

Facilities Appropriations Information Report (Package)

March 7, 2019

The purpose of this document is to provide background information on Indian Health Service (IHS), Office of Environmental Health and Engineering (OEHE) programs funded through Facilities Appropriations, including purposes, needs, and activities.

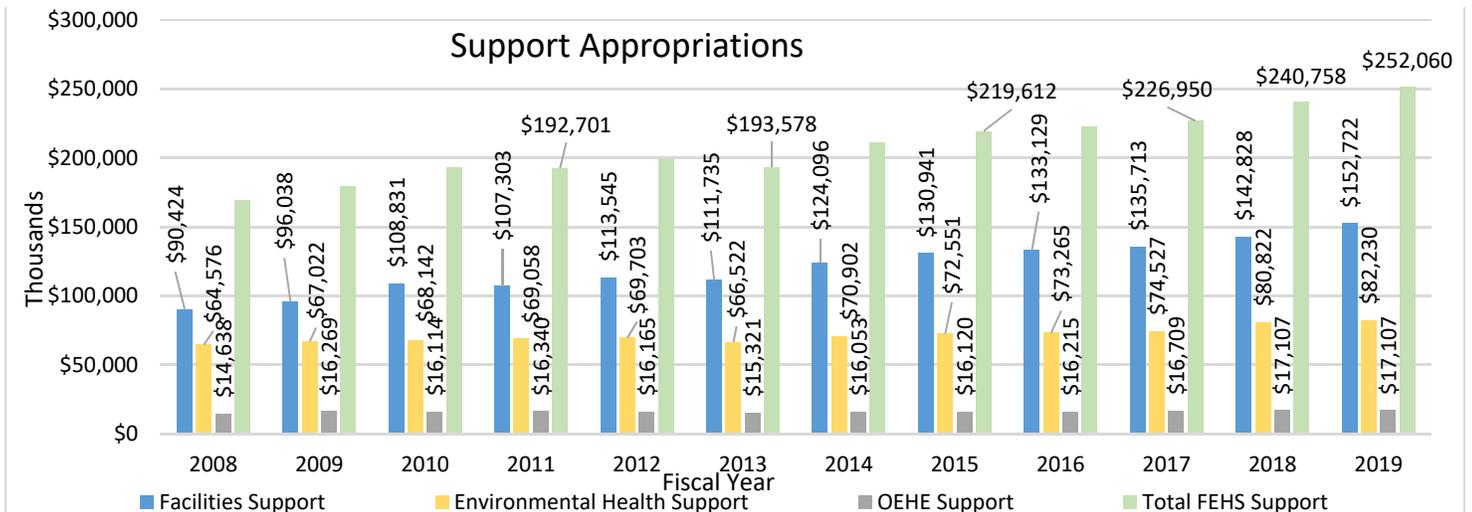
Contents

Facilities Appropriations Summary	2
Facilities Appropriation Budget Activity Line Items Budget Funds These Undertakings	2
Health Care Facilities Construction (HCFC) Appropriations	3
The Importance of the Facility Environment to Patient Outcomes	4
The Importance of the Healthcare Facility Physical Environment for the Model of Care.....	4
The Healthcare Facility Physical Environment for the Health Insurance Portability and Accessibility Act (HIPAA)	4
The Healthcare Facility Low Capital Cost Versus Cost of Other Healthcare System Components	4
The Healthcare Facility Physical Environment’s Impact on Staff	4
Planning, Designing and Constructing IHS Facilities	5
How IHS Uses and Distributes HCFC Appropriation Funds.....	5
The Amount of Health Care Facility Construction Needs	6
Maintenance and Improvement Appropriations	7
Equipment Appropriations	8
Sanitation Facilities Construction Appropriations	9
Facilities and Environmental Health Support Appropriations.....	10
Environmental Health Program	10
Injury Prevention	10
As a result of these efforts, unintentional AI/AN injury deaths, while still high, decreased by 59% between 1973 and 2009.I	10
Institutional Environmental Health Support	10
Sanitation Facilities Construction Personnel and Operations.....	10
Joint Venture Construction Program	11
Facilities Appropriation Information Report Endnotes	12

Facilities Appropriations Summary

There are five line item for the Facilities Appropriation Budget Activity as shown in the table below. Each line item is described in more detail under its own section with specific potential benefits realized from increased funding and consequences from inadequate funding.

Facilities Appropriation Budget Activity Line Items Budget Funds These Undertakings																			
Health Care Facilities Construction (HCFC)	'Grandfathered' HCFC Priority List (Estimated cost of ~\$2 billion for projects in 5 IHS Areas): • Salt River PIMC NE ACC • Winslow-Dilkon, AZ • Alamo Navajo, NM • Whiteriver, AZ • Albuquerque West • Rapid City, SD • PIMC Central Hosp/ACC • Bodaway Gap, AZ • Pueblo Pintado, NM • Gallup, NM • Albuquerque Central • Sells, AZ Health Care Facility Projects beyond 'grandfathered' Priority List. Numerous Types and Phases in every Area. >\$14.5 Billion. Small Ambulatory Program: Funding to construct, expand, or modernize tribally owned and operated ambulatory care facilities.																		
Maintenance and Improvement (M&I)	• Routine Maintenance, Non-routine Maintenance, Repair and Improvements • Projects to resolve the Backlog of Essential Maintenance, Alteration, and Repair (BEMAR) of ~\$650 million. • Environmental audits and remediation. • Demolition of vacant, excess, or obsolete federally-owned buildings																		
Equipment	• Replaces medical equipment and ambulances, • Transfer of excess Department of Defense medical equipment (TRANSAM) to IHS/tribal programs • Provides equipment funding for tribal facilities constructed with non-IHS funding. • The IHS/Tribal medical equipment inventory is ~\$500 million with an annual replacement need of ~\$80 million.																		
Sanitation Facilities Construction	Projects for Water, Sewer, and Solid Waste needs for: • Existing Homes and Communities • New Homes																		
Facilities and Environmental Health Support	<table border="0" style="width: 100%;"> <tr> <td colspan="2">Facilities Support</td> </tr> <tr> <td>• O&M of health care facilities and staff quarters (Real Property)</td> <td>• Construction management support</td> </tr> <tr> <td>• Medical equipment technical support and repair</td> <td>• Facility operating costs, utilities, and building supplies.</td> </tr> <tr> <td colspan="2">• National maintenance management system for facilities/medical devices including tracking FDA alerts on medical devices;</td> </tr> <tr> <td colspan="2">Environmental Health Support</td> </tr> <tr> <td>• Environmental Health program service/staff</td> <td>• Injury Prevention service/staff</td> </tr> <tr> <td>• SFC staff</td> <td>• Institutional Environmental Health Support</td> </tr> <tr> <td colspan="2">Office of Environmental Health and Engineering Support</td> </tr> <tr> <td colspan="2">• OEHE Headquarters Staff (Including Engineering Services) for direct support/management of all Facilities Appropriation activities.</td> </tr> </table>	Facilities Support		• O&M of health care facilities and staff quarters (Real Property)	• Construction management support	• Medical equipment technical support and repair	• Facility operating costs, utilities, and building supplies.	• National maintenance management system for facilities/medical devices including tracking FDA alerts on medical devices;		Environmental Health Support		• Environmental Health program service/staff	• Injury Prevention service/staff	• SFC staff	• Institutional Environmental Health Support	Office of Environmental Health and Engineering Support		• OEHE Headquarters Staff (Including Engineering Services) for direct support/management of all Facilities Appropriation activities.	
Facilities Support																			
• O&M of health care facilities and staff quarters (Real Property)	• Construction management support																		
• Medical equipment technical support and repair	• Facility operating costs, utilities, and building supplies.																		
• National maintenance management system for facilities/medical devices including tracking FDA alerts on medical devices;																			
Environmental Health Support																			
• Environmental Health program service/staff	• Injury Prevention service/staff																		
• SFC staff	• Institutional Environmental Health Support																		
Office of Environmental Health and Engineering Support																			
• OEHE Headquarters Staff (Including Engineering Services) for direct support/management of all Facilities Appropriation activities.																			



Data relevant to Tribal and IHS healthcare facilities Include:

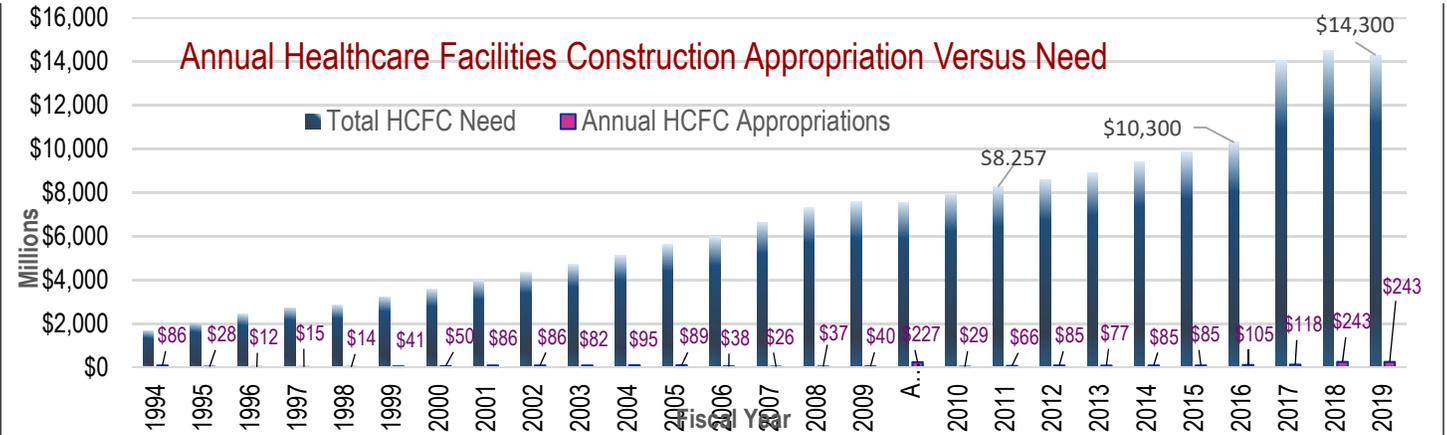
- The IHS Service-Population is ~2.2 million AI/ANs.
- The User-Population is ~1.6 million (active users).¹
- The Service-Population increases ~1.8% per year.²
- There are ~70,000 hospital admissions annually
- There are ~14 million outpatient visits annually.
- Tribes operate 107 of the 168 Service Units (SU).
- The average age IHS healthcare facility is ~40-years.
- The average age US healthcare facilities is ~10-years.³
- IHS/Tribes operate ~500 healthcare facilities in 36 States including⁴:
 - 45 Hospitals
 - Over 310 Health Centers (w/ school health centers)
 - Over 100 Health Stations
 - Over 14 million ft² of existing healthcare space inventory
 - Over 160 Village Built Clinics in Alaska
 - Area Youth Regional Treatment Centers
 - Almost 2,300 staff quarter units

Health Care Facilities Construction (HCFC) Appropriations

The HCFC Appropriations are the primary source for new or replacement healthcare facilities. The number, location, layout, design, capacity and other physical features of healthcare facilities are **essential** for:

- Eliminating health disparities
- Increasing Access
- Improving patient outcomes
- Reducing O&M costs
- Improving staff and operational efficiency
- Increasing patient and staff safety
- Improving staff satisfaction, morale, recruitment and retention
- Reducing medical errors and facility-acquired infection rates

The absence of an adequate facility frequently results in either treatment not being sought or sought later prompted by worsening symptoms and/or referral of patients to outside communities which significantly increases the cost of patient care and causes travel hardships for many patients and their families.



- At the current rate of HCFC appropriations (~\$240 million/year), a new facility in 2019 would not be replaced for 200 to 250 years.⁵
- To replace IHS facilities every 60 years (twice a 30 year design life⁶), would need HCFC appropriations of ~\$700 million/annually.
 - An annual HCFC appropriations of ~\$800 million would increase capacity to 88% in 25 years with a 60-year replacement cycle.
 - IHS would need HCFC appropriations of ~\$750 million/annually to match the U.S. expenditures in healthcare facility construction.⁷
 - Without a sufficient, consistent, and re-occurring HCFC appropriation the entire IHS system is unsustainable.

The 2016 Indian Health Service and Tribal Health Care Facilities' Needs Assessment Report to Congress (2016 Facility Needs

Assessment Report) total estimated cost for new and replacement facilities is over \$14.5 billion. The table at the below shows facility need in ft² and estimated cost by IHS Area in 2016.⁸ There are two types of need shown; the existing "Active Authority Needs;" and the "Expanded Authority Needs."

The "Active Authorities" include the health care services with established planning methodologies that are currently provided as outlined in the 2014b Health System Planning (HSP). These Active Authority services include Ambulatory, Ancillary, Preventive, Inpatient, Behavioral Health and Support Services. The data is based on IHS Health Facilities Data System (HFDS) existing program space, the 2014b Health System Planning (HSP) recommended space, approved Planning Documents and the Facilities Budget Estimating System (FBES).

The "Expanded Authorities" are for health care services recently authorized in the Indian Health Care Improvement Act (IHCIA), 25 U.S.C. The Expanded Authority Facility Need estimated cost was taken from the 2016 Facility Needs Assessment Report and includes these five facility types:

- Inpatient Mental/Behavioral Health (MHBH) and Alcohol Substance Abuse Program (ASAP) Facilities
- Specialty Medical Services Facilities
- Dialysis
- Long-Term Care Facilities – Clinical
- Long-Term Care Facilities – Non-Clinical

2016 Facility Needs Assessment Report			
Area	Active Authority Facility Needs		Expanded Authority
	Space Need ft ²	Facility Need \$	Facility Need \$
Alaska	2,270,000	\$ 2,165,000,000	\$ 636,000,000
Albuquerque	1,040,000	\$ 527,500,000	\$ 186,400,000
Bemidji	890,000	\$ 430,500,000	\$ 310,100,000
Billings	890,000	\$ 387,500,000	\$ 181,800,000
California	1,010,000	\$ 483,500,000	\$ 273,800,000
Great Plains	910,000	\$ 472,800,000	\$ 268,100,000
Nashville	910,000	\$ 385,700,000	\$ 33,600,000
Navajo	2,590,000	\$ 1,494,800,000	\$ 603,100,000
Oklahoma	4,070,000	\$ 1,793,800,000	\$ 838,700,000
Phoenix	1,980,000	\$ 1,319,300,000	\$ 460,800,000
Portland	1,490,000	\$ 640,500,000	\$ 308,000,000
Tucson	260,000	\$ 180,800,000	\$ 60,600,000
Total	18,310,000 ft²	\$10,281,700,000	\$ 4,261,000,000

For more information see The 2016 Indian Health Service and Tribal Health Care Facilities' Needs Assessment Report to Congress located at www.ihs.gov/newsroom/includes/themes/newihs/theme/display_objects/documents/RepCong_2016/IHSRTC_on_FacilitiesNeedsAssessmentReport.pdf

The Importance of the Facility Environment to Patient Outcomes

The healthcare physical environment has long been recognized as having a substantial impact on patient care experiences and outcomes. There is overwhelming rigorous research, over 600 credible studies, linking the physical environment of care to health outcomes⁹. Research reveals that specific design features in the healthcare environments can:¹⁰

- Improve patient outcomes
- Reduce medical errors
- Improves the quality of care
- Increase a facility's market share
- Improve staff satisfaction, morale, recruitment and retention
- Enhance efficient workflow patterns and processes
- Improve staff and operational efficiency and effectiveness
- Reduce the rate of hospital-acquired infection
- Reduce costs
- Reduce stress and anxiety
- Decrease patient lengths of stay, and
- Increase patient and staff safety

Evidence-Based Design (EBD) is the process of basing decisions about the built environment on credible research to achieve the best possible outcomes. EBD creates safe, healing, efficient and therapeutic environments for patient care. EBD yields improvements in clinical, economic, productivity, satisfaction and cultural measures.¹¹ Design features that have a pronounced effect on care include¹²:

- Room configuration and layout
- Facility configuration and layout
- Adjacencies/departments
- Scalability, adaptability, flexibility
- Size/capacity with respect to the user-population
- Flooring material to minimize fatigue
- Providing accessible information near point of service
- Space for patient/family involvement with care
- Minimizing patient transfers/handoffs
- Standardization
- Automation
- Interior Material
- Lighting (artificial and natural)
- Acoustic Environments
- Building location/site optimization
- Visibility of patients to staff
- Furniture, Fixtures and Equipment

The Importance of the Healthcare Facility Physical Environment for the Model of Care

The physical environment must also accommodate the model of care. The Patient-Family-Centered Care (PFCC) model practiced by IHS and its partners has been the international and national standard since 2001.¹³ Crucial features of the PFCC are:

- The design principles correlate highly with improved measures of patient experience and clinical outcomes.
- Certain physical environment attributes are needed for PFCC to be realized.¹⁴
- PFCC must provide a supportive/nurturing physical space for patients, families, and providers.
- The exam rooms need to be sized to hold the patient's family members along with the provider.
- PFCC has been shown to reduce both underuse and overuse of medical services.¹⁵
- Incorporates supportive technology to access information and caregivers for patients and families.¹⁶
- The care team shares an office space for improved interaction and information flow among the provider team.¹⁷

Older health care facilities predate EBD and the PFCC model of care. Older facilities were designed for perceived 'clinical efficiency,' and physician authority with some features that interfere with PFCC,¹⁸ contributing to stress and adverse outcomes for patient and staff.

The Healthcare Facility Physical Environment for the Health Insurance Portability and Accessibility Act (HIPAA)

The HIPAA addresses security and privacy of "protected health information". The HIPAA puts emphasis on acoustic and visual privacy. The HIPAA influences the design, location and layout of workstations that handle medical records and other patient information.

The Healthcare Facility Low Capital Cost Versus Cost of Other Healthcare System Components

In terms of overall healthcare costs, renovating or constructing an appropriate physical environment of care is considerably less expensive than staffing, operation and maintenance. Points to consider are:

- Healthcare is labor-intensive, about 60 to 75% of annual expenses are labor costs with highly skilled and highly paid staff.
- A design that increases productivity or efficiency and reduces staffing needs can have a major impact on costs.¹⁹
- Operations and maintenance costs over a 30-year life cycle contribute up to 80% to the life cycle cost.²⁰
- Physical improvements to facilitate maintenance or reduce life-cycle costs have vast returns on a relatively small up-front investment²¹.
- The operational costs are drastically impacted by the physical environment of care.
- Capital investment that improve patient outcomes, increase access, and reduce operating costs are cost effective.

The Healthcare Facility Physical Environment's Impact on Staff

Architecture is recognized as an important tool in recruiting and retaining the best doctors, nurses and other providers. Additionally, the facility greatly impacts the incidence of medical error and adverse events along with staff attitudes and behaviors. Points to consider are:

- In the 1990s medical errors were estimated to kill ~100,000 Americans annually,²² equal to the 8th leading cause of death.²³
- Recent studies estimate medical errors kill ~210,000 to 400,000 Americans annually,²⁴ equal to the 3rd leading cause of death.²⁵
- Medical errors are preventable and are estimated to cost between \$17- \$29 billion annually.²⁶
- Specific design features in the healthcare environments influence the rate of medical errors.²⁷
- Physical features can cause interruptions to the neurological system and lead to human error;²⁸ Minimizing/eliminating these features yields fewer adverse events and improved patient outcomes.²⁹
- The design of space not only communicates with those who enter it but also "controls their behavior."³⁰
- Individuals are much more likely to be clumsy when things they use are badly conceived and designed.³¹
- Skilled providers may be "compelled to commit errors by the way in which the design of their environment beckons their behavior."³²
- More workers are injured in the healthcare and social assistance industry sector than any other.³³
- Nursing aides, orderlies, and attendants had the highest rates of musculoskeletal disorders of all occupations in 2010.
- Contemporary EBD facilities reduce hazards to health workers, patients and visitors.

Healthcare workers face a number of serious safety and health hazards.³⁴ They include:

- Bloodborne pathogens and biological hazards
- Potential chemical and drug exposures
- Waste anesthetic gas exposures
- Ergonomic hazards from lifting and repetitive tasks
- Radioactive material and ionizing radiation sources.
- Laser hazards
- Workplace violence
- Respiratory hazards

Patient decisions are usually based on cost, accessibility and quality of care/service. An aesthetically pleasing facility is a key aspect of the perceived quality of care.³⁵ Evidence confirms a correlation between the physical healthcare environment and the safety, quality, and patient's perception of care.³⁶ A facility bears a message to patients, providers, community and visitors about the organization and the care being provided.³⁷ The physical environment of care (the setting, facility), is as important in treatment as are medicine and providers.

Planning, Designing and Constructing IHS Facilities

Contemporary healthcare facilities are designed around the needs and preferences of patients, families, and staff. The modern-day IHS constructed facilities, designs and plans successfully integrate these and numerous other important factors, including:

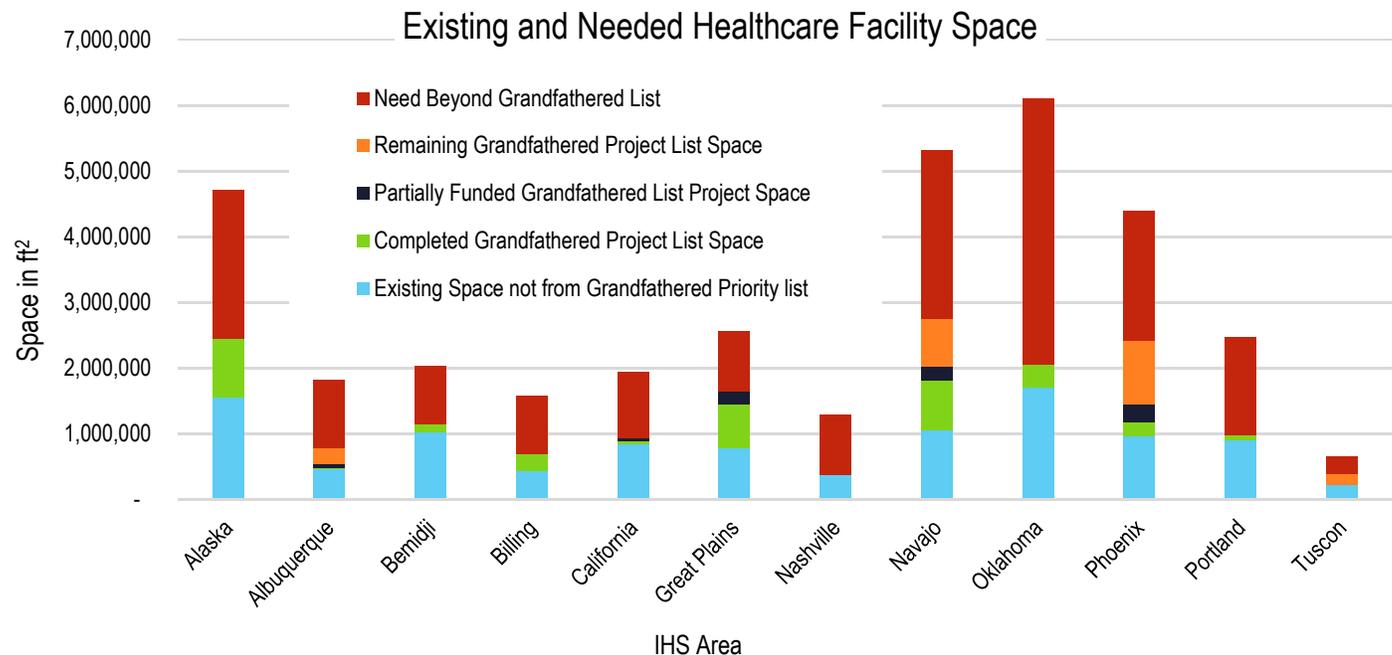
- Proposed care model;
- Provided Services;
- Culture;
- Life Cycle Cost;
- Efficiency;
- Healing environments;
- Tribal and federal consultation;
- Codes, standards and guidelines;
- Safety and injury prevention
- Patient/family needs/preferences;
- Number of program staff;
- Sustainability, renewable energy, and conservation;
- Tribal, federal, state, and local requirements and/or input;
- Remoteness, climate, access (road, waterway, seasonal, etc.);
- Current and future User-Population specific healthcare needs;
- Staff needs, health, efficiency, comfort, space, and preferences;
- Minimum user-populations required to sustain services; and
- Environmental regulations, security and safeguards.

The IHS adheres to strict qualification standards for personnel and contractors that perform the planning, design, construction and operation of its facilities including the requirement for licensed Architects and Engineers, FAC-P/PM³⁸ Project Managers, AICP³⁹ Planners and FBPTA⁴⁰ competent Facility Managers. These requirements help to ensure that the IHS and tribal healthcare facilities are planned, designed, and constructed as culturally appropriate health care facilities that meet programmatic requirements, incorporate proven and effective design principles, are sustainable, and that contribute to the health of the AI/ANs they are intended to serve.

How IHS Uses and Distributes HCFC Appropriation Funds

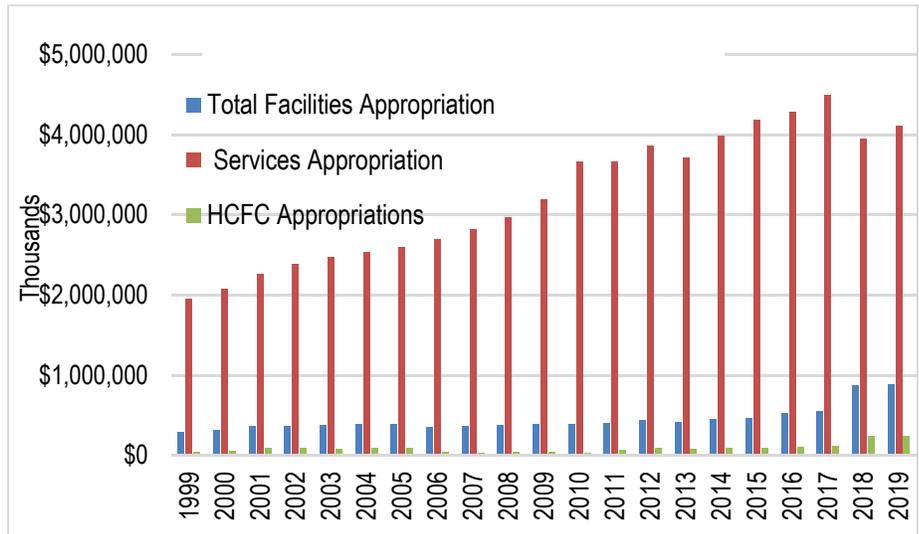
- Most projects are major capital investments exceeding annual HCFC funding resulting in projects being funded in phases over several fiscal years.
- Projects are funded in phases according to acquisition, engineering, and project management requirements.
- Several projects are funded each year allowing projects to advance simultaneously and providing greater geographical distribution of funds.
- The HCFC appropriations continue to fund projects off the 'grandfathered' HCFC Priority list until it is fully funded (estimated cost >\$2.5 billion).
- There are separate lists for facility types, for instance, Inpatient, Outpatient, Youth Regional Treatment Facilities or Staff Housing.
- Budget documents identify the specific projects, the phases and the estimated costs for that fiscal year.
- Once the 13 remaining projects on the 'grandfathered' list are completely funded, new projects will be funded with the revised priority system.
- Currently (2018) there are five IHS Areas are receiving funding for planning, design and /or construction of projects off the grandfathered priority list.
- Four IHS Areas have 'grandfathered' priority list projects remaining to be funded in the future.

The chart below shows: existing space; space proved under 'grandfathered' projects; space (Projects) partially funded off the 'grandfathered' list, needed space in 'grandfathered' projects yet to be funded and needed space beyond the 'grandfathered' list. Every IHS Area has a need for new and replacement facility space.



The Amount of Health Care Facility Construction Needs

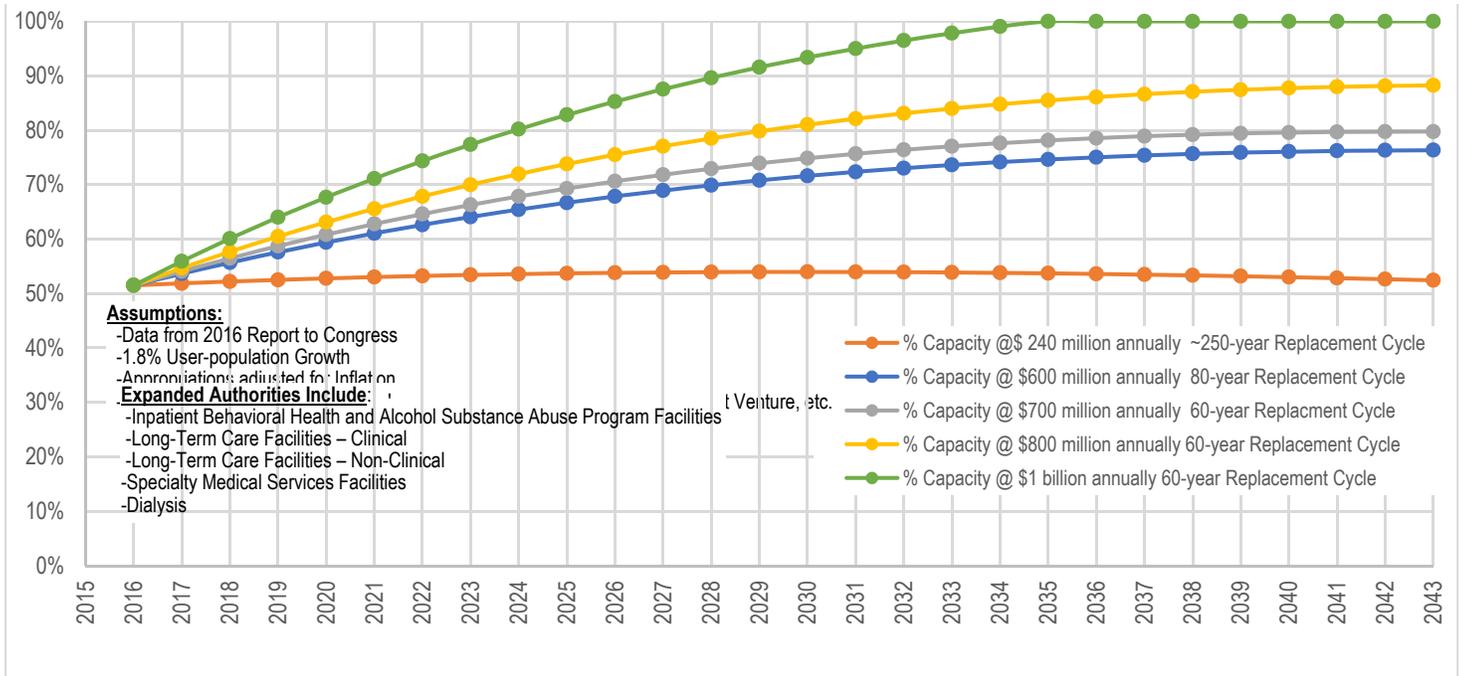
Approximately 5% of the U.S. annual health expenditures are investments in health care facility construction.⁴¹ In 2013, that \$118 billion investment in facility construction equaled ~\$374 per capita compared with IHS construction appropriation of \$77 million or ~\$35 per AI/AN.⁴² That means the nation's annual investment in health care facility construction for the general population is over 10 times the amount per capita than for IHS facility construction. This disparity is reflected in patient outcomes and the immense IHS facilities need.



The table above compares the IHS Facilities Appropriations with the Services Appropriations (without ARRA). Funding for Services have increased about 7% per year while the Facilities Appropriation has remained fairly flat. Maximizing Access to appropriate care requires three elements: an Appropriate Facility (capacity, location, layout, accredited, etc.); Qualified Providers (Services) and Appropriate Time (seeking/receiving care prior to condition worsening). If a facility is too distant or undersized, Access is hindered. Services and facilities need to match up; facility capacity is wasted without providers and additional providers are wasted without an appropriate facility capacity. In general, IHS facilities are old, undersized, have obsolete layouts, and are expensive to operate and maintain. The need for new and replacement facilities in 2016 exceeded 33 million ft² at an estimated cost of more than \$14.5 billion for all authorities.⁴³

The graph below shows the impact of different HFC funding levels on the overall system capacity. At the current HCFC funding levels the need for facilities will continue to grow. The IHS would need ~\$700 million annually to increase capacity from 52% to 80% in 25 years and

Percent of Needed Healthcare Space Capacity Achievable at Various Appropriation Levels for Practiced and Expanded Authorities



Assumptions:

- Data from 2016 Report to Congress
- 1.8% User-population Growth

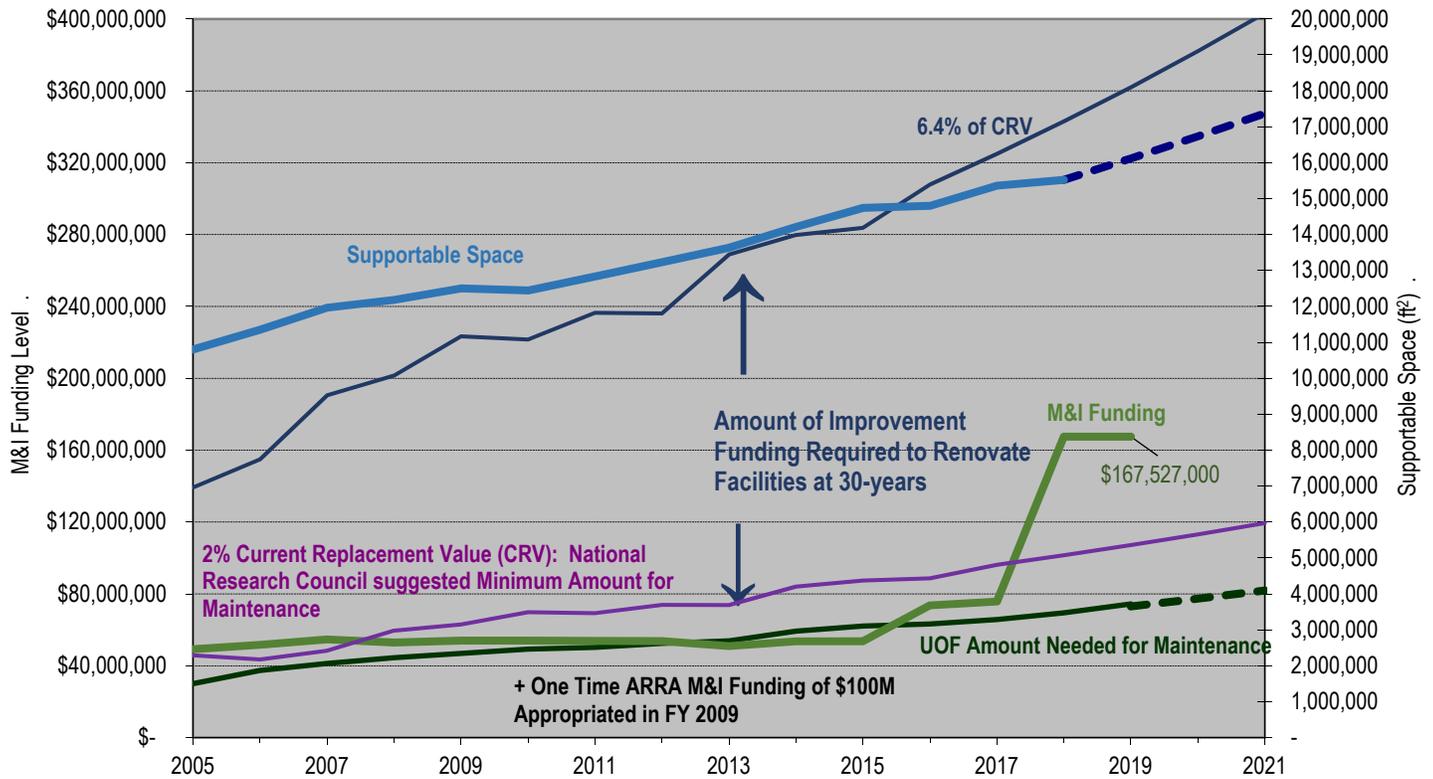
-Appropriations: adjusted for Inflation

Expanded Authorities Include:

- Inpatient Behavioral Health and Alcohol Substance Abuse Program Facilities
- Long-Term Care Facilities – Clinical
- Long-Term Care Facilities – Non-Clinical
- Specialty Medical Services Facilities
- Dialysis

- % Capacity @ \$240 million annually ~250-year Replacement Cycle
- % Capacity @ \$600 million annually 80-year Replacement Cycle
- % Capacity @ \$700 million annually 60-year Replacement Cycle
- % Capacity @ \$800 million annually 60-year Replacement Cycle
- % Capacity @ \$1 billion annually 60-year Replacement Cycle

Maintenance and Improvement Appropriations



Maintenance and Improvement (M&I) funds are the primary source for maintenance, repair, and improvements for facilities which house IHS funded programs, whether provided directly or through P.L. 93-638 contracts/compacts. The M&I program funding is distributed through a formula allocation methodology.

The FY-2019 Maintenance and Improvement (M&I) funding is \$167.5 million which is a 121% increase from 2017. From 2007 to 2015, M&I appropriations remained flat at about \$53 million annually. Consequently the annual M&I funding was less than the amount needed for Preventive, Routine and Non-routine Maintenance from 2011-2015. By 2015, M&I funding was only about 80% of the amount required to properly maintain the existing facilities. The backlog of deferred maintenance is about \$650 million, which if unaddressed could cost significantly more if systems fail.⁴⁴ Adequate funding is essential to ensure functional health care facilities that meet building/life safety codes, conform to laws and regulations and satisfy accreditation standards. The table below shows the activities that use M&I funding along with an estimate of need predicated upon facilities being renovated at 30-years of life and replaced at 60-years of age.

Maintenance and Improvement (M&I)	M&I Annual Need*
Actual M&I Appropriation ~2.8% of "Current Replacement Value" (CRV) or ~\$167 million annually M&I Funding is intended to cover:	~6.4% of CRV = UOF+1/5 BEMAR +Improvements = ~\$355 million annually
Improvements: Renovations; Alterations; upgrades/replacement of primary mechanical, electrical, or other building systems; and site improvements. Improvements increase the facility's useful life and are capitalized in accordance with the accounting principles.	Assumes Major Renovation at 30 years or ~3.0% of CRV ~\$180 million
Deferred Maintenance: Maintenance not performed as scheduled and delayed to a future period. The Backlog of Essential Maintenance Alteration and Repair (BEMAR) deficiencies deferred because of a lack of staffing or funds to implement corrective measures.	Assumes 5-year BEMAR Cycle 1/5 BEMAR or ~2.2% of CRV ~\$130 million
Non-Routine Maintenance: Unscheduled emergency work to restore services or remove problems that could interrupt services. Routine Maintenance: Curative work to restore or repair systems that fail due to action of the elements, fire, storm or other disasters, or use near to or beyond the expected useful life. Preventive Maintenance (PM): Scheduled work to preserve/restore facility (Inspect, lubricate, replace components, paint, etc.).	University of Oklahoma Formula (UOF)=~1.3% of CRV ~\$75 million

M&I Funding is also used for:

- Maintaining compliance with accreditation standards of the Joint Commission or other accreditation bodies;
- Ensuring that health care facilities meet building codes and standards;
- Environmental compliance including audits, remediation, and improving energy and water efficiency;
- Demolition of vacant, excess, or obsolete federally-owned buildings; and
- Executive Orders and public laws, e.g., energy conservation, seismic, environmental, accessibility, and security.

*Based on Major Facility Renovation at 30 years, a 60-year facility replacement cycle and 5-year BEMAR Cycle

The total annual maintenance costs for all repair, preventive maintenance, materials, direct labor and contract costs, should be about:

- Approximately \$75 million using the UOF, which estimates the funding needed for minimal maintenance and repair activities.
- About \$120 to \$240 million using the 2% to 4% CRV range suggested by the National Research Council⁴⁵ to address maintenance.
- The backlog of deferred maintenance is about \$650 million, which if unaddressed and systems fail, could cost significantly more.⁴⁶
- An additional 3% to 5% of the total replacement value is needed to reinvest in renovations/improvements of the existing facilities.

The average age of IHS healthcare facilities is ~40 years with only limited recapitalization in the plant. The average age, including recapitalization and reinvestment, of U.S. private sector hospitals is approximately 10 years.⁴⁷ Maintenance costs increase as facilities and systems age. Available funding levels are impacted by:

- Age and condition of equipment may necessitate more repairs and/or replacement;
- Lessened availability of service/repair parts for aging equipment and limited vendor pool in remote locations;
- Increases in supportable space. Between 2011 and 2015, supportable space increased 3.5 percent per year;
- Increased costs due to remote locations;
- Costs associated with correcting accreditation-related deficiencies;
- Increasing regulatory and/or executive order requirements; and
- Environmental conditions impacting equipment efficiency and life.

Equipment Appropriations

Accurate clinical diagnosis and effective medical treatment depend in large part on health care providers using modern and effective medical equipment/systems to assure the best possible health outcomes. The IHS and Tribes manage approximately 90,000 biomedical devices consisting of laboratory, medical imaging, patient monitoring, pharmacy, and other biomedical, diagnostic, and patient equipment valued at approximately \$500 million. Medical Equipment funds provide for:

- Maintenance and repair of existing medical devices;
- Limited replacement of outdated equipment;
- Initial purchase of equipment for Tribally-constructed health care facilities; and
- Leasing of ambulances for the emergency medical services programs.

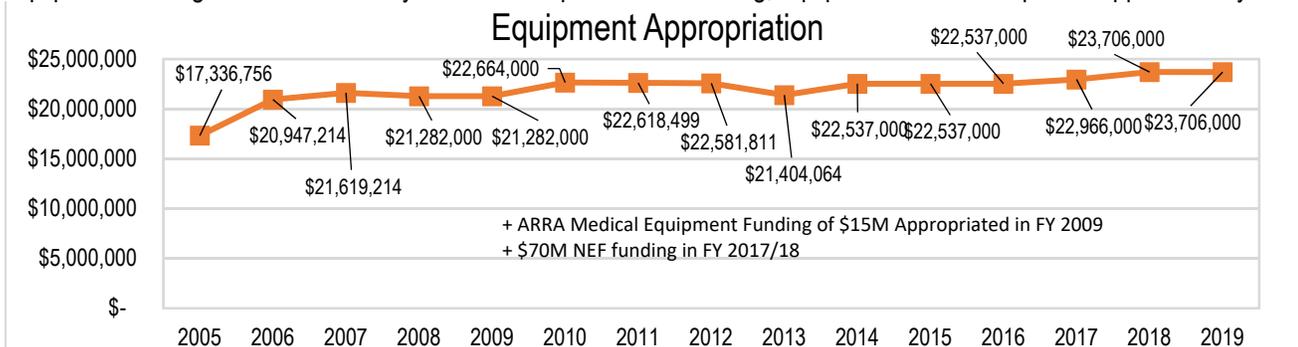
FY-2019 Equipment Appropriation is \$23.7 million which includes:

- \$5 million to support the initial purchase of equipment for tribally-constructed healthcare facilities;
- \$500,000 to acquire excess medical equipment from DoD or other sources through the TRANSAM program;
- The remainder funds medical equipment in support of existing IHS and tribal programs.

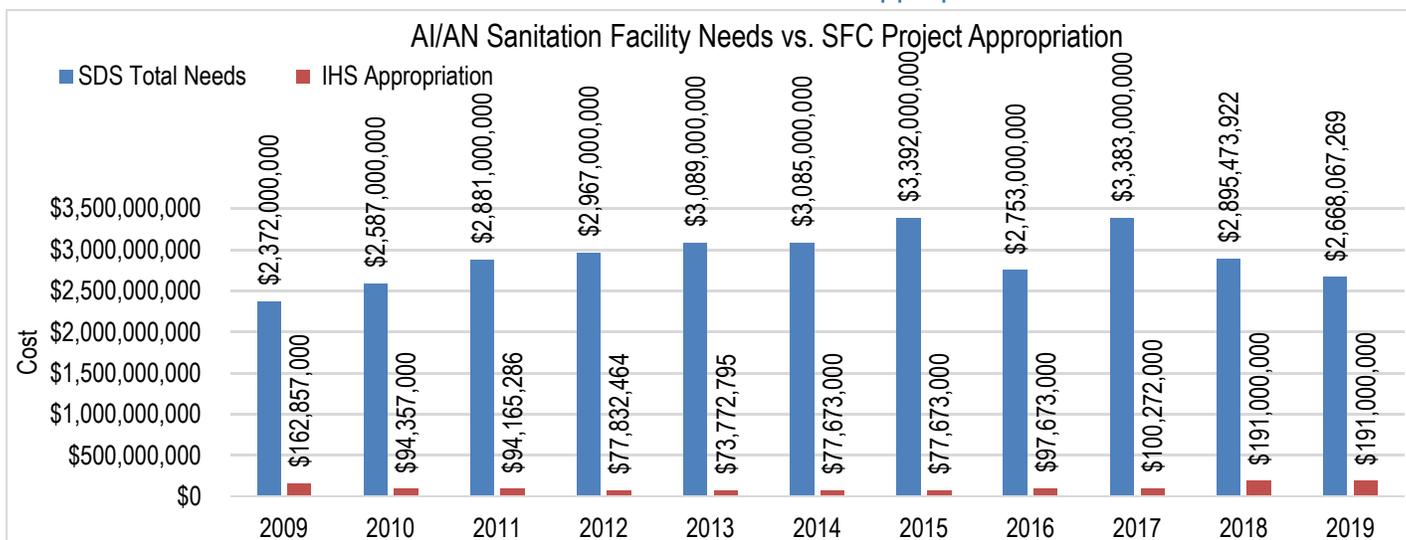
Medical devices management has become complex as a result of increased sophistication and specialization of equipment, integration with electronic records, and increasing requirements for compliance, safety, reliability and accuracy. Many health care services require special medical equipment to meet their mission. Renewal is necessary to replace outdated, inefficient and unsupported equipment with newer electronic health record-compatible equipment to enhance speed and accuracy of diagnosis and treatment. Considerations are:

- Average Equipment Useful Life is approximately 6 to 8 years⁴⁸
- Typical replacement plan guidelines recommend having 60% of equipment <5 years old, 30% of equipment between 6-10 years old, and 10% > 10 years old (~7 year average lifespan).⁴⁹
- In the U.S., a facility's annual medical equipment maintenance costs should be between 5% and 10% of medical equipment inventory value,⁵⁰ which would equate to \$25 to \$50 million annually for the IHS.
- A sustainable medical equipment program for the IHS should be funded in the \$100 to \$150 million annually range to cover replacement and maintenance.
- The IHS and its tribal partners utilize and rely on telemedicine systems in many locations.
- Appropriate types, standardization, needs, use and interoperability of devices must be determined and recommended.
- Equipment must be acquired, installed, tested and calibrated, and maintained.

Equipment funding has remained fairly flat. Based upon current funding, equipment would be replaced approximately every 30 years.

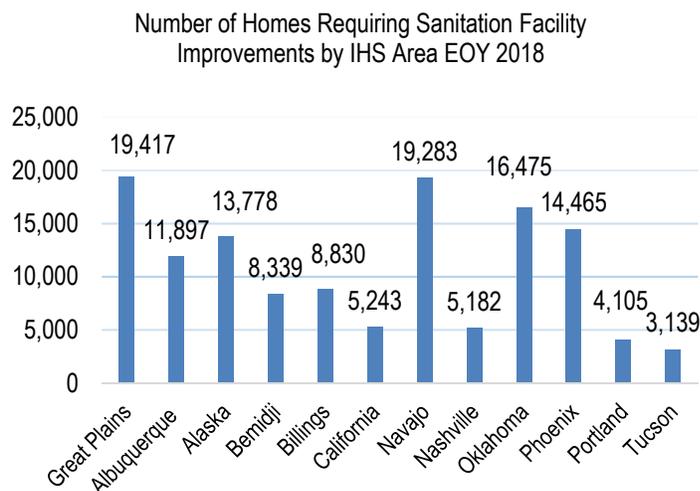
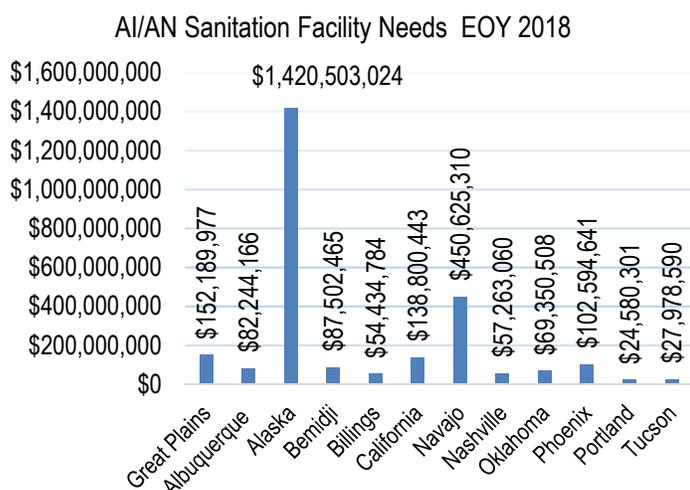


Sanitation Facilities Construction Appropriations



Funds appropriated for water supply and waste disposal facilities are under the Sanitation Facilities Construction (SFC) line item. Projects are cooperatively developed with and transferred to, Tribes which in turn assume responsibility for the operation of safe water, wastewater, and solid waste systems, and related support facilities. The SFC program receives funds for three types of projects:

1. Water, Wastewater, and Solid Waste facilities for *Existing* American Indian and Alaskan Native (AI/AN) Homes and/or Communities;
 - The sanitation project need for *Existing* AI/AN Homes and/or Communities at the end of year 2018 was \$2.7 billion
 - There were over 130,000 AI/AN homes at the end of year 2018 that needed some form of sanitation facility improvement.
2. Water, Wastewater, and Solid Waste facilities for *New* AI/AN Homes and/or New Communities; and
3. Special or Emergency projects.



Infant mortality rates, gastroenteritis mortality rates and other environmentally-related diseases in AI/AN populations have been reduced by about 80 percent since 1973. The availability of sanitation facilities, environmental health efforts and improved housing have been major factors in reducing these mortality rates in AI/AN populations. In addition, research by the Centers for Disease Control and Prevention found that rural populations without in-home water service had significantly higher hospitalization rates for pneumonia, influenza, and respiratory syncytial virus. This study shows that the SFC Program is a key factor in the health status of AI/AN people.

SFC Engineers (for more details see the Environmental Health Support section) provide project related services such as:

- Coordination with all funding and regulatory agencies
- Project site review, surveying, pre-design
- Obtaining construction and environmental permits
- Preparation of contract documents
- Transfer documents and final reports
- Project Data System inputting and reports
- Preparation of as-builts and O&M manuals
- Construction project management and inspection services
- Attending tribal meetings; meeting individual homeowners
- Archeological and other environmental review activities at the site
- Engineering designs, data collection, and preparing specifications and drawings
- Clerical support, project employee training, and project related travel time
- Administrative and supervision/support for project related employees
- Project start-up and training (operators and homeowners)

Facilities and Environmental Health Support Appropriations

Environmental Health Program

The IHS delivers a comprehensive, national, community-based and evidenced-based Environmental Health (EH) program.

- Five foci
 - Children's environment
 - Food safety
 - Safe drinking water
 - Healthy homes
 - Vector-borne and communicable diseases
- Key services
 - Identify EH hazards and risk factors in communities and propose control measures
 - Conduct investigations of disease and injury incidents
 - Provide training to federal, tribal, and community members
 - Work with tribal councils and health departments to develop and pass laws that keep people safer
- Consultation and technical assistance to tribes in an effort to provide safe, healthy environments
- Program support and guidance to Area and Tribal EH programs
- Environmental health database with an inventory of public, commercial and federal facilities, and services provided by IHS/Tribal EHS programs
- Coordinates inter- and intra-agency agreements among various federal and non-federal agencies
- Allocates funds appropriated for environmental health services activities
- Advocates for tribes during the development of policies, regulations, and programs
- Assists tribes in responding to emergency situations
- WebCident System Management– WebCident is the IHS incident reporting system used by any IHS affiliated facility. EHS provides support for occupational injuries and illnesses, visitor injuries, property damage, and hazardous conditions.

Injury Prevention

The IHS Injury Prevention (IP) Program is funded within the Facilities and Environmental Support line item under the Environmental Health Services Account and applies a comprehensive public health approach to injury prevention.

- Unintentional Injuries are the leading cause of death for AI/AN people ages 1-44 years, and the 3rd leading cause of death overall⁵¹
- For 2008-2010 the unintentional injury mortality rate (91.9) for AI/AN people is ~2.5 times that of the 2009 U.S. all races rate (37.5)
- Funds provide administrative support to each Area IP Program
- Occasionally funds are appropriated for specific initiatives
- The IP Program facilitates community and evidence-based IP initiatives using multiple strategies to reduce and prevent injuries and fatalities
- Tribal capacity is fostered through training, technical assistance, knowledge sharing, and program implementation support

Some successful IP initiatives include:

- Tribal Injury Prevention Cooperative Agreement Program (TIPCAP)
 - \$30.3M awarded from 1997-2018
 - 99 tribes and organizations funded for prevention of motor vehicle injuries, fire/burn injuries, drowning, elder falls, suicide
- Elder Fall Prevention through exercise programs, home hazard assessments, medication review, and vision screening
- Projects to reduce motor vehicle injuries and fatalities by:
 - Increasing occupant restraint use through child safety seat distribution and policy development;
 - Supporting tribal law enforcement in deterring drunk drivers (DUI policy development); and
 - Highway environmental modifications (street lights, guard rails, highway striping, etc.).
- Training Program includes:
 - Introduction to Injury Prevention
 - Intermediate Injury Prevention
 - Safe Native American Passengers (SNAP)
 - Injury Prevention Specialist Fellowships for Epidemiology and Program Development

As a result of these efforts, unintentional AI/AN injury deaths, while still high, decreased by 59% between 1973 and 2009.⁵²

Institutional Environmental Health Support

The Institutional Environmental Health Program focuses on assisting community institutions like healthcare and child care facilities to maintain safe and healthy environments for workers, visitors, and clients. The Institutional Environmental Health staff:

- Collaborate with Healthcare Facilities Engineering and Management staff with EBD controls for environmental health and safety hazards
- Ensure facilities have in place effective occupational health and safety programs
- Have knowledge and skills in the following
 - Industrial Hygiene
 - Built Environment Hazard Recognition and Control
 - Radiation Protection
 - Ergonomics
 - Emergency Management
 - Environmental Compliance
 - Fire/Life Safety
 - Occupational injury and Incident reporting and recordkeeping
 - Health Care Accreditation

Sanitation Facilities Construction Personnel and Operations

Personnel and Operations for the Sanitation Facilities Construction program are funded under the Environmental Health Support account. The SFC staff provide engineering and project management for sanitation facility projects and technical assistance to AI/AN communities. Project funding for water, wastewater and solid waste facilities are under the Sanitation Facilities Construction line item. In addition to Sanitation projects, the program:

- Develops and maintains an inventory of sanitation deficiencies in AI/AN communities for use by the IHS and the Congress;
- Provides environmental engineering assistance with utility master plans and sanitary surveys;
- Plans and coordinates multi-agency funded sanitation projects and assists with grant applications to leverage IHS funds;
- Provides professional engineering design and/or construction services for water supply and waste disposal facilities;
- Provides technical consultation and training on the operation and maintenance of tribal water supply and waste disposal systems;
- Advocates for tribes during the development of policies, regulations, and programs; and
- Assists tribes during sanitation facilities emergencies.

Joint Venture Construction Program

The IHS partners with Tribes or Tribal organizations (T/TO) in Joint Venture Construction Projects where a T/TO would acquire, construct, or renovate a health care facility and lease it to the IHS, at no cost, for a period of 20 years. Participants in this competitive program are selected from among eligible applicants who agree to provide an appropriate facility. The facility may be an inpatient or outpatient facility. The Tribe must use Tribal, private or other available (non-IHS) funds to design and construct the facility. In return the IHS will submit requests to Congress for the staff, operations, and maintenance funding of the facility per the Joint Venture Agreement. Project Proposals considered under this program are evaluated against the following criteria:

- The need for space can be verified with the IHS planning methodologies;
- Consistent with the IHS Health Systems Planning program; and
- Additional consideration is given to T/TOs that fully fund the equipment for the facility.
- The T/TO is able to fund and manage the proposed project;
- The project aligns with the IHS Area Health Facilities Master Plan.

The table below lists all the completed and active Joint Venture Projects.

JV FY	Tribe	Location	Cost Estimate	Construction		JVA Date	User Population	Size ft ²
				Scheduled	Actual			
2016	Yakutat Tlingit Tribe	Yakutat, Alaska	\$9,600,000	12/1/2019		9/8/2017	510	10,000
2016	Ysleta del Sur Pueblo	El Paso, Texas	\$20,037,000	5/1/2020		11/25/2017	2677	58,926
2016	Ponca Tribe of Nebraska	Omaha, Nebraska	\$0	12/1/2020		6/22/18	2700	43,602
2016	White Earth Band of Chippewa Indians	Naytahwaush, MN	\$14,750,000	8/1/2019				
2015	Choctaw Nation	Durant, Oklahoma	\$70,215,000	1/1/2017	3/1/2017	6/5/2015	7,061	133,080
2015	Cherokee Nation	Tahlequah, OK	\$227,920,000	7/1/2019		2/24/2016	22,710	455,000
2015	Yukon Kuskokwim Health Corp	Bethel, Alaska	\$236,590,000	7/1/2019		3/29/2016	15,545	246,500
2014	Muskogee (Creek) Nation	Eufaula, OK	\$34,630,000	5/1/2018		2/4/2015	5,208	73,300
2014	Eastern Shoshone /Northern Arapahoe	Wind River, WY	\$28,794,600					
2014	Alaska Pribilof Island Association	Unalaska, Alaska	\$17,260,000				680	8,000
2011	Kenaitze Indian Tribe	Kenai, AK	\$21,915,000	9/15/2013	6/12/2014	12/15/2011	3,140	45,675
2011	Mississippi Band of Choctaw	Pearl River, MS	\$55,021,000	12/1/2014	12/30/2014	3/22/2012	12,647	152,000
2011	Chickasaw Nation	Tishomingo, OK	\$25,252,000	2/1/2013	2/11/2013	3/14/2011	4,505	53,750
2010	Chickasaw Nation	Ardmore, OK	\$30,850,000	7/31/2012	7/15/2012	8/20/2010	6,195	65,960
2010	Southcentral Foundation	Wasilla, AK	\$45,490,000	8/1/2012	8/1/2012	11/28/2010	8,515	88,500
2010	Tanana Chiefs Conference	Fairbanks, AK	\$64,323,000	9/1/2012	9/1/2012	8/20/2010	14,389	140,600
2010	Copper River Native Association	Tazlina, AK	\$19,405,000	7/23/2013	9/17/2013	12/12/2011	830	35,150
2009	Flandreau Santee	Flandreau, SD	\$15,777,000	4/14/2017	9/1/2017	7/22/2014	2,252	41,050
2008	Cherokee Nation	Vinita, OK	\$30,135,000	9/1/2012	9/1/2012	5/14/2010	4,359	75,225
2008	Santee Sioux	Santee, NE	\$11,897,000	2/1/2011	2/9/2011	9/18/2008	1,525	34,100
2007	Absentee Shawnee	Little Axe, OK	\$27,200,00	3/1/2012	3/15/2012	3/5/2009	6,669	77,140
2007	Chickasaw Nation	Ada, OK	\$143,852,000	8/1/2010	8/1/2010	11/8/2007	60,293	304,000
2005	Lake County Tribal Health Consortium	Lakeport, CA	\$9,459,000	8/1/2010	10/1/2010	10/18/2007	2,370	31,300
2005	Cherokee Nation	Muskogee, OK	\$28,790,000	1/29/2008	8/31/2007	12/28/2005	10,396	94,800
2002	Muscogee (Creek) Nation	Coweta, OK	\$16,475,000	6/2/2006	5/30/2006	12/30/2003	8,550	63,050
2002	Choctaw Nation	Idabel, OK	\$11,126,500	5/13/2005	5/13/2005	8/26/2003	7,204	48,500
2001	Tohono O'odham Nation	San Simon, AZ	\$13,192,00	7/1/2008	7/30/2007	2/22/2003	2,275	28,500
2001	Jicarilla Apache	Dulce, NM	\$14,680,00	1/6/2005	3/21/2005	8/21/2002	4,159	61,800

Facilities Appropriation Information Report Endnotes

- 1 DHHS, Indian Health Service. Division of Program Statistics (DPS), Office of Public Health Support (OPHS). *Trends in Indian Health*. 2014 Edition
- 2 DHHS, IHS, Division of Program Statistics (DPS), Office of Public Health Support (OPHS). *Trends in Indian Health* 2014 edition.
- 3 Optum. (2014). *Almanac of hospital financial & operating indicators: a comprehensive benchmark of the nation's hospitals* (2015 ed., pp. 176-179).
- 4 DHHS, Indian Health Service. *Trends in Indian Health*. 2014 Edition
- 5 Estimate based on data from The 2016 IHS and Tribal Healthcare Facilities Needs Assessment Report to Congress and the HFDS data system. Assumes: HCFC Appropriations would be consistent, re-occurring and adjusted annually for inflation; and about 22% of the HCFC funds on average would be replacing existing facility space.
- 6 DHHS, IHS, OEHE, DES. Architect/Engineer Guide. 2013. Page 36, #8.
- 7 Getzen, Thomas E. Health Economics and Financing. 4th Edition, John Wiley and Sons Inc.2010.
- 8 DHHS, IHS. The 2016 Indian Health Service and Tribal Health Care Facilities' Needs Assessment Report to Congress. June 2016. Accessed on October 6, 2016 at https://www.ihs.gov/newsroom/includes/themes/newhstheme/display_objects/documents/RepCong_2016/IHSRTC_on_FacilitiesNeedsAssessmentReport.pdf
- 9 Ulrich, Roger, Xiaobo Qian, Craig Zimring, Anjali Joseph, and Ruchi Choudhary. The Role of the Physical Environment in the Hospital of the 21st Century: Once-in-a-Lifetime Opportunity. Center for Health Design. Sept 2004.
- 10 U of M, Center for Spirituality and Healing. What is a healing environment? Kreitzer, Mary Jo, Terri Zborowsky, and Jean Larson, accessed at <http://www.takingcharge.csh.umn.edu/explore-healing-practices/healing-environment-on-7/14/15>
- 11 American Institute of Architects, Academy of Architecture for Health, Facility Guidelines Institute). *Guidelines for Design and Construction of Hospital and Health Care Facilities*. Washington, DC: AIA Press, 2001.
- 12 Ulrich R, Zimring C. *The role of the physical environment in the hospital of the 21st century: a once-in-a-lifetime opportunity*. Report to The Center for Health Design, for the Designing for the 21st Century Hospital Project 2004:3.
- 13 Hughes, R., (May 31, 2011) "Overview and Summary: Patient-Centered Care: Challenges and Rewards" OJIN: The Online Journal of Issues in Nursing Vol. 16, No. 2, Overview and Summary. DOI: 10.3912/OJIN.Vol16No02Man0S
- 14 Arneill, B., & Frasca-Beaulieu, F. (2003). Healing environments: Architecture and design conducive to health. S.B. Frampton, L. Gilpin, & P.A. Charnel, Putting Patients First: Designing and Practicing Patient-Centred Care. San Francisco, CA.
- 15 Agency for Healthcare Research and Quality, National Healthcare Quality Report, Publication No. 06-0018 (Rockville, Md.: AHRQ, Dec. 2005.
- 16 Altringer B. The emotional experience of patient care: a case for innovation in health care design. J Health Serv Res Policy 2010;15(3):174-177.
- 17 McCormack, B., Dewing, J., McCance, T., 2011. "Developing Person-Centered Care: Addressing Contextual Challenges Through Practice Development" OJIN: Vol. 16, No. 2, Manuscript 3. DOI: 10.3912/OJIN.Vol16No02Man03
- 18 McCormack, B., Dewing, J., McCance, T., (2011) "Developing Person-Centred Care: Addressing Contextual Challenges Through Practice Development" OJIN: Vol. 16, No. 2, Manuscript 3. DOI: 10.3912/OJIN.Vol16No02Man03
- 19 Carr, Robert F. Health Care Facilities. Whole Building Design Guide, National Institute of Building Science. October 2014.
- 20 Federal Facilities Council (FFC). Investments in Federal Facilities: Asset Management Strategies for the 21st Century. NRC, National Academy of Sciences 2004.
- 21 Federal Facilities Council (FFC). Investments in Federal Facilities: Asset Management Strategies for the 21st Century. NRC, National Academy of Sciences 2004.
- 22 American Hospital Association. Hospital statistics. Chicago: the Association; 1999.
- 23 Center for Disease Control and Prevention (National Center for Health Statistics). Deaths: final data for 1997. National Vital Statistics Reports. 1999;47(19):27. [PubMed]
- 24 James, John T. PhD. A New, Evidence-based Estimate of Patient Harms Associated with Hospital Care Journal of Patient Safety, September 2013, Volume 9, Issue 3, p 122–128
- 25 Shots, Health News from National Public Radio. *How Many Die From Medical Mistakes In U.S. Hospitals?* Marshall Allen, ProPublica. September 20, 2013.
- 26 Thomas EJ, Studdert DM, Newhouse JP, Zbar BI, Howard KM, Williams EJ, et al. Costs of medical injuries in Utah and Colorado. Inquiry 1999;36:255-64. [PubMed]
- 27 U of M, Center for Spirituality and Healing. What is a healing environment? Kreitzer, Mary Jo, Terri Zborowsky, and Jean Larson, accessed at <http://www.takingcharge.csh.umn.edu/explore-healing-practices/healing-environment-on-7/14/15>
- 28 Reason J. Managing the risks of organizational accidents. Aldershot, UK: Ashgate Publishing, 1997:1–126. Leape L. Error in medicine. JAMA1994;272:1851–7.
- 29 Reason JT. Understanding adverse events: the human factor. In: *Clinical risk management: enhancing patient safety*. London: BMJ Publishing Group; 2001. p. 9-30.
- 30 Kleeman WB Jr. The challenge of interior design. New York: Van Nostrand Reinhold, 1983:128.
- 31 Norman D. The psychology of everyday things. New York: Basic Books, 1988:42.
- 32 Moray N. Error reduction as a systems problem. In: Bogner MS, ed. *Human error in medicine*. Hillsdale, NJ: Lawrence Erlbaum Associates, 1994:67–91.
- 33 Occupational Safety & Health Administration Safety and Health Topics, Healthcare. Accessed on August 18, 2015 at <https://www.osha.gov/SLTC/healthcarefacilities/index.html>
- 34 Occupational Safety & Health Administration Safety and Health Topics, Healthcare. Accessed on August 18, 2015 at <https://www.osha.gov/SLTC/healthcarefacilities/index.html>
- 35 Carr, Robert F. Health Care Facilities. Whole Building Design Guide, National Institute of Building Science. October 2014.
- 36 Sadler BL, Joseph A, Keller A, Rostenberg B. *Using Evidence-Based Environmental Design to Enhance Safety and Quality*. IHI Innovation Series white paper. Cambridge, Mass: Institute for Healthcare Improvement; 2009.
- 37 Carr, Robert F. Health Care Facilities. Whole Building Design Guide, National Institute of Building Science. October 2014.
- 38 Federal Acquisition Certification for Program and Project Managers (FAC-P/PM)
- 39 American Institute of Certified Planners (AICP)
- 40 Federal Building Personnel Training Act (FBPTA)
- 41 Getzen, Thomas E. Health Economics and Financing. 4th Edition, John Wiley and Sons Inc.2010.
- 42 Centers for Medicare and Medicaid Services. National Health Expenditure data. Accessed 9/21/2015 at <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NHE-Fact-Sheet.html>
- 43 2016 report to Congress IHS/Tribal Healthcare Facilities Needs assessment. Estimate based on HFDS existing program space, HSP recommended space, approved planning documents and FBES.
- 44 Madsen, Jana. Paying for Deferred Maintenance. Buildings Magazine. 2006. Accessed 10/15/15 at www.buildings.com/article-details/articleid/3161/title/paying-for-deferred-maintenance.aspx
- 45 Committing to the Cost of Ownership: Maintenance and Repair of Public Buildings. National Academy of Sciences - NRC, Washington, DC. Building Research Board. 1990
- 46 Madsen, Jana. Paying for Deferred Maintenance. Buildings Magazine. 2006. Accessed 10/15/15 at www.buildings.com/article-details/articleid/3161/title/paying-for-deferred-maintenance.aspx
- 47 Optum. (2014) *Almanac of hospital financial & operating indicators: a comprehensive benchmark of the nation's hospitals* (2015 ed., pp. 176-179).
- 48 Estimated Useful Lives of Depreciable Hospital Assets. American Hospital Association. 2014
- 49 Laktash, Valerie. Medical Equipment Maintenance; performing an audit to improve efficiency and savings. Health Facilities Management, AHA. March 4, 2015
- 50 Cohen T. *AAMI's Benchmarking solution: analysis of cost of service ratio and other metrics*. *Biomedical Instrumentation & Technology*, 2010, 4(4):346-349.
- 51 World Health Organization (WHO). Medical device technical series. *Medical equipment maintenance programme overview*. 2011
- 51 DHHS, IHS, OPH, Division of Program Statistics. *Indian Health Service, Trends In Indian Health*. 2017 Edition.
- 52 DHHS, IHS, OPH, Division of Program Statistics. *Indian Health Service, Trends In Indian Health*. 2017 Edition.