# U.S. St. Lawrence Seaway Asset Renewal Program Capital Investment Plan

## *FYs 2018-2022*

Saint Lawrence Seaway Development Corporation

The U.S. Saint Lawrence Seaway Development Corporation (SLSDC), a wholly owned government corporation and an Operating Administration of the U.S. Department of Transportation (DOT), is responsible for the operations and maintenance of the U.S. portion of the St. Lawrence Seaway between Montreal, Quebec, and Lake Erie. This responsibility includes maintaining navigation channels and aids, managing vessel traffic control in areas of the St. Lawrence River and Lake Ontario, and maintaining and operating the two U.S. Seaway locks, Eisenhower and Snell, located in Massena, N.Y.

The SLSDC coordinates its activities with its Canadian counterpart, the St. Lawrence Seaway Management Corporation (SLSMC), to ensure that the U.S. portion of the St. Lawrence Seaway is available for commercial transit throughout the navigation season (typically late March to late December). The SLSDC also promotes Great Lakes regional trade and economic development.

For more information on the SLSDC, please visit http://www.greatlakes-seaway.com.

**TABLE OF CONTENTS**

# Saint Lawrence Seaway Development Corporation
# U.S. Seaway Asset Renewal Program
# Capital Investment Plan
# FYs 2018-2022

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## Background

Operated and maintained by the U.S. Saint Lawrence Seaway Development Corporation (SLSDC) and the Canadian St. Lawrence Seaway Management Corporation (SLSMC), the St. Lawrence Seaway is a unique binational transportation route, directly serves an eight-state, two-province region that accounts for one-quarter of the U.S. gross domestic product (GDP), one-half of North America's manufacturing and services industries, and is home to nearly one-quarter of the continent's population. The Great Lakes region represents nearly $6 trillion in annual economic activity, which equates to the third largest economy in the world if it were a country, behind only the United States and China.

Since the 15-lock binational waterway's opening in 1959, nearly 3 billion metric tons of cargo has moved on the St. Lawrence Seaway valued at $400 billion. Additionally, maritime commerce on the Great Lakes Seaway System provides shippers with nearly $4 billion in annual transportation cost savings compared to the next least expensive mode of transportation.[1]

In addition, Great Lakes Seaway System ships remain a fuel-efficient and cost effective mode for moving commercial goods to and from foreign markets and the Great Lakes region. The SLSDC remains dedicated to promoting the economic benefits of the marine mode, attracting new cargoes to the Seaway, and leveraging technology to enhance the system's performance and safety.

The waterway also produces significant economic benefits to the Great Lakes region. In fact, an economic impact study completed in 2011 concluded that maritime commerce on the Great Lakes Seaway System sustains 227,000 U.S. and Canadian jobs, $35 billion in transportation-related business revenue, $14 billion in personal income, and $5 billion in federal, state, provincial, and local taxes each year.[2]

To continue providing these economic benefits, the binational St. Lawrence Seaway must remain available, efficient, and competitive for commercial transportation. To achieve these goals, the Seaway's infrastructure, which has reached the end of its original "design" life (50 years for the lock structures), must be renewed through reinvestment on both sides of the border.

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[1] *Great Lakes Navigation System: Economic Strength to the Nation*, U.S. Army Corps of Engineers, January 2009.
[2] *The Economic Impacts of the Great Lakes St. Lawrence Seaway System*, Martin Associates, October 2011.

## Summary

Starting in 2009, the SLSDC began its Asset Renewal Program (ARP) for its navigation infrastructure, associated facilities, and equipment. The projects and equipment included in the ARP address various needs for the two U.S. Seaway locks, the Seaway International Bridge, maintenance dredging, operational systems, and Corporation facilities and equipment in Massena, N.Y. None of the ARP investments result in increases to the authorized depth or width of the navigation channel or to the size of the two locks.

The SLSDC obligated $120 million on 48 separate projects during the ARP's first eight years (FYs 2009-2016). These projects included maintenance dredging in the U.S. portion of the Seaway navigation channel, lock culvert valve machinery upgrade to hydraulic operation, structural rehabilitation and corrosion prevention work on the Seaway International Bridge, gatelifter upgrades, and miter gate rehabilitation, as well as various other structural and equipment repairs and/or replacement.

For the FY 2018-2022 period, the Seaway ARP/Capital Investment Plan (CIP) includes 57 separate ARP projects and equipment estimated at $92.6 million with total funding for each year of the plan constrained to funding targets for those years as approved by the Secretary and subject to annual appropriations. It is important to note that dollar amounts for ARP projects are "project feasibility" estimates that can vary by an industry-recognized standard of 20-30 percent. Project estimates and schedules may fluctuate at various points in the lifespan of the ARP and will be revised as needed and on a continuing basis throughout the length of the ARP.

The SLSDC's ARP is resulting in not only modernized infrastructure and new equipment to ensure the long-term reliability of the St. Lawrence Seaway, but it is also having a positive and significant impact on the Upstate New York economy. In fact, approximately $60 million of ARP funds obligated during the program's first eight years were awarded within the Upstate New York region. In addition to these contracts, the ARP generates, on average, $2 million in additional economic benefits to the region (local permanent and temporary hires, local spending on supplies and equipment, lodging, meals, etc.) each year based on information provided to the SLSDC by ARP contractors.

ARP baseline project estimates were developed by the SLSDC using four criteria, as applicable: (1) historical costs for similar work completed previously by the SLSDC; (2) consultation with the U.S. Army Corps of Engineers (USACE) for similar work completed at other U.S. locks; (3) consultation with the SLSMC for similar work completed at the Canadian Seaway locks; and (4) utilization of data from RSMeans®, which serves as North America's leading supplier of construction cost information. In several cases, estimates for FYs 2018-2022 have been revised for the latest five-year plan based on either actual bids for similar ARP work and/or more complete designs.

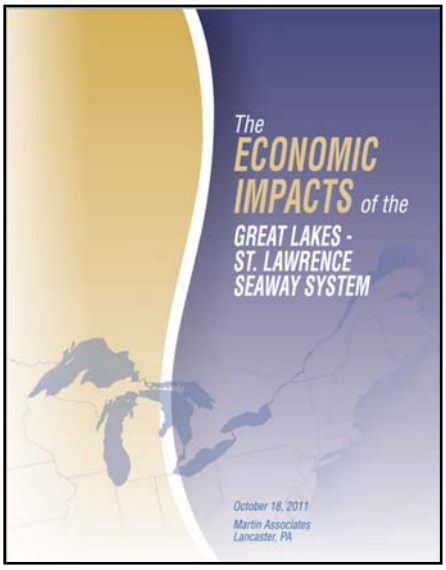
Although the majority of ARP work is completed by contractors, the SLSDC federal workforce is directly responsible for completing several of the maintenance-related projects as well as pre-contract work, including preparation of designs, specifications, and drawings.

Unlike many of the other lock-based waterway systems in the world, which have twinned locks to ensure continued operations in the event of a lock failure, the St. Lawrence Seaway is a single-lock system. A delay or shutdown at any one of the 15 U.S. or Canadian Seaway locks would cause system-wide delays. In 1985, a lock wall failure at the Canadian Welland Canal caused 53 commercial vessels to be trapped in the Seaway System for 24 days at a cost to the shippers of more than $24 million, an approximate value of $54 million in 2017 dollars. The ARP program is vital to ensuring system availability and the flow of goods via the St. Lawrence Seaway.

The Canadian Seaway locks along the St. Lawrence River are identical in age and design to those owned by the SLSDC. In the past decade prior to the SLSDC's ARP, the Canadian Government began addressing its own Seaway asset capital reinvestment needs. Together, the SLSDC and SLSMC have spent more than $480 million over the past five years (2012-2016) on asset renewal projects. Many of the lock-related ARP improvements at the U.S. locks parallel activities either completed, underway, or planned at the Canadian Seaway locks.

These significant investments clearly demonstrate the commitment of the United States and Canada to the long-term health and vitality of the Great Lakes Seaway System, complementing similar investments being made by many other Seaway System stakeholders, including ports, terminals, and carriers.

In January 2015, a report was released highlighting public and private investments in the Great Lakes St. Lawrence Seaway navigation system. The report, which was based on a survey of more than 450 U.S. and Canadian public organizations and private companies, found that nearly $7 billion is being spent on asset renewal and infrastructure improvements in the Great Lakes St. Lawrence Seaway navigation system by both the public and private sectors. Between 2009-2013 more than $4.7 billion has been invested in ships, ports and terminals, and waterway infrastructure, while an additional $2.2 billion in capital spending has been committed for infrastructure investments in the system by companies and governments.




## *Great Lakes Seaway System Economic Impact Study Background Information*

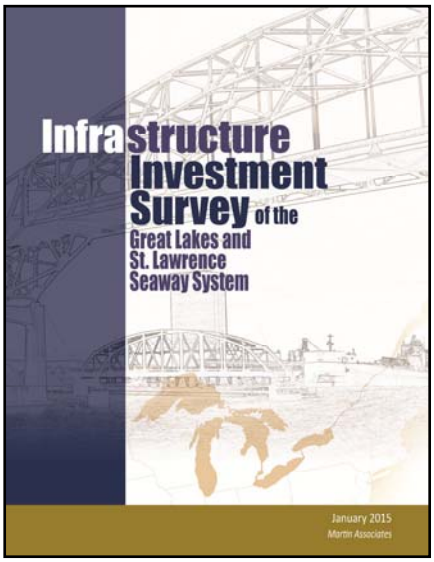
On October 18, 2011, the Great Lakes maritime industry released the results of a year-long study of the economic impacts of the entire Great Lakes-St. Lawrence Seaway navigation system. The study was commissioned by members of the marine shipping industry, in partnership with U.S. and Canadian government agencies. Martin Associates of Lancaster, Pa., a global leader in transportation economic analysis and strategic planning, was retained to conduct the study.

The study found that maritime commerce supported 227,000 U.S. and Canadian jobs, $35 billion in transportation-related business revenue, $14 billion in personal income, and $5 billion in federal, state, provincial, and local taxes each year. North American farmers, steel producers, construction firms, food manufacturers, and power generators depend on the 164 million metric tons of essential raw materials and finished products that are moved annually on the system. Additionally, marine shipping saves companies nearly $4 billion per year in transportation costs compared to the next least-costly land-based alternative.

The report provides the navigation community, transportation planners, government policymakers and the general public with a realistic assessment of the contributions made by the Great Lakes Seaway System to the federal, state/provincial, and local economies. The region depends on ocean vessels, U.S. and Canadian lake carriers, and barges to deliver iron ore, coal, stone, salt, sugar, grain, steel, wind turbine components, and heavy machinery to keep binational businesses running.

An update to this report is expected to be completed in late 2017/early 2018.

*(The report is available at: www.greatlakes-seaway.com/en/pdf/eco_impact_full.pdf)*




## *Great Lakes Seaway System Public-Private Sector Infrastructure Investment Survey Background Information*

The results of a year-long infrastructure investment survey were released in January 2015 by the American Great Lakes Ports Association and the Canadian Chamber of Marine Commerce.

The survey report, *Infrastructure Investment Survey of the Great Lakes and St. Lawrence Seaway System*, was commissioned by a coalition of U.S. and Canadian Great Lakes-Seaway maritime industry stakeholders, including the SLSDC, and was conducted by Martin Associates of Lancaster, Pennsylvania.

The purpose of the survey was to document the level of public and private sector investments being made throughout the navigation system. More than 600 entities, including vessel operators, ports, terminals, and government agencies were contacted.

The survey quantifies investments made over the past five years (2009-2013), as well as amounts already committed for future years. Data is broken out by industry sector, by country, by state and province, and by public vs. private sector.

Key survey findings include:

- A total of $7 billion is being spent on asset renewal and infrastructure improvements by both public and private sectors.
- Between 2009-2013, more than $4.7 billion has been invested in ships, ports and terminals, and waterway infrastructure.
- An additional $2.2 billion has been committed for infrastructure investments in the system by companies and governments. The SLSDC's ARP is a subset of this investment amount.
- American, Canadian, and international ship owners are spending more than $4 billion on the biggest renewal of the Great Lakes fleets in 30 years.
- Total port, terminal, and waterway infrastructure investments by state and province total $2.9 billion.

*(The report is available at: http://greatlakesseaway.org/wp-content/uploads/2015/04/Investment-Survey-Final-Version-LR.pdf)*

# SUMMARY OF SLSDC ASSET RENEWAL PROGRAM (ARP) CAPITAL AND MAINTENANCE PROJECTS FYs 2018-2022 $92,555,000

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The SLSDC's Asset Renewal Program (ARP) includes capitalized projects and equipment as well as non-capitalized, maintenance-related projects.

Capital projects and equipment are defined as those of a durable nature that may be expected to have a period of service of more than a year without material impairment of its physical condition and includes equipment, improvements and modifications to existing structures.

Non-capital/maintenance projects include those that do not materially add to the value of the property nor appreciably prolong the life of the infrastructure but merely keeps it in an ordinarily efficient operating condition. Expenditures for these maintenance projects are recognized as operating costs.

Dollar amounts for ARP projects are "project feasibility" estimates that can vary by an industry-recognized 20-30 percent. Funding for each year of the ARP is constrained to annual funding targets as approved by the Secretary and subject to annual appropriations. Project estimates and schedules may fluctuate at various points in the lifespan of the ARP and will be revised as needed throughout the length of the ARP. Many of the projects listed below have additional ARP-related project costs beyond this five-year plan.

**(1)** **Project No. 1: Both Locks – Replace Fendering on Approach Walls (Capital Project) (Estimated at $200,000 for FYs 2018-2022)** – This project is to replace wood fendering on the approach walls at both locks with rubber fenders to protect both the transiting vessels and the approach walls. This is necessary due to the fact that the cost of the wood fenders is increasing such that the rubber fenders have become cost competitive. The rubber fenders that have been installed to date have performed well. *(SLSDC obligated $439,000 over four years in FYs 2009-2010 and 2014-2015)*

**(2)** **Project No. 8: Floating Navigational Aids – Upgrade/Replace (Capital Project) (Estimated at $900,000 for FYs 2018-2022)** – This is an ongoing program to replace floating navigational aids/buoys and winter markers that have been damaged over the years, on an as required basis. The Corporation is responsible for approximately 100 buoys and 50 winter markers. In addition, the Corporation has purchased and is testing all-season buoys to determine what types will work in the Seaway. *(SLSDC obligated $341,000 over five years in FYs 2009-2010 and 2013-2015)*

**(3)** **Project No. 9: Corporation Equipment – Replace Heavy and Light Equipment, Maintenance Vehicles and Shop Equipment (Capital Project, Capital Equipment, and Non-Capital Maintenance Equipment) (Estimated at $1,850,000 for FYs 2018-2022)** – This is an ongoing program to replace heavy and light equipment, vehicles and shop equipment as they become worn out and unserviceable. Heavy and light equipment include such items as cranes, dump trucks, snowplows, backhoes, graders, front-end

loaders and assorted shop equipment. Equipment and vehicles are inspected regularly and their replacement is prioritized based on the results of those inspections. (*SLSDC obligated $2.8 million over eight years in FYs 2009-2016)*

**(4)** **Project No. 10: Both Locks – Upgrade Power Supply Infrastructure from Moses-Saunders Dam to Both Locks and Adjacent Facilities (Non-Capital Maintenance Project) (Estimated at $450,000 for FYs 2018-2022)** – This project is for upgrading the infrastructure that supplies power to Eisenhower and Snell Locks and to the Corporation's Maintenance Facility. The power is furnished directly from the Moses-Saunders Power Dam over infrastructure that is almost 60 years old. The loss of power from the Moses-Saunders Power Dam makes it necessary to use diesel generators, which are expensive to operate, to continue operation of Eisenhower and Snell Locks and the Maintenance Facility. Additionally, the diesel generators will not provide enough power to support all lock and maintenance operations. (*SLSDC obligated $429,000 over seven years in FYs 2009-2014 and 2016)*

**(5)** **Project No. 11: Fixed Navigational Aids – Rehabilitate (Capital Project and Non-Capital Maintenance Project) (Estimated at $400,000 for FYs 2018-2022)** – This project is for rehabilitating fixed navigational aids in the Seaway. Many of the structures are almost 60 years old and are in need of more than routine repairs. Many of these structures have concrete bases that are partially underwater and have experienced varying degrees of damage from water, ice, and freeze-thaw cycles. Any repairs to the foundations will require divers as well as the use of a tug and barge with crane to complete. Failure of a fixed aid would likely make replacement necessary at a cost significantly higher than repairing the existing structure. (*SLSDC obligated $114,000 over six years in FYs 2010-2015)*

**(6)** **Project No. 12: Corporation Equipment – Upgrade/Replace Floating Plant (Capital Project, Capital Equipment, and Non-Capital Maintenance Project) (Estimated at $21,200,000 for FYs 2018-2022)** – This is an ongoing program to rehabilitate and/or replace the Corporation's floating plant that is utilized for maintaining the locks and navigation channels. This multi-year project includes: replacing the SLSDC's tugboats *Robinson Bay* and *Performance*; upgrading the buoy tender barge; purchasing a boat to be used for hydrographic surveying with upgraded surveying equipment and software; purchasing a small boat for emergency response; purchasing a spud barge/scow for work on navigational aids and for emergency/spot dredging; and rehabilitating the SLSDC's crane barge/gatelifter *Grasse River*, which would have to be utilized if a miter gate were damaged and had to be replaced.

The most significant project over the next five years is the replacement of the SLSDC's two tugboats. The first tugboat to replace, *Robinson Bay* (103 feet long), is almost 60 years old and the expenses incurred in maintaining it have increased significantly in recent years. The new tugboat will achieve greater operational and cost-savings efficiencies, especially for navigation aid maintenance and retrieval/placement at the end and start of each navigation season. Currently, the SLSDC must use its buoy barge to move or replace any navigation aid, and tug crews are unable to bunk onboard the tug during multi-day buoy runs resulting in lodging and other travel-related expenses. The tugboat is the SLSDC's primary watercraft for emergency responses, ice breaking

operations, navigation aids placement, and other operational activities. The SLSDC's *Robinson Bay* is the only icebreaking asset in the region.

The SLSDC's smaller tugboat *Performance* (52 feet long) is used for buoy positioning at the beginning of each navigation season, assisting the Robinson Bay during buoy tending operations at the beginning and end of each navigation season, moving buoys back onto station during the navigation season and for assisting the Robinson Bay with moving the gatelifter crane barge. The Performance has been experiencing serious corrosion issues with the hull and some of the appurtenances. The SLSDC has had to remove the Performance from the water for inspection, blast cleaning, repair and repainting of the hull on a recurring basis at a significant cost to ensure that it continues to be serviceable.

**(7)** **Project No. 14: Corporation Facilities – Replace Paving and Drainage Infrastructure (Capital Project) (Estimated at $4,500,000 for FYs 2018-2022)** – This project is for improving the pavement and drainage along lock approach walls as well as the roadways, public parking, and work areas at all Corporation facilities. In Upstate New York, the damage to pavements caused by winter conditions is significant. If repairs are not made before the damage is too severe, complete replacement of the pavement down to and often including the base materials is required at a much higher cost. *(SLSDC obligated $2.8 million over three years in FYs 2009-2011)*

**(8)** **Project No. 15: Eisenhower Lock Highway Tunnel – Rehabilitate (Capital Project and Non-Capital Maintenance Project) (Estimated at $1,500,000 for FYs 2018-2022)** – This is an ongoing project to maintain the highway tunnel which goes through the upper sill area of Eisenhower Lock, providing the only access to the north sides of both Eisenhower and Snell Locks, to the New York Power Authority's Robert Moses Power Project, and to the New York State Park on Barnhart Island.

This project includes grouting to limit the water leaking into the tunnel, upgrading the tunnel lighting, replacing damaged/missing tiles from the walls and ceiling, replacing deteriorated/damaged gratings and railings, stabilizing/repairing wingwalls at the tunnel approaches and clearing tunnel drains which are becoming plugged with concrete leachate products. Due to the fact that this tunnel is the only means of access to the facilities noted above, any problems that would make it necessary to close the tunnel for repair would have very significant impacts. (*SLSDC obligated $1.6 million over seven years in FYs 2009-2012 and 2014-2016)*

**(9)** **Project No. 16: Corporation Technologies - Upgrade GPS/AIS/TMS (Capital Project and Capital Equipment) (Estimated at $400,000 for FYs 2018-2022)** – This project is to expand the use of the Seaway's Global Positioning System (GPS)/Automatic Identification System (AIS) navigation technologies, which are incorporated into the Seaway's binational Traffic Management System (TMS). Future upgrades will further improve the safety for vessels transiting the Seaway. Plans are to use these technologies to enable vessels to better identify hazards at times of limited visibility. *(SLSDC obligated $190,000 over four years in FYs 2009-2010 and 2012-2013)*

**(10)** **<u>Project No. 17</u>: Navigation Channels – Dredge U.S. Sectors to Maintain Design Grade and Dispose of Sediments (Non-Capital Maintenance Project) (Estimated at $12,000,000 for FYs 2018-2022)** – This project is for dredging of the U.S. Seaway navigation channel to remove sediment and to maintain the design grade for the channel bottom. Maintenance dredging areas include the intermediate pool (between Eisenhower and Snell Locks), the international tangent section to the east of Snell Lock, and several other sections of U.S. waters west of Eisenhower Lock. FY 2018 and 2020 funding will address high spots than still remain and silting that has occurred since the completion of earlier maintenance dredging projects and begin work on other sections of the St. Lawrence River under U.S. jurisdiction. (*SLSDC obligated $8.1 million over six years in FYs 2009 and 2011-2015)*

**(11)** **<u>Project No. 19</u>: Corporation Facilities – Upgrade Electrical Distribution Equipment (Capital Project) (Estimated at $1,300,000 for FYs 2018-2022)** – This project is for upgrading electrical distribution equipment at both Eisenhower and Snell Locks and at the Maintenance Facility to insure continued reliability. The majority of this equipment is almost 60 years old. *(SLSDC obligated $1.1 million over six years in FYs 2010-2015)*

**(12)** **<u>Project No. 20</u>: Both Locks – Upgrade Lock Status/Controls (Capital Project and Non-Capital Maintenance Project) (Estimated at $500,000 for FYs 2018-2022)** – This project is for upgrading the lock/equipment status systems and the lock operating controls at both Eisenhower and Snell Locks. At present, all of the major components are monitored and controlled by the new computerized system. Adding control of some of the less critical components and more in depth monitoring of the status of all components will improve the effectiveness of preventive maintenance activities and result in increased reliability. *(SLSDC obligated $487,000 over eight years in FYs 2009-2016)*

**(13)** **<u>Project No. 21</u>: Both Locks – Compressed Air Systems – Upgrade/Replace (Capital Project) (Estimated at $500,000 for FYs 2018-2022) –** This project is for upgrading the compressed air systems and for replacing corroded piping at Eisenhower and Snell Locks which provide compressed air for various systems at the locks, for maintenance work and for air curtains and bubblers utilized to control ice in and around the locks during the opening and closing of the navigation seasons. The ability of the existing compressed air systems to provide the required volumes and/or pressures reliably is becoming a problem. *(SLSDC obligated $816,000 over five years in FYs 2009-2012 and 2015)*

**(14)** **<u>Project No. 22</u>: Both Locks – Install Vessel Self Spotting Equipment (Capital Project) (Estimated at $200,000 for FYs 2018-2022)** – This project is for installing equipment at the U.S. Seaway locks such that transiting vessels can spot/locate themselves in the lock. This new technology, once fully implemented, will eliminate the need for Lock Operations' personnel to spot vessels in a lock. *(SLSDC obligated $422,000 over two years in FYs 2014-2015)*

**(15)** **<u>Project No. 23</u>: Both Locks – Install Hands-Free Mooring System (Capital Project) (Estimated at $3,250,000 for FYs 2018-2022)** – The funding for this project is to complete the installation of the hands-free mooring (HFM) system at the U.S. Snell Lock. The system was funded and will be installed at the U.S. Eisenhower Lock with previous

years' funding. The Eisenhower Lock HFM system is expected to become operational with the start of the 2018 navigation season.

The Seaway's HFM project is the first use of this technology for an inland waterway to safely transit commercial vessels through a lock system. The new technology allows commercial ships to transit safely and efficiently, while also enhancing workplace and operational safety conditions. In May 2015, the Seaway's HFM technology was recognized by the Organization for Economic Cooperation and Development (OECD) with the Promising Innovation in Transport Award.

This technology has been used previously to secure ships to dock walls, but this is the first time it is being applied to secure ships through a lock transit. The HFM system uses vacuum pads, each of which provides up to 20 tons of holding force, mounted on vertical rails inside the lock chamber wall to secure the ship during the lockage process as it is raised or lowered while keeping it at a fixed distance from the lock wall. The last step in the lockage operation consists of releasing the vacuum and retracting the pads so that the vessel is able to sail safely out of the lock.

The Canadian St. Lawrence Seaway Management Corporation (SLSMC) began testing the HFM technology in 2007 for potential use to replace the traditional practice of manually securing commercial vessels within the Seaway locks with mooring lines. Practical application began in earnest in late 2013. Testing by the SLSMC led to a fourth generation design, which includes three units with two vacuum pads on each unit, mounted on slots in the lock chamber wall. The SLSMC and Transport Canada are committed to installing the HFM system at the Canadian Seaway locks by the end of 2017.

Once fully implemented at all of the U.S. and Canadian Seaway locks, the HFM system will produce a number of significant benefits involving workplace safety, carrier operating costs, transit efficiencies, and system competitiveness. *(SLSDC obligated $13 million over three years in FYs 2014-2016)*

**(16)** **<u>Project No. 24</u>: Both Locks – Structural Repair – Grout Leaks in Galleries and Recesses (Non-Capital Maintenance Project) (Estimated at $500,000 for FYs 2018-2022)** – This project is for grouting cracks/joints in the concrete in the galleries and recesses at both Eisenhower and Snell Locks to reduce the infiltration of water into these areas. Water leaking into these areas accelerates the corrosion of the components/ machinery and makes it difficult to maintain these items. *(SLSDC obligated $38,000 in FY 2009)*

**(17)** **<u>Project No. 25</u>: Corporation Facilities – Upgrade/Replace Fire Alarm/Protection Systems (Capital Project) (Estimated at $350,000 for FYs 2018-2022)** – This project if for replacing antiquated fire alarm and fire protection systems (i.e., pumps, piping, and hydrants) at Corporation facilities in Massena, New York. *(SLSDC obligated $8,000 over two years in FYs 2009 and 2011)*

**(18)** **<u>Project No. 26</u>: Corporation Facilities – Upgrade Storage for Lock Spare Parts and Equipment (Capital Project) (Estimated at $750,000 for FYs 2018-2022)** – This project is for constructing shelters/buildings for storage of lock spare parts and equipment to prevent them from corroding. Many of these items are currently not stored under cover and/or are stored in old storage sheds that are in need of repair or replacement. (*SLSDC obligated $1.6 million over five years in FYs 2010-2011 and 2013-2015)*

**(19)** **<u>Project No. 27</u>: Corporation Facilities – Replace Windows and Doors and Repair Building Facades (Capital Project) (Estimated at $1,375,000 for FYs 2018-2022)** – This project is for replacing corroded/inefficient windows and doors with more energy efficient units and for repairing the brick and stone facades which are in need of repair. (*SLSDC obligated $49,000 over five years in FYs 2010-2013 and 2015)*

**(20)** **<u>Project No. 28</u>: Snell Lock – Walls, Sills and Culverts – Rehabilitate Concrete (Capital Project) (Estimated at $4,500,000 for FYs 2018-2022)** – This project is to replace deteriorated/damaged concrete at Snell Lock in all areas except the diffusers. This includes concrete that has been damaged by freeze-thaw cycles and by vessel impacts. This deteriorated/damaged concrete includes the mass concrete that forms the locks walls, the walls, floors and ceilings of the filling and emptying culverts and the gate sills. *(No prior ARP funds were obligated)*

**(21)** **<u>Project No. 29</u>: Eisenhower Lock – Walls, Sills and Culverts – Rehabilitate Concrete (Capital Project) (Estimated at $4,500,000 for FYs 2018-2022)** – This project is to replace deteriorated/damaged concrete at Eisenhower Lock. This includes concrete that was of poor quality when placed during original construction and concrete that has been damaged by freeze-thaw cycles and by vessel impacts. This deteriorated/damaged concrete includes the mass concrete that forms the locks walls, the walls, floors and ceilings of the filling and emptying culverts and the gate sills. This project includes replacing concrete to depths ranging between approximately 8 inches and 24 inches. *(SLSDC obligated $209,000 in FY 2010)*

**(22)** **<u>Project No. 30</u>: Eisenhower Lock – Ice Flushing System – Upgrade (Capital Project) (Estimated at $200,000 for FYs 2018-2022)** – This project is for making improvements to the ice flushing system at Eisenhower Lock. This system was installed in the early 1980's and is utilized for flushing ice from the lock chamber to make room for a vessel and to prevent/ minimize damage to the vessel and the lock structures/components. *(No prior ARP funds were obligated)*

**(23)** **<u>Project No. 32</u>: Snug Harbor – Rehabilitate Spare Gate Storage and Assembly Area (Capital Project) (Estimated at $325,000 for FYs 2018-2022)** – This project is for rehabilitating the spare miter gate storage and assembly area at Snug Harbor. The work will include repair of the spare gate assembly pads and their supporting piles, repairs to sheetpile bulkheads and maintenance of the spare miter gates and gate assembly towers. *(SLSDC obligated $2.5 million over four years in FYs 2010-2011 and 2013-2014)*

**(24)** **<u>Project No. 33</u>: Both Locks – Upgrade Drainage Infrastructure in Galleries and Recesses (Capital Project) (Estimated at $250,000 for FYs 2018-2022)** – This project is to open existing drains, to drill new drains or to install pumps and piping in the galleries and machinery recesses at both Eisenhower and Snell Locks. The drains are being filled up with concrete leachate products which slow and/or stop the drains and cause flooding of the galleries and machinery recesses. (*SLSDC obligated $309,000 over three years in FYs 2013-2015)*

**(25)** **<u>Project No. 34</u>: Both Locks – Improve Ice Control (Capital Project) (Estimated at $400,000 for FYs 2018-2022)** – This project is to improve the methods/equipment used to control ice in and around both U.S. Seaway locks during the opening and closing of each navigation season. Air curtains and bubblers are currently used to minimize the ice entering a lock chamber and to move it away from the miter gates. Backhoes are used for removing ice from the lock walls, which reduces the width available for transiting vessels. Improving existing systems/equipment and utilizing new technologies would make operations during icy conditions more efficient and would minimize damages to the lock components and transiting vessels. *(SLSDC obligated $7,000 in FY 2010)*

**(26)** **<u>Project No. 35</u>: Vessel Mooring Cells – Rehabilitate and Extend (Capital Project) (Estimated at $300,000 for FYs 2018-2022)** – This project is for rehabilitating and extending the vessel mooring cells upstream of Eisenhower Lock and in the Intermediate Pool between the locks. These mooring cells are available for vessels with problems to tie to until the problems can be corrected and/or for vessels to tie to for inspections. The existing cells are almost 60 years old, are in a state of disrepair and are too short for current Seaway length vessels. *(No prior ARP funds were obligated)*

**(27)** **<u>Project No. 36</u>: Eisenhower Lock – Diffusers – Rehabilitate/Replace (Capital Project) (Estimated at $2,500,000 for FYs 2018-2022)** – This project is to replace deteriorated/damaged concrete in the diffusers at Eisenhower Lock. This includes poor quality concrete used during original construction of the locks as well as concrete that was damaged by freeze-thaw cycles. The diffusers are the outlet structures used to dampen the flow of water when the lock is emptied. *(No prior ARP funds were obligated)*

**(28)** **<u>Project No. 37</u>: Eisenhower Lock – Construct Drydock for Vessel Maintenance (Capital Project) (Estimated at $1,000,000 for FYs 2018-2022)** – This project is for constructing a drydock in Eisenhower Lock so that repairs to the Corporation's floating plant can be made on site. Because a lock is dewatered in the winter, it could serve as a drydock by installing a floor and some pedestals/blocking in a section of the lock to accommodate the Corporation's vessels. This would save both the cost of transporting vessels to a drydock typically located in the Great Lakes and the daily rate costs associated with drydocking a vessel. *(No prior ARP funds were obligated)*

**(29)** **<u>Project No. 43</u>: Both Locks – Miter Gate Machinery – Upgrade/Replace (Capital Project) (Estimated at $850,000 for FYs 2018-2022)** – This project is for rehabilitating the operating machinery for the miter gates at both locks. This machinery is almost 60 years old and needs to be upgraded to insure its continued reliability. *(SLSDC obligated $5.4 million over six years in FYs 2011-2016)*

**(30)** **<u>Project No. 44</u>: Both Locks – Ship Arrestor Machinery – Upgrade/Replace (Capital Project) (Estimated at $1,000,000 for FYs 2018-2022)** – This project is for replacing/upgrading the operating machinery for the ship arrestors at both Eisenhower and Snell Locks. The ship arrestors protect the miter gates from damage that would be caused should a vessel malfunction, making it unable to stop. This operating machinery is almost 60 years old and needs to be upgraded to insure continued reliability. *(No prior ARP funds were obligated)*

**(31)** **<u>Project No. 46</u>: Both Locks – Guidewall Extensions – Rehabilitate (Capital Project) (Estimated at $800,000 for FYs 2018-2022)** – This project is to repair damage to the guidewall extensions located at the upstream end of Eisenhower Lock and at the downstream end of Snell Lock. These structures were erected after original construction of the locks to lengthen the approach walls, which are used to assist vessels entering the locks. These structures are comprised of sheet pile cells with bridge spans and are not as stable as the original mass concrete guidewalls. They have been damaged by vessel impacts over the years and require rehabilitation to maintain their serviceability. *(No prior ARP funds were obligated)*

**(32)** **<u>Project No. 47</u>: Eisenhower Lock – Vertical Lift Gate – Structural Rehabilitation (Capital Project) (Estimated at $2,000,000 for FYs 2018-2022)** – This project is for blast cleaning and painting the vertical lift gate at Eisenhower Lock to prevent further corrosion. The vertical lift gate is an emergency closure designed to be raised in the event of a miter gate failure to prevent loss of the power pool. This gate has not been cleaned and painted in over 30 years. *(No prior ARP funds were obligated)*

**(33)** **<u>Project No. 48</u>: Both Locks – Stiffleg Derricks – Upgrade (Capital Project) (Estimated at $1,000,000 for FYs 2018-2022)** – This project is for upgrading the stiffleg derricks at both Eisenhower and Snell Locks. There is a stiffleg derrick located at each end of each lock. These are hoisting devices utilized to place the stoplogs, which are the temporary closure structures required for dewatering a lock for inspection and/or repair of the underwater components. These units are of riveted construction and are almost 60 years old. *(No prior ARP funds were obligated)*

**(34)** **<u>Project No. 50</u>: Snell Lock – Diffusers – Rehabilitate/Replace (Capital Project) (Estimated at $2,500,000 for FYs 2018-2022)** – This project is to replace deteriorated/damaged concrete in the diffusers at Snell Lock. This is primarily concrete that was damaged by freeze-thaw cycles. The diffusers are the outlet structures used to dampen the flow of water when the lock is emptied. *(No prior ARP funds were obligated)*

**(35)** **<u>Project No. 51</u>: Corporation Facilities – Upgrade Physical Security to Meet HSPD-12 Requirements (Capital Project and Non-Capital Maintenance Project) (Estimated at $100,000 for FYs 2018-2022)** – This project is for continuing to improve the physical security at Corporation facilities to meet HSPD-12 requirements. *(SLSDC obligated $425,000 over six years in FYs 2010-2015)*

**(36)** **<u>Project No. 52</u>: Corporation Facilities – Eisenhower Lock Visitors' Center – Replace/Upgrade (Capital Project) (Estimated at $5,000,000 for FYs 2018-2022**) – The SLSDC is proposing to replace the Dwight D. Eisenhower Lock Visitors' Center with a new facility. Each year, the almost 60-year-old Center is visited by more than 50,000 people and is an important attraction for Upstate New York tourism. The Center provides historical displays on the St. Lawrence Seaway and U.S. President Eisenhower and also includes observation decks for tourists to watch vessels transiting the lock. Earlier requests for this project were denied and the SLSDC was directed to complete a more thorough analysis of the feasibility of and costs associated with the renovation vs. construction.

In the summer of 2011, the SLSDC contracted with the architect, engineering, and land surveying firm Aubertine and Currier Architects to perform a condition survey, conceptual design, and cost analysis for the Visitors' Center for the two options – renovation and new construction. At that time, the cost estimate to construct a new center was $3.9 million, while the renovation option was $3.8 million. In 2014, the SLSDC awarded a contract to construct a new restroom and security guard facility, which became operational with the start of the 2015 summer season.

As part of this first phase of Center improvements, the SLSDC again contracted with Aubertine and Currier to perform preliminary design work as well as look at how the FY 2014 improvements could be integrated with either a renovated or a newly constructed main facility. As part of its work, Aubertine and Currier updated the renovation vs. new construction cost estimates to reflect the inclusion of the first phase of work to be funded in FY 2014. The updated preliminary construction cost estimates were $3.1 million for a new facility as compared to $2.9 million for refurbishing the current building. These estimates did not include furnishings, displays, or site improvements.

In its draft findings, Aubertine and Currier noted:

*"Our professional opinion (based upon scope of work and cost to renovate the existing facility) would be to start by removing the existing Security Trailer and abating and demolishing the existing Restroom Facility as part of Phase I. We would than suggest building a new Security/Restroom Building as outlined in this study. As part of Phase II (being that there is very little to salvage) we would suggest abating and demolishing the 1950's Visitors' Center and building a new energy-efficient facility to meet the needs of the public, the SLSDC, the security setbacks, and other current codes and regulations."*

A new facility will address many of the shortcomings of the current one, including security, operational safety (current center location does not allow crane accessibility on the south side of the lock), and accessibility to the disabled. *(SLSDC obligated $1.1 million over four years in FYs 2011 and 2013-2015)*

**(37)** **<u>Project No. 57</u>: Corporation Technologies – Upgrade Network Security (Capital Project and Non-Capital Maintenance Project) (Estimated at $200,000 for FYs 2018-2022)** – This project enhances and improves the SLSDC's IT network infrastructure and security in Massena, New York. The growth of more technology-based ARP improvements is resulting in an increased need to expand and refine the SLSDC's

network environment. The SLSDC is working closely with DOT's Office of the Chief Information Officer to coordinate and make these improvements. *(SLSDC obligated $184,000 over three years in FYs 2011-2013)*

**(38)** **Project No. 58: Corporation Facilities – Upgrades to Meet Sustainability and Energy Goals (Capital Project) (Estimated at $400,000 for FYs 2018-2022)** – This project is to implement the recommendations of an energy/water conservation audit and a retro-commissioning study both of which were conducted by consultants. These upgrades will be made to meet the sustainability requirements of the various executive orders and acts. *(SLSDC obligated $147,000 over six years in FYs 2011-2016)*

**(39)** **Project No. 59: Corporation Facilities – Communications Improvements (Capital Project) (Estimated at $200,000 for FYs 2018-2022)** – This is a multi-year project to upgrade the communication equipment/systems utilized by SLSDC Operations and Maintenance personnel and by Vessel Traffic Controllers to communicate with commercial vessels. SLSDC personnel are currently unable to communicate when working in the machinery recesses at the locks. Installing new equipment to provide this service will increase the safety for personnel working in these areas and improve their ability to troubleshoot and resolve machinery problems at these locations. Upgrading the communications equipment used by Lock Operations' personnel and Vessel Traffic Controllers will improve the quality and reliability of these communications, which are critical to safe and efficient navigation in the Seaway. *(SLSDC obligated $33,000 in FYs 2015 and 2016)*

**(40)** **Project No. 60: Both Locks – Improve Access to and Rehabilitate Machinery in Crossovers and Recesses (Capital Project) (Estimated at $400,000 for FYs 2018-2022)** – This project is a multi-year project to rehabilitate the operating machinery that is located within the crossover galleries and recesses at both locks. This equipment will be cleaned and coated to remove existing and to prevent further corrosion. In addition, severely corroded components such as support structures and anchor bolts will be replaced with corrosion resistant materials. *(SLSDC obligated $716,000 in FYs 2015 and 2016)*

**(41)** **Project No. 61: Both Locks – Replace Recess Covers on Lock Walls (Capital Project) (Estimated at $225,000 for FYs 2018-2022)** – This is a multi-year project to replace steel and steel/concrete composite covers that are used to access the lock operating machinery located in the galleries and recess at both locks. Many of these recess covers are original and will be almost 60 years old when replaced. They have deteriorated due to the use of salt to keep the areas in which these covers are located clear of ice and they have been damaged by trucks and heavy equipment driving over them. The plan is to replace them with more durable/maintainable materials designed for greater loads. *(SLSDC obligated $14,000 in FYs 2015 and 2016)*

**(42)** **Project No. 62: Both Locks – Install/Upgrade Air Curtains (Capital Project) (Estimated at $4,000,000 for FYs 2018-2022)** – Both Eisenhower and Snell Locks have air curtains across the upstream entrance to the lock. These are pipes mounted on the channel bottom which distribute air to stop floating ice from entering the lock during the Seaway opening and closing periods. This project is to improve the effectiveness of

those two air curtains and to install air curtains at the downstream entrances to both locks. *(No prior ARP funds were obligated)*

**(43)** **Project No. 63: Both Locks – Install Electronic Pleasure Craft Toll Collection Facilities (Capital Project) (Estimated at $100,000 for FYs 2018-2022)** – This project is to install facilities at the upstream approach to Eisenhower Lock and at the downstream approach to Snell Lock so that operators of transiting pleasure boats can pay their tolls electronically. Currently, SLSDC linehandlers at the locks collect cash from those boat operators that have not paid on-line before entering the Seaway. *(No prior ARP funds were obligated)*

**(44)** **Project No. 64: Corporation Facilities – Upgrade Lock Structures Maintenance Building (Capital Project) (Estimated at $150,000 for FYs 2018-2022)** – This project is to make improvements to a building that was constructed and is set up for blast cleaning, repairing and painting large steel structures including but not limited to stoplogs, ship arrestors, and roof cover bar joists. These improvements will make it much more efficient to change operations within the building by not having to relocate vacuum, grit recycling, and air handling equipment when setting up for different operations. *(No prior ARP funds were obligated)*

**(45)** **Project No. 66: Corporation Facilities – Upgrade/Replace CCTV Systems (Capital Project) (Estimated at $150,000 for FYs 2018-2022)** – This project is for upgrading the Corporation's CCTV system and for providing additional cameras, monitors, and data recording capabilities for the hands-free mooring systems to be installed at Eisenhower and Snell Locks. The existing CCTV system has exceeded its expected service life and daily security and vessel traffic monitoring has become increasingly difficult due to frequent equipment failures and lack of redundancy. *(No prior ARP funds were obligated)*

**(46)** **Project No. 67: Both Locks – Improve Lighting (Capital Project) (Estimated at $400,000 for FYs 2018-2022)** – This is an ongoing rehabilitation program to upgrade or replace inefficient lighting equipment with high-efficiency lighting equipment at Eisenhower and Snell Locks and at the Maintenance Facility. These improvements are needed to replace deteriorated existing equipment, improve illumination for employee work areas, and meet developing Executive Order and DOT policy requirements for sustainability. *(No prior ARP funds were obligated)*

**(47)** **Project No. 68: Corporation Facilities – Repair/Replace Security Fencing (Capital Project) (Estimated at $400,000 for FYs 2018-2022)** – This is an ongoing maintenance program to repair or replace security fencing and personnel and vehicle entry gates at Corporation facilities. These improvements are needed to rehabilitate deteriorated/damaged fencing and gates and to eliminate barrier gaps that are critical to maintaining perimeter and entry security. *(No prior ARP funds were obligated)*

**(48)** **Project No. 69: Both Locks – Repair/Replace Corroded Piping and Malfunctioning Valves (Capital Project) (Estimated at $500,000 for FYs 2018-2022)** – This is an ongoing maintenance program to repair and/or replace air and water piping, fittings, valves and monitoring equipment at Eisenhower and Snell Locks. The lock facilities

have extensive air and water distribution systems that are continuously subject to corrosion damage. Repairs are needed to clean and paint or replace deteriorated piping and appurtenances to maintain these critical utilities. *(No prior ARP funds were obligated)*

**(49)** **Project No. 71: Corporation Facilities – Facility and Underground Utilities Improvements (Capital Project and Non-Capital Maintenance Project) (Estimated at $200,000 for FYs 2018-2022)** – This project is to repair and/or replace corroded/malfunctioning underground utilities including water, wastewater, storm drain, and air piping as well as electrical conduits and conductors. It also includes surveying Corporation facilities and underground utilities to locate existing features and revise facility maps and master utility plans. Various improvements and additions over the years have necessitated the need to verify the type and location of all existing facilities and utilities and update this information on record documents, maps, and plans. *(No prior ARP funds were obligated)*

**(50)** **Project No. 72: Corporation Facilities – Stormwater Upgrades (Capital Project) (Estimated at $100,000 for FYs 2018-2022)** – This project evaluates existing stormwater systems at Corporation facilities and rehabilitates or installs upgrades to meet current Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (NYSDEC) standards. These improvements are also needed for expanding stormwater collection and flow control during increasingly severe weather events to help avoid potential scouring or flooding damage to critical infrastructure. *(No prior ARP funds were obligated)*

**(51)** **Project No. 73: Eisenhower Lock – Install Stoplog Slots Upstream of the Highway Tunnel (Capital Project) (Estimated at $3,000,000 for FYs 2018-2022)** – This project is for installing stoplog slots upstream of the highway tunnel that passes through the upstream concrete sill at Eisenhower Lock. This will allow the Corporation to install stoplogs and dewater the upstream sill area to inspect and repair the concrete around the highway tunnel. *(No prior ARP funds were obligated)*

**(52)** **Project No. 74: Corporation Facilities – Building Rehabilitation (Capital Project and Non-Capital Maintenance Project) (Estimated at $400,000 for FYs 2018-2022)** – This is an ongoing maintenance program to rehabilitate, repair, or replace building systems and office or workshop spaces utilized by Corporation employees. These improvements are needed to update building systems, finishes, and/or furnishings that are exceeding their intended service life or requiring excessive resources to maintain. *(No prior ARP funds were obligated)*

**(53)** **Project No. 75: Maintenance Facility – Install Vehicle Corrosion Prevention Facility (Capital Project) (Estimated at $250,000 for FYs 2018-2022)** – This project is to design and construct a vehicle wash building including equipment and utilities for maintaining and extending the service life of Corporation vehicles. Winter conditions in Upstate New York require the use of road salt for typically 4-6 months per year. A vehicle wash building improves the Corporation's ability to clean vehicles more regularly and significantly reduce the corrosive effects of road salt on these vehicles. *(No prior ARP funds were obligated)*

**(54)** **<u>Project No. 76</u>: Maintenance Facility – Upgrade Waste Storage and Lead Decontamination Rooms (Capital Project) (Estimated at $50,000 for FYs 2018-2022)** – This project rehabilitates and upgrades the hazardous materials and waste and waste oil storage buildings and lead decontamination rooms to meet current EPA, NYSDEC, and Occupational Safety and Health Administration (OSHA) standards. These improvements are needed to continuously maintain updated hazardous materials and waste storage and to provide upgraded decontamination facilities for Corporation employees. *(No prior ARP funds were obligated)*

**(55)** **<u>Project No. 77</u>: Corporation Facilities – Upgrade Telephone System (Capital Project) (Estimated at $30,000 for FYs 2018-2022)** – This project is to upgrade the Corporations' telephone system which serves all of the facilities in Massena, New York. These upgrades will include the head end equipment at the Administration Building, the media gateways at the locks and Maintenance Facility, and the individual handsets and conference phones. *(No prior ARP funds were obligated)*

**(56)** **<u>Project No. 78</u>: Corporation Facilities – Upgrade Weather Stations (Capital Project) (Estimated at $50,000 for FYs 2018-2022)** – This project is to upgrade the two weather stations that are located in the American Narrows in the upper part of the St. Lawrence River. The weather stations are equipped with visibility meters which provide critical information to the Vessel Traffic Controllers which enables them to determine when it is necessary to suspend navigation in that section of the river when visibility issues make it unsafe for ships to transit. *(No prior ARP funds were obligated)*

**(57)** **<u>Project No. 80</u>: Corporation Facilities – Renewable Energy Project (Capital Project) (Estimated at $2,000,000 for FYs 2018-2022)** – This project evaluates, designs, and constructs a renewable energy system to meet Executive Order and DOT policy requirements for on-site renewable energy generation. The Corporation will work with a consultant to determine a feasible system that meets policy requirements and then to construct and commission an approved system in Massena, New York. *(No prior ARP funds were obligated)*

## SLSDC ARP Obligations (FYs 2009-2016)

| ARP # | ARP Project Description | FY 2009 | FY 2010 | FY 2011 | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Both Locks - Replace Fendering on Approach Walls | $241,600 | $8,091 | $0 | $0 | $0 | $188,725 | $140 | $0 | $438,556 |
| 2 | Both Locks - Rehabilitate Downstream Miter Gates | $0 | $0 | $3,539,935 | $8,384 | $3,009,854 | $203,666 | $0 | $0 | $6,761,839 |
| 3 | Both Locks - Rehabilitate Mooring Buttons, Pins, and Concrete Along Guidewalls and Guardwalls | (Comb. w/ No. 14 | $35,422 | $0 | $0 | $0 | $0 | $0 | $0 | $35,422 |
| 4 | Both Locks - Culvert Valve Machinery - Upgrade to Hydraulic Operation | $4,117,050 | $344,915 | $3,965,005 | $539,889 | $203,678 | $0 | $0 | $0 | $9,170,537 |
| 5 | Both Locks - Rehabilitate Winter Maintenance Lock Covers | $46,698 | $6,638 | $23,781 | $28,335 | $27,906 | $34,254 | $1,700 | $0 | $169,312 |
| 6 | Seaway International Bridge – Perform Structural Rehabilitation and Corrosion Prevention | $3,102,878 | $5,680,707 | $0 | $0 | $0 | $0 | $0 | $0 | $8,783,585 |
| 7 | Both Locks - Culvert Valves - Replace With Single Skin Valves | $0 | $326,898 | $65,591 | $302,468 | $162 | $1,370,028 | $102,091 | $22,641 | $2,189,879 |
| 8 | Floating Navigational Aids - Replace | $61,254 | $54,576 | $0 | $0 | $31,434 | $68,149 | $125,562 | $0 | $340,975 |
| 9 | Corporation Equipment - Replace Heavy and Light Equipment, Maintenance Vehicles, and Shop Equipment | $1,574,504 | $481,052 | $108,038 | $81,623 | $137,393 | $227,151 | $141,124 | $18,486 | $2,769,371 |
| 10 | Both Locks - Upgrade Power Supply Infrastructure from Moses-Saunders Dam to Both Locks and Adjacent Facilities | $19,594 | $231,269 | $93,613 | $28,003 | $17,099 | $38,320 | $0 | $1,442 | $429,340 |
| 11 | Fixed Navigational Aids - Rehabilitate | $0 | $10,998 | $16,217 | $21,048 | $29,210 | $14,199 | $22,456 | $0 | $114,128 |
| 12 | Corporation Equipment - Upgrade/Replace Floating Plant | $678,745 | $1,627,925 | $1,908,563 | $2,160,169 | $860,413 | $572,622 | $313,398 | $9,214,579 | $17,336,414 |
| 13 | Corporation Facilities - Replace Roofs | $143,949 | $0 | $3,348 | $89,024 | $17,820 | $0 | $283,426 | $27,340 | $564,907 |
| 14 | Corporation Facilities - Replace Paving and Drainage Infrastructure | $921,837 | $1,829,621 | $85,481 | $0 | $0 | $0 | $0 | $0 | $2,836,939 |
| 15 | Eisenhower Lock - Highway Tunnel - Rehabilitate | $26,636 | $271,804 | $99,459 | $1,523 | $0 | $1,143,224 | $33,583 | $10,747 | $1,586,976 |
| 16 | Corporation Technologies - Upgrade GPS/AIS/TMS | $100,997 | $76,451 | ($3,328) | $10,000 | $6,350 | $0 | $0 | $0 | $190,470 |
| 17 | Navigation Channels - Dredge U.S. Sectors to Maintain Design Grade and Dispose of Sediments | $4,279,556 | $0 | $3,662,267 | $99,714 | $100 | $100 | $19,542 | $0 | $8,061,279 |
| 18 | Eisenhower Lock - Vertical Lift Gate - Replace Wire Ropes | $0 | $487,750 | $109,490 | $268,549 | $0 | $0 | $0 | $0 | $865,789 |
| 19 | Corporation Facilities - Upgrade Electrical Distribution Equipment | $0 | $753,400 | $306,847 | $41,304 | $1,465 | $420 | $7,384 | $0 | $1,110,820 |
| 20 | Both Locks - Upgrade Lock Status/Controls | $8,558 | $139,805 | $89,507 | $37,549 | $76,722 | $32,570 | $37,698 | $64,749 | $487,158 |
| 21 | Both Locks - Compressed Air Systems - Upgrade/Replace | $19,878 | $787,549 | $3,381 | $986 | $0 | $0 | $4,154 | $0 | $815,948 |
| 22 | Both Locks - Install Vessel Self Spotting Equipment | $0 | $0 | $0 | $0 | $0 | $485,201 | $1,491 | ($65,000) | $421,692 |
| 23 | Both Locks - Install Hands-Free Mooring System | $0 | $0 | $0 | $0 | $0 | $686,074 | $10,756,839 | $1,586,248 | $13,029,161 |
| 24 | Both Locks - Structural Repair - Grout Leaks in Galleries and Recesses | $37,561 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $37,561 |
| 25 | Corporation Facilities - Upgrade/Replace Fire Alarm/Protection Systems | $4,148 | $0 | $4,007 | $0 | $0 | $0 | $0 | $0 | $8,155 |
| 26 | Corporation Facilities - Upgrade Storage for Lock Spare Parts | $0 | $418,000 | $12,144 | $0 | $1,115,266 | $18,572 | $2,380 | $0 | $1,566,362 |
| 27 | Corporation Facilities - Replace Windows and Doors and Repair Building Facades | $0 | $33,776 | $5,537 | $8,070 | $167 | $0 | $1,811 | $0 | $49,361 |
| 29 | Eisenhower Lock - Walls, Sills, and Culverts - Rehabilitate Concrete | $0 | $209,395 | $0 | $0 | $0 | $0 | $0 | $0 | $209,395 |
| 31 | Both Locks - Rehabilitate Upstream Miter Gates | $2,201,585 | $2,478,896 | $347,662 | $14,961 | ($750) | $0 | $0 | $0 | $5,042,354 |
| 32 | Snug Harbor - Rehabilitate Spare Gate Storage and Assembly Area | $0 | $12,734 | $346,600 | $0 | $2,099,934 | $42,445 | $0 | $0 | $2,501,713 |
| 33 | Both Locks - Upgrade Drainage Infrastructure in Galleries and Recesses | $0 | $0 | $0 | $0 | $6,938 | $301,737 | $152 | $0 | $308,827 |
| 34 | Both Locks - Improve Ice Control | $0 | $7,462 | $0 | $0 | $0 | $0 | $0 | $0 | $7,462 |
| 38 | Both Locks - Upgrade/Replace Emergency Generators | $0 | $0 | $0 | $0 | $1,764,008 | $344,313 | $32,774 | $0 | $2,141,095 |
| 39 | Both Locks - Dewatering Pumps - Upgrade Outdated Equipment | $0 | $0 | $0 | $189,763 | $25,721 | $23,568 | $17,936 | $0 | $256,988 |
| 41 | Snell Lock - Install Ice Flushing System Technologies | $0 | $0 | $272,000 | $11,477,293 | $1,577,272 | $90,045 | $128,144 | $498 | $13,545,252 |
| 42 | Both Locks - Miter Gates - Structural Rehabilitation | $0 | $0 | $0 | $210 | $2,898,819 | $3,740,613 | $0 | $0 | $6,639,642 |
| 43 | Both Locks - Miter Gate Machinery - Upgrade/Replace | $0 | $0 | $133,364 | $1,207 | $505 | $3,740,933 | $1,568,096 | $5,827 | $5,449,932 |
| 51 | Corporation Facilities - Upgrade Physical Security to Meet HSPD-12 Requirements | $0 | $24,183 | $21,097 | $352,347 | $20,143 | $5,985 | $977 | $0 | $424,732 |
| 52 | Corporation Facilities - Eisenhower Lock Visitors' Center - Replace | $0 | $0 | $13,042 | $0 | $298,391 | $794,473 | $5,631 | $0 | $1,111,537 |
| 54 | Corporation Facilities - Administration Building - Replace Elevator | $0 | $0 | $140,346 | $0 | $0 | $0 | $0 | $0 | $140,346 |
| 55 | Corporation Facilities - Maintenance Building - Replace Fuel Tanks | $0 | $0 | $189,350 | $2,350 | $0 | $0 | $0 | $0 | $191,700 |
| 56 | Corporation Facilities - Duty Free Store Property - Upgrade Security | $0 | $0 | $13,025 | $0 | $0 | $0 | $0 | $0 | $13,025 |
| 57 | Corporation Technologies - Upgrade Network Security | $0 | $0 | $158,536 | $16,998 | $8,687 | $0 | $0 | $0 | $184,221 |
| 58 | Corporation Facilities - Upgrades to Meet Sustainability and Energy Goals | $0 | $0 | $47,511 | $57,036 | $8,180 | $22,140 | $8,405 | $3,564 | $146,836 |
| 59 | Corporation Facilities - Communications Improvements | $0 | $0 | $0 | $0 | $0 | $0 | $29,000 | $3,996 | $32,996 |
| 60 | Both Locks - Improve Access to and Rehabilitate Machinery in Crossovers and Recesses | $0 | $0 | $0 | $0 | $0 | $0 | $716,052 | $396 | $716,448 |
| 61 | Both Locks - Replace Recess Covers on Lock Walls | $0 | $0 | $0 | $0 | $0 | $0 | $2,200 | $11,532 | $13,732 |
| 65 | Both Locks - Install Lock Wall Guardrails | $0 | $0 | $0 | $0 | $0 | $0 | $548,679 | $14,425 | $563,104 |
| -- | Miscellaneous Expenses | $0 | $443 | $1,700 | $0 | $0 | $0 | $0 | $0 | $2,143 |
| | Asset Renewal Program Total | **$17,587,028** | **$16,339,760** | **$15,783,116** | **$15,838,803** | **$14,242,887** | **$14,189,527** | **$14,912,825** | **$10,921,470** | **$119,815,416** |

**NOTES:**

(1) Rounding may affect the addition of rows and columns in the table.

(2) In FY 2009, ARP Project Nos. 3 and 14 were contractually combined.

(3) The SLSDC expended an additional $474,000, $535,000, $783,000, $672,000, $674,000, $970,000, $620,000, and 478,000 in personnel compensation for staff time associated with ARP work in FYs 2009-2016, respectively.

(4) The miscellaneous expenses of $443 in FY 2010 and $1,700 in FY 2011 were for ARP-related travel costs by SLSDC personnel that could not be linked to a specific ARP project.

# SLSDC Asset Renewal Program (ARP)

## FY 2018 Request / FY 2019-2022 Estimates

| PROJECT NO. | PROJECT TITLE | FIVE-YEAR TOTALS |
|---|---|---|
| 1 | Both Locks -- Replace Fending on Approach Walls | **$200,000** |
| 8 | Floating Navigational Aids - Replace | **$900,000** |
| 9 | Corporation Equipment - Replace Heavy and Light Equipment, Maintenance Vehicles and Shop Equipment | **$1,850,000** |
| 10 | Both Locks - Upgrade Power Supply Infrastructure from Moses-Saunders Dam to Both Locks and Adjacent Facilities | **$450,000** |
| 11 | Fixed Navigational Aids - Rehabilitate | **$400,000** |
| 12 | Corporation Equipment - Floating Plant/Tugs - Replace | **$21,200,000** |
| 14 | Corporation Facilities - Replace Paving and Drainage Infrastructure | **$4,500,000** |
| 15 | Eisenhower Lock - Highway Tunnel - Rehabilitate | **$1,500,000** |
| 16 | Corporation Technologies - Upgrade GPS/AIS/TMS | **$400,000** |
| 17 | Navigation Channels - Dredge U.S. Sectors to Maintain Design Grade and Dispose of Sediments | **$12,000,000** |
| 19 | Corporation Facilities - Upgrade Electrical Distribution Equipment | **$1,300,000** |
| 20 | Both Locks - Upgrade Lock Status/Controls | **$500,000** |
| 21 | Both Locks - Compressed Air Systems - Upgrade/Replace | **$500,000** |
| 22 | Both Locks - Install Vessel Self Spotting Equipment | **$200,000** |
| 23 | Both Locks - Install Hands-Free Mooring System | **$3,250,000** |
| 24 | Both Locks - Structural Repair - Grout Leaks in Galleries and Recesses | **$500,000** |

# SLSDC Asset Renewal Program (ARP)

## FY 2018 Request / FY 2019-2022 Estimates

| PROJECT NO. | PROJECT TITLE | FIVE-YEAR TOTALS |
|---|---|---|
| 25 | Corporation Facilities - Upgrade/Replace Fire Alarm/Protection Systems | **$350,000** |
| 26 | Corporation Facilities - Upgrade Storage for Lock Spare Parts and Equipment | **$750,000** |
| 27 | Corporation Facilities - Replace Windows and Doors and Repair Building Facades | **$1,375,000** |
| 28 | Snell Lock - Walls, Sills and Culverts - Rehabilitate Concrete | **$4,500,000** |
| 29 | Eisenhower Lock - Walls, Sills and Culverts - Rehabilitate Concrete | **$4,500,000** |
| 30 | Eisenhower Lock - Ice Flushing System - Upgrade | **$200,000** |
| 32 | Snug Harbor - Rehabilitate Spare Gate Storage and Assembly Area | **$325,000** |
| 33 | Both Locks - Upgrade Drainage Infrastructure in Galleries and Recesses | **$250,000** |
| 34 | Both Locks - Improve Ice Control | **$400,000** |
| 35 | Vessel Mooring Cells - Rehabilitate and Extend | **$300,000** |
| 36 | Eisenhower Lock - Diffusers - Replace | **$2,500,000** |
| 37 | Eisenhower Lock - Construct Drydock for Vessel Maintenance | **$1,000,000** |
| 43 | Both Locks - Miter Gate Machinery - Upgrade/Replace | **$850,000** |
| 44 | Both Locks - Ship Arrestor Machinery - Upgrade/Replace | **$1,000,000** |
| 46 | Both Locks - Guidewall Extensions - Rehabilitate | **$800,000** |
| 47 | Eisenhower Lock - Vertical Lift Gate - Structural Rehabilitation | **$2,000,000** |

# SLSDC Asset Renewal Program (ARP)

## FY 2018 Request / FY 2019-2022 Estimates

| PROJECT NO. | PROJECT TITLE | FIVE-YEAR TOTALS |
|---|---|---|
| 48 | Both Locks - Stiffleg Derricks - Upgrade | **$1,000,000** |
| 50 | Snell Lock - Diffusers - Replace | **$2,500,000** |
| 51 | Corporation Facilities - Upgrade Physical Security to Meet HSPD-12 Requirements | **$100,000** |
| 52 | Corporation Facilities - Eisenhower Lock Visitors' Center - Replace | **$5,000,000** |
| 57 | Corporation Technologies - Upgrade Network Security | **$200,000** |
| 58 | Corporation Facilities - Upgrades to Meet Sustainability and Energy Goals | **$400,000** |
| 59 | Corporation Facilities - Communications Improvements | **$200,000** |
| 60 | Both Locks - Improve Access to and Rehabilitate Machinery in Crossovers and Recesses | **$400,000** |
| 61 | Both Locks - Replace Recess Covers on Lock Walls | **$225,000** |
| 62 | Both Locks - Install/Upgrade Air Curtains | **$4,000,000** |
| 63 | Both Locks - Install Electronic Pleasure Craft Toll Collection Facilities | **$100,000** |
| 64 | Corporation Facilities - Upgrade Lock Structures Maintenance Building | **$150,000** |
| 66 | Corporation Facilities - Upgrade/Replace CCTV Systems | **$150,000** |
| 67 | Both Locks - Improve Lighting | **$400,000** |
| 68 | Corporation Facilities - Repair/Replace Security Fencing | **$400,000** |
| 69 | Both Locks - Repair/Replace Corroded Piping and Malfunctioning Valves | **$500,000** |

# SLSDC Asset Renewal Program (ARP)

## FY 2018 Request / FY 2019-2022 Estimates

| PROJECT NO. | PROJECT TITLE | FIVE-YEAR TOTALS |
|---|---|---|
| 71 | Corporation Facilities - Facility and Underground Utilities Improvements | **$200,000** |
| 72 | Corporation Facilities - Stormwater Upgrades | **$100,000** |
| 73 | Eisenhower Lock - Install Stoplog Slots Upstream of the Highway Tunnel | **$3,000,000** |
| 74 | Corporation Facilities - Building Rehabilitation | **$400,000** |
| 75 | Maintenance Facility - Install Vehicle Corrosion Prevention Facility | **$250,000** |
| 76 | Maintenance Facility - Upgrade Waste Storage and Lead Decontamination Rooms | **$50,000** |
| 77 | Corporation Facilities - Upgrade Telephone System | **$30,000** |
| 78 | Corporation Facilities - Upgrade Weather Stations | **$50,000** |
| 80 | Corporation Facilities - Renewable Energy Project | **$2,000,000** |
| | **TOTAL** | **$92,555,000** |