Appendix 7 - Debt Affordability Study

State of Hawaii
Debt Affordability Study

12/1/2018

Table of Contents

I. Summary 1

A. Goals and Objectives 1

B. Scope 1

C. Summary of Overall State Debt and State Department Debt Programs 1

D. General Assumptions 2

E. Market Conditions 2

F. Other Considerations 5

II. The Department of Budget and Finance and General Fund Debt 6

A. Debt Profile 7

B. Debt Service Chart 7

C. Credit Ratings 8

D. Schedule of Callable Bonds 8

E. Multi-Year Program Anticipated/Intended Debt Issuance 9

F. Measuring Debt Burden 11

G. Discussion on Debt Affordability, Potential Concerns and Recommendations 15

III. Department of Transportation – Airports 17

A. Debt Profile 18

B. Debt Service Chart 19

C. Credit Ratings 20

D. Schedule of Callable Bonds 20

E. Multi-Year Program Anticipated/Intended Debt Issuance 21

F. Measuring Debt Burden 22

G. Discussion on Debt Affordability, Potential Concerns and Recommendations 27

IV. Department of Transportation – Harbors 29

A. Debt Profile 30

B. Debt Service Chart 30

C. Credit Ratings 31

D. Schedule of Callable Bonds 31
E. Multi-Year Program Anticipated/Intended Debt Issuance 32
F. Measuring Debt Burden 33
G. Discussion on Debt Affordability, Potential Concerns and Recommendations 35
V. Department of Transportation – Highways 36
A. Debt Profile 36
B. Debt Service Chart 37
C. Credit Ratings 37
D. Schedule of Callable Bonds 38
E. Multi-Year Program Anticipated/Intended Debt Issuance 38
F. Measuring Debt Burden 39
G. Discussion on Debt Affordability, Potential Concerns and Recommendations 41
VI. University of Hawaii 42
A. Debt Profile 42
B. Debt Service Chart 43
C. Credit Ratings 44
D. Schedule of Callable Bonds 44
E. Multi-Year Program Anticipated/Intended Debt Issuance 45
F. Measuring Debt Burden 46
G. Discussion on Debt Affordability, Potential Concerns and Recommendations 48
VII. Hawaiian Home Lands 49
A. Debt Profile 49
B. Debt Service Chart 50
C. Credit Ratings 50
D. Schedule of Callable Bonds 51
E. Multi-Year Program Anticipated/Intended Debt Issuance 51
F. Measuring Debt Burden 52
G. Discussion on Debt Affordability, Potential Concerns and Recommendations 53
VIII. Hawaii Housing Finance and Development Corporation 54
A. Debt Profile 54

B. Debt Service Chart 55
C. Credit Ratings 56
D. Schedule of Callable Bonds 56
E. Multi-Year Program Anticipated/Intended Debt Issuance 57
F. Measuring Debt Burden 58
G. Discussion on Debt Affordability, Potential Concerns and Recommendations 59
IX. Department of Business, Economic Development, and Tourism 60
A. Debt Profile 60
B. Debt Service Chart 60
C. Credit Ratings 61
D. Schedule of Callable Bonds 61
E. Multi-Year Program Anticipated/Intended Debt Issuance 61
F. Measuring Debt Burden 61
G. Discussion on Debt Affordability, Potential Concerns and Recommendations 61
Appendix 62
A. Debt Service Assumptions 62
B. General Fund Debt by Series 63
Glossary 64

DEBT AFFORDABILITY STUDY

I. Summary

A. Goals and Objectives

The Director of Finance has undertaken a biennial Debt Affordability Study (Study) in order to optimize the use of limited debt capacity while meeting public spending goals and to ensure the prudent use of debt and to preserve sufficient future debt capacity. The Study has been prepared by PFM Financial Advisors LLC on behalf of the State of Hawaii (State) and Department of Budget and Finance (B&F). The Study summarizes and analyzes the current debt outstanding and future capital plans of the State and State Departments as it evolves over time. The Study aims to aid in decision making with respect to the State and State Department multi-year capital plans and to understand trade-offs while evaluating projects and debt alternatives.

The Study seeks to identify affordability metrics to measure debt burden, assess affordability of proposed debt issuances, ensure the State does not over leverage, and assess overall adequacy of revenues to pay for all obligations including pension and other postemployment benefits (OPEB) costs.

B. Scope

On June 26, 2015, Governor David Y. Ige signed Act 149 (15) directing the Director of Finance to submit a debt affordability study to promote both transparency in budget-making and more informed decisions on capital improvement project and debt issuance authorizations. The Director of Finance is charged with the submission of a debt affordability study to the legislature before the convening of the regular session of each odd-numbered year. The Act is now formalized within the Hawaii Revised Statutes §37C on State Debt and the first such report on affordability was submitted in December 2016 before the start of the 2017 legislative session. This is the second version of the report.

C. Summary of Overall State Debt and State Department Debt Programs

The Department of Budget and Finance plans, monitors and manages the issuance of State bonds. B&F oversees the general management of State debt, including reimbursable and non-reimbursable general obligation (GO) bonds, special assessment bonds, refunding bonds, mortgage credit certificates, short-term loans, certificates of participation (COPs), and municipal lease financings. In addition, B&F has oversight responsibility for revenue bonds and special facility revenue bonds issued by State Departments including the Department of Transportation – Airports, Harbors, and Highways Divisions, University of Hawaii, Hawaiian Home Lands, Department of Business, Economic Development, and Tourism, and Hawaii Housing Finance and Development Corporation.

The Study focuses on each financing program to review outstanding debt, discuss legal limitations, summarize callable bonds, project and analyze multi-year capital plans, and measure affordability based on pertinent metrics and credit and peer considerations.

D. General Assumptions

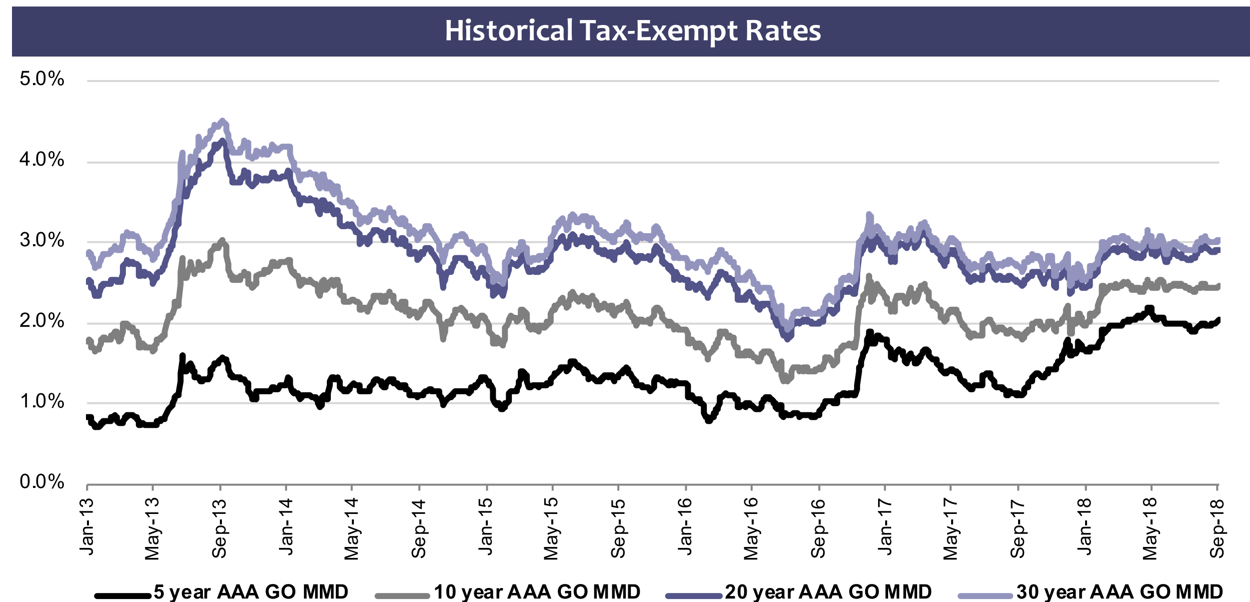
This Study makes certain assumptions and projections about future financial information and bond issuance timing and amount, for the purpose of analyzing debt affordability. In addition, conservative interest rate assumptions were utilized (see Appendix A for details). Actual financial information, bond issuance timing and amounts, interest rates, and metrics may vary from the projections presented in this Study. In addition, this Study does not take into account potential future refundings that may occur and may reduce annual debt service costs. The credit ratings reflected in this report are as of September 1, 2018. The debt outstanding under each financing program is as of September 1, 2018. For the latest credit and financial information, please refer to the State's investor relations website: http://investorrelations.hawaii.gov.

E. Market Conditions

This section highlights the municipal market conditions over the last five years. These factors affect the market for the State's bonds.

Interest Rates

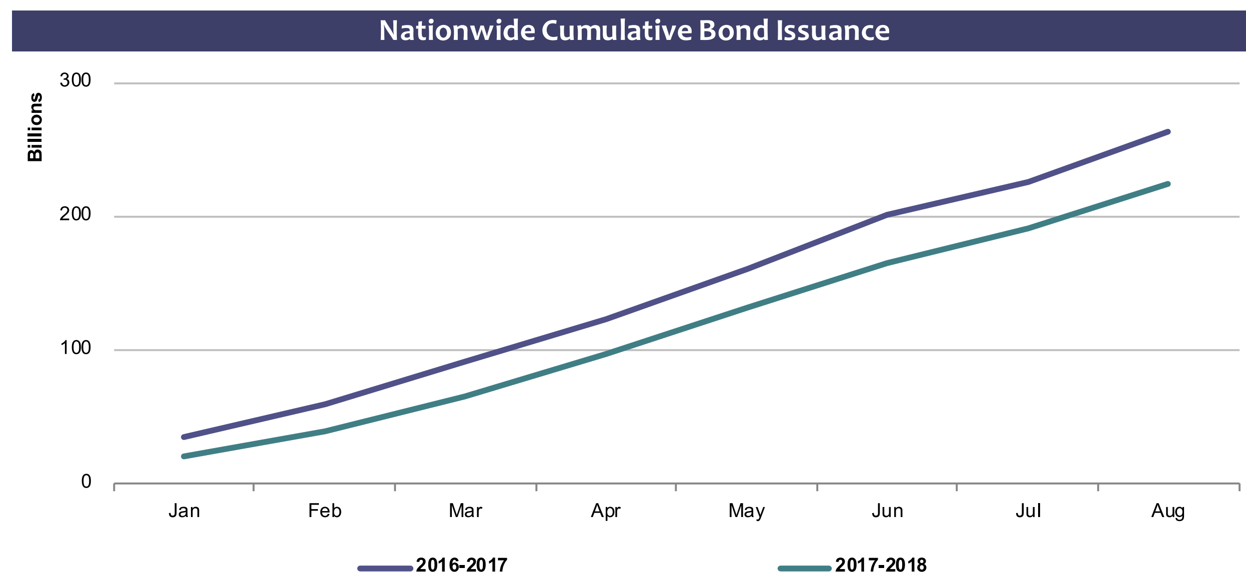
The Thomson Reuters Municipal Market Data (MMD) AAA curve is the benchmark for tax-exempt municipal borrowing rates. The chart below depicts the 5-year, 10-year, 20-year and 30-year AAA MMD interest rates. As reflected below, interest rates have increased across the yield curve over the last year: the increase in short-term rates has been sharper owing to six rate hikes by the Federal Open Market Committee since 2015; while concerns over the global economy, escalation of trade disputes, emerging market currency risks and a waning of fiscal stimulus have resulted in sustained low long-term interest rates, resulting in one of the flattest yield curves in over a decade.



Source: TM3 – Thomson Reuters

Bond Volume

Generally, the rates on municipal bonds relative to other fixed-income investments is a function of supply and demand. A good measure of supply is the amount of new issuance occurring relative to prior years. This, as well as the amount of bonds maturing or being redeemed, determines how many municipal bonds are outstanding at any given time.



Source: TM3 – Thomson Reuters

Nationally, municipal bond issuance volume year-to-date has been lower in 2018 than in prior years. Cumulative bond issuance for first eight months through August 2018 was $224.8 billion or 14.7% lower compared to the same period in 2017. The new tax legislation, which was passed in December 2017 and became effective in January 2018, eliminated the ability to advance refund bonds on a tax-exempt basis. Over the last decade, advance refundings constituted roughly 20% of the tax-exempt market. Loss of these tax-exempt advance refundings coupled with a record issuance volume in December 2017 as issuers rushed to execute transactions before the new tax law became effective are primary reasons for the lower volumes in 2018.

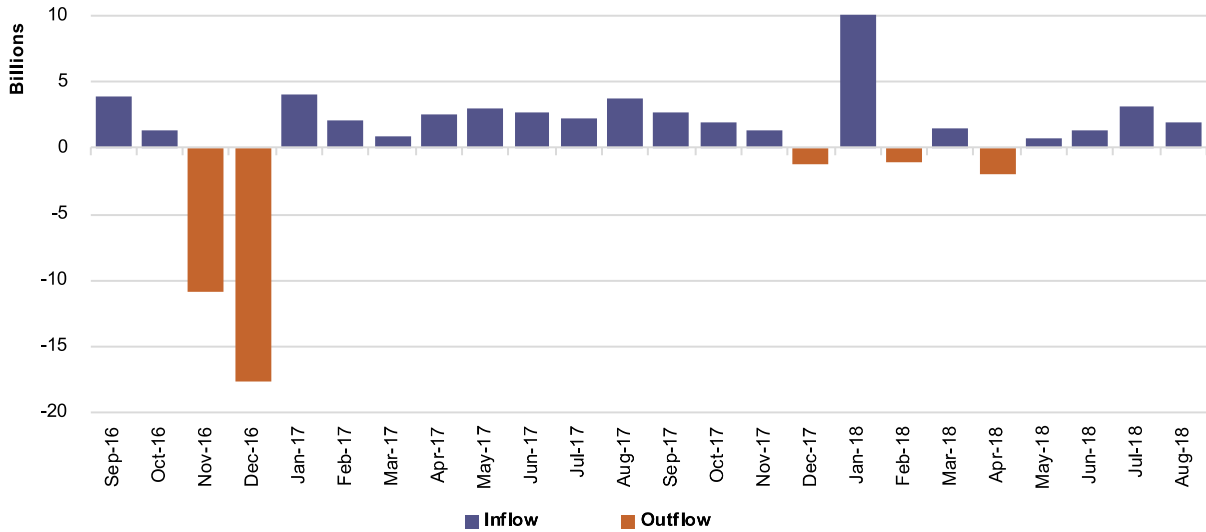
For the State, issuance volume for the first eight months of 2018 totals $1.94 billion, almost equal to the issuance volume over the same period in 2017.

Municipal Bond Market Monthly Fund Inflows/Outflows

Municipal bond mutual funds specializing in tax advantaged investments represent a significant segment of the investor base for tax-exempt bonds. Asset inflows and outflows of cash for these funds are a good proxy of overall demand for municipal bonds.

With the exception of a few months in early 2018, there have been net cash inflows into municipal bond funds since the beginning of 2017, reflecting a healthy demand for municipal bonds. In fact, January 2018 marked the highest net cash inflow to municipal bond funds in the last five years. There has been a healthy appetite for municipal bonds in 2018 with total net inflows of $15.8 billion through August.

Municipal Bond Market Monthly Fund Inflows/Outflows

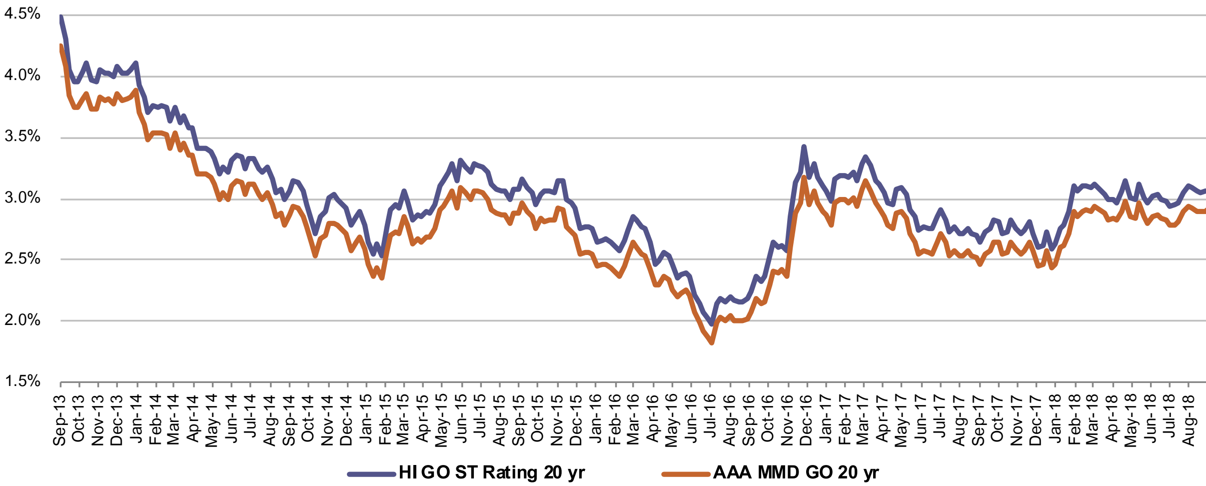


Source: Investment Company Institute

Interest Rates on Hawaii's Bonds

Interest rates on Hawaii's bonds are driven by both State-specific factors such as credit ratings as well as overall market conditions. Given the State's GO credit ratings in the high 'AA' category, the State's GO bonds trade close to the AAA benchmark rates. Over the last five years, the State's interest rates have consistently tracked the AAA benchmark.

Historical Hawaii GO 20-Year and AAA MMD GO 20-Year Rates



Source: TM3 – Thomson Reuters

F. Other Considerations

Natural Disasters:

Given the State's geology and location in the Pacific Ocean, natural disasters such as earthquakes, volcanic eruptions, hurricanes, flooding, mudslides and tsunamis may impact the State. Recent activity that received significant media coverage include the mudslides on Kauai and Oahu in April 2018, the volcanic eruption of Kilauea in May 2018, and flooding and heavy rainfall on account of Hurricane Lane in August 2018. Such geothermal activity as well as storms are not unusual for the State. The State has experienced and managed such events in the past. There has not been any sustained adverse effects on tourism following any such natural disaster. Between 1953 and 2016, the State has been exposed to far fewer instances of what Federal Emergency Management Agency (FEMA) defines as "Major Disaster" or "Emergency" situations, relative to other States. These most recent natural disasters in 2018 were not viewed as credit risks to the State's ratings by the rating agencies. The State's strong financial position and funding assistance from FEMA and other federal sources, support these views. In the same vein, there are minimal debt affordability implications for the State and its Departments from the natural disasters on record.

II. The Department of Budget and Finance and General Fund Debt

The Department of Budget and Finance, headed by the Director of Finance, administers the State budget, develops near-term and long-term financial plans and strategies for the State, conducts reviews of finances, organization, and operations of each department of the State to ensure appropriate and effective expenditure of public funds and provides programs for the improvement of management and financial management of the various departments and agencies. The issuance of all debt issued by Departments of the State is coordinated with and overseen by the Director of Finance and the Department of Budget and Finance. Non-general fund State financing programs are described in the following sections under applicable Departments.

It is important to note that the State has unique characteristics as compared to the other 49 U.S. states by virtue of its location in the Pacific Ocean. Because the State is not physically connected to any other state, it is dependent on air and sea transportation to bring goods and people to and from the islands.

The State has a large military presence as a result of its strategic location. This results in sizeable federal spending in the State which is a significant component of the State economy, particularly in relation to its size and population. Compared to most other states, Hawaii's scenic location promotes tourism and is a source of considerable economic activity and revenues for the State. The State is highly dependent on overnight visitors' spending.

Additionally, the State of Hawaii's general fund supports several functions that are typically supported by regional and local governments in other states across the nation. These additional responsibilities include GO bond funding for the K-12 education system, the university system, the hospital system, and the jail and penitentiary system that are typically supported by cities and counties, school districts, hospital districts etc. in other states.

The combination of these economic characteristics that drive the State's revenues in combination with the State's expanded support of more commonly regional/local obligations make the State of Hawaii particularly unique and it is challenging to compare the State with other states. While these programs contribute to the overall debt levels of the State, they are essential to the long-term viability of the State and the welfare of the population. Major State general fund tax revenues include general excise and use tax, income taxes, transient accommodations tax, and other taxes.

B&F administers the issuance of general fund supported debt including GO bonds. While GO bonds are the primary financing program, B&F also issues COPs and enters into financing agreements such a capital leases, as required. All GO bonds are secured by the full faith and credit of the State, and the State must take action to ensure that sufficient revenues will be raised and provided from time to time for the purpose of payment of principal and interest on GO bonds. The State also issues reimbursable GO bonds on behalf of other Departments, and debt service on these bonds is payable by the beneficiary Department from revenues or user taxes, or both, derived from the public undertaking or improvements that were financed by such GO bonds. COPs and capital leases are payable from any lawfully available funds of the State including the general fund and are subject to legislative appropriation.

A. Debt Profile

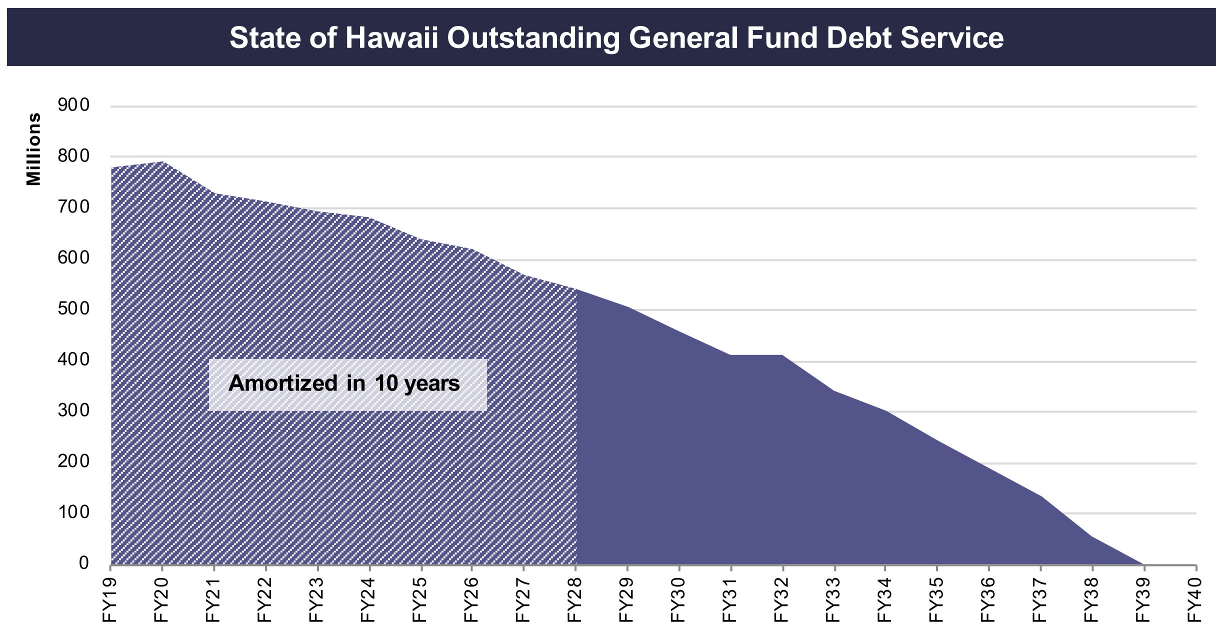
The State currently has 44 series of GO bonds outstanding with a total par amount of $7.19 billion. In addition to GO debt, the State also has COPs and capital leases outstanding in the amount of $3.7 million and $51.8 million respectively, which are payable from the general fund and account for less than 1% of the total debt portfolio. A detailed list of all outstanding series supported by the general fund is included in **Appendix B**.

Summary of General Fund Supported Debt			
GENERAL FUND SUPPORTED DEBT	**OUTSTANDING**		
Figures in thousands	Reimbursable	Non-Reimbursable	Total
General Obligation Bonds	$23,262*	$7,170,691	$7,193,953
Certificates of Participation	NA	$3,665	$3,665
Capital Lease	NA	$51,818	$51,818
TOTAL GENERAL FUND SUPPORTED DEBT	**$23,262**	**$7,226,173**	**$7,249,436**

*As of June 1, 2018

B. Debt Service Chart

Per the Hawaii Constitution, the State is required to structure all GO bonds with annual level principal payments or annual level debt service payments resulting in an overall tapering amortization schedule as seen below. With the State's conservative GO debt structure, the State's debt service amortization is rapid. About 63.6% of principal is repaid within ten years. The chart below reflects the State's annual general fund debt service.



C. Credit Ratings

Credit ratings provide an independent opinion regarding the State's ability and willingness to meet its financial commitments. Credit ratings issued by the bond rating agencies are a major factor in determining the cost of borrowed funds in the municipal bond market and are one of the tools used by investors when purchasing municipal obligations. Moody's Investors Service (Moody's), Standard & Poor's (S&P), and Fitch Ratings (Fitch) assign ratings to the State's GO bonds and general fund COPs. As reflected in the table below, the State maintains high 'AA' ratings from Moody's and S&P and the ratings were last upgraded in 2016. Fitch maintains a flat 'AA' rating on the State's GO credit, however it assigned a positive outlook in 2017. The State strives to obtain the highest possible credit ratings in order to minimize interest costs while maintaining future flexibility.

State of Hawaii GO Credit Ratings			
	Moody's	**S&P**	**Fitch**
General Obligation	Aa1 Stable	AA+ Stable	AA Positive
Certificates of Participation	Aa2 Stable	AA Stable	AA- Positive

The State's high credit ratings are a result of its strong financial position, which has weathered several major economic stressors during the last 15 years, strong financial governance practices including multi-year planning, quarterly consensus revenue forecasting, and strong executive power to reduce spending, and commitment to and progress toward reducing pension and OPEB liabilities. Additional credit strengths include rapid amortization of debt with a conservative all-fixed-rate debt profile, low unemployment rates, healthy tourism growth, stable military presence and strong liquidity position.

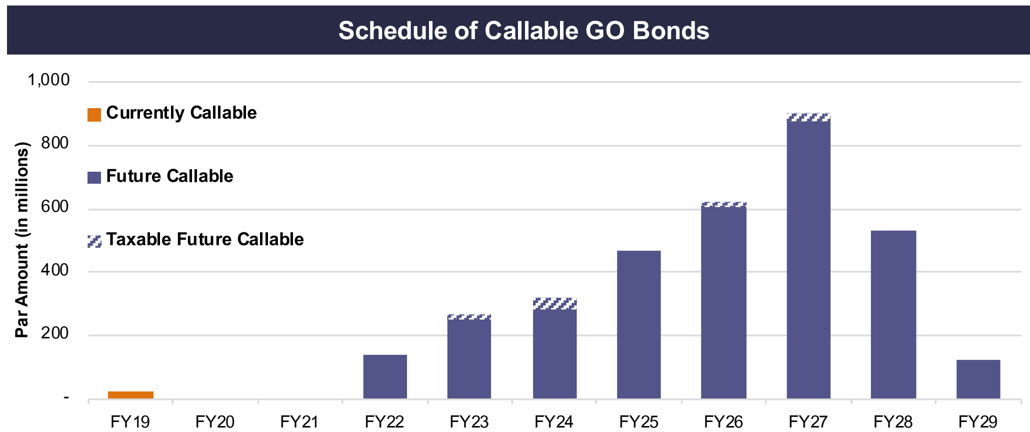
Credit challenges include vulnerability to tourism, higher-than-average debt ratios because of the State's centralized provision of public-sector services, and large pension and OPEB liabilities albeit formalized action plans backed by legislative mandates are in effect that reflect progress in that area.

The State's GO ratings are largely driven by outside forces. Economic performance continues to be a major driver of the credit picture for the State. Prioritization of funding pension and OPEB liabilities and continued sound financial management will contribute to addressing ratings analysts' cited concerns. Although the State's debt levels are among the highest in the nation, additional credit factors including fiscal conservatism and proactive financial management boost the State's credit quality. In addition, this Study promotes a systematic approach towards prudent use of debt further supporting sound financial management.

D. Schedule of Callable Bonds

The State monitors its debt portfolio for refunding opportunities and from time to time, the State has executed refundings, both current and advance, based on market conditions and other factors. Over the last five fiscal years, the State issued $2.3 billion in refunding bonds for total nominal savings of $229.4 million and present value savings of $186.4 million.

The chart below provides a summary of outstanding GO callable par amounts by fiscal year. The State's total outstanding GO callable par is about $3.4 billion of which $20.1 million in currently callable and the remaining is callable in future years beginning in FY2022. As indicated in the chart, the callable par amounts also include certain portions of taxable bonds that are callable without the make-whole-call (MWC) premium that is typically associated with taxable bonds. In addition to GO bonds, the State has $3.7 million COPs outstanding all of which are currently callable but are unlikely to be refunded due to their small size and near-term maturities.

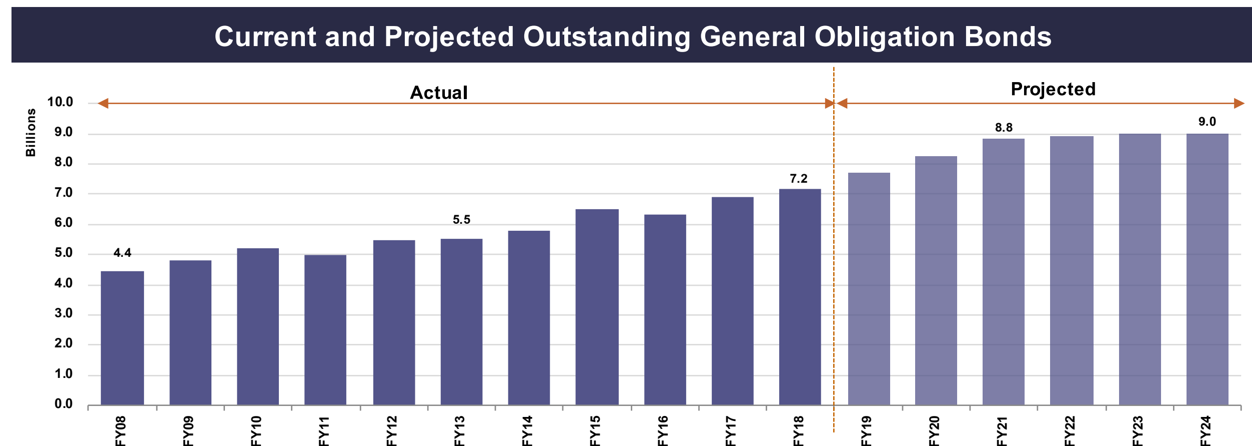


Pursuant to the criteria outlined in its Debt Management Policy, the State may pursue opportunities to refund callable bonds. However with the elimination of tax-exempt advance refundings, the State may choose to wait until the call date to current refund bonds or explore other options such as a forward refunding on a case-by-case basis.

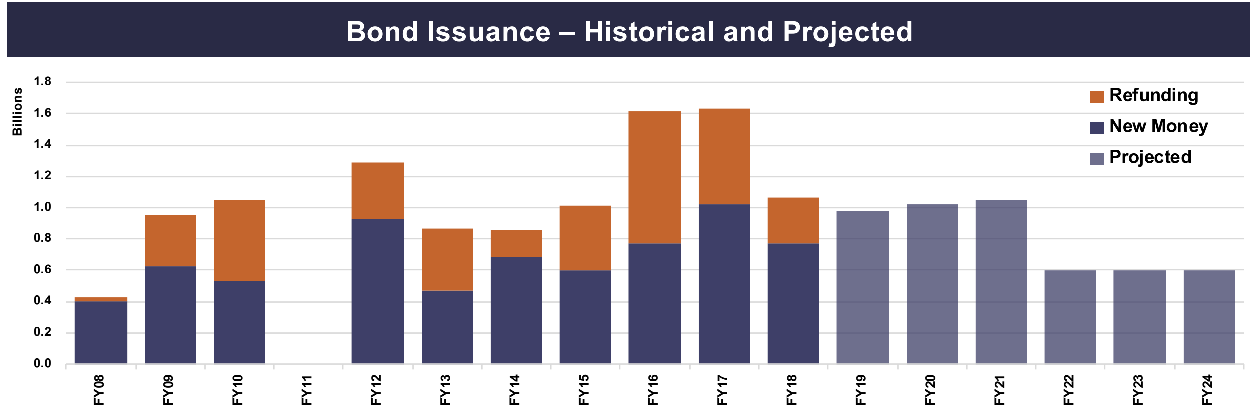
E. Multi-Year Program Anticipated/Intended Debt Issuance

Existing Debt and Anticipated Issuance

The State's annual issuance, and by relation the amount of GO debt outstanding, has increased significantly since 1990; more rapidly so in recent years. New money issuance in the last five fiscal years totaled $3.6 billion including $775 million in FY2018. The amount of debt supported by the general fund increased by 30% over the five-year period.



The State tentatively plans to issue about $4.85 billion in new money GO bonds over the six year planning horizon for this Study, through FY2024. Of this about $3.05 billion is currently authorized through FY2021 and the remaining $1.8 billion is proposed for future requirements through FY2024. These GO bonds are anticipated to fund infrastructure projects throughout the State.



Unissued but Authorized Debt

The total amount of authorized but unissued State GO bonds as of June 30, 2018 is $3.05 billion.

F. Measuring Debt Burden

Debt ratios form the basis for peer comparison and allow the State to measure and track its debt burden over time. It is important to note that the State is unique in that it funds capital needs that are more typically funded by local municipal entities (as described previously). As such, the State's debt burden metrics are higher in comparison to medians and peers. The State's affordability metrics since FY2013 are provided below. In addition, the State is projected to issue $4.85 billion in GO Bonds through FY2024 and the projected impact on affordability metrics is shown in the table as well.

Historical and Projected (six-years) Metrics

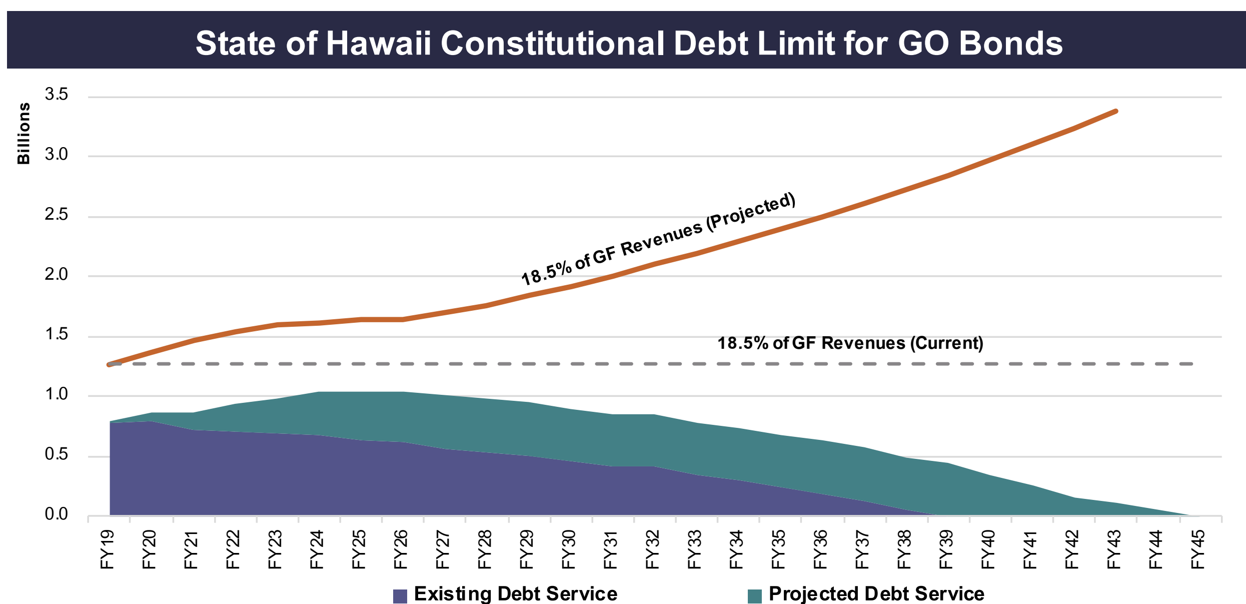
AFFORDABILITY METRICS	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Annual debt service to annual revenues	11.2%	12.4%	11.5%	11.0%	10.8%	9.6%	10.1%	10.5%	10.1%	10.5%	11.5%	11.6%
Pension contribution to annual revenues	6.3%	8.3%	8.4%	8.3%	8.2%	8.2%	9.2%	10.0%	9.9%	9.8%	10.5%	10.4%
OPEB contribution to annual revenues	4.8%	6.8%	6.6%	8.6%	9.9%	10.2%	9.9%	9.8%	9.8%	9.8%	10.5%	10.5%
All annual obligations to annual revenues	22.4%	27.5%	26.5%	27.8%	28.9%	27.9%	29.2%	30.4%	29.9%	30.2%	32.5%	32.6%
Annual debt service to annual appropriations	14.0%	13.9%	13.2%	12.5%	12.0%	11.6%	12.4%	13.0%	12.5%	12.9%	13.0%	13.1%
Pension contribution to annual appropriations	7.9%	9.3%	9.6%	9.4%	9.0%	10.0%	11.4%	12.4%	12.3%	12.1%	11.9%	11.8%
OPEB contribution to annual appropriations	6.0%	7.5%	7.5%	9.8%	10.9%	12.4%	12.2%	12.2%	12.2%	12.1%	12.0%	11.9%
All annual obligations to annual appropriations	27.9%	30.7%	30.2%	31.8%	31.9%	34.0%	36.1%	37.6%	36.9%	37.2%	37.0%	36.8%
Debt per capita	$4,042	$4,179	$4,651	$4,922	$5,376	$5,032	$5,344	$5,658	$6,019	$6,048	$6,052	$6,027
Debt per capita (Adjusted)	$2,478	$2,559	$2,842	$2,996	$3,269	$3,058	$3,245	$3,434	$3,651	$3,668	$3,669	$3,653
Pension UAAL per capita	$6,072	$3,648	$3,300	$3,503	$5,284	$6,420	$6,548	$6,601	$6,594	$6,575	$6,541	$6,492
OPEB UAAL per capita	$9,773	$6,045	$6,002	$6,353	$6,331	$6,465	$6,565	$6,585	$6,596	$6,594	$6,581	$6,557
Debt as a % of state GDP	7.7%	7.8%	8.3%	8.4%	8.9%	8.1%	8.3%	8.5%	8.8%	8.5%	8.2%	7.9%
Debt as a % of state GDP (Adjusted)	4.7%	4.8%	5.1%	5.1%	5.4%	4.9%	5.0%	5.2%	5.3%	5.2%	5.0%	4.8%
Pension UAAL as a % of state GDP	11.5%	6.8%	5.9%	6.0%	8.7%	10.3%	10.2%	9.9%	9.6%	9.3%	8.9%	8.5%
OPEB UAAL as a % of state GDP	18.6%	11.2%	10.7%	10.9%	10.5%	10.4%	10.2%	9.9%	9.6%	9.3%	8.9%	8.6%
Debt as a % of personal income	9.1%	9.1%	9.7%	9.9%	10.5%	9.6%	9.9%	10.1%	10.4%	10.1%	9.7%	9.3%
Debt as a % of personal income (Adjusted)	5.6%	5.6%	5.9%	6.0%	6.4%	5.8%	6.0%	6.1%	6.3%	6.1%	5.9%	5.6%
Pension UAAL as a % of personal income	13.6%	8.0%	6.9%	7.1%	10.4%	12.2%	12.1%	11.8%	11.4%	11.0%	10.5%	10.0%
OPEB UAAL as a % of personal income	21.9%	13.2%	12.6%	12.8%	12.4%	12.3%	12.1%	11.8%	11.4%	11.0%	10.6%	10.1%
Pension UAAL as a % of total GF revenues	146.9%	91.6%	78.1%	78.1%	113.7%	122.3%	119.1%	116.2%	112.7%	108.9%	113.0%	108.6%
OPEB UAAL as % of total GF revenues	236.4%	151.8%	142.2%	141.6%	136.3%	123.2%	119.4%	115.9%	112.7%	109.2%	113.7%	109.7%
Liquidity – days' cash on hand	15 days	24 days	48 days	45 days	37 days	41 days	36 days	29 days	27 days	30 days	42 days	-

Note: Projected metrics assume issuance of $4.85 billion of additional GO bonds during the projection period (see anticipated debt above)

Relevant Affordability Metrics

The table above offers several metrics to measure debt burden and evaluate affordability. Many of the metrics are used for peer/median comparison which constitutes an alternate method to measure debt level and affordability. Some of the most relevant metrics are discussed below.

Constitutional Debt Limit for GO Bonds (Per Constitutional Calculation): The State's constitution limits maximum annual debt service on aggregate outstanding GO bonds to 18.5% of the average of general fund revenues for the three preceding years. Current projection of the State's future GO debt reflects significant capacity under the 18.5% ceiling (orange line in the chart below). Projected debt service is estimated to reach a maximum of 11.9% of projected general fund revenues (average for three preceding years) in FY2024.



Annual debt service payments to annual revenues or Annual debt service payments to annual appropriations: Both of these ratios indicate the percentage of the State's general fund budget that is dedicated to fixed costs such as debt service payments. It is a measure of financial flexibility available within the State's general fund. For FY2018, an estimated 9.6% of general fund revenue was utilized to service debt, down from 12.4% in FY2014 which is the highest it has been this decade. Similarly, debt service payments account for 11.6% of FY2018 general fund expenditures, down from 14.0% in FY2013 which is the highest it has been this decade. Relative to growth in State revenues which has been fairly strong in the last three years, a smaller portion is being allocated to debt service which gives the State flexibility to absorb others costs such as pension and OPEB contributions.

The general fund's contribution towards pension and OPEB are also categorized as "fixed costs". Accounting for these contributions, approximately 27.9% of the State's general fund revenue for FY2018 supports fixed costs, up from 22.4% in FY2013. Act 17, effective July 1, 2017 enacted substantial increases in employer contribution rates to the State's Employee Retirement System (ERS) to be phased in over a period of four years. Per the Act, future employer contributions for police and firefighters will be increased

to 41% by FY2021 from 25% in FY2017, and for all other employees to 24% by FY2021 from 17% in FY2017. This followed another Act 268 that was enacted in 2013 requiring employer contribution for the State's OPEB plan to be equal to the annual required contribution (ARC) determined by an actuary commencing FY2019.

As the State ramps up its pension and OPEB contributions to meet these requirements, fixed costs are projected to increase to 32.6% in FY2024. It should be noted, however, that the State's proactive funding of OPEB is viewed favorably as a prudent financial measure. Many states across the nation are still evaluating potential strategies to address their significant pension and OPEB liabilities while the State has already made significant strides towards funding them with visible results as cited below.

Debt as a percentage of State GDP: This ratio is a measure of financial leverage provided by the State's economy and its ability to repay debt based on the goods and services produced in its economy. Debt-to-GDP is 8.1% for FY2018 which is higher than other states primarily due to State funding of K-12 education that is normally funded at the local level in other states. As B&F executes its borrowing program over the next few years, debt levels are projected to peak at 8.8% of GDP in FY2021.

Although not direct debt, the unfunded actuarial accrued liability (UAAL) for pension and OPEB are mandatory long-term obligations, and as such get treated akin to debt for financial analysis. The pension UAAL and OPEB UAAL account for about 10.3% and 10.4% of the estimated 2018 state GDP. The significant increase in unfunded pension liabilities in FY2017 is attributable to changes in certain actuarial assumptions – (1) Hawaii Employees' Retirement System Board's decision to reduce future annual earnings rate for assets held in the pension fund to 7.0% from 7.5%, and (2) increased life expectancy for retirees The higher employer contribution schedule for pension adopted by the State in 2017 will enable it to offset the effects of the lower earnings rate assumption described above and achieve 100% funded ratio for pension liabilities in less than 30 years from now.

The OPEB UAAL was as high as 18.6% of State GDP in FY2013 compared to the 10.4% in FY2018. Recent OPEB reforms (making 100% of actuarially determined required contribution) adopted by the State made a significant impact in addressing these unfunded liabilities, and the positive effect of these proactive actions is visible in the liability ratios already, which otherwise tend to escalate rather quickly. This proactive funding of retirement liabilities contributed to the increase in fixed costs in the last few years as discussed above but is part of the State's overall strategy towards reducing these long-term obligations.

Debt as a percentage of personal income: Total personal income for a state provides the basis for evaluating its revenue generating ability. The debt-to-personal income metric measures a state's ability to continually generate sufficient revenues to repay debt. For FY2018, B&F's debt-to-personal income ratio is 9.6% and is projected to increase to 10.4% by FY2021. Pension UAAL and OPEB UAAL are 12.2% and 12.3% of the estimated FY2018 total personal income. The ratio is similar to the debt-to-GDP ratio and therefore follows the same trend as discussed above.

Debt per capita: This ratio is a measure of the debt burden shared by each resident of a state on average. Since it accounts for all residents with no specificity for age, income or employment, the ratio is not as efficient in measuring ability to repay debt but is still meaningful for peer comparison. The State's debt per capita is $5,032 for FY2018. It is projected to increase to about $6,052 per capita by FY2023 as the State

executes the projected borrowing program. On a per capita basis, pension and OPEB UAAL add another $6,420 to $6,465, each, to B&F's obligations.

As discussed in detail in the next section, the State's debt levels are very high. As such, the State needs to carefully monitor its debt issuances in relation to potential credit impact which may lead to borrowing cost increases. It is important to note that debt burden is one of several evaluation factors which determine the State's ratings and a holistic review will take into account other pertinent criteria besides leverage.

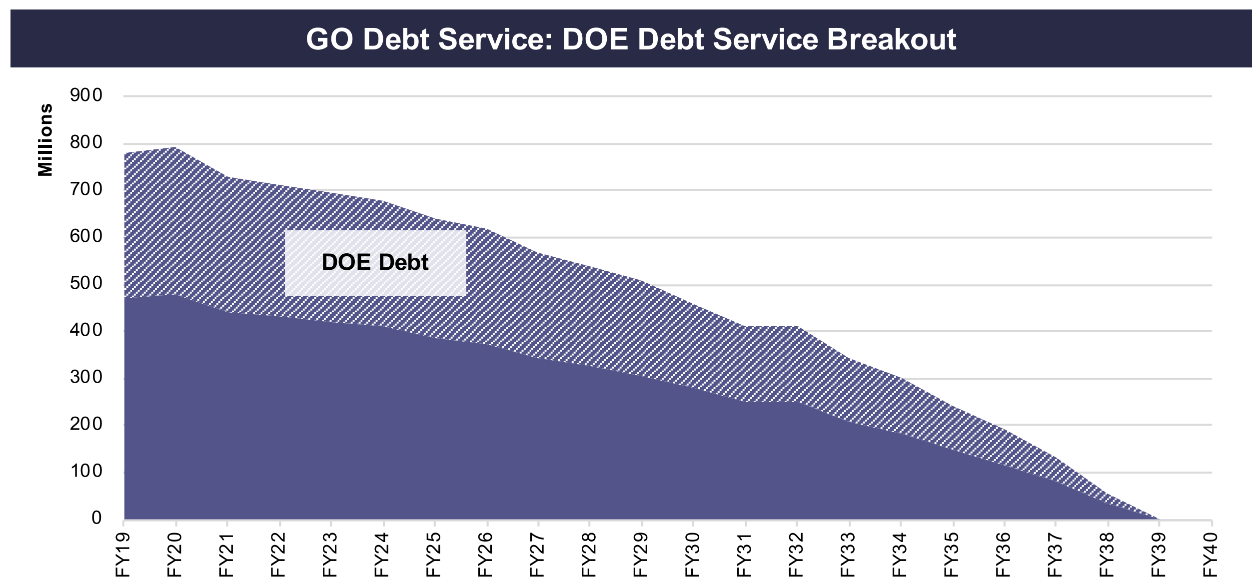
Median Comparisons

Moody's publishes an annual Debt Median Report including debt ratios for all 50 States and the sector means and medians. The report provides a broader perspective on debt levels and affordability basis through the comparison of Hawaii's debt burden to other states across the country. The following table summarizes the State's GO debt metrics alongside Moody's 2018 medians data. The 50-state FY2017 median for debt as percentage of state GDP and debt as a percentage of personal income is 2.05% and 2.3%, respectively. On a per capita basis, the 50-state median is $987. As discussed previously, the State's general fund supports significant capital needs for local municipalities in contrast to other states in the nation. As such, the State's general fund supported debt metrics are considerably higher than the states medians and are approaching some of the highest debt levels seen among states (rank in the top 5).

DEBT METRICS	MOODY'S STATES SECTOR DEBT REPORT			STATE OF HAWAII	
2017	Median	Average	Max	Actual	Adjusted*
Debt Service Ratio	4.20%	4.50%	13.80%	10.8%	6.5%
Debt as a % of State GDP	2.05%	2.57%	9.03%	8.9%	5.4%
Debt as a % of Personal Income	2.30%	2.90%	10.40%	10.5%	6.3%
Debt per Capita	$987	$1,477	$6,544	$5,376	$3,251

* Adjusted to exclude estimated debt incurred for K-12 school system; According to Moody's, Debt Service Ratio is annual debt service as a % of revenues

Unlike other states, Hawaii has the responsibility for funding the K-12 school system, hospital system, and penitentiary capital needs which contributes to the State's high debt levels. The following graph reflects the estimated DOE related debt service in relation to the State's overall GO debt portfolio.



To account for this unique situation and aid a more accurate comparison with State medians, the affordability metrics table above also presents Hawaii's debt metrics as adjusted for the largest of these obligations: Department of Education (DOE) K-12 related obligations. The adjusted debt ratios remain high when benchmarked against states' medians. With the modified metrics, the State still ranks among the top five states with the highest debt levels. Note that the size and purpose of debt programs vary greatly for each state since they are driven by several different factors and the resulting medians should be viewed as such.

G. Discussion on Debt Affordability, Potential Concerns and Recommendations

The State has planned significant debt issuances totaling $4.85 billion during the multi-year plan. With the additional debt issuances, the State is projected to remain well below the constitutional debt limit based on current revenue projections. Taking into account the projected GO bond issuances, general fund revenues would have to decline by more than 18% from their current levels or 32% from their projected levels, in the year of peak debt service, before the debt limit is breached. Barring any extraordinary events, legal restrictions are unlikely to hinder the State's GO borrowing capacity.

From a broader affordability perspective, projected revenues are sufficient to cover existing and projected debt service and anticipated pension and OPEB contributions. It is important to note that as the State makes progress towards contributing the full 100% of its OPEB ARC and incorporates the higher pension contribution percentages through FY2021, a much larger share of the State's operating budget will be associated with these fixed costs. As per projections, an additional 4.7% of general fund revenues is projected to be designated to pension and other benefits through FY2024 to cover the additional contributions. This increase in fixed cost may limit the State's financial flexibility, particularly its ability to devote resources towards debt service on future debt among other operational needs and constraints. That being said, the State's revenue projections reflect sufficient revenues to cover current projected debt service and retirement contributions.

From a credit perspective, the State is at the highest level of debt burden under the rating agency methodologies. The State's affordability metrics for general fund debt as evaluated on the basis of economic factors (debt-to-personal income, debt-to-GDP and debt-per-capita) are among the highest in the nation. Given the unique nature of the State's responsibilities, the State will remain at the high end of the debt burden spectrum and there is limited comparability to other states. We note here that all rating analysts acknowledge the State's distinct funding needs when comparing it to other states and sector medians. Given the State's high-AA ratings it does not seem that ratings are penalized for its high debt ratios. Instead, the focus is on the State's ability to manage its operations and budget while funding the high fixed costs related to debt and retiree benefits. Maintaining financial flexibility and preserving liquidity and reserve levels while funding its obligations will be key to future credit ratings.

It is important to note, however, that the increasing historical trend for many of the State's affordability metrics indicates that borrowing has outpaced economic growth in the State. Given the State's desire to obtain the highest possible credit ratings, the State should continue to monitor its debt levels to proactively avoid negative rating pressure in the future.

As reflected in the analysis above, the State is able to afford the planned additional debt issuances based on projections. As long as new issuances keep pace with economic expansion and revenue growth, debt affordability concerns are mitigated. However, in the near-to-medium term, it will be crucial to maintain contingency in the budget to absorb expected and unexpected increases in general fund expenditures as well as to offset underperformance in any revenues. We are in the post-recovery era with revenue growth slowing down or levelling off in most cases. Given the known higher pension and OPEB costs in the near-term, prioritizing essential capital projects and evaluating projects that can be deferred until the full budgetary impact of pension and OPEB costs are absorbed, will preserve financial flexibility during the projection period and will position the State to manage economic cycles.

III. Department of Transportation – Airports

The Department of Transportation (DOT) maintains and operates the transportation facilities of the State and are carried out through three primary divisions: Airports, Harbors and Highways. The Department of Transportation, Airports Division (DOT-Airports) supervises and controls all State airways and State owned or managed airports and other air navigation facilities with the exception of private federal facilities. Nearly all non-military passenger traffic throughout Hawaii passes through the Airports System. The System includes five primary and ten secondary airports. The primary airports are Daniel K. Inouye International (on the Island of Oahu), Kahului (on the Island of Maui), Hilo International and Ellison Onizuka Kona International at Keahole (both on the Island of Hawaii), and Lihue (on the Island of Kauai).

Airports system revenues consist of operating revenues which include aeronautical revenues (landing fees, premises charges, Aviation fuel tax and airports system support charges) and non-aeronautical revenues (non-aeronautical rentals, concession fees including duty-free, retail, and food and beverage revenues as well as parking revenues and ground transportation). Non-operating revenues include interest income, federal operating grants, passenger facility charges, rental customer facility charges, debt service support charges, and other revenues.

DOT-Airports' primary financing program consists of *airport system revenue bonds* secured by net available revenue. Net available revenue represents, generally, total operating revenues less total operating expenses excluding depreciation. DOT-Airports also issues COPs and enters into financing agreements such as loans and leases, as required. The COPs are also secured by the same net revenues however their claim is subordinated to revenue bonds. The rates and charges prescribed by the DOT-Airports on participating airlines are determined by a cost center residual hybrid rate-setting methodology. Under this methodology, the airlines are charged landing fees to allow DOT-Airports to fully recover operating and capital costs associated with the airfield facilities (runways, taxiways, and other facilities), net of any grant reimbursements. Costs associated with the terminal facilities are recovered through aeronautical rentals, premises charges, and airline system support charges to the airlines under the Airline Lease Extension Agreement. This provides DOT-Airports the flexibility to set rates such that it is fully compensated for all operating expenses including debt service.

As such, DOT-Airports benefits from relative financial stability in the fact that as operating costs and debt service increase, there is a corresponding increase in operating revenues sufficient to cover the increase in costs. However, as debt service costs increase, the cost to the airlines to operate at the airports will also increase which could eventually lead to airlines reducing service, particularly if those costs are greater than at other U.S. airports. This risk is mitigated by the high level of demand to, from, and in-between the islands, and the lack of alternative options for such travel, but airlines will generally deploy resources to their most profitable routes. As such, airline costs are an important measure of the ability of DOT-Airports to afford new debt.

DOT-Airports is authorized under Act 226 to impose a Customer Facility Charge (CFC) on car rentals at the airport, effective September 1, 2008. The rate was increased in 2010 as per Act 104 and is currently set at $4.5 per day. The CFC has no expiration. Under Section 261-7, HRS, the DOT-Airports has the power to adjust the CFC rate when necessary, without rule-making or legislative approval. The CFC

revenues can be used for enhancement, renovation, operation, and maintenance of existing rental car facilities and the development of new rental car facilities and related services to better serve visitors and residents. DOT-Airports initiated its consolidated rental car facilities (ConRACs) program in 2011 funded by a combination of CFC revenues, bond proceeds from *CFC revenue bonds* and other debt secured by CFC revenues. The CFC revenue bonds are issued under a separate Master Trust Indenture and are secured by a pledge of CFC revenues and other payments related to rental car activity at the Airports. The CFC revenue bonds do not have a pledge of general airport revenues. Currently, ConRAC facilities are under construction at Honolulu and Kahului.

DOT-Airports also issues special facility revenue bonds payable from leasing revenues collected from airlines. Given the payment source of special facility revenue bonds, these bonds have been excluded from DOT-Airports' affordability discussion.

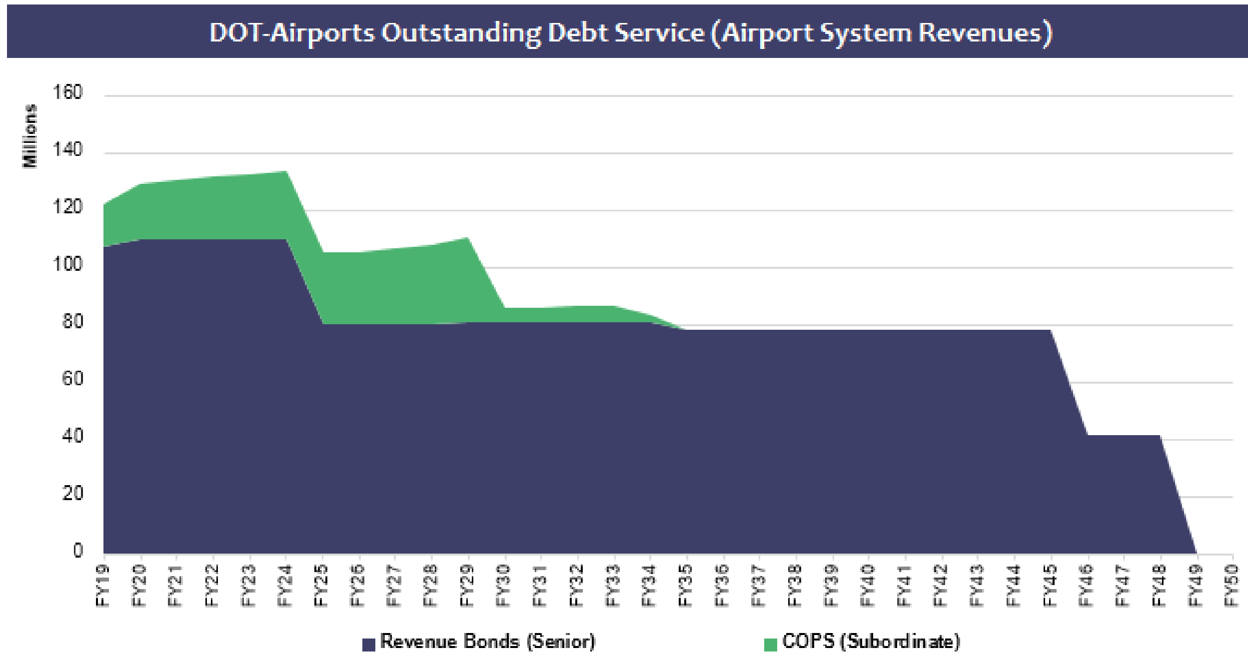
A. Debt Profile

Including the most recent issuance in August 2018, DOT-Airports currently has seven series of senior lien general airport revenue bonds outstanding for a total par amount of $1.35 billion and three series of subordinate lien COPs outstanding for a total par amount of $208.8 million dollars. The COPs were issued to fund energy conservation projects and in addition to being secured by a subordinate lien on the net revenues of the airport system they are also secured by the improvements funded by these COPs. Energy savings generated from the projects are sufficient to cover debt service related to the COPs. In addition, DOT-Airports has $244.8 million in CFC revenue bonds outstanding and a $76.0 million EB-5 Loan outstanding.

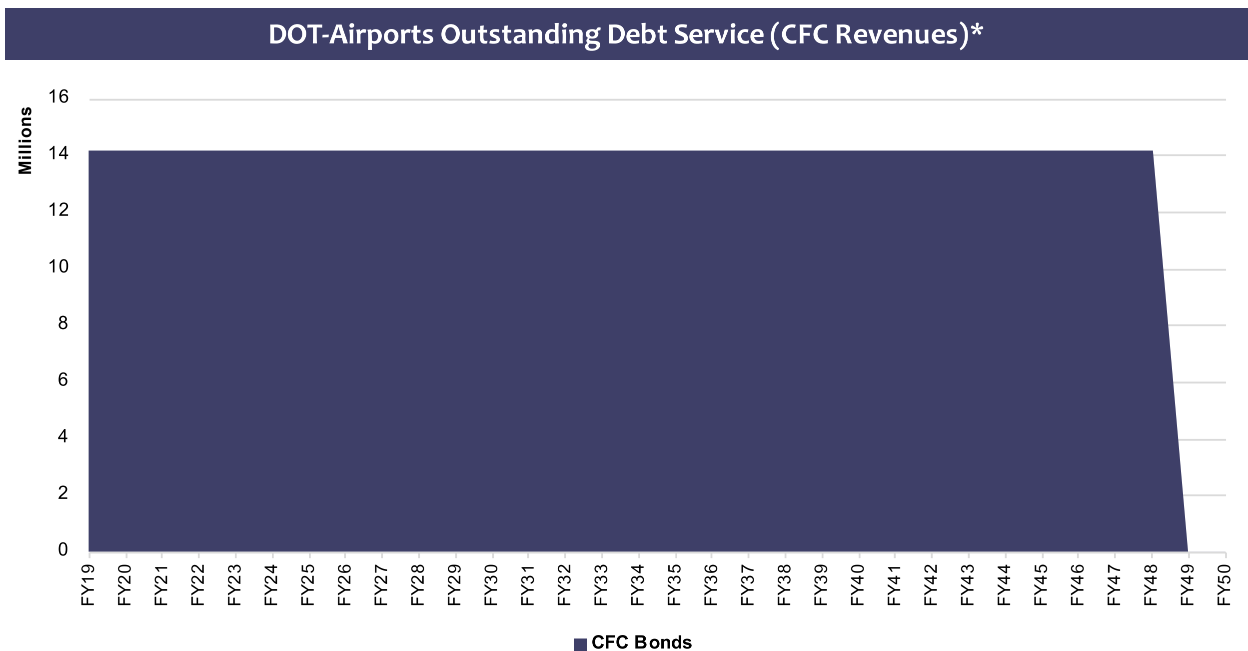
Series Name	Tax Status	Issue Size	Delivery Date	Final Maturity	Outstanding Par	Next Par Call Date	Callable Par
Senior Lien Airport System Revenue Bonds							
Series 2010A	Tax-Exempt	478,980,000	4/7/10	7/1/39	476,430,000	7/1/2020	468,455,000
Series 2010B	AMT	166,000,000	4/7/10	7/1/20	43,815,000	-	-
Series 2011	AMT	300,885,000	10/4/11	7/1/24	170,565,000	7/1/2021	93,055,000
Series 2015A	AMT	235,135,000	11/18/15	7/1/45	235,135,000	7/1/2025	235,135,000
Series 2015B	Tax-Exempt	9,125,000	11/18/15	7/1/45	9,125,000	7/1/2025	9,125,000
Series 2018A	AMT	388,560,000	8/22/18	7/1/48	388,560,000	7/1/2028	378,760,000
Series 2018B	Tax-Exempt	26,125,000	8/22/18	7/1/27	26,125,000	-	-
Sub-Total	-	-	-	-	1,349,755,000	-	805,770,000
Subordinate Lien Certificate of Participation							
Series 2013	Tax-Exempt	167,740,000	12/19/13	8/1/28	150,830,000	8/1/2023	98,215,000
Series 2016	Tax-Exempt	8,057,000	4/13/16	8/1/25	6,544,441	8/1/2018	6,544,441
Series 2017	Tax-Exempt	51,500,000	3/31/17	8/1/34	51,473,427	8/1/2019	51,473,427
Sub-Total	-	-	-	-	208,847,868	-	156,232,868
Customer Facility Charge Revenue Bonds							
Series 2017	Taxable	249,805,000	7/27/17	7/1/47	244,775,000	7/1/2027	193,770,000
EB-5 Loan							
EB-5 Loan	-	76,000,000	-	8/27/19	76,000,000	8/27/2018	76,000,000
Total	-	-	-	-	1,879,377,868	-	1,231,772,868

B. Debt Service Chart

DOT-Airports' debt service profile for debt supported by airport system revenues is slightly front-loaded. Approximately 30% of revenue bond principal is paid down over the next ten years. Total annual debt service on the senior lien revenue bonds is approximately $109 million per year through 2025 and then drops to approximately $77-$80 million per year through 2046. After 2046, debt service decreases to $40.5 million per year.



The debt service profile for CFC revenue debt consists of $14.2 million level annual debt service payments until the final maturity in 2047.



*Excludes EB-5 Loan to be refinanced with future debt in 2019

C. Credit Ratings

DOT-Airports maintains strong credit ratings. Additionally, S&P reviewed the Airport System Revenue Bonds under the new criteria and upgraded the rating in August 2018 by one notch to 'AA-' supported by an *extremely strong* enterprise risk profile and *strong* financial risk profile.

Department of Transportation Airport System Credit Ratings			
	Moody's	**S&P**	**Fitch**
Airport System Revenue Bonds	A1 Stable	AA- Stable	A+ Stable
Certificates of Participation	A2 Stable	A+ Stable	A Stable

Airport revenue credit strengths include reliable and growing air service demand, monopolistic position, favorable enplanement trends and strong financial flexibility owing to competitive cost per enplanement (CPE), low debt burden and very strong liquidity position.

Airport revenue credit challenges include a large capital improvement program with corresponding projected decline in financial metrics (coverage, CPE and cash), and exposure to volatility in tourism industry.

Department of Transportation CFC Credit Ratings			
	Moody's	**S&P**	**Fitch**
CFC Revenue Bonds	A2 Stable	A+ Stable	A Stable

In addition to strengths of the airport credit, the CFC revenue credit is specifically strengthened by its strong legal covenants and coverage and strong and favorable agreements with rental car companies.

The CFC revenue credit challenges include a single revenue stream pledged for bondholders, potential for additional debt for ConRAC facilities at other airports in the system and erosion in future car rental demand to mass transit and ride-sharing services.

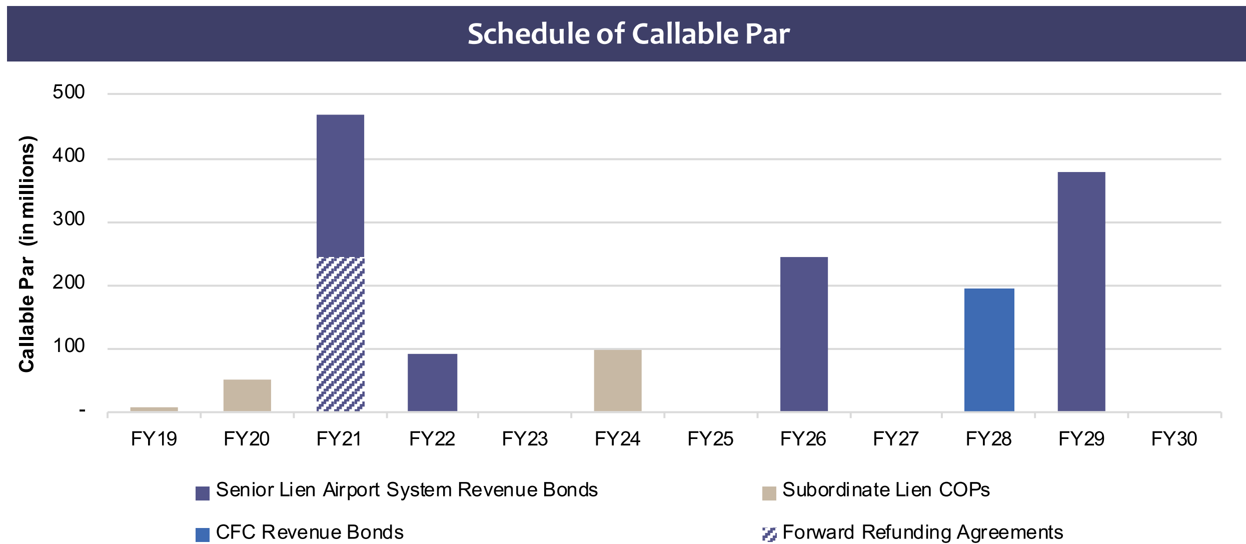
D. Schedule of Callable Bonds

The following chart provides a summary of callable DOT-Airports debt along with the par amounts and call dates. Of the total senior lien revenue bonds outstanding, $1.28 billion represents callable par with future call dates starting 2020. Of this, Series 2010A has the earliest call date of July 1, 2020 with $476.43 million callable at that time. The DOT-Airports executed forward refunding agreements in August 2018 to refund for savings $245.39 million of the callable par for Series 2010A. The refunding bonds will be delivered in April 2020 when the bonds are currently refundable.

Of the ConRAC financing program, the CFC revenue bonds Series 2017 were issued with a 10-year par call and will be callable in FY2028. The $76.0 million EB-5 loan may be refunded at any time at the option of DOT-Airports and will likely be refunded from future issuance of CFC revenue bonds before their maturity date in August 2019.

In addition to above, $7.4 million of the subordinate lien COPs are currently refundable at the option of DOT-Airports and another $149.7 million COPs outstanding may be refundable after the optional redemptions dates in August 2019 and August 2023.

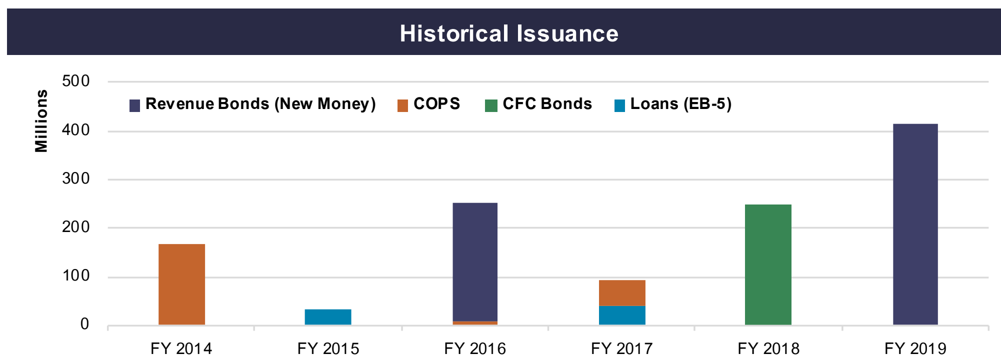
Pursuant to the criteria outlined in its Debt Management Policy, DOT-Airports may pursue opportunities to refund callable bonds.



E. Multi-Year Program Anticipated/Intended Debt Issuance

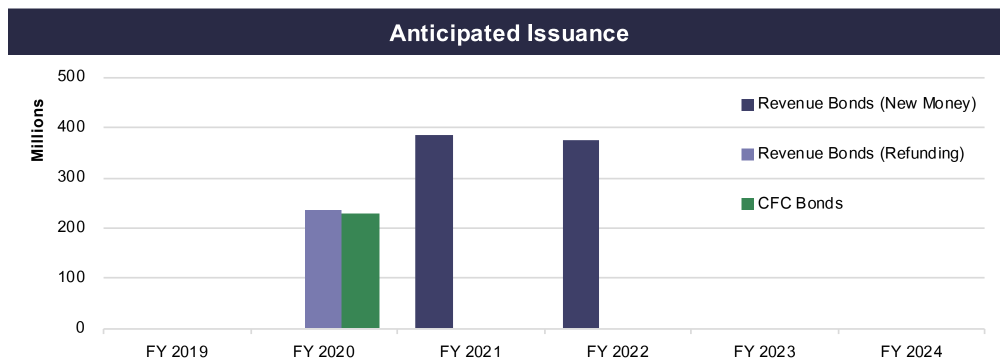
Existing Debt

DOT-Airports currently has $1.35 billion of outstanding senior lien airport system revenue bonds as reflected above. DOT-Airports' most recent Series 2018 airport system revenue bonds were issued to fund capital projects. Prior to that, the Series 2015 bonds were also issued to fund capital projects. In addition, DOT-Airports issued three series of COPs – one public sale in FY2014 and two private placements in FY2016 and FY2017 – in relation to energy savings projects. The EB-5 loan agreement to fund the ConRAC project was executed in FY2015 and the authorized $76.0 million was drawn partly in FY2015 and fully drawn by end of FY2017. The first series of CFC revenue bonds was issued in FY2018.



Anticipated Debt

As DOT-Airports makes progress on its airport capital program as well as the ConRAC project, it is anticipated that new debt will need to be issued to fund capital needs. DOT-Airports plans to issue approximately $761.5 million in airport system revenue bonds over the next five years. In addition, DOT-Airports plans to issue approximately $230.0 million in CFC revenue bonds to support ConRAC project costs.



Unissued but Authorized Debt

As of June 30, 2018, DOT-Airports has a total of $1.03 billion in authorized but unissued revenue bonds and $92.03 million in additional authorized but unissued CFC revenue bonds.

F. Measuring Debt Burden

Last Full Fiscal Year and Projected (six-years) Metrics

AFFORDABILITY METRICS (Airport Revenue Debt)	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Annual debt service to annual revenues	24.0%	26.7%	26.6%	26.1%	26.5%	26.7%	25.8%
Annual debt service to annual appropriations	25.8%	28.9%	38.4%	30.8%	30.8%	30.5%	29.4%
Senior lien debt service coverage	1.30x	1.07x	1.07x	1.19x	1.16x	1.12x	1.11x
Total debt service coverage	1.11x	0.93x	0.90x	0.99x	0.97x	0.94x	0.92x
Senior lien debt service coverage (Adjusted Net Revenues)	1.72x	1.47x	1.48x	1.65x	1.65x	1.59x	1.60x
Total debt service coverage (Adjusted Net Revenues)	1.47x	1.28x	1.25x	1.38x	1.39x	1.34x	1.33x
Cost per Enplanement	9.63	9.93	10.09	11.09	11.79	12.57	13.03
Debt per Enplanement	64.5	82.8	78.5	94.0	108.2	103.0	97.8
Liquidity – days' cash on hand	698 days	631 days	639 days	600 days	573 days	553 days	540 days

Note: Projected metrics assume issuance of $761.5 million of additional airport system revenue bonds during the projection period (see anticipated debt above)

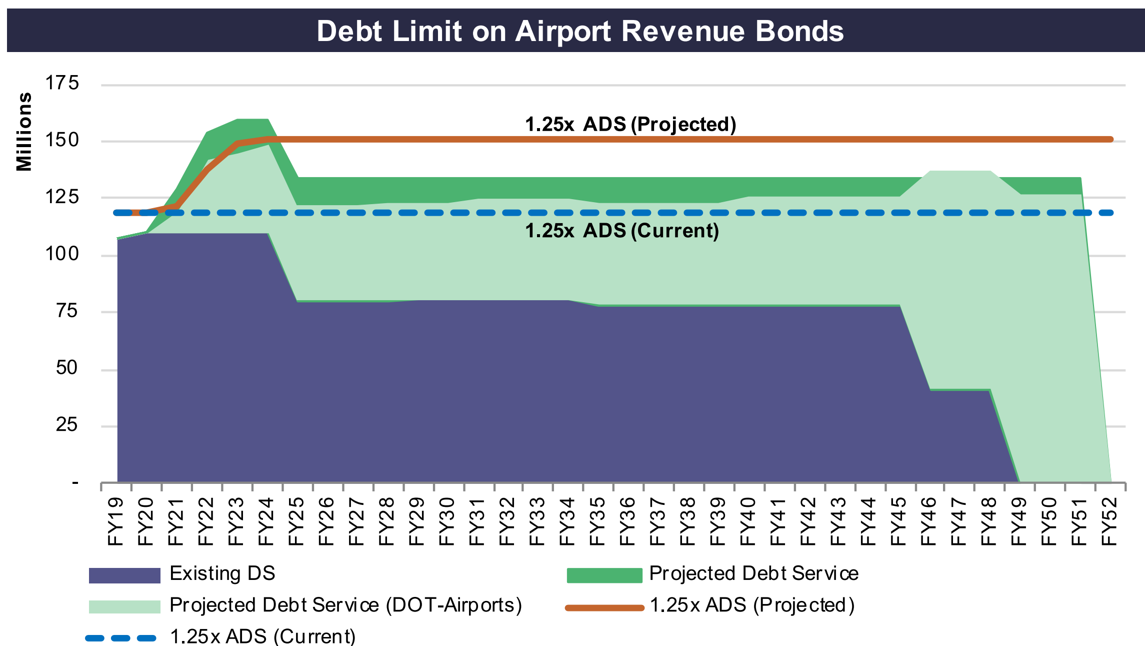
AFFORDABILITY METRICS (CFC Revenue Debt)	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Debt service coverage	14.84x	5.00x	4.55x	2.63x	2.67x	2.71x	2.76x
Debt service coverage (excluding rolling coverage fund)	14.14x	4.77x	4.11x	2.38x	2.42x	2.46x	2.51x
CFC Transaction Days ('000)	15,925	16,216	16,508	16,803	17,101	17,399	17,712

Note: Projected metrics assume issuance of $230.0 million CFC revenue bonds during the projection period (see anticipated debt above)

Relevant Affordability Metrics

1. Certificate and Indenture Limitations: The Certificate of the Director of Transportation dated May 1, 1969 contains a rate covenant relating to DOT-Airports' airport system revenue bond debt. DOT-Airports shall impose rates and charges, which together with unencumbered funds on deposit in the Airport Revenue Fund at the end of the fiscal year certified as Revenues, should be sufficient to yield net revenues and taxes at least equal to 1.25 times debt service on all revenue bonds.

   DOT-Airports plans to issue approximately $761.5 million in revenue bonds to support capital projects. Any additional bonds are subject to an additional bonds test (ABT) wherein pledged revenues based on most recent audited fiscal year must be at least 1.25 times annual debt service on outstanding debt for the year as well as projected pledged revenues as estimated by a consulting engineer over three year period after close of construction must be at least 1.25 times annual debt service on all bonds then outstanding including the additional bonds. As reflected in the following chart, current revenues are expected to be at least equal to 1.25 times current debt service in compliance with the rate covenant (with existing debt service in purple less than the 1.25 times revenue threshold depicted by the blue dotted line). The projected debt service is higher than the ABT threshold based on projected revenues (with the total debt service exceeding the orange line representing the 1.25 times ABT threshold with projected revenues).

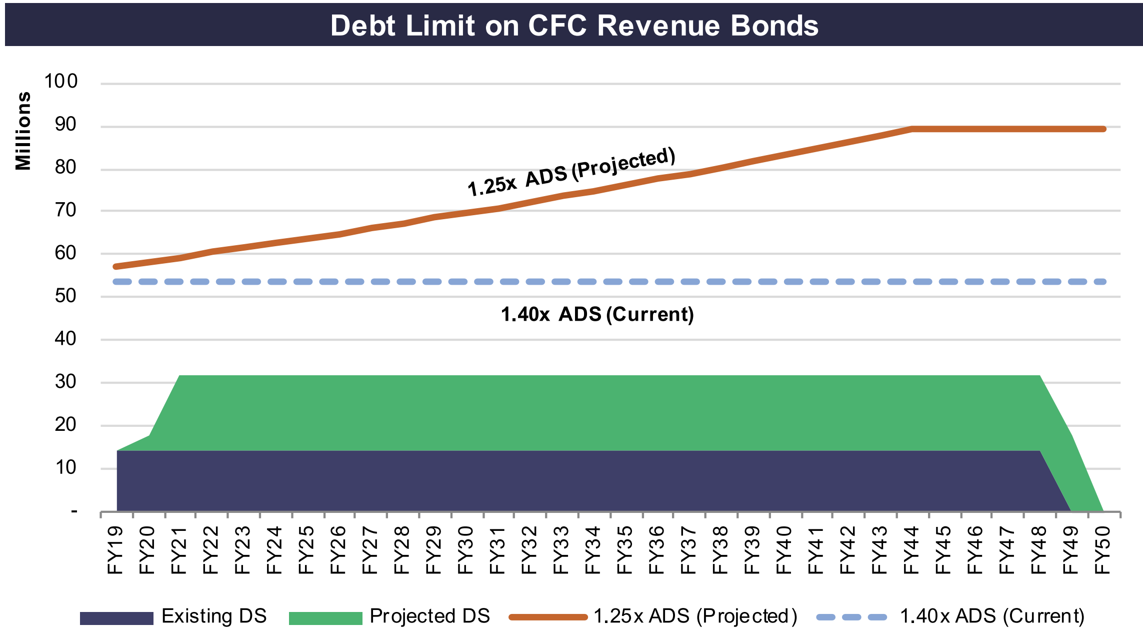


   This is in part due to very conservative interest rate assumptions used to project future debt service which is different from projected debt service provided by DOT-Airports. The projections provided by DOT-Airports for future debt service satisfy the ABT test (with the total debt service less than or equal to the orange line representing the 1.25 times threshold in the chart).

   As previously described, DOT-Airports employs a residual hybrid rate-setting methodology: essentially, the airlines fully compensate DOT-Airports for any operating expenses including debt

service. Due to cost recovery mechanisms in place, DOT-Airports is anticipated to have sufficient revenues to meet the indenture limitations for these planned debt issuances.

The 1969 Certificate of the Director also permits the construction of special facilities, such as the ConRAC facilities being constructed at the various airports, and provides for the issue of bonds, such as the CFC revenue bonds under the CFC Indenture. All debt secured by CFC revenues, including the EB-5 loan, is issued pursuant to the CFC Indenture of Trust dated August 14, 2014, as amended and supplemented. As per the indenture DOT-Airports must set the CFC rate and collect such CFC revenues as well as any additional "deficiency payments" from the rental car companies so as to provide a 1.40 times debt service coverage including funds available in the rolling coverage fund.



DOT-Airports plans to issue approximately $230.0 million in CFC revenue bonds to fund the ConRAC projects. Any additional bonds are subject to an ABT test wherein projected CFC revenues as estimated by a consulting engineer over three year period after final expenditure of capitalized interest must be at least 1.25 times maximum annual debt service on all bonds then outstanding including the additional bonds. As reflected in the chart above, current CFC revenues and funds in the rolling coverage account are expected to be at least equal to 1.4 times current debt service in compliance with the rate covenant (with existing debt service in purple less than the 1.4 times revenue threshold depicted by the blue dotted line). The projected CFC revenues are also more than sufficient to pass the projected ABT test (with the total debt service significantly lower than the orange line representing the 1.25 times threshold with projected revenues).

2. Annual debt service payments to annual revenues and Annual debt service payments to annual appropriations: Annual debt service is projected to be consistently, approximately 24% to 27% of annual revenues during the next five years. Annual debt service is projected to be approximately

26% up to 31% of annual expenditures. The ratios peak in the years of projected debt issuance and moderate thereafter as the operating revenue and budget size increase overtime.

3. Debt service coverage: Debt service coverage is equal to net revenues, as defined in the Certificate, divided by principal and interest requirements for the fiscal year. Due to DOT-Airports' hybrid rate setting methodology, revenues are projected to be sufficient to meet existing and projected debt service requirements on all airport revenue debt as well as pay projected operating expenses. Based on net revenues from operations alone without including other sources and accounts available for debt service, senior lien coverage is adequate. Including interest income and other funds available for debt service, the total debt service coverage on all senior and subordinate lien debt is also adequate.

4. Liquidity – days' cash on hand: Days' cash-on-hand, a measure of liquidity, is unrestricted cash and investments plus discretionary reserves, divided by operating and maintenance expenditures and multiplied by 365. DOT-Airports anticipates maintaining current levels of unrestricted cash and investments which provide strong days' cash on hand. For FY2018, DOT-Airports is estimated to maintain 698 days' cash on hand providing significant liquidity for budgetary fluctuations in future fiscal years.

5. Cost per enplanement: CPE is airline-derived revenues (airline payments for the use of airport facilities in accordance with the adopted rates and charges methodology) divided by enplaned passengers. CPE is projected to increase as DOT-Airports funds capital projects and layers on additional debt service. However, DOT-Airports' CPE levels remain competitive.

6. Debt per enplanement: Debt per enplaned passenger (DPE) is total debt divided by total enplaned passengers. DPE is projected to increase in the near-term as DOT-Airports funds its capital projects.

7. CFC debt service coverage: The projected coverage on CFC revenue bonds and EB-5 loan in excess of 2.0 times, is sufficiently high based on current CFC collections. DOT-Airport has the authority to increase the CFC rate in the future, if needed. Similar to airport revenue bonds program, DOT-Airports is made whole by rental car companies. If CFC revenues are insufficient, the rental car agencies must provide "deficiency payments" to cover all of costs under the indenture. Hence revenues are projected to be sufficient to meet existing and projected debt service requirements on CFC bonds.

8. CFC transaction days: At all Hawaii airports, a CFC or user fee is imposed on each rental car user. A $4.5 CFC fee is collected per transaction per day. Transaction days is an estimate of total rental car transactions times the average number of days a car is rented. It is projected to increase by approximately 1.8% annually in line with anticipated visitor volume.

Peer/Median Comparisons

It is important to note that DOT-Airports is relatively unique in that it is a system of airports rather than a single airport. As such, it is challenging to evaluate DOT-Airports among peer airports. Using Fitch's Analytic Comparative Tool (FACT) for U.S. Airports for FY2016, DOT-Airports compares favorably to the operational and financial medians reflected below.

DEBT AND OPERATING METRICS	DOT Airports FY 2018	DOT Airports FY 2016	FITCH AIRPORTS SECTOR FY2016 MEDIANS				
			All	Large Hub	Regional O&D	AA- Rated	A-Rated
Fitch Rating	A+	A+					
Enplanements	18,490	17,215	4,708	22,154	3,247	21,559	4,302
Largest Carrier Share	51%	52%	41%	44%	39%	35%	44%
O&D	88%	86%	95%	70%	97%	78%	95%
CPE	9.63	9.08	9.95	10.67	8.56	8.54	9.73
Days' Cash on Hand	698	786	508	438	540	769	548
Total Debt Service Coverage Ratio(x)	1.72	1.62	1.71	1.69	1.85	2.02	1.60
Net Debt/Cash Flow After Debt Service	4.05	5.82	4.48	5.78	3.10	4.30	4.80
Debt/O&D Enplanement	73	86	84	170	71	103	87
Debt/Enplanement	64	74	80	119	69	80	83

Fitch Analytic Comparative Tool for U.S. Airports FY2016. FY2018 data from DOT-Airports.

DOT-Airports' total debt service coverage is in line with other A-rated airports and slightly lower than the median for other large airports; however, DOT-Airports' hybrid rate setting methodology should support sufficient coverage. Debt per enplanement is very low for DOT-Airports but this is expected to increase as DOT-Airports layers on additional debt reaching a projected $108 in FY2022. CPE for DOT-Airports compares favorably with sector medians, but is much higher than some of its Florida peers including Broward County and Greater Orlando Aviation Authority but lower than Las Vegas and San Diego. While CPE for DOT-Airports is projected to increase to $13.03 by FY2024, similar increases in CPE are also expected for some its peers as they execute their capital plans. DOT-Airports must carefully balance the need to fund infrastructure with maintaining CPE levels so as to attract service. Given DOT-Airports' monopolistic position in the service area and strong tourism levels, rising CPE is less of a concern than for other airports with competitive airports nearby.

DEBT AND OPERATING METRICS	DOT Airports FY 2018	DOT Airports FY 2016	PEERS					
			Broward County	Greater Orlando	Alaska	San Diego	Tampa	Las Vegas
Fitch Rating	A+	A+	A+	AA-	A+	A+	AA-	A
Enplanements	18,490	17,215	14,352	20,737	3,321	10,206	9,486	23,343
Largest Carrier Share	51%	52%	24%	26%	62%	38%	35%	39%
O&D	88%	86%	89%	95%	100%	93%	89%	90%
CPE	9.63	9.08	3.94	4.66	10.28	10.71	5.02	11.05
Days' Cash on Hand	698	786	404	655	406	721	424	716
Total Debt Service Coverage Ratio(x)	1.72	1.62	1.41	1.95	1.49	1.81	2.04	1.49
Net Debt/Cash Flow After Debt Service	4.05	5.82	10.44	2.05	5.56	4.78	4.26	8.13
Debt/O&D Enplanement	73	86	149	52	136	206	90	197
Debt/Enplanement	64	74	133	49	136	192	80	177

Fitch Analytic Comparative Tool for U.S. Airports FY2016. FY2018 data from DOT-Airports.

Moody's also publishes US Airport Medians annually, and sector medians for FY2016 are presented below. DOT-Airports' liquidity is very strong and compares favorably to all medians. Total and net coverage levels are lower than medians for other A1-rated credits. This is less of a concern given DOT-Airports' ability to raise rates.

DEBT AND OPERATING METRICS	DOT Airports FY 2018	DOT Airports FY 2016	MOODY'S AIRPORTS SECTOR FY2016 MEDIANS					
			All	Hub	O&D	AA Rated	A1 Rated	A2 Rated
Moody's	A1	A1						
Enplanements	18,490	17,215	3,353	22,267	1,978	21,559	6,161	3,384
Largest Carrier Share	51%	52%	42%	71%	39%	32%	47%	42%
O&D	88%	86%	96%	55%	98%	89%	95%	97%
CPE	9.63	9.08	8.42	10.23	8.36	8.54	8.73	6.90
Days' Cash on Hand	15,925	15,167	615	589	615	774	564	617
Total Debt Service Coverage (x)	1.72	1.62	1.86	1.44	2.01	2.38	1.91	2.08
Net Debt Service Coverage (x)	1.30	1.24	1.62	1.17	1.82	1.86	1.57	1.59
Debt/O&D Enplanement	73	86	81	157	69	100	88	51
Debt/Enplanement	64	74	69	97	69	75	77	49

Moody's Investor Service: US Airport Medians Fiscal 2016. FY2018 data from DOT-Airports.

The DOT-Airports' CFC credit is one of the highest rated among airports in the nation. In the following table, we provide a comparison of the DOT Airports' CFC metrics with some of its peers that also support tourism activity. The DOT-Airports' coverage and legal covenants compare favorably to most of its peers.

CFC DEBT METRICS	DOT Airports	PEERS				
		Orlando	San Diego	Tampa	Anchorage	New Orleans
Rating	A2 / A+ / A	A2 / - / A	A3 / A- / -	A3 / A- / -	Baa2 / - / -	Baa1 / A- / -
CFC Rate	4.5	2.5	9.0	6.0	5.5	9.0
Rate Covenant (x)	1.40	1.25	1.30	1.50	1.25	1.35
Min. Debt Service Coverage (x)	2.22	2.30	2.00	1.65	1.23	1.50

Source: Audit Reports and Continuing Disclosure Reports for FY2016 and FY2017 and latest rating reports

G. Discussion on Debt Affordability, Potential Concerns and Recommendations

As DOT-Airports evaluates funding of significant capital improvements, affordability for DOT-Airports can be assessed by several factors including debt service coverage, liquidity and cash balances, cost per enplanement and debt per enplanement. Often times assessing whether an airport is over-leveraged is difficult because of the cost recovery mechanisms in place through the airline and/or rental car agreements.

Enplanements grew by 3.5% in FY2018 from FY2017. DOT-Airports' enplanement forecast conservatively assumes annual enplanement growth of under 2.0% during the projection period. Continued progress on DOT-Airports' Capital Improvement Plan (CIP) combined with sustained strong and stable operational and financial metrics support DOT-Airports' credit and overall affordability. The projected financial metrics are subject to enplanement volatility due to unforeseen economic events. Cost mitigation and delayed CIP contingency plans are flexibility measures that may be utilized to support strong metrics despite enplanement volatility throughout the projection period. DOT-Airports' residual hybrid rate-setting methodology provides sufficient revenues to cover increased debt service costs. Projections reflect higher

but still competitive CPE and DPE levels, strong maintenance of liquidity, and ultimately, sufficient revenues to pay existing and projected debt service on airport revenue debt.

CFC transaction days and CFC revenues increased by about 3.2% in FY2017 from FY2016. DOT-Airports conservatively projects future CFC transaction days and revenues to increase by 1.8% over the next five years. While there is sufficient cushion to support additional anticipated CFC revenue supported debt without assuming any increase in revenues from current levels, there is flexibility to raise the CFC rate (which at $4.5 is lower than several other airports) and protection under the agreements with rental car agencies that must provide for deficiency payments, as needed. The DOT-Airports' overall conservative approach to funding as much as the ConRAC capital cost as possible with pay-go dollars, further supports overall affordability of CFC Revenue Bonds.

IV. Department of Transportation – Harbors

The Department of Transportation, Harbors Division (DOT-Harbors) manages a commercial harbors system that facilitates safe and efficient operations of commercial cargo, passenger, fishing, and other commercial maritime-related services.

The Harbor System is comprised of ten harbors. DOT-Harbors operates as a landlord port. DOT-Harbors derives its revenues from three major sources: services revenues, rental income and other operating revenue. Services revenues are derived from tariffs assessed on the activities of ships and handling of cargo and include wharfage charges, dockage fees, port entry fees, demurrage, mooring charges and fees for other services. Rental income includes charges for wharf space and land, storage, pipeline usage and automobile parking space. DOT-Harbors operated for many years without any increase in tariffs but it has remedied that in recent years. In 2016, DOT-Harbors adopted a schedule of discrete multi-year tariff increases in consultation and with support from primary harbor system users.

DOT-Harbors' primary financing program consists of harbor revenue bonds secured by net available revenue. Net available revenue represents generally, total operating and non-operating revenues (including but not limited to rates and charges assessed in relation with the services provided) deposited into the Harbor Special Fund after payment of any operating costs. DOT-Harbors has the flexibility to adjust the rates and charges prescribed for the services and facilities to ensure sufficiency of revenues. In certain cases, B&F may issue GO bonds on behalf of DOT-Harbors repayment of which is entirely the responsibility of DOT-Harbors. Repayment of reimbursable GO bonds is subordinate to payment on DOT-Harbors' revenue bonds.

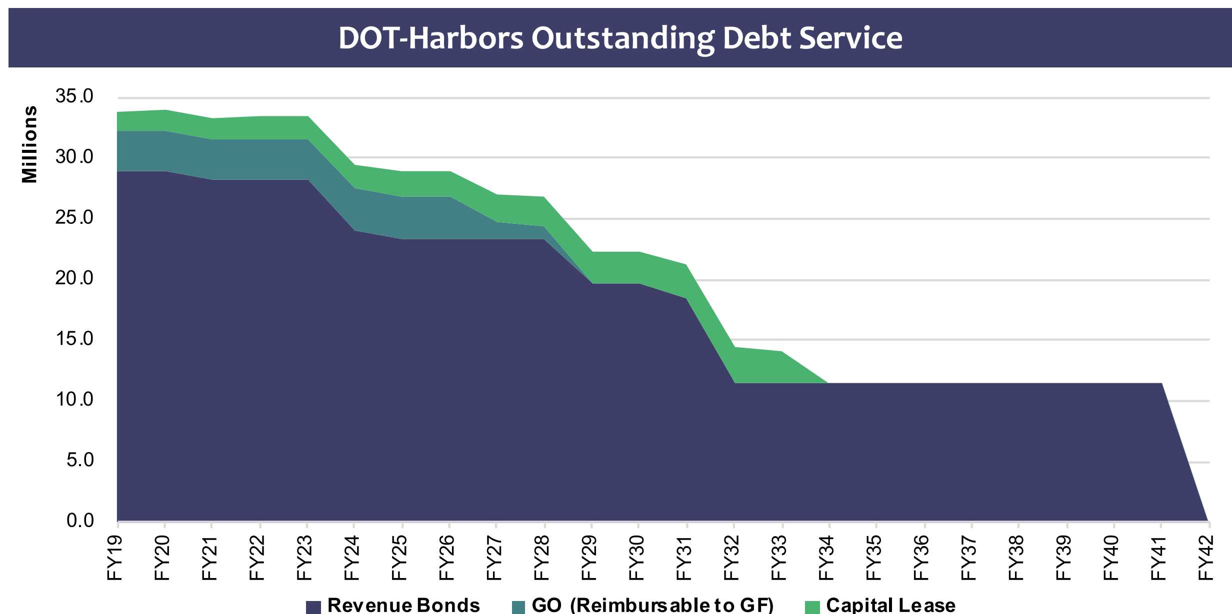
A. Debt Profile

DOT-Harbors currently has seven series of harbor revenue bonds outstanding for a total par amount of nearly $284.0 million. In addition, DOT-Harbors is responsible for payments on $23.3 million in reimbursable GO bonds. It also has a $26.3 million capital lease outstanding the proceeds of which were used to fund energy conservation projects. Energy savings generated from the projects are sufficient to cover the lease payments.

Series Name	Tax Status	Issue Size	Delivery Date	Final Maturity	Outstanding Par	Next Par Call Date	Callable Par
				Revenue Bonds			
Series 2010A	Tax-Exempt	164,275,000	11/30/10	7/1/40	148,735,000	7/1/2020	140,395,000
Series 2010B	AMT	37,115,000	11/30/10	7/1/21	11,540,000	7/1/2020	4,785,000
Series 2013A	AMT	23,615,000	8/2/13	7/1/29	16,615,000	7/1/2019	13,405,000
Series 2016A	AMT	14,565,000	12/6/16	1/1/24	12,625,000	1/1/2018	12,625,000
Series 2016B	AMT	68,535,000	12/6/16	1/1/31	64,935,000	1/1/2018	64,935,000
Series 2016C	Taxable	8,135,000	12/6/16	7/1/20	7,135,000	7/1/2018	7,135,000
Series 2016D	AMT	22,425,000	7/5/17	7/1/27	22,410,000	7/1/2018	22,410,000
Sub-Total	-	-	-	-	**283,995,000**	-	**265,690,000**
				GO Bonds (Reimbursable)			
GO Bonds	Tax-Exempt	-	-	-	23,254,635	-	-
				Capital Lease			
Capital Lease	Tax-Exempt	26,992,659	9/17/15	10/1/32	26,275,925	-	-
Total	-	-	-	-	**333,525,560**	-	**265,690,000**

B. Debt Service Chart

DOT-Harbors' debt service is front-loaded. Total debt service is approximately $32.0 million through FY2023, gradually decreases through FY2031, and levels off at $11.5 million through FY2041. DOT-Harbors has moderate debt amortization with 56% of revenue bond principal paid over the next ten years.



C. Credit Ratings

DOT-Harbors maintains strong ratings as reflected in the table below. These include a one notch upgrade from all three rating agencies within the last two years.

Department of Transportation Harbors Credit Ratings			
	Moody's	**S&P**	**Fitch**
Revenue Bonds	A1 Stable	AA- Stable	AA- Stable

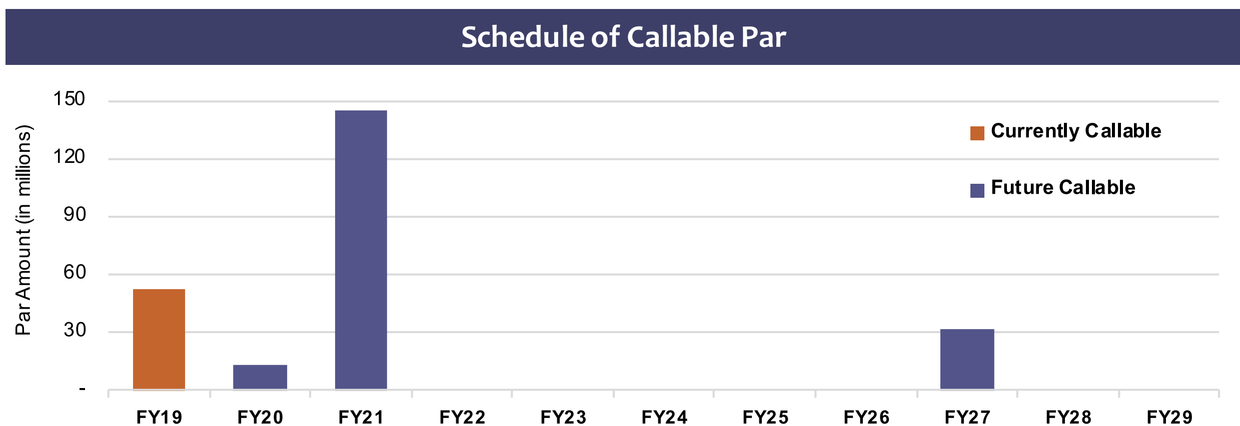
The upgrades were a direct result of favorable financial performance driven by the enacted tariff adjustments to support rising operating costs.

Credit strengths include monopolistic position and DOT-Harbors' essentiality to Hawaii's economy, strong management focus on financial performance and scheduled tariff increases, very high liquidity position, conservative debt structure, and strong debt service coverage levels consistently above 2.0x.

Credit challenges include exposure to economic volatility owing to a significant tourism industry, customer concentration of cargo in one shipping line and a sizable capital program and the projected impact on financial metrics including debt service coverage.

D. Schedule of Callable Bonds

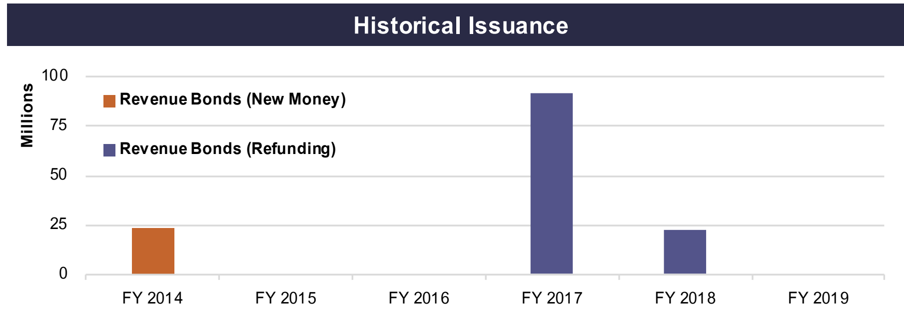
The following chart provides a summary of callable harbor revenue bonds and par amounts. DOT-Harbors has approximately $243.3 million in callable par outstanding. Approximately $52.7 million is currently callable as reflected in FY2019 in the chart (Series 2016A, Series 2016C and part of Series 2016D). However since they were issued fairly recently they are unlikely to be refunded for savings at this time. A majority of the remaining, that is, approximately $145.2 million is callable in FY2021 (Series 2010). Pursuant to the criteria outlined in its Debt Management Policy, DOT-Harbors may pursue opportunities to refund callable bonds.



E. Multi-Year Program Anticipated/Intended Debt Issuance

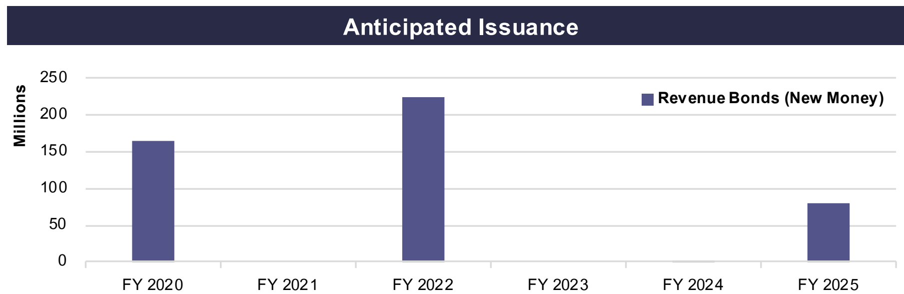
Existing Debt

In the past five years, DOT-Harbors has issued five series of refunding bonds all of which were private placements. DOT-Harbors has not issued new money bonds since 2010 as a result of limited debt-financed CIP needs.



Anticipated Debt

While DOT-Harbors anticipates significant cash-funding of its CIP, $473 million of revenue bonds (including $165.0 million in FY2020 and $225.0 million in FY2022) are projected to be issued through FY2025 as shown below. DOT-Harbors also expects to set up a revolving loan facility of $140.0 million by FY2024 to support future projects, with interest-only payments on the facility for the first five years. The facility is anticipated to provide liquidity and support lower interest costs compared to long-term borrowing.



Unissued but Authorized Debt

DOT-Harbors has approximately $728.0 million in unissued but authorized revenue bonds.

F. Measuring Debt Burden

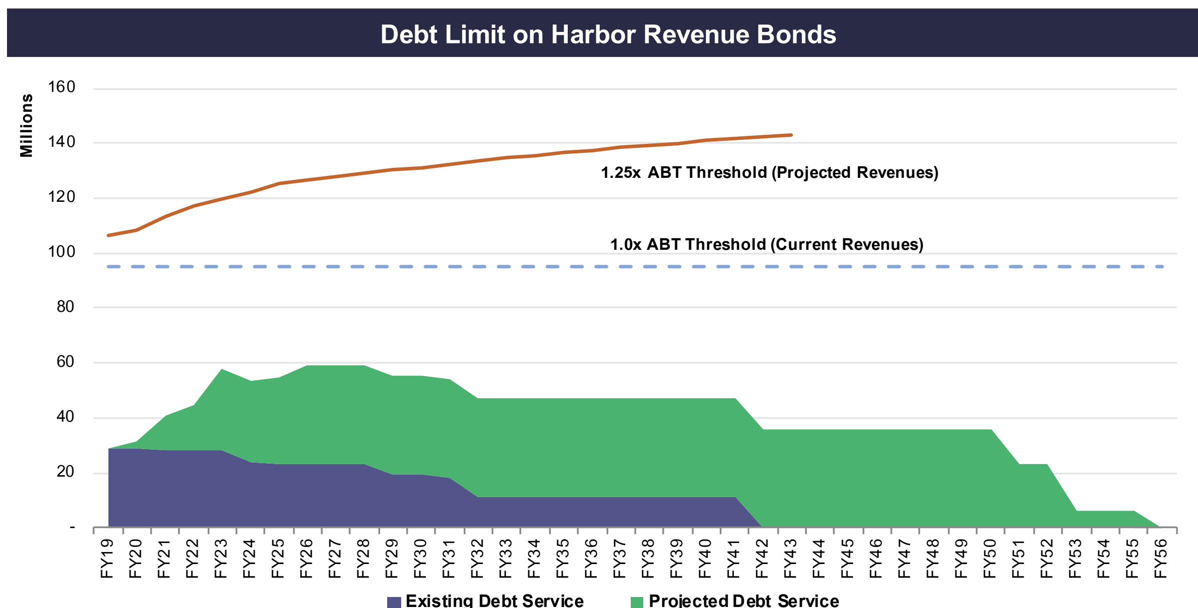
Last Full Fiscal Year and Projected (six-years) Metrics

AFFORDABILITY METRICS	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Annual debt service to annual revenues	21.1%	18.3%	19.0%	22.8%	23.9%	29.7%	27.1%
Annual debt service to annual appropriations	34.2%	32.0%	32.5%	37.0%	38.3%	43.7%	41.4%
Revenue bonds debt service coverage (Indenture Revenues)	3.97x	4.60x	4.29x	3.48x	3.29x	2.59x	2.85x
Total debt service coverage (Indenture Revenues)	3.40x	3.94x	3.70x	3.09x	2.95x	2.37x	2.59x
Revenue bonds debt service coverage (Net Revenues)	3.28x	3.91x	3.71x	3.02x	2.88x	2.27x	2.50x
Total debt service coverage (Net Revenues)	2.81x	3.34x	3.20x	2.69x	2.58x	2.08x	2.28x
Debt to operating revenues	2.1x	1.7x	2.4x	2.2x	3.1x	2.9x	2.7x
Liquidity – days' cash on hand	1,020 days	1,050 days	1,050 days	1,046 days	1,019 days	1,016 days	1,003 days

Note: Projected metrics assume issuance of $393.0 million of additional revenue bonds during through FY2024 (see anticipated debt above)

Relevant Affordability Metrics

1. Bond Certificate Limitations: As per the Bond Certificate of the Director of Transportation dated March 1, 1997, the DOT-Harbors' revenue bonds are subject to a rate covenant that requires setting appropriate rates, rents, fees, and charges so as to always remain self-supporting, i.e. be sufficient to cover all of DOT-Harbor's obligations including but not limited to operating expenses and debt service on outstanding revenue and reimbursable GO bonds. In other words, DOT-Harbors is required to maintain one times coverage on bonds from net revenues of the system before adjustments. Net revenues when adjusted for balances available in the reserve and contingency are subject to a higher rate covenant of 1.25 times aggregate debt service.



Over and above that, should DOT-Harbors want to issue additional senior lien debt, the Certificate dictates a twofold ABT test - at least one times coverage on all anticipated debt based on historical net revenues (such threshold shown as gray dotted line in the chart) and 1.25 times coverage after inclusion

of any projected increases in most recent year's net revenues (such threshold shown as an orange line in the chart).

With plans to issue an additional $473.0 million in revenue bonds, DOT-Harbors is projected to maintain very strong debt service coverage levels. Historical revenues, even before incorporating projected increases, provide coverage of over 1.0 times and projected revenues provide a coverage much greater than 1.25 times projected debt service in fulfillment of the ABT test.

2. Annual debt service payments to annual revenues and annual debt service payments to annual appropriations: Over the projection period, annual debt service to annual revenues ranges between 18% and 30% (FY2023). A combination of strong demand for the harbors system, and scheduled as well as inflation driven increases in various fees and tariffs, have resulted in strong revenue performance for DOT-Harbors in recent years with a favorable impact on the debt service-to-annual revenues ratio. Over the projection period, annual debt service to annual appropriations ranges between 32% and 44% (FY2023). This is a reflection of increasing debt service and its growing share of DOT-Harbors' operating budget.

3. Debt service coverage: Debt service coverage is net revenues, as defined in the Certificate, divided by principal and interest requirements for the fiscal year. Over the projection period, debt service coverage (based on net revenues as adjusted based on the Certificate) is projected to remain strong – in excess of 2.5 times.

4. Debt to operating revenue: The debt to operating revenues ratio is calculated by dividing total outstanding debt by total annual operating revenues and is a measure of leverage. DOT-Harbors' leverage ratio for FY2018 is 2.1 times and has moderated significantly over the last five years due to healthy increases in operating revenues over the period. It is projected to increase to 3.1 times by FY2022 as DOT-Harbors borrows to implement it capital projects but will likely moderate thereafter. Such variations in leverage ratio are not uncommon among infrequent issuers like DOT-Harbors that access markets after long intervals.

5. Liquidity – days' cash on hand: Days' cash on hand, a measure of liquidity, is unrestricted cash and investments plus discretionary reserves, divided by operating and maintenance expenditures and multiplied by 365. Despite DOT-Harbors' planned use of cash on hand to fund capital projects and setting aside certain funds for future projects, liquidity ratios are very strong. DOT-Harbors estimates 1,020 days cash on hand at the end of FY2018. Liquidity is anticipated to remain above a 1,000 days cash on hand during the course of the next six years.

Peer/Median Comparisons

Utilizing FACT for U.S. Ports for FY2017, we compare DOT-Harbors against Fitch rated seaports sector medians, Harbor Department of Los Angeles, Port of Long Beach, San Diego Unified Port District and Broward County-Port Everglades. As reflected in the following table, DOT-Harbors' liquidity is extremely strong in comparison to the seaports sector median and DOT-Harbors' peers. Even after the planned utilization of cash on hand for capital projects, the projected 1,020 days' cash on hand is significantly higher than the sector median and in line with its AA-rated peers.

DEBT AND OPERATING METRICS	DOT Harbors FY2018	DOT Harbors FY2017	FITCH SEAPORTS FY2017 MEDIANS		
			Overall Seaports	AA Rated	A Rated
Fitch Rating	AA-	A+			
Days' Cash on Hand	1,020	1,321	570	993	568
Total Debt Service Coverage (x)	3.40	2.84	2.72	2.84	2.24
Net Debt/Cashflow after debt service	2.13	2.63	1.17	0.81	3.53
Minimum Annual Guarantees as a % of	0%	0%	53%	68%	53%

Fitch Analytic Comparative Tool for U.S. Ports for FY2017. FY2018 data from DOT-Harbors.

DEBT AND OPERATING METRICS	DOT Harbors FY2018	DOT Harbors FY2017	PEERS			
			Harbor Dept. of Los Angeles	Port of Long Beach	San Diego Unified Port District	Broward County-Port Everglades
Fitch Rating	AA-	A+	AA	AA	A+	A
FY Cargo TEU	n/a	0.4%	9.7%	4.1%	3.0%	3.9%
FY Cargo Tons	n/a	-3.3%	-6.5%	-1.7%	-2.9%	8.0%
FY Cruise Passengers	n/a	8.0%	-21.9%	NA	13.1%	1.0%
Days' Cash on Hand	1,020	1,321	993	1,045	284	1,278
Total Debt Service Coverage (x)	3.40	2.84	2.97	2.72	4.21	3.22
Net Debt/Cashflow after debt service	2.13	2.63	0.81	2.21	Cash +ve	Cash +ve
Minimum Annual Guarantees as a % of Operating Revenues	0%	0%	68%	87%	51%	64%

Fitch Analytic Comparative Tool for U.S. Ports for FY2017. FY2018 data from DOT-Harbors.

G. Discussion on Debt Affordability, Potential Concerns and Recommendations

In the midst of the DOT-Harbors' modernization plan, DOT-Harbors utilized cash on hand to fund major capital project needs over the past few years. Over the projection period, approximately $473.0 million in revenue bonds is planned to be issued, in part to reimburse DOT-Harbors for capital projects funded with cash. As reflected in the affordability metrics above, DOT-Harbors is projected to maintain sufficient revenues to support the additional projected debt service. DOT-Harbors' projected liquidity (as measured by days' cash on hand) is anticipated to remain high (around the 1,000 days' level). While the financial projections are dependent on volume/traffic as well as assumed tariff increases, DOT-Harbors' significant liquidity can help mitigate budgetary fluctuations. DOT-Harbors' projected revenues are sufficient to cover existing and projected revenue bond debt service and comfortably satisfy future ABT tests.

V. Department of Transportation – Highways

The Department of Transportation, Highways Division (DOT- Highways) supervises the management and maintenance of the State Highway System and the location, design and construction of new highways roads and facilities. The State imposes taxes, fees, and charges relating to the operation and use of motor vehicles on the public highways of the State and these funds are deposited into the State Highway Fund. The major revenue sources of the State Highway Fund include highway fuel license taxes, vehicle registration fees, vehicle weight taxes, and rental motor vehicle, tour vehicle and car-sharing vehicle surcharge taxes.

DOT-Highways' primary financing program consists of highway revenue bonds. These revenue bonds are secured by a gross pledge of revenues in the State Highway Fund, including but not limited to highway fuel license taxes, registration fees, weight taxes rates and rental motor vehicle taxes. The flow of funds requires payment of debt service before operations and maintenance. With legislative approval, DOT-Highways has the flexibility to adjust the rates and allocation of the fees and taxes prescribed to ensure sufficiency of revenues. In certain cases, B&F may issue GO bonds on behalf of DOT-Highways, repayment of which is entirely the responsibility of DOT-Highways. Repayment of reimbursable GO bonds is subordinate to payment on DOT-Highways' revenue bonds. DOT-Highways also issues COPs and Lease Purchase Agreements payable from funds appropriated for DOT-Highways.

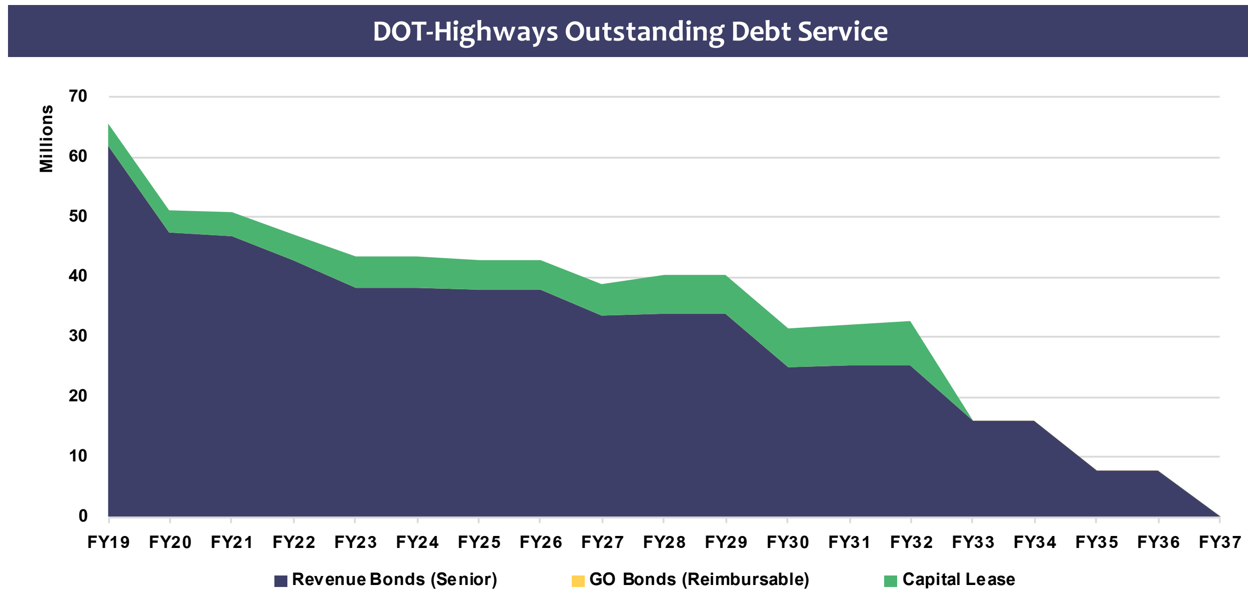
A. Debt Profile

DOT-Highways currently has eight series of highway revenue bonds outstanding for a total outstanding par of $408.1 million. In addition DOT-Highways is also responsible for payment of its share of reimbursable GO debt. It also has a $60.2 million capital lease outstanding the proceeds of which were used to fund energy conservation projects. Energy savings generated from the projects are sufficient to cover the lease payments.

Series Name	Tax Status	Issue Size	Delivery Date	Final Maturity	Outstanding Par	Next Call Date	Callable Par
			Revenue Bonds				
Series 2005B	Tax-Exempt	123,915,000	3/15/05	7/1/21	20,285,000	-	-
Series 2008	Tax-Exempt	125,175,000	12/17/08	1/1/29	11,940,000	1/1/2019	6,115,000
Series 2011A	Tax-Exempt	112,270,000	12/15/11	1/1/32	47,485,000	1/1/2022	26,825,000
Series 2011B	Tax-Exempt	5,095,000	12/15/11	1/1/23	5,095,000	1/1/2022	5,095,000
Series 2014A	Tax-Exempt	103,375,000	8/14/14	1/1/34	90,285,000	7/1/2024	64,305,000
Series 2014B	Tax-Exempt	32,285,000	8/14/14	1/1/26	26,905,000	7/1/2024	7,735,000
Series 2016A	Tax-Exempt	103,395,000	9/8/16	1/1/36	98,460,000	7/1/2026	63,520,000
Series 2016B	Tax-Exempt	101,090,000	9/8/16	1/1/30	100,270,000	7/1/2026	52,080,000
Sub-Total	-	-	-	-	**408,070,000**	-	**225,675,000**
			GO Bonds (Reimbursable)				
GO Bonds	Tax-Exempt	-	-	-	7,777	-	-
			Capital Lease				
Capital Lease	-	-	-	-	60,241,710	-	-
Total	-	-	-	-	**468,319,487**	-	**225,675,000**

B. Debt Service Chart

DOT-Highways' aggregate debt service structure is tapering with gradually declining debt service payments over time. DOT-Highways structures series with level debt service with the exception of refunding bonds which are structured to generate level savings. The principal amortization of revenue bonds is fairly rapid with nearly 68% of principal being amortized over the next ten years.



C. Credit Ratings

The DOT-Highways' revenue bonds carry strong credit ratings in the 'AA' category from all three rating agencies.

Department of Transportation Highways Credit Ratings			
	Moody's	**S&P**	**Fitch**
Revenue Bonds	Aa2 Stable	AA+ Stable	AA Stable

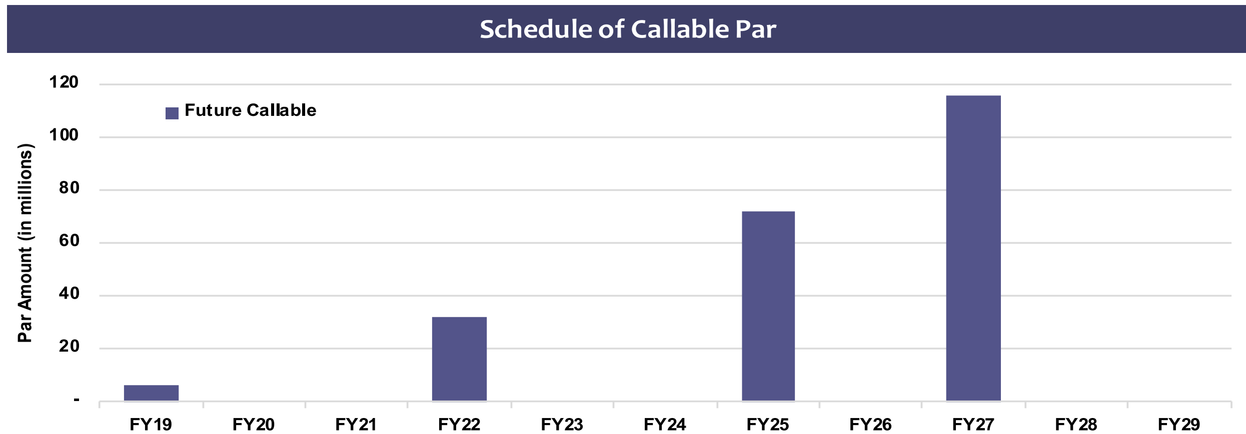
Credit strengths include strong senior lien debt service coverage, 100% fixed-rate debt portfolio, strong additional bonds test that provides bondholders protection against overleveraging in the future, diverse and robust economy with strong demographics and a healthy rental car market, and prudent management.

Credit challenges include volatility of pledged revenues either driven by economic considerations or by transfers from the highway fund to the general fund, as had occurred in the past, although none are anticipated at this time.

Per the indenture, DOT-Highways funds a debt service reserve sized at one-half of maximum annual debt service for its revenue bonds. However, DOT-Highways through supplemental indenture may eliminate the debt service reserve fund requirement pending consent of 100% of bondholders. Rating agencies are aware of the potential change and have not indicated any potential impact to DOT-Highways' credit ratings given their methodologies placing minimal value in reserve funds for special tax credits like DOT-Highways.

D. Schedule of Callable Bonds

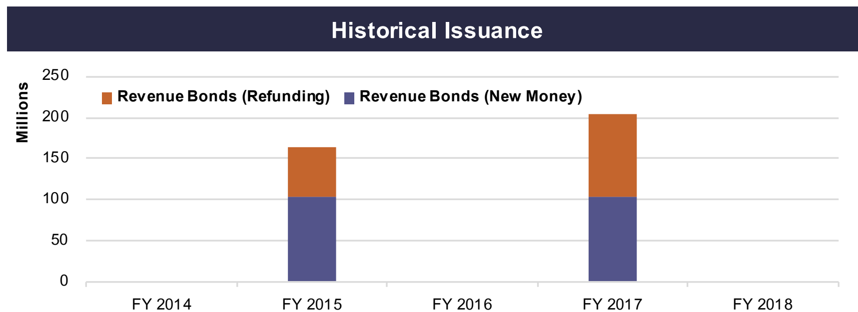
The following chart provides a summary of callable highway revenue bonds. Of the $408.1 million in highway revenue bonds outstanding, about $225.7 million represents callable par that can be refunded at the call date in advance of final maturity. DOT-Highways does not have any currently callable bonds. The next call date is in January 2019 with $6.1 million callable at the time. Future call dates for the remaining par are in FY2022, FY2025, and FY2027. Pursuant to the criteria outlined in its Debt Management Policy, DOT-Highways may pursue opportunities to refund callable bonds.



E. Multi-Year Program Anticipated/Intended Debt Issuance

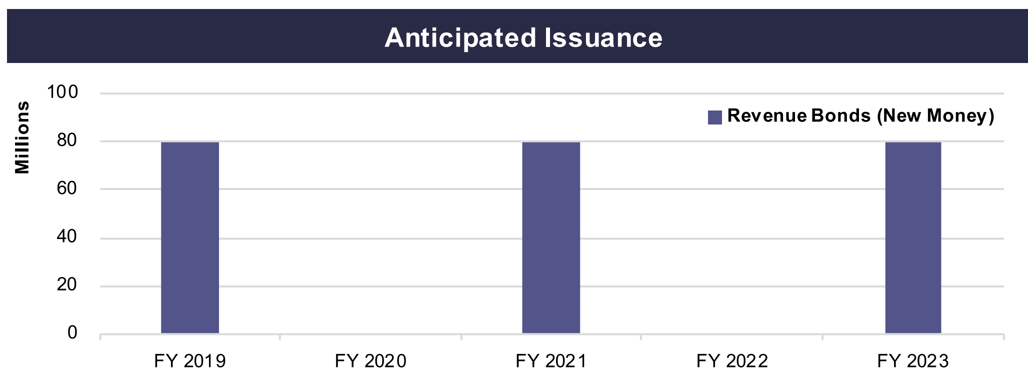
Existing Debt

DOT-Highways has accessed capital markets for both new money and refunding bonds every two to three years in the past with the last issuance in September 2016. New money issuance has consistently been in the range of $100 million to $115 million with the latest issuance par of $103.4 million in FY2017.



Anticipated Debt

Consistent with the historical trend, DOT-Highways anticipates additional new money issuances for capital projects (maintenance and preservation of the system) in FY2019, FY2021 and FY2023 in the par amount of about $80 million in each of those years.



Unissued but Authorized Debt

DOT-Highways has [$970.5 million] authorized but unissued revenue bonds.

F. Measuring Debt Burden

Last Full Fiscal Year and Projected (six-years) Metrics

AFFORDABILITY METRICS	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Annual debt service to annual revenues	22.2%	22.6%	19.4%	19.5%	20.1%	18.8%	20.8%
Annual debt service to annual appropriations	25.6%	25.9%	21.9%	22.0%	22.5%	21.0%	23.0%
Debt service coverage (Gross)	4.51x	4.43x	5.17x	5.12x	4.99x	5.31x	4.82x
Debt service coverage (Net)	1.60x	1.57x	1.60x	1.57x	1.53x	1.55x	1.47x
Liquidity – days' cash on hand	384 days	377 days	332 days	325 days	313 days	301 days	296 days

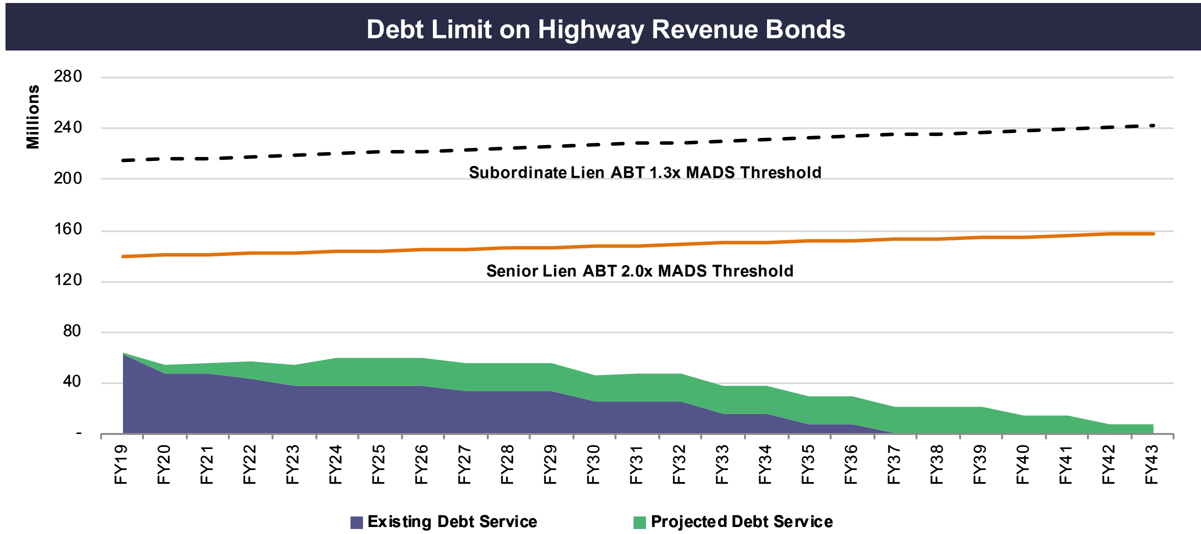
Note: Projected metrics assume issuance of $240 million of additional revenue bonds (see anticipated debt above)

Relevant Affordability Metrics

1. Master Certificate Limitations: As per the Master Certificate of the Director of Transportation dated August 1, 1993, DOT-Highways' revenue bonds are subject to a rate covenant that requires setting appropriate rates, rentals, fees, and charges so as to generate sufficient revenues to cover all of DOT-Highway' obligations including but not limited to operating expenses and debt service on outstanding bonds. In other words the DOT-Highways is required to maintain one times coverage on revenue bonds. Over and above that, should the DOT-Highways want to issue additional senior lien debt, the Certificate dictates an ABT test of 2.0 times coverage (orange line in the chart) on projected maximum annual debt service (MADS) payment from pledged revenues for any twelve consecutive calendar month period out of the last eighteen consecutive calendar month preceding the date of issuance. If DOT-Highways were to issue new bonds on a subordinated lien to currently outstanding debt which are all senior lien bonds, the ABT requirement is slightly less stringent at 1.3 times MADS (black line in the chart).

   As reflected in the chart, there is significant capacity under senior lien ABT limitations and DOT-Highways can fund its projected capital needs within indenture limits. Although DOT-Highways has sufficient senior lien capacity and does not intend to leverage the subordinate lien at this time, that option is also available to DOT-Highways and provides additional borrowing capacity. These legal limits

are based on gross revenues before payment of operating expenses which is typical for state highway DOTs.



2. Annual debt service payments to annual revenues or annual debt service payments to annual appropriations: These ratios measure the financial flexibility available to DOT-Highways by analyzing the fixed costs embedded in the budget. Debt service which is a fixed cost accounts for at most 23% of revenues or 26% of expenditures over the next five years. This affords DOT-Highways flexibility to make budgetary adjustments, if required. These metrics include the impact of DOT-Highways planned new issuances. Even with very modest revenue growth assumptions, these ratios are projected to decline indicating that the size of the planned borrowing is commensurate with revenue growth.
3. Gross debt service coverage: Gross debt service coverage is computed based on gross pledged revenues before payment of any operating expenses. Based on conservative revenue estimates for FY2018, the coverage on revenue bonds was very strong at 4.5 times. Assuming a modest 0.5% annual increase in revenues over the next five years, the coverage including new debt issuance is expected to remain over 4.0 times, well above the 2.0 times ABT requirement discussed above. It should be noted that while there is capacity to increase leverage based on indenture limitations and affordability considerations, lower coverage levels may result in credit implications.
4. Net debt service coverage: Legally, debt service is payable before operating expenses reflecting the strength of the gross revenue pledge. However, it is important to evaluate debt service coverage based on net revenues (after operating expenses) as a measure of self-sustainability and overall affordability. Net debt service coverage is based on net revenues which are available for debt service after payment of necessary operating costs. With conservative revenues projections, net debt service on existing and projected bonds is expected to be close to or above 1.5 times over the next five years. As reflected in the metrics, gross revenues are sufficient to pay projected debt service and operating expenses; these levels provide sufficient cushion and flexibility should revenues come in significantly lower than anticipated or expenses higher than expected.

5. Liquidity – days' cash on hand: DOT-Highways' liquidity levels are strong with an estimated 384 days' cash on hand in FY2018. While there are no specific plans to utilize cash on hand, liquidity is conservatively projected to decline but remain in excess of 290 days over the next five years.

Peer Comparisons

We compare DOT-Highways against other similarly rated state transportation agencies across the nation, namely, Arizona Transportation Board, Missouri Highways and Transportation Commission, Kansas DOT, Oregon DOT and Nevada DOT. As reflected in the table below, the gross coverage of MADS maintained by DOT-Highways on its senior lien bonds is in line with peers in the sector.

DEBT METRICS	DOT-Highways	STATE DEPARTMENT OF TRANSPORTATION PEERS				
		Arizona	Missouri	Kansas	Oregon	Nevada
Lien	Senior	Subordinate	Third	Senior	Subordinate	Senior
Credit Ratings	Aa2/AA+/AA	Aa2/AA+/--	Aa1/AA+/AA	Aa2/AAA/AA+	Aa2/AA+/AA+	Aa2 / AAA / AA+
Par Outstanding	$463 million	$1.4 billion	$2.0 billion	$2.0 billion	$2.5 billion	$659 million
Additional Bonds Test	2x MADS	3x MADS	2x MADS	3x MADS	3x MADS	3x MADS
Gross Coverage	4.48x	4.3x	4.5x	6.8x	3.1x	3.75x
Debt Service to OpEx*	15.2%	18.6%	13.5%	11.4%	14.9%	6.9%

Source: Audit Reports and Continuing Disclosure Reports for FY2016 and FY2017 **Operating Expenditures*

Despite lower coverage levels, Oregon DOT and Nevada DOT have been able to achieve the same or higher ratings than DOT-Highways on account of their stricter ABT covenant at 3.0 times MADS. Since DOT-Highways projects coverage levels, including new money issuances, to stay above 4.0x, there is potential for achieving higher ratings similar to peers by modifying the legal covenant for ABT while still maintaining capacity for additional bonds over and above what is currently planned. A stronger ABT will also help address rating agencies' concerns to some degree over DOT-Highways' exposure to general fund operations and performance.

DOT-Highways' debt service as a percentage of operating expenditures is at 15% which is on the higher end of where peer agencies are.

G. Discussion on Debt Affordability, Potential Concerns and Recommendations

Based on the affordability metrics, DOT-Highways is projected to fund its projected capital needs while maintaining strong coverage levels. For DOT-Highways along with its state transportation agency peers, debt service coverage is a critical affordability metric. DOT-Highways' gross coverage levels are projected to remain strong. When taking into account operational needs, net coverage is projected to be stable close to 1.5 times. With a short debt service profile on existing debt, DOT-Highways has significant capacity on the back-end to accommodate the projected new money issuances during the projection period, if required. DOT-Highways' projected revenues are sufficient to cover existing and projected revenue bond debt service.

VI. University of Hawaii

The State of Hawaii University System (UH) is a multi-institutional system comprised of a major research university (the University of Hawaii at Manoa), two baccalaureate campuses (Hilo and West Oahu), seven community colleges (Hawaii Honolulu, Kapiolani, Kauai, Leeward, Maui, and Windward) and nine educational centers distributed across the State. UH is the sole public higher education system within the State and, therefore, has a unique competitive position and value in Hawaii. Furthermore, the UH system is the only truly integrated higher education system in the country that seamlessly arranges its universities and community colleges into one system. Other public higher education systems in the country are typically separate and distinct systems defined by the type of system (community colleges, junior colleges and universities).

In addition to being an integrated higher education system, the UH system distinguishes itself through its Hawaiian, Asian and Pacific orientation and its position as one of the world's foremost multicultural centers for global and indigenous studies. Students are members of a population in which no one ethnic group constitutes a majority, and the educational experience is enriched by the diversity of cultures represented. UH's fall 2017 enrollment totaled 51,674 (90% undergraduate and 10% graduate students). Hawaii residents comprised 86% of all enrolled students, nearly 10% were from the U.S. mainland, and the remaining 4% of students were international students from over 100 countries.

Major UH operating revenue sources include State operating support, net tuition and fee revenue, and federal funding of research. UH also receives significant State capital support. Net tuition revenue has increased steadily over the past five years as a result of tuition increases and enrollment increases during the recession. Enrollment has been declining for the last few years and measures have been taken to stabilize the trend. The rate of decline has slowed and enrollment is projected to remain flat over the next two years. UH plans to make only minor adjustments to tuition levels to retain affordability for students. As such, net tuition revenue is expected to be flat over the projection period.

UH's primary financing program consists of university revenue bonds which are generally secured by income derived by UH from its ownership and management of the Network including housing and auxiliary activities and moneys in any special fund or revolving fund, which include tuition and fees. Certain revenue bonds series are additionally secured by other revenues such as cigarette tax revenues or appropriations from the Hawaii Tobacco Settlement Special Fund.

In certain cases, B&F may issue reimbursable GO bonds on behalf of UH, repayment of which is entirely the responsibility of UH. Repayment of reimbursable GO bonds is subordinate to payment of UH's revenue bonds. As described above, UH receives significant operating and capital support from the State's general fund – including non-reimbursable GO bond funding.

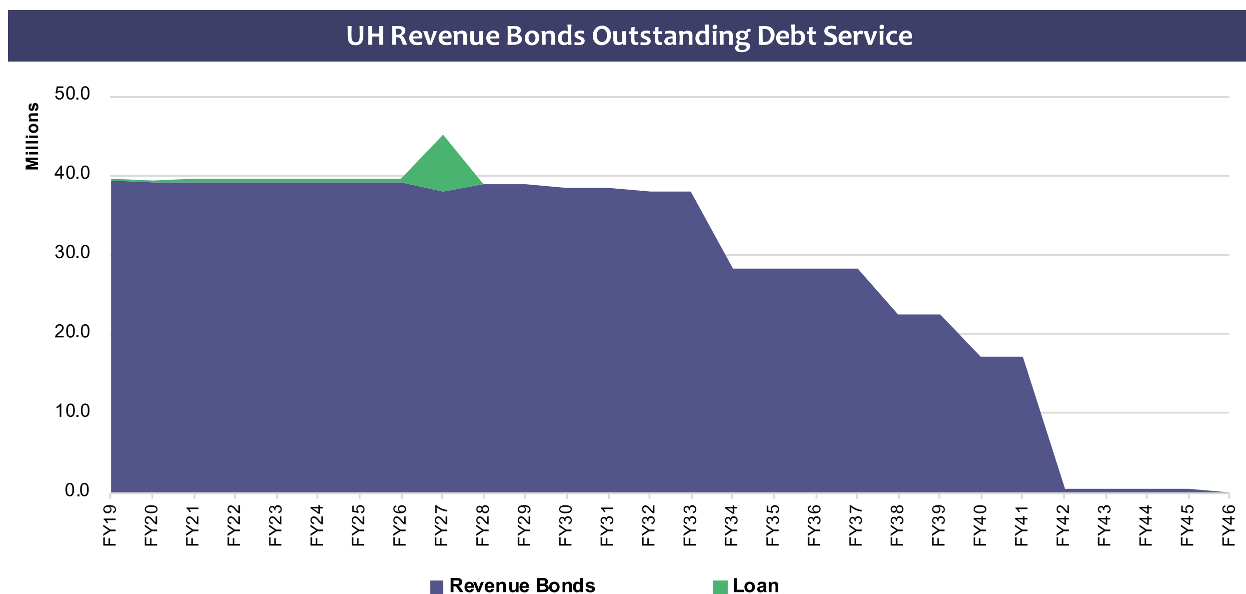
A. Debt Profile

UH currently has 18 series of bonds outstanding for a total par amount of $525.4 million. UH also has a loan outstanding in the amount of $8.2 million.

Series Name	Tax Status	Issue Size	Delivery Date	Final Maturity	Outstanding Par	Next Call Date	Callable Par
				Revenue Bonds			
Series 2009A	Tax-Exempt	100,000,000	4/15/09	10/1/38	5,690,000	10/1/2019	-
Series 2010A-1	BABs	111,265,000	10/7/10	10/1/40	111,265,000	10/1/2020	107,610,000
Series 2010A-2	Tax-Exempt	27,375,000	10/7/10	10/1/19	6,930,000	-	-
Series 2010B-1	BABs	127,535,000	10/7/10	10/1/40	127,535,000	10/1/2020	123,345,000
Series 2010B-2	Tax-Exempt	26,555,000	10/7/10	10/1/19	7,820,000	-	-
Series 2012A	Tax-Exempt	8,575,000	2/22/12	10/1/18	240,000	-	-
Series 2015A	Taxable	8,575,000	9/24/15	10/1/44	8,220,000	10/1/2025	6,630,000
Series 2015B	Tax-Exempt	47,010,000	9/24/15	10/1/36	47,010,000	10/1/2025	34,610,000
Series 2015C	Taxable	17,585,000	9/24/15	10/1/22	12,725,000	MWC	-
Series 2015D	Taxable	25,715,000	9/24/15	10/1/21	19,795,000	MWC	-
Series 2015E	Tax-Exempt	67,400,000	4/20/16	10/1/32	67,400,000	10/1/2026	34,200,000
Series 2017A	Tax-Exempt	3,990,000	12/28/17	10/1/32	3,990,000	10/1/2027	1,610,000
Series 2017B	Tax-Exempt	12,040,000	12/28/17	10/1/28	12,040,000	10/1/2027	6,110,000
Series 2017C	Taxable	4,110,000	12/28/17	10/1/28	4,110,000	10/1/2027	2,090,000
Series 2017D	Tax-Exempt	13,185,000	12/28/17	10/1/30	13,185,000	10/1/2027	3,250,000
Series 2017E	Taxable	4,450,000	12/28/17	10/1/30	4,450,000	10/1/2027	3,390,000
Series 2017F	Tax-Exempt	52,275,000	12/28/17	10/1/38	52,275,000	10/1/2027	33,110,000
Series 2017G	Taxable	20,745,000	12/28/17	10/1/38	20,745,000	10/1/2027	12,325,000
Sub-Total	-	-	-	-	**525,425,000**	-	**368,280,000**
				Other Obligations			
Loan	-	13,200,000	4/20/2017	7/1/2027	8,200,000	-	-
Total	**-**	**-**	**-**	**-**	**533,625,000**	**-**	**368,280,000**

B. Debt Service Chart

UH's debt service is fairly level with $40 million annual payments through FY2033. Thereafter, debt service gradually steps down until all debt is repaid in FY2045. A majority of the loan outstanding is payable in FY2028. UH typically issues 30 year revenue bonds. Approximately 41% of outstanding principal will be paid down in the next ten years.



C. Credit Ratings

UH's credit ratings are split among the rating agencies on account of different methodologies and evaluation of UH's credit profile. UH's revenue bonds carry strong ratings as reflected below.

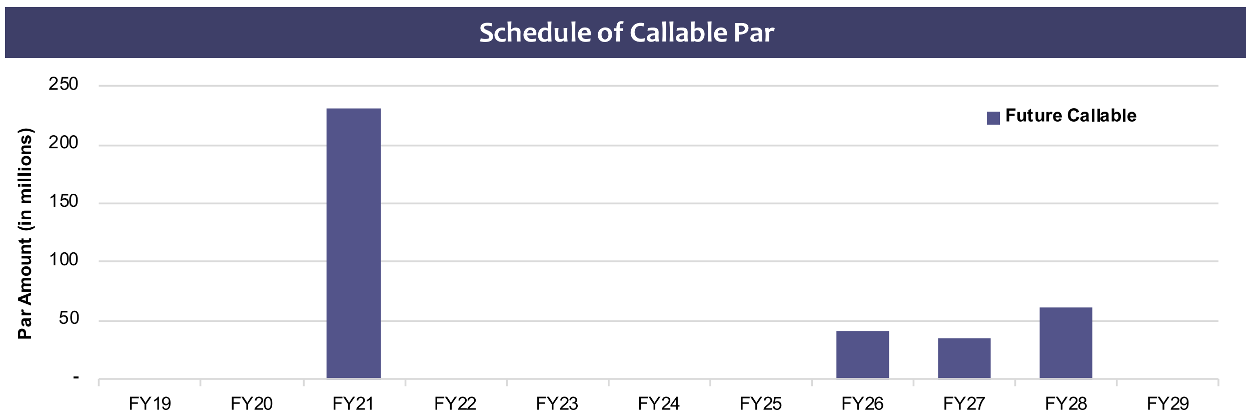
University of Hawaii Credit Ratings			
	Moody's	S&P	Fitch
Revenue Bonds	Aa2 Stable	NR	AA Stable

Credit strengths include UH's essential role as the State's only public system of higher education, strong support from the State for capital and operations and GO debt issuances, and large scale and scope of operations with strategically important research enterprise and well diversified revenues.

Credit challenges include declining enrollment, weak operations and limited projected net tuition revenue growth, large backlog of deferred maintenance and low financial resources ratios, and very high pension and OPEB obligations.

D. Schedule of Callable Bonds

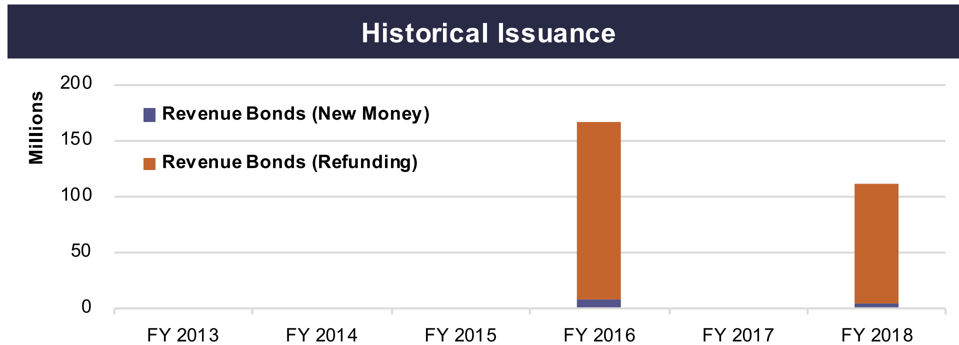
The following chart provides a summary of callable university revenue bonds and par amounts along with their call dates. The total callable par in UH's debt portfolio is $368.3 million. UH does not have any currently callable bonds. The earliest call date is in FY2021 at which time $231 million is refundable. These are Series 2010A-1 and Series 2010B-1 taxable Build America Bonds (BABs). Due to the receipt of subsidy payments from the federal government, there is additional complexity to refunding BABs. Pursuant to the criteria outlined in its Debt Management Policy, UH may pursue opportunities to refund callable bonds.



E. Multi-Year Program Anticipated/Intended Debt Issuance

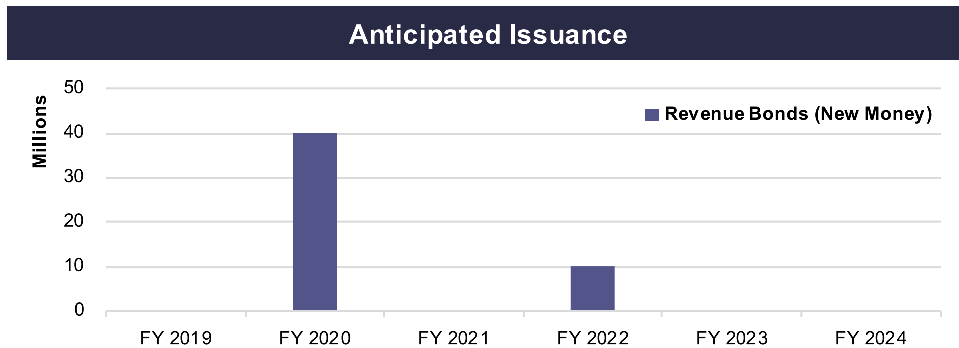
Existing Debt

UH's last sizeable new money issuance was in FY2011 with the most recent issuance in FY2016 and FY2018 largely being refunding bonds.



Anticipated Debt

Over the next six years, UH plans to issue approximately $50 million in aggregate new money revenue bonds - $40 million in FY2020 followed by $10 million in FY2022. Although UH has a $1.64 billion capital plan (2020-2025) focused on reducing deferred maintenance with its new class of Renew, Improve and Modernize Projects (RIM Projects), it is anticipated that most of the plan will be funded by State sources including GO Bonds and not funded with UH revenue bonds.



Unissued but Authorized Debt

UH has $100 million in authorized but unissued revenue bonds remaining.

F. Measuring Debt Burden

Last Full Fiscal Year and Projected (six-years) Metrics

AFFORDABILITY METRICS	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Annual debt service to annual revenues	7.2%	5.0%	5.1%	5.3%	5.3%	5.3%	5.3%
Pension pay-go to annual revenues	14.4%	17.1%	19.2%	19.7%	20.1%	20.6%	21.1%
OPEB pay-go annual revenues	18.3%	18.6%	19.1%	19.7%	20.3%	20.9%	21.5%
All annual obligations to annual revenues	39.9%	40.7%	43.3%	44.6%	45.7%	46.8%	47.9%
Annual debt service to annual appropriations	3.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.2%
Pension pay-go to annual appropriations	6.8%	7.9%	8.8%	8.9%	9.0%	9.0%	9.1%
OPEB pay-go annual appropriations	8.6%	8.6%	8.8%	8.9%	9.0%	9.2%	9.3%
All annual obligations to annual appropriations	18.7%	18.8%	19.8%	20.1%	20.3%	20.5%	20.6%
Debt service coverage	1.73x	1.72x	2.52x	1.66x	2.39x	1.61x	2.40x
Operating margin(1)	-112.7%	-115.5%	-117.9%	-121.3%	-124.7%	-128.1%	-131.4%
Operating margin(2)	-9.1%	-9.1%	-8.9%	-9.1%	-9.3%	-9.4%	-9.4%
Liquidity – days' cash on hand	93 days	91 days	91 days	87 days	83 days	80 days	78 days
Debt to operating revenues	0.33x	0.32x	0.32x	0.30x	0.29x	0.27x	0.25x
Debt to net cash flow from operations	(0.60x)	(0.56x)	(0.57x)	(0.53x)	(0.50x)	(0.47x)	(0.43x)

(1) Excluding State support for operations (2) Including State support for operations

Note: Projected metrics assume issuance of $50 million of additional revenue bonds during the projection period (see anticipated debt above)

Relevant Affordability Metrics

1. Indenture Limitations: UH's revenue bonds do not have legal covenants limiting the issuance of additional bonds nor a rate covenant required to maintain revenues at a certain level.
2. Annual debt service payments to annual revenues or annual debt service payments to annual appropriations: This ratio is a measure of budgetary flexibility afforded to UH by evaluating how much of UH's budget is tied up in fixed costs such as debt service. UH's debt service payments account for 5% to 7% of revenues and 2% to 3% of UH expenditures. However including pension and OPEB contributions UH's fixed costs are anticipated to be a sizeable 40% to 48% of revenues.
3. Debt service coverage: While legally only a part of UH operating revenue defined as 'network revenues' are pledged for specific series, in the context of affordability we look to all available revenues of the university system to evaluate debt service coverage. Debt service coverage after payment of all operating expenses and including debt service on anticipated debt is projected to remain adequate at or above 1.6 times.
4. Operating margin: This is a ratio of net income from operating activities to operating revenue. It's a basic ratio used to gauge profitability of operations. UH's operating margin is negative as it relies on grants, contributions and State support for its operations. UH reports near break-even operations, after accounting for the State support it receives for operations. UH's reliance on State support for operations is largely attributable to its broader scope and functions which include community colleges.
5. Liquidity – days' cash on hand: For FY2018, UH estimates having adequate liquidity with about 93 days' cash on hand.

6. Balance sheet leverage – expendable resources to debt: The ratio measures the resources available to UH to repay debt in case of short-to-medium term volatility in operations. UH's expendable resources are negative limiting its ability to respond to operational volatility.
7. Income statement leverage – expendable resources to operations: This ratio evaluates the ability to operate relying on wealth that can be accessed over time without earning additional revenue and is discussed in the following section on peer comparison.
8. Debt to operating revenues: The ratio is a balance sheet ratio which measures the coverage of debt from annual revenues. UH's debt-to-operating ratio is 0.33 times for FY2018 which is considered low. It has been gradually decreasing over the last five years and is projected to continue to decrease over the six year planning horizon indicative of limited borrowing as compared to revenue growth allowing the ratio to moderate overtime.
9. Debt to cashflow: This ratio measures the ability of UH to repay its debt from the profitability of its current operations and is a good measure of debt affordability. UH's operating margin has been negative for several years resulting in a negative debt-to-cashflow. It is reflective of UH's reliance on State transfers for operations.

Peer/Median Comparisons

It is important to note that UH is unique in that it is a system of university campuses, community colleges, and educational centers. As such, it is challenging to compare UH against peer universities and university systems based on UH's specific characteristics. Moody's publishes a median ratios report for public universities analyzing various financial metrics relevant to the sector, some of which were discussed in the affordability metrics section.

DEBT AND OPERATING METRICS (2017)	UH*	MOODY'S UNIVERSITY		
Rating Level	**Aa2**	**Aa1**	**Aa2**	**Aa3**
Balance Sheet Ratios				
Spendable Cash & Investments to Total Debt (x)	**1.20**	2.20	1.16	1.25
Total Debt to Operating Revenue (x)	**0.40**	0.42	0.59	0.55
Total Cash & Investments-to-Total Debt (x)	**1.60**	2.99	1.68	1.79
Debt Service to Operating Expenses (%)	**2.60**	3.30	4.20	4.30
Capital Ratios				
Spendable Cash & Investments to Operating Exper	**0.40**	0.86	0.68	0.69
Operating Ratios				
Moody's Operating Margin (%)	**-14.70**	3.20	2.60	1.00
Annual Debt Service Coverage (x)	**1.80**	4.04	3.12	2.68

*US Public Universities 2017 Moody's Medians; *UH data from Moody's Financial Ratios Analysis*

In the adjoining tables, in addition to comparing UH's metrics to sector medians, we analyze UH against specific credits rated in the 'Aa' category like UH from Moody's report using FY2017 data. These peers include the University of Utah, University of Colorado, University of New Mexico, Washington State University, University of Kentucky, University of Arizona and Texas Tech University System.

DEBT AND OPERATING METRICS (FY 2017)	Univ. of Hawaii	Univ. of Utah	Univ. of Colorado	Univ. of New Mex.	WA State Univ.	Univ. of Kentucky	Univ. of Arizona	Texas Tech Univ. Sys.
Rating	**Aa2**	**Aa1**	**Aa2**	**Aa2**	**Aa2**	**Aa2**	**Aa2**	**Aa2**
Balance Sheet Ratios								
Spendable Cash & Investments to Total Debt (x)	**1.2**	2.3	2.2	1.5	0.4	1.8	0.8	2.0
Total Debt to Operating Revenue (x)	**0.4**	0.2	0.4	0.3	0.6	0.3	0.7	0.5
Total Cash & Investments-to-Total Debt (x)	**1.6**	2.8	2.6	2	1.9	2.4	1.3	2.8
Debt Service to OpEx* (%)	**2.6**	2.3	3.3	2.1	4.9	2.8	6.4	3.5
Capital Ratios								
Spendable Cash & Investments to OpEx* (x)	**0.4**	0.6	0.8	0.4	0.2	0.6	0.6	1.0
Operating Ratios								
Moody's Operating Margin (%)	**-14.7**	7.7	-6.9	0	-3.3	4.6	6.6	5.4
Annual Debt Service Coverage (x)	**1.8**	6.2	3.3	3.6	1.9	3.9	2.7	4.0

Moody's Financial Ratios Analysis **Operating Expenditure*

UH's debt service coverage levels, although adequate are weaker compared to other similarly rated credits. Its operating margin, at negative 14.7%, is much lower than the 2.6% sector medians for 'Aa2' rated universities. This is indicative of UH's significant reliance on State support. Some of its balance sheet ratios which compare liquidity and spendable resources against debt burden as well as income statement leverage are in line with sector medians. UH's debt service expenditure is low, accounting for about 2.6% of operations and compares favorably with peers.

G. Discussion on Debt Affordability, Potential Concerns and Recommendations

UH's revenues and coverage levels are strong, boosted by State support received for operations and capital purposes. However, net tuition revenue growth is projected to be limited given the desire to maintain affordable tuition rates for students. As reflected in the affordability metrics, projected revenues are sufficient to cover existing and projected debt service over the projection period.

On a broad level, UH's debt affordability is constrained by two factors - other fixed costs embedded in the budget and its reliance on State support for operations. Pension and OPEB contribution make up a significant portion of UH's expenses. As the funding requirements for these liabilities ramp up, UH should preserve budgetary flexibility and financial capacity in consideration of its future debt issuances. While state support for university systems across the nation is not atypical, it will be crucial for UH to secure necessary appropriations to fulfill debt obligations, address the capital backlog, and maintain operations during the projection period. Increased fixed costs (pension and OPEB) pressure UH's budgetary requirements and continued reliance on State support limit progress towards department self-sustainability.

As UH addresses its capital plan needs, it is essential for UH to continue to seek solutions and funding strategies which minimize reliance on UH operating revenues. A strategic focus on securing funding or partnerships with stakeholders will improve financial metrics and gradually enhance debt affordability over time.

VII. Hawaiian Home Lands

The Department of Hawaiian Home Lands (DHHL) is responsible for the management and disposition of the 'Hawaiian Home Lands' which are lands set aside for rehabilitation of native Hawaiians by the Hawaiian Home Commission Act (HHCA). DHHL's primary mission is to provide qualified native Hawaiians the opportunity to own homes on the trust's lands. DHHL performs various functions including administering the homestead lease program, providing direct loans to lessees for construction and repairs, undertaking infrastructure development for the homestead lands, administering other general leases, licenses and permits and managing the overall land inventory system. Major DHHL revenue sources include general lease revenues, and income derived from DHHL's loans made to native Hawaiian lessees.

DHHL primarily issues revenue bonds and COPs. The revenue bonds are secured by a gross pledge on general lease and license and permit fee revenues with debt service having priority over operating costs. DHHL has the flexibility to revise rates, rentals, fees and charges to ensure sufficiency of revenues for payment of debt service on its revenue bonds. DHHL's COPs are payable from funds appropriated by the State for DHHL.

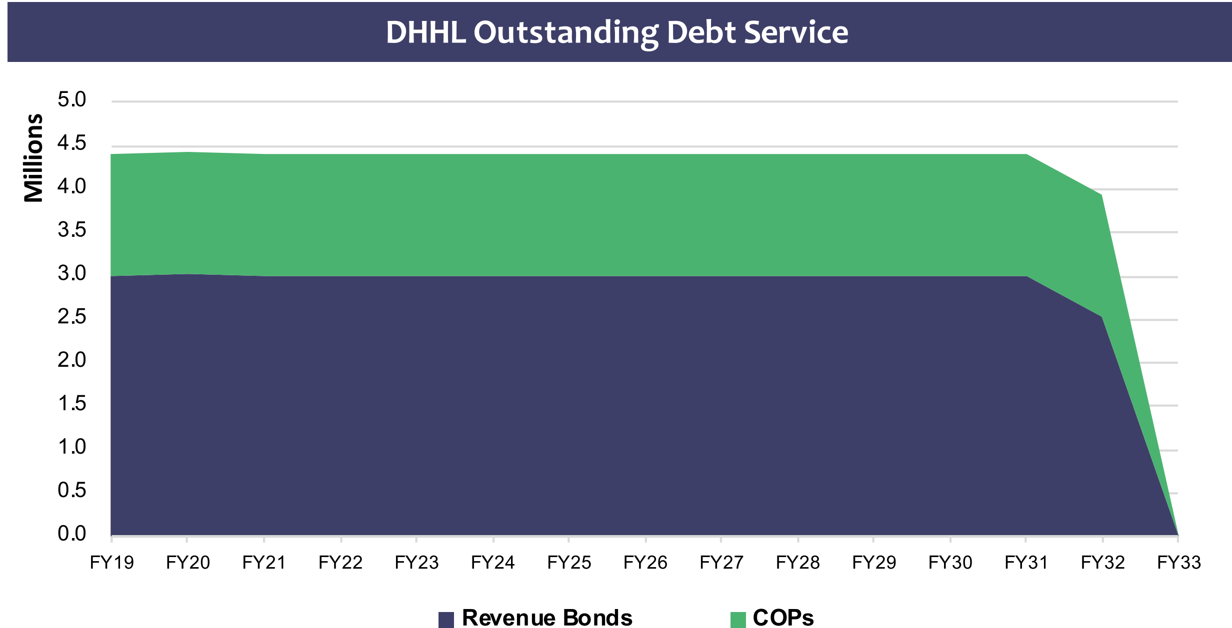
A. Debt Profile

DHHL currently has one revenue bond series outstanding for a total par of $29.8 million. DHHL also has COPs outstanding in the amount of $14.2 million. For the purpose of this Study, only the "available lands" (as defined in Section 207(a) of the Hawaiian Homes Commission Act, 1920) related debt is evaluated.

Series Name	Tax Status	Issue Size	Delivery Date	Final Maturity	Outstanding Par	Next Par Call Date	Callable Par
Revenue Bonds							
Series 2017	Tax-Exempt	30,940,000	8/25/17	4/1/32	29,840,000	4/1/2027	11,505,000
COPs							
Series 2017A	Tax-Exempt	15,125,000	8/25/17	11/1/31	14,175,000	11/1/2027	5,065,000
Total	-	-	-	-	**44,015,000**	-	**16,570,000**

B. Debt Service Chart

DHHL's debt service structure consists of level annual debt service payments on both the revenue bonds and COPs. Annual debt service is approximately $4.4 million through final maturity in FY2032. Approximately 65% of the total principal will be repaid within the next ten years.



C. Credit Ratings

DHHL's revenue bonds and COPs are rated in the 'A' category.

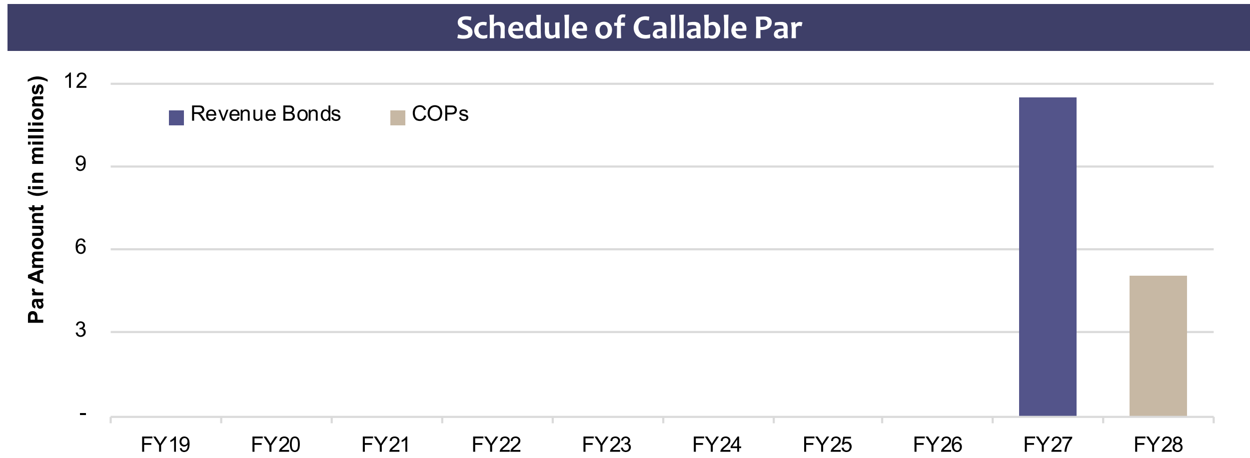
Department of Hawaiian Home Lands Credit Ratings			
	Moody's	**S&P**	**Fitch**
Revenue Bonds	Aa3 Stable	NR	NR
Certificates of Participation	Aa2 Stable	NR	NR

For the revenue bonds, credit strengths include DHHL's, Office of Hawaiian Affairs (OHA) and the State's commitment to develop homesteads for native Hawaiians, increasing income from non-homestead trust lands, adequate debt service coverage supported by availability of OHA payments and no future debt plans. Credit challenges include concentration of revenues from top lessees and non-payment risk from lessees.

The COP rating is driven by the State's GO rating and is one notch below the State's 'Aa1' reflecting the limited, subject-to-appropriation nature of a lease security. As such the strengths and weaknesses for the credit are also driven by the State's credit characteristics.

D. Schedule of Callable Bonds

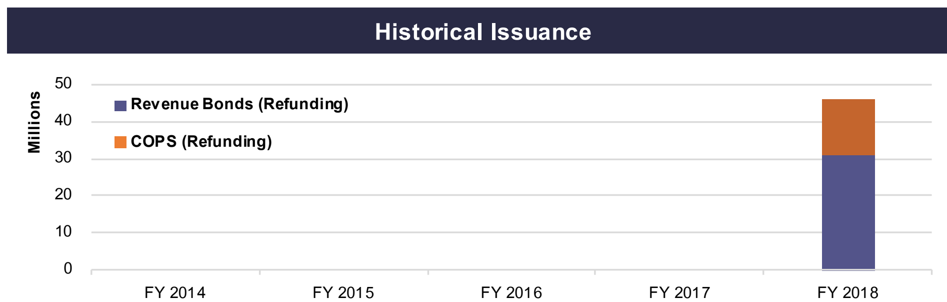
DHHL refunded the revenue bonds and COPs recently in 2017. Both the refunding series have a 10-year call option. Approximately $11.5 million of the revenue bonds outstanding and $5.0 million of the COPs outstanding are callable in April and November of 2027 respectively.



E. Multi-Year Program Anticipated/Intended Debt Issuance

Existing Debt

DHHL has not issued any new money debt in the last five years. Its latest issuance of revenue bonds and COPs in FY2018 was for refunding prior debt.



Anticipated Debt

DHHL does not have any plans for additional debt over the next five years.

Unissued but Authorized Debt

DHHL does not have any unissued bond authorization remaining.

F. Measuring Debt Burden

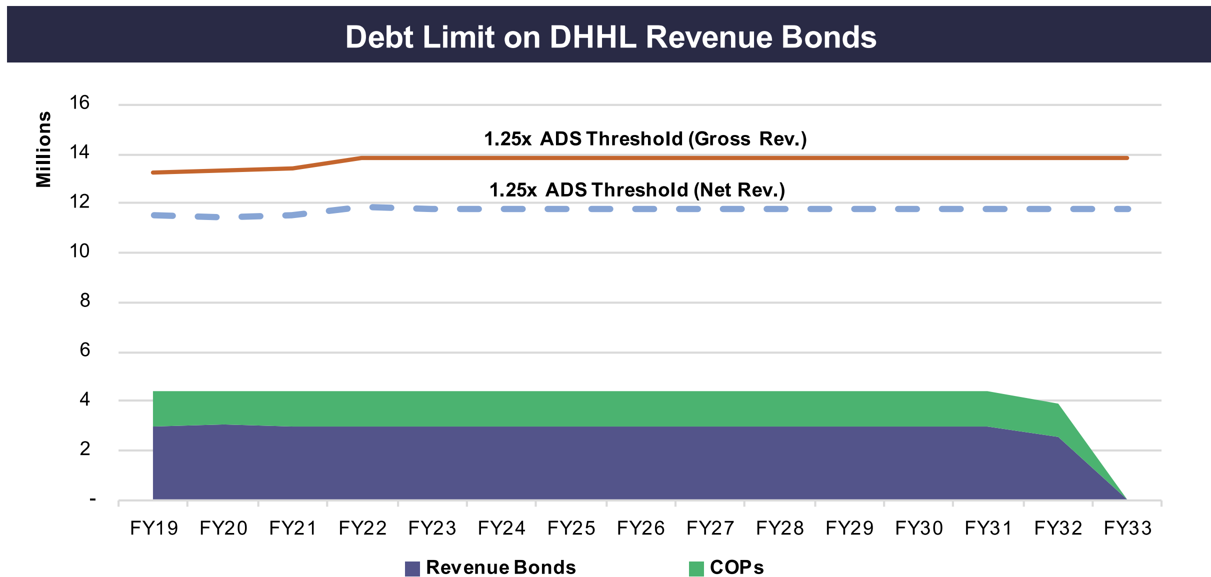
Last Full Fiscal Year and Projected (six-years) Metrics

AFFORDABILITY METRICS	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Annual debt service to annual revenues	5.5%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%
All annual obligations to annual revenues	12.2%	13.8%	13.8%	13.8%	13.8%	13.8%	13.8%
Annual debt service to annual appropriations	7.7%	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%
All annual obligations to annual appropriations	16.2%	18.2%	18.3%	18.2%	18.2%	18.2%	18.2%
Gross Debt Service Coverage (Revenue Bonds)	8.35x	5.52x	5.55x	5.76x	5.74x	5.75x	5.74x
Net Debt Service Coverage (Revenue Bonds)	7.25x	4.76x	4.76x	4.92x	4.87x	4.88x	4.88x
Liquidity – days' cash on hand	2,450 days	2,396 days	2,394 days	2,396 days	2,395 days	2,396 days	2,396 days

Note: Projected metrics assume no additional debt issuances.

Relevant Affordability Metrics

1. Indenture Limitations: DHHL's revenue bonds are subject to a rate covenant to maintain rates, rentals, fees, and charges of at least 1.25 times aggregate annual debt service. In addition the indenture includes a twofold ABT test – a forward looking test requiring projected revenues for the next five years to provide a coverage of at least 1.25 times on projected debt service including debt service on the proposed issuance and a historical test requiring revenues in the most recent fiscal provide a coverage of at least 1.25 times on the maximum aggregate debt service including the debt service on the proposed issuance. The COPs are lease obligations payable from appropriations and such structures typically do not have debt limitations in the indenture as with revenue bonds. DHHL's revenue bonds are in compliance with the rate covenant reflected in the following chart. The debt service on outstanding revenue bonds is significantly lower than the legal maximum allowable debt service while maintaining 1.25 times coverage (orange line in the chart). The legal requirements are based on gross revenues pledged in the indenture (instead of net revenues after operating expenditures) and exclude COPs.



However, the rate covenants are met even on a net revenue basis after incorporating debt service on COPs. There is significant capacity under the legal limits to issue additional debt, if required. None is anticipated at this time.

2. Annual debt service payments to annual revenues or annual debt service payments to annual appropriations: Both of these ratios give an indication of the amount of fixed costs that are built into the budget and are a measure of financial/operational flexibility. For FY2018, the estimated debt service on all outstanding debt to total DHHL revenues was 5.5% and debt service compared to total DHHL expenditures was 7.7%. The ratios are expected to increase slightly in FY2019 and remain stable thereafter over the projected horizon through FY2024.

3. Gross debt service coverage: Gross debt service coverage is computed based on gross pledged revenues before payment of any operating expenses. Gross coverage has been very strong historically and is projected to remain above 5.0 times.

4. Net debt service coverage: Legally, debt service is payable before operating expenses reflecting the strength of the gross revenue pledge. However, it is important to evaluate debt service coverage based on net revenues (after operating expenses) as a measure of self-sustainability and overall affordability. Current and future net debt service coverage on DHHL's revenue bonds is also strong at over 4.0 times for the next five years.

5. Liquidity – days' cash on hand: The unrestricted cash balance accessible to DHHL is very strong at approximately 2,450 days of cash in FY2018.

G. Discussion on Debt Affordability, Potential Concerns and Recommendations

As reflected in the affordability metrics above, DHHL is projected to generate more than sufficient revenues to pay debt service on all of its obligations. Furthermore, its finances are buoyed by its exceptionally strong cash balances. Current debt service is well under the legal limits dictated by the indenture with capacity for more debt should DHHL require it. From a broader affordability perspective, net debt service coverage is very strong on existing debt. At this time, DHHL has no borrowing plans over the next five years and affordability metrics are expected to remain stable.

VIII. Hawaii Housing Finance and Development Corporation

The Hawaii Housing Finance and Development Corporation (HHFDC) was established with the purpose of amalgamating other housing corporations, authorities and trust funds of the State under one corporation. HHFDC's mission is to increase the supply of workforce and affordable homes by providing tools and resources to facilitate housing development. Tools and resources include housing tax credits, low interest construction loans, equity gap loans, developable land and expedited land use approvals.

HHFDC manages three financing programs: Hawaii rental housing system revenue bonds (RHS Program), single family mortgage purchase revenue bonds (SF Program), and the multifamily housing revenue bonds. HHFDC plans to sell all of its leasehold interests under the RHS Program and defease all related debt in calendar year 2019 after which there are no plans to issue additional debt under the program in the foreseeable future. The multifamily housing revenue bonds are conduit issuances and not direct obligations of HHFDC. As a result, detailed affordability discussions on the RHS Program and the multifamily housing revenue bonds program are excluded from this Study. The affordability discussion is limited to the SF Program.

SF Program

The SF Program assists eligible borrowers to finance the purchase of single family homes. HHFDC uses proceeds of these bonds to purchase mortgage loans. The SF Program revenue bonds are pledged by payments on mortgage-backed pass-through securities guaranteed by Ginnie Mae and Fannie Mae.

RHS Program

The RHS Program assists in the delivery of affordable rental housing throughout the State on a cost-effective basis. HHFDC may issue revenue bonds pledged by revenues (net of operating expenses) from income, rent, fees and charges derived from operating the rental housing program. HHFDC has the flexibility to raise rates to ensure sufficiency of revenues. HHFDC's rental housing system revenue bonds are also supported by a general obligation pledge of HHFDC. As stated above, all existing debt will be defeased next year and there is no intent to incur additional debt under this program at this time.

A. Debt Profile

The SF Program has four series of bonds outstanding for a total par value of $24.3 million.

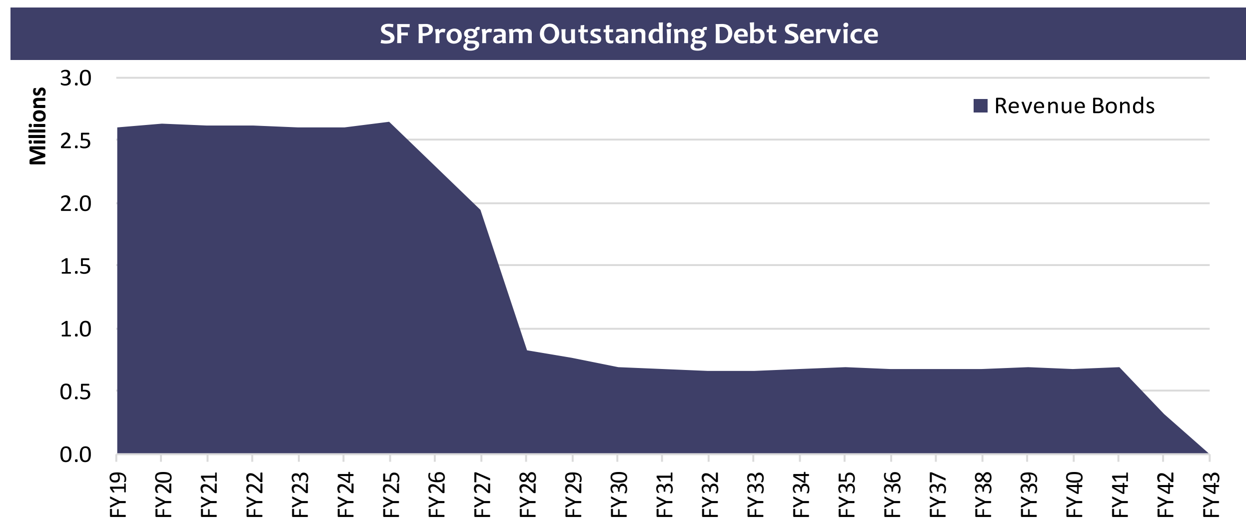
Series Name	Tax Status	Issue Size	Delivery Date	Final Maturity	Outstanding Par	Next Call Date	Callable Par
			SF Program				
Series 2009A-1	Tax-Exempt	30,000,000	12/1/11	7/1/41	8,480,000	Current	8,480,000
Series 2011A	Tax-Exempt	7,005,000	12/1/11	1/1/19	415,000	-	-
Series 2011B	Tax-Exempt	12,995,000	12/1/11	7/1/26	6,945,000	7/1/2021	4,530,000
Series 2013A	Taxable	26,309,825	3/28/13	6/1/27	8,498,920	Current	8,498,920
Total	-	-	-	-	**24,338,920**	-	**21,508,920**

The RHS Program has two series of bonds outstanding for a total par value of $71.4 million.

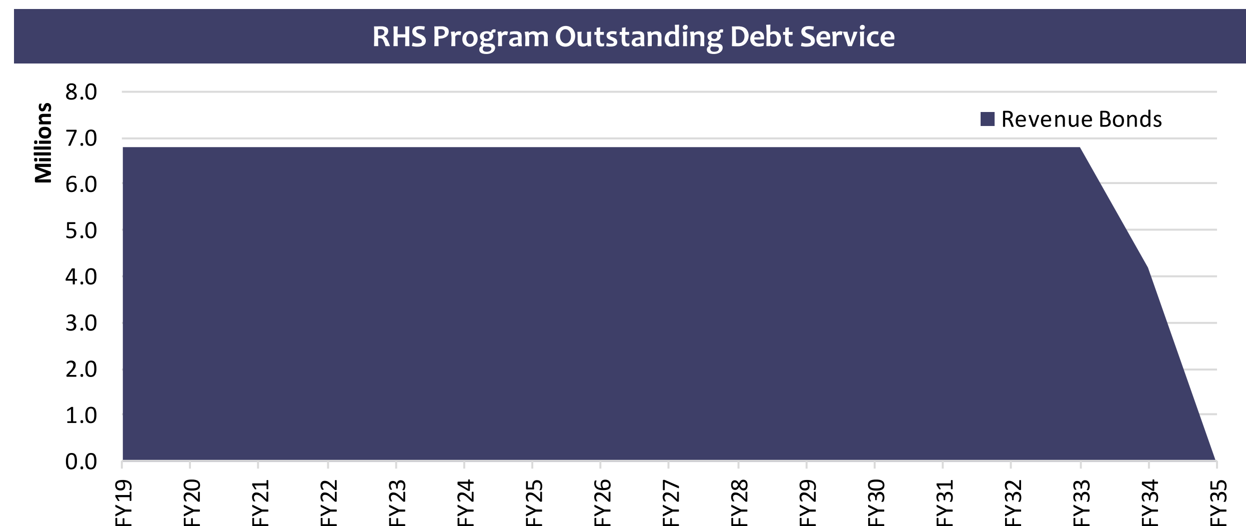
Series Name	Tax Status	Issue Size	Delivery Date	Final Maturity	Outstanding Par	Next Call Date	Callable Par
				RHS Program			
Series 2004A	Tax-Exempt	84,055,000	10/13/04	7/1/33	55,690,000	Current	55,690,000
Series 2004B	Tax-Exempt	20,875,000	10/13/04	7/1/33	15,660,000	7/1/2019	14,955,000
Total	-	-	-	-	**71,350,000**	-	**70,645,000**

B. Debt Service Chart

For the SF Program, annual debt service is about $2.6 million through FY2026 and steps down thereafter to about $700,000 until the final maturity in FY2042. Aggregate principal amortization is rapid with over 70% of debt being retired over the next ten years.



The RHS Program revenue bonds amortize with level debt service payments of approximately $6.8 million through FY2033. As previously mentioned, the current plan is to defease all debt for the RHS Program by the end of calendar year 2019.



C. Credit Ratings

The SF Program carries the ratings and outlook of the U.S. government as shown in the table below. Credit strengths include high level of security provided by pledged indenture assets consisting of mortgage-backed pass-through securities guaranteed by Ginnie Mae and Fannie Mae, sound legal structure including a debt service reserve fund and a mortgage loan reserve fund and fixed-rate debt portfolio.

Hawaii Housing Finance and Development Corporation SF Program Credit Ratings			
	Moody's	**S&P**	**Fitch**
Revenue Bonds	Aaa Stable	AA+ Stable	AAA Stable

The RHS Program is rated in the 'A' Category as shown below.

Hawaii Housing Finance and Development Corporation RHS Program Credit Ratings			
	Moody's	**S&P**	**Fitch**
Revenue Bonds	A1 Stable	NR	A Stable

D. Schedule of Callable Bonds

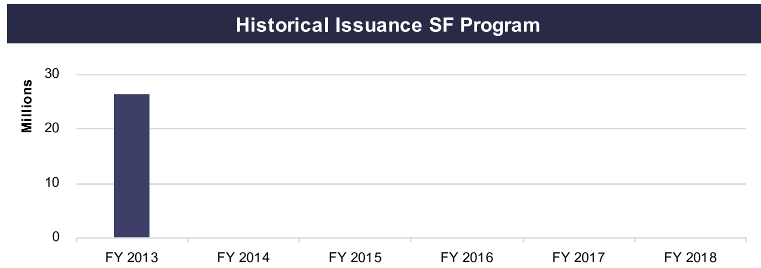
The total callable par under the SF Program is approximately $21.5 million. The SF Program has a complex structure including various timing of loan repayments and as such refunding evaluations are driven by factors other than savings. The portfolio is monitored for refunding opportunities internally by HHFDC.

Within the RHS Program, Series 2004A is currently callable and the Series 2004B is callable on July 1, 2019 with all debt outstanding for the program is expected to be defeased in calendar year 2019.

E. Multi-Year Program Anticipated/Intended Debt Issuance

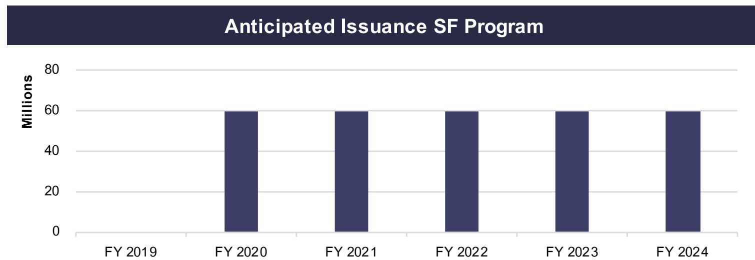
Existing Debt

HHFDC has not issued new debt under the RHS Program since 2004. No new money debt has been issued under the SF Program in the last five years; however, HHFDC has issued refunding bonds on occasion. The last refunding series was issued in FY2013.



Anticipated Debt

At this time, HHFDC does not have plans to issue additional revenue bonds under the RHS Program. As for the SF Program, HHFDC issues revenue bonds when market conditions are favorable. For the purpose of this Study, HHFDC has assumed the following schedule of issuances; however, market conditions will dictate the actual issuance for HHFDC's SF Program.



Unissued but Authorized Debt

HHFDC has $326.95 million and $97.7 million in revenue bonds authorized but unissued under the SF Program and RHS Program, respectively.

F. Measuring Debt Burden

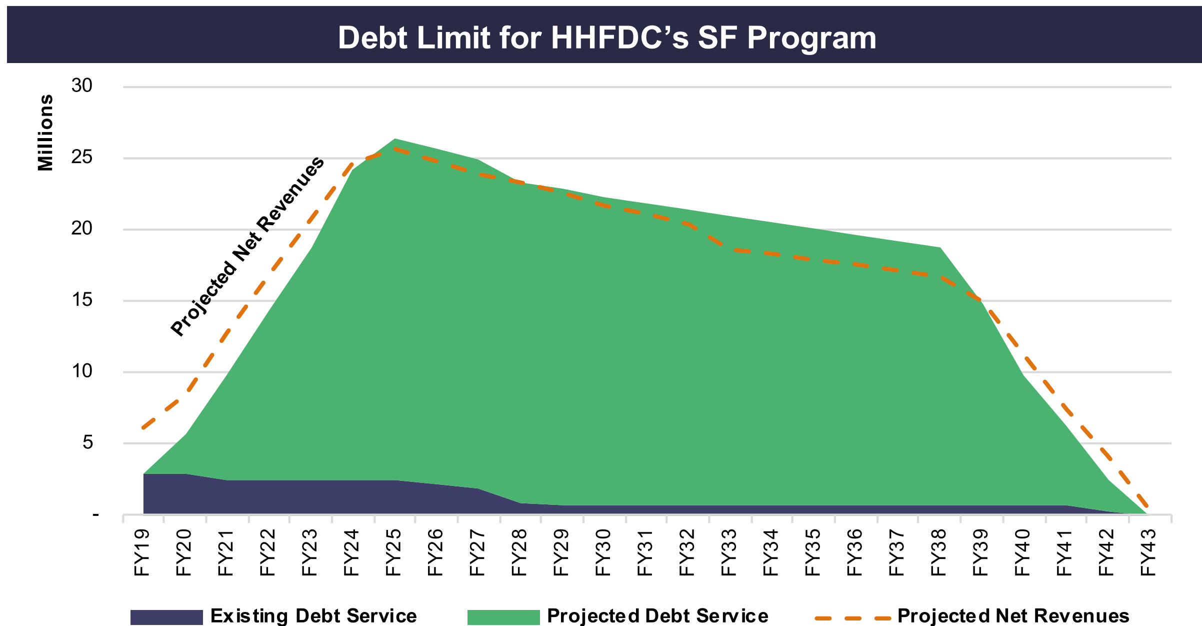
Last Full Fiscal Year and Projected (six-years) Metrics: SF Program

AFFORDABILITY METRICS	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Annual debt service to annual revenues	46.5%	53.8%	60.8%	72.6%	81.2%	86.6%	94.9%
Annual debt service to annual appropriations	83.9%	84.1%	88.5%	92.8%	94.8%	95.8%	96.6%
Debt service coverage (Net)	1.96x	1.67x	1.51x	1.30x	1.18x	1.11x	1.02x

Note: Projected metrics assume issuance of $300 million of additional revenue bonds during the projection period (see anticipated debt above)

Relevant Affordability Metrics

1. Indenture Limitations: There are no legal limitations in the bond indenture for SF Program revenue bonds. However, if market conditions are conducive to additional borrowings, HHFDC would need to conduct the program such that sufficient revenues are available to pay debt service. At this time, projected net revenues (orange line in the following chart) are approximately in line with future additional debt service on anticipated borrowings. It is noted here that, while the projected net revenues appear to increase significantly in a short period of time, this is in line with mortgage-backed passed-through security income that would correspond with additional debt issuances. Additional debt is strictly contingent on market conditions and may not materialize both in terms of timing and amount.



It is noted here that the slight mismatch in the net revenues and debt service in the later years is attributable to anticipated prepayment of debt. In prior years, HHFDC has used excess revenues to redeem debt sooner than the scheduled maturity date. As such, the existing and any new debt is anticipated to be paid off earlier than the scheduled final maturity in FY2042. The revenues are projected assuming such early redemption of debt. Therefore, as depicted, projected revenues trail off slightly as the corresponding debt is gradually repaid in advance of stated maturity.

2. Annual debt service payments to annual revenues and annual debt service payments to annual appropriations: These ratios are used to measure the fixed costs in a budget to evaluate the degree of flexibility in the budget. These metrics are more meaningful when evaluated for a department as a whole. Usually at a program level, a majority of the revenues are dedicated towards debt service, with little being assigned to ongoing costs and administrative expenses. For this reason, the high debt service ratios (debt service of about 45% to 97% of the program budget) for the SF Program is not atypical.
3. Net debt service coverage: The net debt service coverage on SF Program revenue bonds, taking into account additional debt, is expected to be adequate at or above one times.

G. Discussion on Debt Affordability, Potential Concerns and Recommendations

For the SF Program, the projected revenues are sufficient to pay debt service on existing bonds. During the projection period, HHFDC may issue new money debt under the SF Program. There are no affordability concerns relating to any additional revenue bonds under the SF Program. The bonds are pledged by payments on mortgage-backed pass-through securities guaranteed by Ginnie Mae and Fannie Mae and in the absence of extraordinary events affecting the national credit, there will be sufficient revenues to pay corresponding debt service relating to the SF Program. The debt service reserve fund and the mortgage loan reserve fund provide additional security to the bonds.

Given the anticipated defeasance of RHS Program debt, there are no affordability concerns related to the RHS Program.

IX. Department of Business, Economic Development, and Tourism

The Department of Business, Economic Development, and Tourism (DBEDT) is Hawaii's resource center for economic and statistical data, business development opportunities, energy and conservation information, and foreign trade advantages. DBEDT's mission is to achieve a Hawaii economy that embraces innovation and is globally competitive, dynamic and productive, providing opportunities for all Hawaii's citizens. Through its attached agencies, DBEDT fosters planned community development, creates affordable workforce housing units in high-quality living environments, and promotes innovation sector job growth.

The State acting through DBEDT issued its first Green Infrastructure Bond, the Green Energy Market Securitization (GEMS) Bonds, to finance the purchase or installation of green infrastructure equipment for clean energy technology, energy use reduction, demand side management infrastructure among other related purposes as authorized by the public utilities commission highlighted in the statute (HRS §39A, HRS §196 Part IV and HRS §269 Part X).

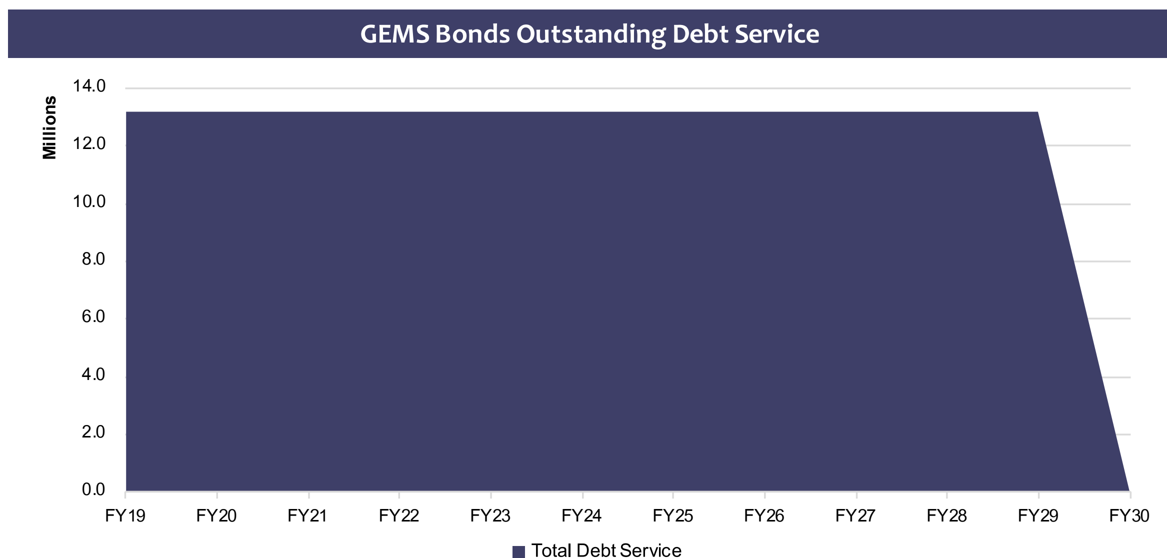
A. Debt Profile

The GEMS Bonds 2014 Series A were issued in two tranches totaling $150 million in par amount; $117 million is currently outstanding.

Series Name	Tax Status	Issue Size	Delivery Date	Final Maturity	Outstanding Par
Series 2014 A-1	Taxable	50,000,000	11/1/14	7/1/20	17,102,026
Series 2014 A-2	Taxable	100,000,000	11/1/14	1/1/29	100,000,000
Total	-	-	-	-	117,102,026

B. Debt Service Chart

GEMS Bond annual debt service is approximately $13.2 million through FY2029.



C. Credit Ratings

The GEMS Bonds carry the highest credit ratings.

Department of Business, Economic Development & Tourism Credit Ratings			
	Moody's	**S&P**	**Fitch**
Green Energy Market Securitization Bonds	Aaa Stable	AAA Stable	AAA Stable

Credit strengths include the State's legislative non-impairment pledge, the size, stability and diversity of the service area, and the statutory true-up mechanism which adjusts the charges to ensure sufficient collections for payment of debt service.

D. Schedule of Callable Bonds

The GEMS Bonds are not subject to optional redemption prior to maturity. As such, there are no refunding opportunities associated with the GEMS Bonds.

E. Multi-Year Program Anticipated/Intended Debt Issuance

Existing Debt

DBEDT issued $150 million of GEMS Bonds 2014 Series A as reflected in the debt profile above.

Anticipated Debt

DBEDT does not have any plans for additional Green Infrastructure debt over the next five years.

Unissued but Authorized Debt

DBEDT does not have any unissued but authorized Green Infrastructure debt.

F. Measuring Debt Burden

The GEMS Bond structure is unique in the strength of the security and pledge to bondholders. Per the Certificate of the Director of the DBEDT, the GEMS bonds are supported by green infrastructure property and DBEDT's irrevocable right to impose, collect, and adjust non-by-passable securitization charges from all existing and future electric service customers of Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc. and Maui Electric Company, Limited. A statutorily uncapped true-up mechanism mandatorily adjusts the securitization charges to ensure sufficient collections for timely payments on the bonds.

The GEMS Bond's unique structure ensures that sufficient revenues will be generated, along with available funds, to cover all operating expenses and debt service payments. As such current year and projected years' coverage (revenues plus available funds) is greater than or equal to 1.00 times debt service in every year.

G. Discussion on Debt Affordability, Potential Concerns and Recommendations

The GEMS Bond true-up mechanism adjusts the securitization charges to ensure sufficient collections for timely payments on the bonds. With the strength of the credit and structure in place, it is clear that sufficient revenues will be available to pay existing debt service on the GEMS Bonds.

Appendix

A. Debt Service Assumptions

New Money Assumptions

Department	Credit Ratings	Coupon	First Principal	Final Maturity
B&F	Aa1/AA+/AA (P)	6.00%	year 3	20
DOT-Airports (GARB)	A1/AA-/A+	6.50%	2025	30
DOT-Airports (CFC)	A2/A+/A	6.50%	year 1	30
DOT-Harbors	A2/AA-/A+	6.50%	year 1	30
DOT-Highways	Aa2/AA+/AA	6.50%	year 1	20
University of Hawaii	Aa2/-/AA	6.50%	year 1	30
DHHL (Revenue Bonds)	Aa3/--/A	n/a - no bonds anticipated		
DHHL (COPs)	Aa2/--/--	n/a - no bonds anticipated		
HHFDC - Single Family	Aaa/AA+/AAA	Debt service and MBS assumptions provided by HHFDC		
DBEDT (GEMS)	Aaa/AAA/AAA	n/a - no bonds anticipated		

B. General Fund Debt by Series

Series Name	Tax Status	Issue Size	Delivery Date	Final Maturity	Outstanding Par	Next Call Date	Callable Par
GO Bonds							
Series DK	Tax-Exempt	375,000,000	5/20/08	5/1/28	415,000	Current	415,000
Series DN	Tax-Exempt	100,000,000	12/16/08	8/1/28	6,970,000	Current	1,825,000
Series DO	Tax-Exempt	101,825,000	12/16/08	8/1/18	14,760,000	-	-
Series DQ	Tax-Exempt	500,000,000	6/23/09	6/1/29	43,805,000	Current	17,860,000
Series DR	Tax-Exempt	225,410,000	6/23/09	6/1/19	42,060,000	-	-
Series DS	Taxable	32,000,000	11/5/09	9/15/24	20,640,000	-	-
Series DT	Tax-Exempt	204,140,000	11/24/09	11/1/19	74,480,000	-	-
Series DX	BAB	500,000,000	2/18/10	2/1/30	405,910,000	MWC	-
Series DY	Tax-Exempt	221,625,000	2/18/10	2/1/20	80,575,000	-	-
Series DZ	Tax-Exempt	800,000,000	12/7/11	12/1/31	111,170,000	12/1/2021	22,010,000
Series EA	Tax-Exempt	403,455,000	12/7/11	12/1/23	316,380,000	12/1/2021	115,430,000
Series EE	Tax-Exempt	444,000,000	12/4/12	11/1/32	220,280,000	11/1/2022	135,350,000
Series EF	Tax-Exempt	396,990,000	12/4/12	11/1/24	355,605,000	11/1/2022	114,595,000
Series EG	Taxable	26,000,000	12/4/12	11/1/32	24,630,000	11/1/2022	17,460,000
Series EH	Tax-Exempt	635,000,000	11/21/13	8/1/33	401,605,000	8/1/2023	283,290,000
Series EL	Tax-Exempt	50,860,000	11/21/13	8/1/23	44,400,000	-	-
Series EM	Taxable	25,000,000	11/21/13	8/1/33	25,000,000	8/1/2023	17,355,000
Series EN	Taxable	29,795,000	11/21/13	8/1/33	29,795,000	8/1/2023	18,605,000
Series EO	Tax-Exempt	575,000,000	11/25/14	8/1/34	546,130,000	8/1/2024	406,320,000
Series EP	Tax-Exempt	209,015,000	11/25/14	8/1/26	209,015,000	8/1/2024	60,330,000
Series EQ	Taxable	25,000,000	11/25/14	8/1/34	25,000,000	MWC	-
Series ET	Tax-Exempt	190,000,000	10/29/15	10/1/35	190,000,000	10/1/2025	122,415,000
Series EU	Tax-Exempt	35,000,000	10/29/15	10/1/35	35,000,000	10/1/2025	21,600,000
Series EW	Tax-Exempt	34,950,000	10/29/15	10/1/18	34,950,000	-	-
Series EX	Tax-Exempt	25,035,000	10/29/15	10/1/25	25,035,000	-	-
Series EY	Tax-Exempt	212,120,000	10/29/15	10/1/27	212,120,000	10/1/2025	61,230,000
Series EZ	Tax-Exempt	215,590,000	10/29/15	10/1/28	215,590,000	10/1/2025	76,325,000
Series FA	Taxable	25,000,000	10/29/15	10/1/35	25,000,000	10/1/2025	15,695,000
Series FB	Tax-Exempt	500,000,000	4/14/16	4/1/36	500,000,000	4/1/2026	323,515,000
Series FC	Taxable	25,000,000	4/14/16	4/1/21	15,185,000	MWC	-
Series FE	Tax-Exempt	219,690,000	4/14/16	10/1/28	219,690,000	10/1/2026	53,095,000
Series FF	Taxable	119,730,000	4/14/16	10/1/28	119,730,000	10/1/2026	26,345,000
Series FG	Tax-Exempt	375,000,000	10/13/16	10/1/36	375,000,000	10/1/2026	246,845,000
Series FH	Tax-Exempt	379,295,000	10/13/16	10/1/31	379,295,000	10/1/2026	197,840,000
Series FI	Tax-Exempt	2,710,000	10/13/16	10/1/33	2,710,000	10/1/2026	1,800,000
Series FJ	Taxable	25,000,000	10/13/16	10/1/22	25,000,000	-	-
Series FK	Tax-Exempt	575,000,000	5/24/17	5/1/37	575,000,000	5/1/2027	374,315,000
Series FN	Tax-Exempt	229,355,000	5/24/17	10/1/31	229,355,000	10/1/2027	98,275,000
Series FO	Taxable	37,500,000	5/24/17	5/1/21	37,500,000	-	-
Series FP	Taxable	7,500,000	5/24/17	5/1/37	7,500,000	5/1/2027	4,685,000
Series FR	Tax-Exempt	15,090,000	12/21/17	10/1/21	15,090,000	-	-
Series FS	Tax-Exempt	275,363,064	12/21/17	10/1/33	275,363,064	10/1/2028	125,201,985
Series FT	Tax-Exempt	631,215,000	2/14/18	1/1/38	631,215,000	1/1/2028	430,720,000
Series FU	Taxable	50,000,000	2/14/18	1/1/21	50,000,000	-	-
Sub-Total	**-**	**10,085,258,064**	**-**	**-**	**7,193,953,064**	**-**	**3,390,746,985**
COPs							
Series 2009A	Tax-Exempt	41,120,000	11/5/09	5/1/20	3,665,000	-	-
Sub-Total	**-**	**41,120,000**	**-**	**-**	**3,665,000**	**-**	**-**
Capital Lease							
DAGS Facilities I	-	12,377,000	9/3/09	6/1/26	11,584,870	NA	NA
DAGS Facilities II	-	18,835,000	8/1/13	9/20/33	17,812,000	NA	NA
Public Safety Div.	-	25,512,000	4/14/11	11/1/30	22,420,640	NA	NA
Sub-Total	**-**	**56,724,000**	**-**	**-**	**51,817,509**	**-**	**-**
Grand Total	**-**	**10,183,102,064**	**-**	**-**	**7,249,435,574**	**-**	**3,390,746,985**

Glossary

Advance Refunding: When bonds are refunded more than 90 days prior to their express call date, the refunding is said to be an advance refunding. It should be noted that not all callable bonds are eligible for advance refunding. Only bonds, the proceeds of which are applied to projects, or bonds issued for current refundings may be advance refunded. Tax-exempt advance refundings were eliminated in December 2017.

Build America Bonds or BABs: BABs are taxable municipal securities issued through December 31, 2010 under the American Recovery and Reinvestment Act of 2009 (ARRA). BABs may be direct pay subsidy bonds, wherein the issuer would receive a direct payment from federal government equal to about 35% of the interest costs or they may be tax credit bonds wherein the issuer may offer a tax credit to the buyer.

Current Refunding: When bonds are refunded no sooner than 90 days before their call date, the refunding is said to be a current refunding.

Forward Refunding: When bonds are priced to refund bonds more than 90 days prior to their express call date, with delivery within 90 days of the call date, the refunding is said to be a forward refunding.

Make Whole Call (MWC): A type of call option that is designed to protect the investor from losses as a result of the earlier call. In order to exercise the call, the issuer must make a lump sum payment (referred to as a “make-whole-call premium”) derived from a formula based on the net present value of future interest payments that will not be paid as a result of the call. Because the cost can often be significant, such a call option is rarely exercised.

Net Revenues: Net Revenues, are the total operating revenues net of any operations and maintenance cost for the department, program, project or undertaking as the case may be.

Optional Call or Redemption: The terms of the bond contract, sometimes referred to as “call or prepayment provisions,” giving the issuer the right to redeem or call, all or a portion of an outstanding issue of bonds prior to its stated date of maturity. Optional redemptions often can be exercised only on or after a specified date (referred to as the “call date”), typically for a municipal security beginning approximately ten years after the issue date.

Present Value Savings: It is the difference, expressed in current dollars, between the debt service on a refunded bond (or maturity) and debt service on the refunding bond (or maturity). It is calculated by discounting the difference in the future debt service payments at an appropriate discount rate.