2
PMIS Rehab Grasslands Nature Trail	High	38	2010	Reg. Cyclic Maint.	\$59,448	2
PMIS Rehab Auditorium	Medium	100	2011	R/R	\$0	1

* Highlight Project is the result of the PAMP Process! GED



Projects (continued)

PMIS Install Ceramic Tile in Malaquite Campground Facilities	Medium	33	2011	R/R	\$106,002	4
PMIS Repair Structural Supports of the Visitor Center and Park Headquarters	High	2	2011	R/R	\$400,000	2
PMIS Installation of Barbecue Grills in Order to Enhance Visitor Enjoyment and Maximize Fire Prevention	High	37	2011	Rec Fee	\$0	1
PMIS Rehab Storm Shutters Parkwide	Low	135	2012	R/R	\$221,760	1
PMIS: Rehab Electrical Panels/HVAC & Exterior Lighting Systems	Low	130	2012	R/R	\$329,050	20
PMIS Rehab View Tower Water Storage Facility	High	5	2012	R/R	\$68,058	2
PMIS Replacement of 300,000 Gal. Water Tank and Building in Order to Meet State Environmental Standards	High	5	2012	R/R	\$624,724	1
PMIS Repair and Upgrade Visitor Facilities and Access Road to Yarborough Pass	High	58	2012	Rec Fee	\$0	2
PMIS Rehabilitation of Park Paved Roads (RTE0100), (RTE0200), (RTE0201) and (RTE0010)	High	31	2013	FLHP	\$1,046,500	2
PMIS Replace VC Boardwalk	High	40	2014	Rec Fee	\$169,250	2
PMIS Cultural Cyclic Maintenance of Novillo	Medium	n/a	2014	Reg. Cyclic Maint.	\$30,000	2
PMIS Replace Elevator At Island Operations	Low	137	2050	R/R	\$43,980	1
PMIS Rehab Deteriorating Water Reservoirs	Low	134	2050	R/R	\$0	1
PMIS Rehab Bib Caliche Roads	Medium	99	2050	R/R	\$1,558,730	2
PMIS Rehabilitate Patrol Cabin at the 40 Mile Marker on South Beach	Medium	7	2050	R/R	\$225,000	2

Note: ranking is not available for the highlighted fields.



Punchlist

Project Name	Total Estimated Project Cost	Number of Work Orders
Punchlist Auto Shop	\$4,665	9
Punchlist Campground Lift Station	\$0	4
Punchlist Carpenter Shop	\$339	1
Punchlist Chemical Stg. Bldg.	\$346	1
Punchlist Concessions Building	\$884	3
Punchlist Electrical and Flammable Storage	\$0	4
Punchlist Generator Bldg.	\$650	2
Punchlist Grasslands Nature Trail	\$1,395	5
Punchlist Headquarters Bldg.	\$4,062	12
Punchlist Heavy Equipment Bays	\$1,095	6
Punchlist LE Residence 503	\$4,658	7
Punchlist Maintenance Bldg	\$4,543	9
Punchlist Malaquite Lift Station	\$670	1
Punchlist Malaquite VC Interpretive Center	\$7,883	25
Punchlist Necropsy Facility	\$5,733	16
Punchlist Oil and Water Separator	\$900	2
Punchlist Park Paved Roads	\$480	6
Punchlist Pier Enhancement	\$590	1
Punchlist Ranger Building	\$696	1
Punchlist Shredder Building	\$443	1
Punchlist Turtle Cabin	\$1,497	3
Punchlist UTV Bay	\$416	2
Punchlist Vault Toilets	\$1,118	6
Punchlist VC Parking Lot	\$0	1
Punchlist VC Showers/Utility/Restrooms	\$2,744	9

Appendix II O&M results by Priority



Malaquite Campground Boardwalk (handicapped accessible)



Priority 1 Assets

Asset	Asset Code	Description	API	FCI	Band
55366	3100	VIP RV Campground	54	0.470	1
55255	1100	Park Road 22 Rt. 0010	59	0.497	1
55268	6300	Bird Island Basin Rd, RT 200 Docks and Ramps	61	0.184	1
55139	4100	Malaquite Showers/utility/Restrooms	88	0.243	1
55134	4100	Malaquite VC Building	88	0.653	1
105555	3100	Malaquite Visitor Center Deck	88	0.121	1
104153	4100	Sea Turtle Division Laboratory	92	0.068	1
57049	5500	COMMUNICATIONS SYSTEMS	92	0.035	1
55106	4100	Ranger Building	100	0.052	1



Malaquite Visitor Center



Priority 2 Assets

Asset	Asset Code	Description	API	FCI	Band
54307	1100	Yarborough Pass Rd, RT 0101	37	0.000	2
114082	1300	BIB RV Campground	48	0.088	2
55151	4100	South Beach Vault Toilet	61	0.016	2
55260	4100	Boat Ramp Vault Toilet-BIB	61	0.046	2
55261	4100	BIB Primittive Campground Vault Toilet	61	0.017	2
55153	4100	Windsurfer Vault Toilet - BIB	61	0.033	2
111868	7900	Malaquite Campground Amphitheater	61	0.116	2
110430	4100	Campground Lift Station	61	0.201	2
55126	3100	Malaquite Campground	63	0.359	2
111865	2100	Amphitheatre Trail	63	0.789	2
111879	4100	Malaquite Campground Showers	71	0.814	2
110432	4100	Radio Communications Building	72	0.081	2
55150	2100	Nature Trail Paved	75	0.183	2
54321	1300	Nature Trail Parking, RT 904	75	0.197	2
54316	1300	Malaquite VC Parking, RT 900	78	0.599	2
111878	4100	Malaquite Campground Restrooms	78	0.092	2
55553	4100	Entrance Station	78	0.849	2
55149	5200	PAIS Wastewater system	80	0.190	2
54308	1100	Bird Island Basin Rd, RT 0200	81	0.245	2
54309	1100	Bird Island Basin Rd. Unpaved RT 0700	81	0.305	2
55264	3100	BIB Primitive Campground	81	0.180	2
114097	1100	North Beach Sand Road	83	0.027	2
113422	2100	Malaquite Campground Boardwalk	83	0.030	2
55137	4100	Malaquite Auditorium	88	0.171	2
110431	4100	Malaquite Lift Station	88	0.024	2
55089	4100	Headquarters Building	92	0.519	2
55108	4100	STSR Necropsy and RM Storage Facility	92	0.122	2
61506	1300	Headquarters Visitors Parking Rt. 902 (front lot next to flagpole)	92	0.514	2



Priority 3 Assets

Asset	Asset Code	Description	API	FCI	Band
54307	1100	Yarborough Pass Rd, RT 0101	37	0.000	2
114082	1300	BIB RV Campground	48	0.088	2
55151	4100	South Beach Vault Toilet	61	0.016	2
55260	4100	Boat Ramp Vault Toilet-BIB	61	0.046	2
55261	4100	BIB Primittive Campground Vault Toilet	61	0.017	2
55153	4100	Windsurfer Vault Toilet - BIB	61	0.033	2
111868	7900	Malaquite Campground Amphitheater	61	0.116	2
109649	5700	Propane Heating System	42	0.346	3
55363	4100	HazMat Building	44	0.029	3
99804	1100	BIB Boat Ramp Road	50	0.650	3
55104	4100	Maintenance Building	53	0.118	3
55111	4100	Electrical and Flammable Storage	54	0.085	3
61504	1100	Malaquite Visitor Center Road RT 0201	59	0.216	3
54306	1100	North Beach (Paved) Rd, RT 0100	59	0.501	3
61505	1100	VIP Campground Road RT 0400	59	0.121	3
55128	1300	Malaquite Campground Parking Rt. 901	59	0.196	3
102403	4300	Mobile Home (LE Housing)	61	0.130	3
114106	5200	HQ Oil and Water Separator	63	0.032	3
55136	4100	Concessions Building	69	0.037	3
84820	4100	Novillo Line Camp	70	0.750	3
110433	1300	Boat Ramp Parking	71	0.017	3
55107	4100	Auto Shop	73	0.012	3
99803	1300	Headquarters GOV Parking	77	0.545	3
55148	5100	PAIS Potable Water system	80	0.339	3
55316	5700	PAIS Fuel System	80	0.506	3
114098	1100	South Beach Sand Road	83	0.307	3
91475	4100	Turtle Cabin	83	0.997	3
55361	4300	LE Residence 503	92	0.093	3
110429	4100	View Tower Building	100	0.467	3
110428	4100	Mile 1/2 Building	100	0.137	3



Priority 4 Assets

Asset	Asset Code	Description	API	FCI	Band
110437	4100	Heavy Equipment Bays	33	0.143	4
55109	4100	Equipment Garage Carpenter Shop	33	0.040	4
110438	4100	UTV Garage	33	0.122	4
54320	1300	Maintenance Area Paved Parking Rt903	33	0.030	4
114080	3100	Yarborough Pass Campground	38	0.064	4
111884	2100	Employee Concrete Trail to Turtle Lab	51	0.098	4
55110	4100	Chemical Storage Building	54	0.971	4
54315	1100	Water Tank Rd, RT 0402	59	0.180	4
54312	1100	Sewer Lagoon Rd, RT 0401	59	0.095	4

Priority 5 Assets

Asset	Asset Code	Description	API	FCI	Band
111523	3100	Firing Range	21	0.595	5
54310	1100	Back Island Rd., Unpaved RT 0202	27	0.438	5
55116	4100	Shredder Building	33	0.875	5
110426	4100	Generator Building	49	0.061	5
114138	1100	Novillo Line Camp Road	63	0.151	5
113972	4100	L.E. Facility (Planned)	70	0.000	5

Appendix III O&M Model Cost Examples



Law Enforcement Officer Required Housing (FEMA Trailer)



O&M Models - Costs

The costs used in the O&M Model are obtained through several sources

- RS Means Standards - Where applicable (generally PM and RM) the labor, material, and equipment totals
- Estimated labor hours for an activity (NPS Exp) x NPS supplied labor rates
- Sample NPS Contracts for work (e.g. elevator service)
- Metered costs reported by Park (e.g. utilities)
- Federal Highway estimates on pavement per mile maintenance costs



Costs are collected in tables using MS Excel

Reference	Description	Cost (\$)	U/M	Frequency	\$/sq. Ft.
21000	Trails Maintenance				
7	Trail Treatments: Water D	218	sq-ft	5 Yrs	PM
8	Trail Treatments: Water A	5,547	MI	5 Yrs	PM
9	Trail Treatments: Water S	218	sq-ft	5 Yrs	PM
10	Trail Treatments: Water D	218	MI	5 Yrs	PM
11	Trail Treatments: Water S	524	MI	5 Yrs	PM
12	Trail Treatments: Water D	218	sq-ft	5 Yrs	PM
13	Trail Treatments: Water S	218	MI	5 Yrs	PM
14	Trail Treatments: Water D	218	MI	5 Yrs	PM
15	Trail Treatments: Water S	218	MI	5 Yrs	PM
16	Trail Treatments: Water D	218	MI	5 Yrs	PM
17	Trail Treatments: Water S	218	MI	5 Yrs	PM
18	Trail Treatments: Water D	218	MI	5 Yrs	PM
19	Trail Treatments: Water S	218	MI	5 Yrs	PM
20	Trail Treatments: Water D	218	MI	5 Yrs	PM
21	Trail Treatments: Water S	218	MI	5 Yrs	PM
22	Trail Treatments: Water D	218	MI	5 Yrs	PM
23	Trail Treatments: Water S	218	MI	5 Yrs	PM
24	Trail Treatments: Water D	218	MI	5 Yrs	PM
25	Trail Treatments: Water S	218	MI	5 Yrs	PM
26	Trail Treatments: Water D	218	MI	5 Yrs	PM
27	Trail Treatments: Water S	218	MI	5 Yrs	PM
28	Trail Treatments: Water D	218	MI	5 Yrs	PM
29	Trail Treatments: Water S	218	MI	5 Yrs	PM
30	Trail Treatments: Water D	218	MI	5 Yrs	PM
31	Trail Treatments: Water S	218	MI	5 Yrs	PM
32	Trail Treatments: Water D	218	MI	5 Yrs	PM
33	Trail Treatments: Water S	218	MI	5 Yrs	PM
34	Trail Treatments: Water D	218	MI	5 Yrs	PM
35	Trail Treatments: Water S	218	MI	5 Yrs	PM
36	Trail Treatments: Water D	218	MI	5 Yrs	PM
37	Trail Treatments: Water S	218	MI	5 Yrs	PM
38	Trail Treatments: Water D	218	MI	5 Yrs	PM
39	Trail Treatments: Water S	218	MI	5 Yrs	PM
40	Trail Treatments: Water D	218	MI	5 Yrs	PM
41	Trail Treatments: Water S	218	MI	5 Yrs	PM
42	Trail Treatments: Water D	218	MI	5 Yrs	PM
43	Trail Treatments: Water S	218	MI	5 Yrs	PM
44	Trail Treatments: Water D	218	MI	5 Yrs	PM
45	Trail Treatments: Water S	218	MI	5 Yrs	PM
46	Trail Treatments: Water D	218	MI	5 Yrs	PM
47	Trail Treatments: Water S	218	MI	5 Yrs	PM
48	Trail Treatments: Water D	218	MI	5 Yrs	PM
49	Trail Treatments: Water S	218	MI	5 Yrs	PM
50	Trail Treatments: Water D	218	MI	5 Yrs	PM
51	Trail Treatments: Water S	218	MI	5 Yrs	PM
52	Trail Treatments: Water D	218	MI	5 Yrs	PM
53	Trail Treatments: Water S	218	MI	5 Yrs	PM
54	Trail Treatments: Water D	218	MI	5 Yrs	PM
55	Trail Treatments: Water S	218	MI	5 Yrs	PM
56	Trail Treatments: Water D	218	MI	5 Yrs	PM
57	Trail Treatments: Water S	218	MI	5 Yrs	PM
58	Trail Treatments: Water D	218	MI	5 Yrs	PM
59	Trail Treatments: Water S	218	MI	5 Yrs	PM
60	Trail Treatments: Water D	218	MI	5 Yrs	PM
61	Trail Treatments: Water S	218	MI	5 Yrs	PM
62	Trail Treatments: Water D	218	MI	5 Yrs	PM
63	Trail Treatments: Water S	218	MI	5 Yrs	PM
64	Trail Treatments: Water D	218	MI	5 Yrs	PM
65	Trail Treatments: Water S	218	MI	5 Yrs	PM
66	Trail Treatments: Water D	218	MI	5 Yrs	PM
67	Trail Treatments: Water S	218	MI	5 Yrs	PM
68	Trail Treatments: Water D	218	MI	5 Yrs	PM
69	Trail Treatments: Water S	218	MI	5 Yrs	PM
70	Trail Treatments: Water D	218	MI	5 Yrs	PM
71	Trail Treatments: Water S	218	MI	5 Yrs	PM
72	Trail Treatments: Water D	218	MI	5 Yrs	PM
73	Trail Treatments: Water S	218	MI	5 Yrs	PM
74	Trail Treatments: Water D	218	MI	5 Yrs	PM
75	Trail Treatments: Water S	218	MI	5 Yrs	PM
76	Trail Treatments: Water D	218	MI	5 Yrs	PM
77	Trail Treatments: Water S	218	MI	5 Yrs	PM
78	Trail Treatments: Water D	218	MI	5 Yrs	PM
79	Trail Treatments: Water S	218	MI	5 Yrs	PM
80	Trail Treatments: Water D	218	MI	5 Yrs	PM
81	Trail Treatments: Water S	218	MI	5 Yrs	PM
82	Trail Treatments: Water D	218	MI	5 Yrs	PM
83	Trail Treatments: Water S	218	MI	5 Yrs	PM
84	Trail Treatments: Water D	218	MI	5 Yrs	PM
85	Trail Treatments: Water S	218	MI	5 Yrs	PM
86	Trail Treatments: Water D	218	MI	5 Yrs	PM
87	Trail Treatments: Water S	218	MI	5 Yrs	PM
88	Trail Treatments: Water D	218	MI	5 Yrs	PM
89	Trail Treatments: Water S	218	MI	5 Yrs	PM
90	Trail Treatments: Water D	218	MI	5 Yrs	PM
91	Trail Treatments: Water S	218	MI	5 Yrs	PM
92	Trail Treatments: Water D	218	MI	5 Yrs	PM
93	Trail Treatments: Water S	218	MI	5 Yrs	PM
94	Trail Treatments: Water D	218	MI	5 Yrs	PM
95	Trail Treatments: Water S	218	MI	5 Yrs	PM
96	Trail Treatments: Water D	218	MI	5 Yrs	PM
97	Trail Treatments: Water S	218	MI	5 Yrs	PM
98	Trail Treatments: Water D	218	MI	5 Yrs	PM
99	Trail Treatments: Water S	218	MI	5 Yrs	PM
100	Trail Treatments: Water D	218	MI	5 Yrs	PM



- O&M Calculator pulls directly from activity tables for selected asset types
- Costs are updated periodically
- During PAMP the requirements calculated by the O&M models are reviewed at Park to test for validity to their actual activities



O&M Models of Unique Assets

- Despite the being same asset class, some unique NPS assets can vary widely in their function and equipment
- As a result unit measure profiles do not provide the same precision that they do for more standardized assets, such as roads, trails, buildings, maintained landscapes, and housing
- In most cases, the CRV is a good proxy of the complexity and amount of equipment for a given asset

For these unique assets (shown right)

- O&M requirements are based a percentage of CRV (between 1% and 4%)

5100	<u>Water System</u>
5200	<u>Waste Water System</u>
5300	<u>Heating & Cooling Plant</u>
5400	<u>Electrical System</u>
5500	<u>Radio System</u>
5510	<u>Phone System</u>
5520	<u>IT System (i.e. LAN)</u>
5700	<u>Fuel System</u>
5800	<u>Solid Waste/Recycle System</u>
6100	<u>Dam/Levee/Dike</u>
6200	<u>Constructed Waterway</u>
6300	<u>Marina/Waterfront System</u>
6400	<u>Aviation System</u>
6500	<u>Railroad System</u>
7100	<u>Outdoor Sculpture/Monument/Memorials</u>
7200	<u>Ruins</u>
7300	<u>Fortification</u>
7400	<u>Towers/Missile Silos</u>
7900	<u>Amphitheatres</u>



Appendix IV Component Renewal Detail by Asset Type

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Buildings	232,958	41,296	21,558	49,897	15,936	126,220	1,457	-	241,327	2,000
Housing	-	-	-	-	10,134	-	-	-	12,527	-
Roads	1,000	-	1,482	-	-	-	-	-	5,366	4,662
Trails	-	-	35,000	-	-	863	-	-	-	-
Water Systems	-	60,949	3,563	12,647	-	11,162	-	-	415,343	1,029
Wastewater Systems	-	-	-	-	-	9,669	-	-	111,854	-
Maintained Landscapes	14,862	516,490	17,784	-	-	818,025	-	-	-	156,740
Other	100,398	51,603	7,600	-	-	101	-	34,560	6,000	2,764
Total	349,218	670,338	86,987	62,544	26,070	966,040	1,457	34,560	792,417	167,195

Total renewal cost out to 2017 is \$3,156,824.



Appendix IV
Federal Highway Administration
Deferred Maintenance



The Federal Highway Administration’s (FHWA) Road Inventory Program (RIP) determined the condition of road and parking lot surfaces at PAIS. The difference between the RIP’s deferred maintenance and the deferred maintenance for the individual assets was added in to the asset’s record, without creating work orders.

FMSS Region	FMSS Park Alpha	FMSS Asset Code	FMSS Location Asset Number	FMSS Surface Equip Record	FHWA RIP Route ID	FMSS Asset Description and RIP Route ID (FY2007)	FHWA Pavement Deficiencies (DM+ RMDM+ CRDM) (8-14-07)	FMSS Pavement DM (08-28-07)	FHWA Pavement DM Not in FMSS Work Orders (FY07)
IMR	PAIS	1300	61506	410363	PAIS-0902	HEADQUARTERS PARKING, RT. 0902	\$ 44,079	\$ 75,000	\$ -
IMR	PAIS	1100	54315	410336	PAIS-0402	WATER TANK ROAD, RT. 0402	\$ 16,607	\$ -	\$ 16,607
IMR	PAIS	1300	54320	410369	PAIS-0903	MAINTENANCE AREA, RT. 0903	\$ 20,381	\$ -	\$ 20,381
IMR	PAIS	1300	54321	410388	PAIS-0904	NATURE TRAIL PARKING, RT. 0904	\$ 23,581	\$ -	\$ 23,581
IMR	PAIS	1100	61505	410285	PAIS-0400	SEWAGE TREATMENT PLANT ROAD, RT. 0400	\$ 44,703	\$ -	\$ 44,703
IMR	PAIS	1100	54306	409889	PAIS-0100	NORTH BEACH ACCESS ROAD, RT. 0100	\$ 198,475	\$ 20,862	\$ 177,613
IMR	PAIS	1100	54308	410230	PAIS-0200	BIRD ISLAND BASIN ROAD, RT. 0200	\$ 237,555	\$ -	\$ 237,555
IMR	PAIS	1100	61504	410256	PAIS-0201	MALAQUITE VISITOR CENTER ROAD, RT. 0201	\$ 287,323	\$ 20,863	\$ 266,460
IMR	PAIS	1300	55128	410377	PAIS-0901	CAMPGROUND PARKING, RT. 0901	\$ 420,282	\$ -	\$ 420,282
IMR	PAIS	1300	54316	410349	PAIS-0900	MALAQUITE VISITOR CENTER PARKING, RT. 0900	\$ 1,680,950	\$ 350,000	\$ 1,330,950
IMR	PAIS	1100	55255	409937	PAIS-0010	PADRE ISLAND ENTRANCE ROAD, RT. 0010	\$ 2,223,520	\$ 89,235	\$ 2,134,285



Treatments Associated with FHWA DM

FMSS Region	FMSS Park Alpha	FMSS Location Asset Number	FHWA RIP Route ID	Work Treatment	From (milepost)	To (milepost)	Net Estimated Cost (without PECE or Park Location Factor)	PECE Multiplier	Park Location Factor	Gross Estimated Cost (includes PECE and Park Location Factor)
IMR	PAIS	55255	PAIS-0010	Leveling Course + 2 inch overlay	0.62	4.38	\$ 1,236,521	1.35	0.9100	\$ 1,519,066
IMR	PAIS	54316	PAIS-0900	Leveling Course + 2 inch overlay	0	5	\$ 738,262	1.35	0.9100	\$ 906,955
IMR	PAIS	54316	PAIS-0900	Leveling Course + 2 inch overlay	5	9.267	\$ 630,033	1.35	0.9100	\$ 773,996
IMR	PAIS	55128	PAIS-0901	Leveling Course + 2 inch overlay	0	2.317	\$ 342,110	1.35	0.9100	\$ 420,282
IMR	PAIS	55255	PAIS-0010	Leveling Course + 2 inch overlay	4.38	5.26	\$ 294,123	1.35	0.9100	\$ 361,330
IMR	PAIS	61504	PAIS-0201	Leveling Course + 2 inch overlay	0	0.72	\$ 233,881	1.35	0.9100	\$ 287,323
IMR	PAIS	55255	PAIS-0010	Leveling Course + 2 inch overlay	5.26	5.81	\$ 178,659	1.35	0.9100	\$ 219,483
IMR	PAIS	54306	PAIS-0100	Leveling Course + 2 inch overlay	0	0.51	\$ 161,559	1.35	0.9100	\$ 198,475
IMR	PAIS	54308	PAIS-0200	Double Course Chip Seal / Micro-surfacing	0.58	1.5	\$ 118,127	1.35	0.9100	\$ 145,119
IMR	PAIS	55255	PAIS-0010	Double Course Chip Seal / Micro-surfacing	0	0.62	\$ 100,644	1.35	0.9100	\$ 123,641
IMR	PAIS	54308	PAIS-0200	Double Course Chip Seal / Micro-surfacing	0	0.58	\$ 75,243	1.35	0.9100	\$ 92,436
IMR	PAIS	61505	PAIS-0400	AC Overlay 1.5 to 2.5 inches	0	0.2	\$ 36,388	1.35	0.9100	\$ 44,703
IMR	PAIS	61506	PAIS-0902	Leveling Course + 2 inch overlay	0	0.243	\$ 35,880	1.35	0.9100	\$ 44,079
IMR	PAIS	54321	PAIS-0904	Leveling Course + 2 inch overlay	0	0.13	\$ 19,195	1.35	0.9100	\$ 23,581
IMR	PAIS	54320	PAIS-0903	PCC Joint and Crack Repair	0	0.743	\$ 16,590	1.35	0.9100	\$ 20,381
IMR	PAIS	54315	PAIS-0402	Pulverization + AC Overlay <= 3.0 inches	0	0.05	\$ 13,518	1.35	0.9100	\$ 16,607