



Debt Affordability Committee

Meeting #4

10 December 2018



Agenda for Meeting #4

- **Updates and additional information developed since Meeting #3**
 - Producer price index for government construction
 - Output from Consensus Revenue process
 - Interest rate forecast update
- **Implications for DAC recommendation: points for discussion**
 - Increasing PPI in “construction for government” ⇒ potential to reduce purchasing power
 - Less optimistic financial market and economic outlook ⇒ modest changes in rate outlook
 - Revenue outlooks for FY19 and FY20 do not change long-term CAGRs
- **Modeling – and thinking- our way toward the DAC recommendation**
 - Updated base model
 - Sensitivities



Producer price index for government construction

• Follow-up on the Meeting #3 discussion

- Bureau of Economic Analysis (BEA) provides PPI specific to government construction
- From the latest report (October 2018), the **one-year price increase is 4.5%**
- This is considerably higher than the same figure from one year ago, which was 3.1%
- It is well above the CPI for year ending October 2018, which was 2.5%

• Implications for capital expenditure

- This single measure does not reflect or predict costs changes for the Commonwealth's capital spending.
- It does provide one relevant datapoint, especially when it varies from CPI
- Rising costs have the potential to reduce the purchasing power of capital funds

Table 1. Producer price indexes and percent changes for final demand¹
(Nov 2009=100, unless otherwise indicated)

Grouping	Other index base	Relative importance Dec. 2017 ²	Unadjusted index			Unadjusted percent change to Oct. 2018 from:		Seasonally adjusted percent change from:		
			June 2018 ³	Sept. 2018 ³	Oct. 2018 ³	Oct. 2017	Sept. 2018	July to Aug.	Aug. to Sept.	Sept. to Oct.
Final demand.....		100.000	116.6	116.5	117.4	2.9	0.8	-0.1	0.2	0.6
Final demand goods.....		33.022	116.0	115.6	116.0	3.6	0.3	0.0	-0.1	0.6
Final demand foods.....		5.723	116.9	115.0	115.6	-0.7	0.5	-0.6	-0.6	1.0
Finished consumer foods ⁴	00/82	4.604	206.9	205.1	206.1	-0.7	0.5	-0.9	-0.4	0.9
Finished consumer foods, crude.....	00/82	0.484	191.4	192.2	195.9	-7.8	1.9	-5.8	-2.2	3.5
Finished consumer foods, processed.....	00/82	4.120	208.1	206.9	207.6	0.1	0.3	-0.3	-0.2	0.6
Government purchased foods.....		0.344	121.1	119.0	118.7	-0.7	0.6	-1.0	0.0	1.2
Foods for export.....		0.775	114.6	108.2	108.9	-0.7	0.6	1.3	-1.8	1.5
Final demand energy.....		5.577	115.3	114.4	114.7	12.5	0.3	0.4	-0.8	2.7
Finished consumer energy goods ⁴	00/82	4.549	181.7	179.8	179.8	10.9	0.0	0.6	-0.9	2.6
Government purchased energy.....		0.786	118.4	119.0	120.1	17.6	0.9	0.0	-0.5	3.4
Energy for export.....		0.242	108.7	109.4	112.4	24.9	2.7	-1.7	-0.3	4.1
Final demand goods less foods and energy.....		21.722	116.0	116.2	116.6	2.5	0.3	0.0	0.2	0.0
Finished goods less foods and energy ⁵	00/82	12.775	202.9	203.7	204.7	2.2	0.5	0.1	0.3	0.0
Finished consumer goods less foods and energy.....	00/82	6.902	226.7	227.4	228.5	2.5	0.5	0.1	0.3	0.0
Nondurable consumer goods less foods and energy.....	00/82	4.205	290.1	291.2	291.6	2.7	0.1	0.0	0.2	0.2
Durable consumer goods.....	00/82	2.697	180.9	181.2	182.9	2.0	1.1	0.1	0.4	-0.2
Private capital equipment.....	00/82	5.873	173.2	174.0	174.9	2.0	0.5	0.2	0.3	0.0
Private capital equipment for manufacturing industries.....	00/82	1.316	176.7	178.2	178.5	3.0	0.2	0.1	0.5	0.0
Private capital equipment for nonmanufacturing industries.....	00/82	4.557	172.0	172.6	173.6	1.8	0.6	0.2	0.2	-0.1
Government purchased goods, excluding foods and energy.....		2.241	112.9	113.4	113.5	2.4	0.1	0.2	0.2	0.1
Government purchased goods excluding foods, energy, and capital equipment.....		1.309	115.1	115.8	115.9	3.2	0.1	0.2	0.3	0.1
Government purchased capital equipment.....		0.932	106.6	108.8	108.8	1.3	0.0	0.1	0.1	0.2
Goods for export, excluding foods and energy.....		6.706	114.1	113.6	113.8	2.8	0.2	-0.3	0.0	-0.1
Final demand services.....		65.333	116.6	116.6	117.6	2.4	0.9	-0.1	0.3	0.7
Final demand trade services ⁶		20.290	117.2	116.3	118.7	1.5	2.1	-0.9	0.1	1.6
Trade of finished goods ⁴		17.671	116.7	115.8	118.4	1.4	2.2	-0.8	0.0	1.6
Trade of personal consumption goods.....		14.474	115.7	114.9	117.6	0.9	2.3	-0.7	-0.1	1.7
Trade of private capital equipment.....		3.197	120.3	119.0	120.8	3.7	1.5	-1.4	0.4	1.5
Trade of government purchased goods.....		0.721	119.9	119.2	120.8	2.0	1.3	-1.1	0.6	1.3
Trade of government purchased goods, excluding capital equipment.....		0.443	117.0	117.4	118.6	1.1	1.0	-0.7	1.1	1.0
Trade of government purchased capital equipment.....		0.278	123.9	121.7	123.8	3.5	1.7	-1.7	-0.2	1.7
Trade of exports.....		1.898	120.5	119.4	120.8	2.7	1.2	-0.6	0.6	1.2
Final demand transportation and warehousing services.....		4.485	122.6	122.4	123.7	5.8	1.1	-0.6	1.8	0.6
Transportation of passengers for final demand.....		1.235	117.1	113.7	117.3	3.5	3.2	-1.9	5.4	1.1
Transportation of private passengers.....		0.844	117.2	113.8	117.3	3.5	3.1	-1.9	5.4	1.1
Transportation of government passengers.....		0.127	117.2	113.8	117.4	3.6	3.2	-1.9	5.4	1.1
Transportation of passengers for export.....		0.264	117.1	113.6	117.2	3.5	3.2	-2.0	5.6	1.0
Transportation and warehousing of goods for final demand.....		3.250	124.1	125.2	125.6	6.4	0.3	-0.1	0.5	0.3
Transportation and warehousing of finished goods ⁴		2.296	123.1	124.2	124.6	6.7	0.3	-0.2	0.5	0.3
Transportation and warehousing of personal consumption goods.....		1.798	123.3	124.4	124.8	6.6	0.3	-0.1	0.4	0.3
Transportation and warehousing of private capital equipment.....		0.498	122.0	123.2	123.6	6.9	0.3	-0.1	0.5	0.3
Transportation and warehousing of government purchased goods.....		0.239	122.8	123.7	124.0	5.7	0.2	-0.1	0.4	0.3
Transportation and warehousing of exports.....		0.715	127.7	128.7	129.1	6.0	0.3	0.0	0.6	0.3
Final demand services less trade, transportation, and warehousing.....		40.558	115.7	116.2	116.6	2.6	0.3	0.3	0.3	0.2
Finished services less trade, transportation, and warehousing ⁴		36.063	116.1	116.6	117.0	2.8	0.3	0.3	0.2	0.3
Finished consumer services less trade, transportation, and warehousing.....		32.606	116.0	116.5	116.9	2.6	0.3	0.3	0.2	0.3
Private capital investment services less trade, transportation, and warehousing.....		3.457	116.9	117.8	117.8	3.7	0.0	-0.1	0.5	0.0
Government purchased services less trade, transportation, and warehousing.....		3.048	110.7	111.3	111.4	1.5	0.1	0.3	0.3	0.1
Gov. purchased services less trade, transportation, and warehousing, excl. capital investment.....		2.947	111.0	111.7	111.8	1.5	0.1	0.4	0.3	0.0
Government purchased capital investment services less trade, transportation, and warehousing.....		0.101	101.3	102.4	102.0	1.5	-0.4	-1.2	1.5	-0.4
Services for export less trade, transportation, and warehousing.....		1.447	116.9	117.9	117.9	3.4	0.0	0.0	0.7	0.1
Final demand construction.....		1.644	120.7	121.3	123.6	4.7	1.9	0.1	0.1	1.9
Construction for private capital investment.....		1.108	120.8	121.5	123.7	4.9	1.8	0.1	0.1	1.8
Construction for government.....		0.536	120.4	120.9	123.4	4.5	2.1	0.0	0.1	2.1



Output from Consensus Revenue

- **DOR outlook**

- For FY19, DOR models currently predict a modest upside to current benchmark.
- No change in benchmark is recommended.
- For FY20, DOR's midpoint model sees a 2.1% actual increase and 3.2% baseline increase

- **Revenue outlooks were provided by Mass Taxpayers Foundation, the Beacon Hill Institute, and Prof Clayton-Matthews**

- DOR is analyzing the testimony to ensure apples-to-apples comparison
- Each of these FY20 submissions appears to be slightly higher than DOR's outlook

- **Result:**

- Plugging these figures into the long-term revenue trend analysis, does not materially change the outlook
- Cautious outlooks for FY20 follow very strong FY18 growth and moderate FY19 growth

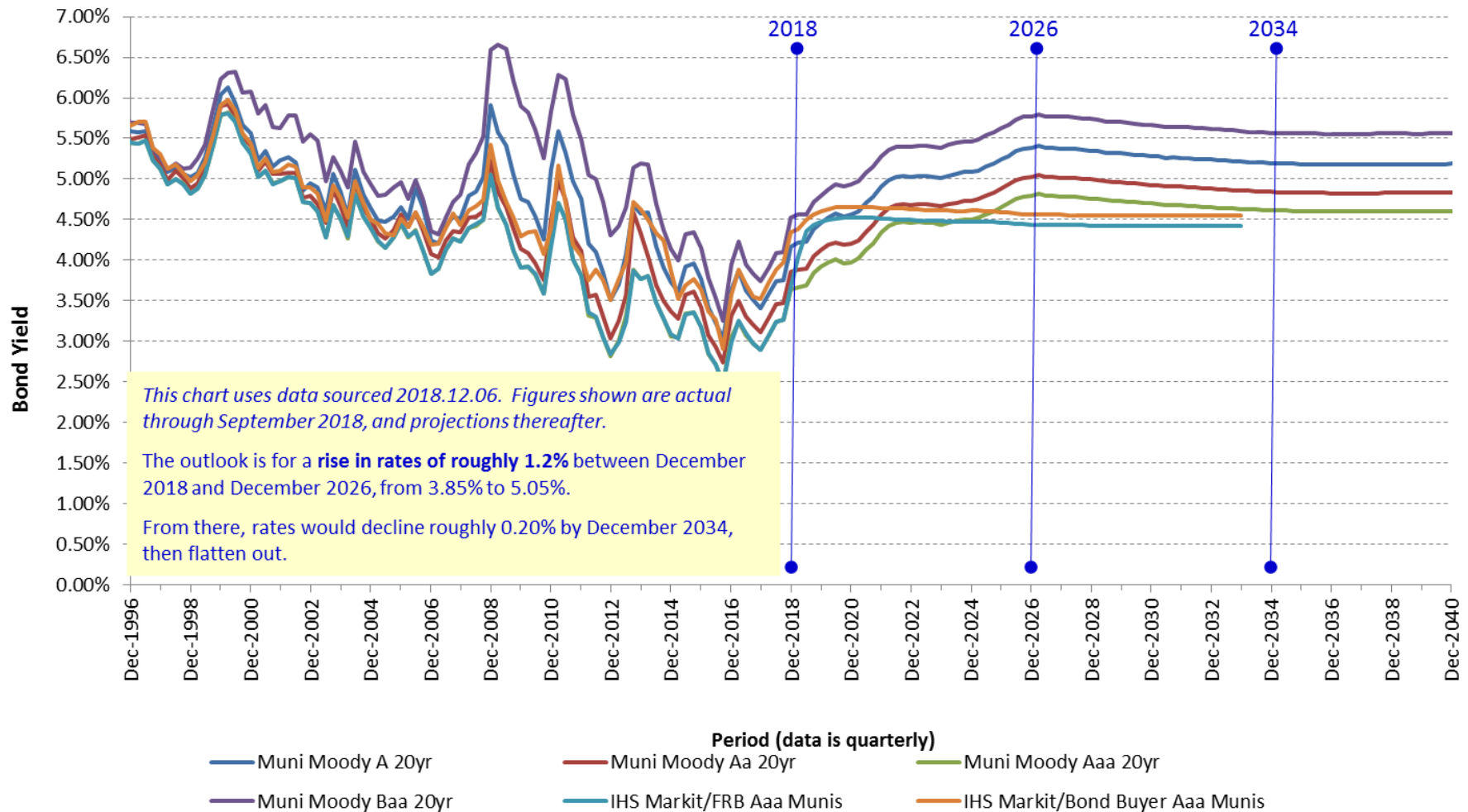
FY19 and FY20 Department of Revenue Tax Revenue Projections
(in \$ Billions)

	FY19 Projections	% Growth Actual from FY18	% Growth Baseline from FY18	FY20 Projections	% Growth Actual from FY19	% Growth Baseline from FY19	% Growth Actual from current FY19 Benchmark
Current Benchmark	\$28.392	2.2%	2.0%	N/A	N/A	N/A	N/A
Economy.com	\$28.744	3.5%	3.3%	\$29.384	2.2%	3.1%	3.5%
Global Insight	\$28.648	3.1%	2.9%	\$29.217	2.0%	2.9%	2.9%
Midpoint	\$28.696	3.3%	3.1%	\$29.301	2.1%	3.1%	3.2%

Excerpt from DOR's Briefing Book for FY20 Consensus Revenue Hearing, dated 5 December 2018



Updated projection on muni yields, including additional information from IHS Markit



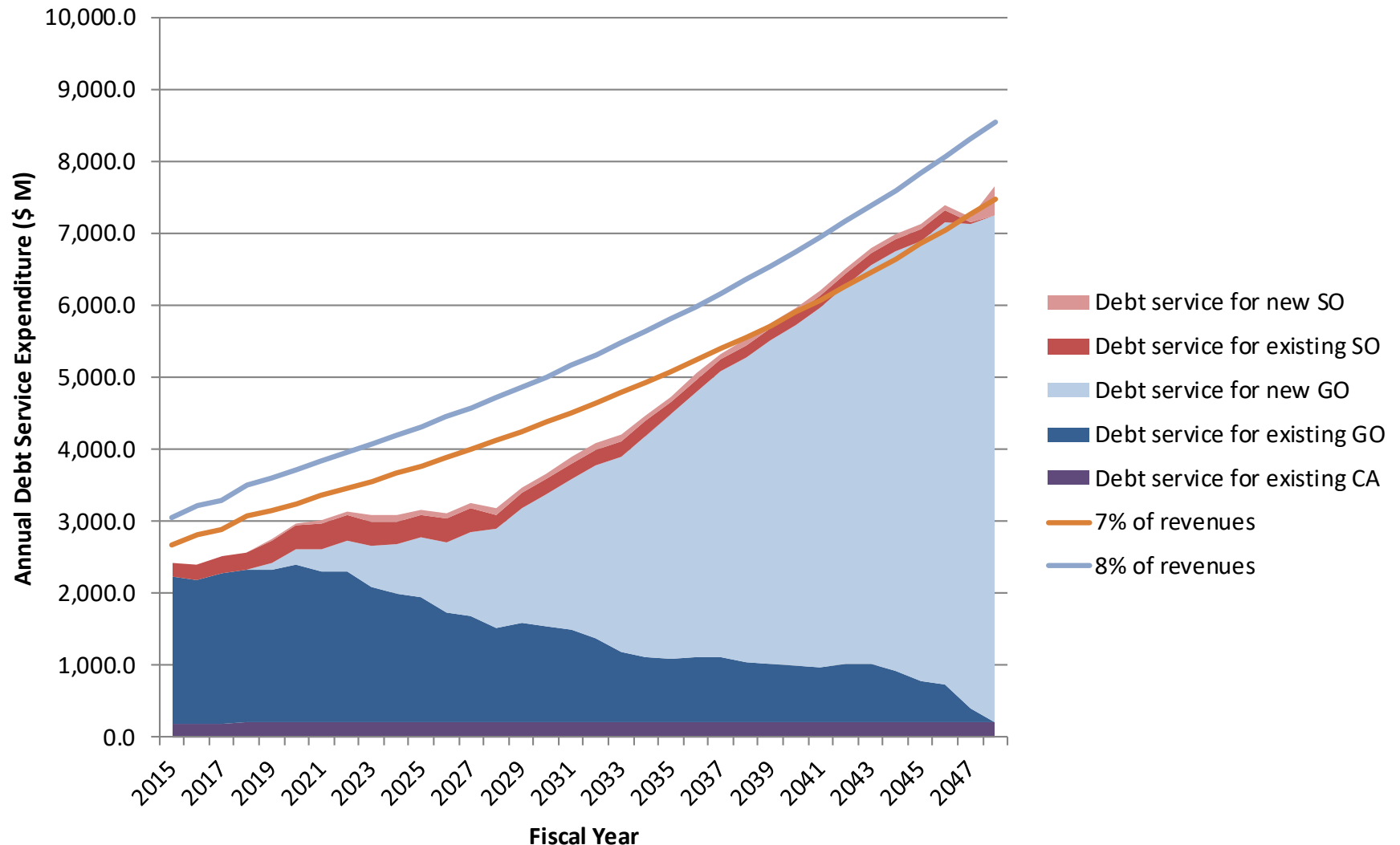


Updated input to the model: 3.6% yield at the end of 2018, then rising a total of 1.2% over four years

Calendar Year	IHS					For DAC modeling:			Simplified increase to model	Resulting 20-Year	Simple higher/(lower)
	Markit/FRB Aaa Munis	Buyer Aaa Munis	Muni Moody Aaa 20yr	Muni Moody Aa 20yr	Muni Moody A 20yr	Moody's Aa (conservative)	Increase from 2018	YoY Change			
2018	3.31%	3.98%	3.31%	3.52%	3.81%	3.52%	n/a	n/a	n/a	3.60%	0.08%
2019	4.33%	4.51%	3.78%	3.99%	4.32%	3.99%	0.47%	0.47%	0.30%	3.90%	-0.09%
2020	4.51%	4.65%	3.98%	4.20%	4.55%	4.20%	0.68%	0.21%	0.30%	4.20%	0.00%
2021	4.52%	4.65%	4.17%	4.40%	4.75%	4.40%	0.88%	0.20%	0.30%	4.50%	0.10%
2022	4.50%	4.63%	4.45%	4.68%	5.02%	4.68%	1.16%	0.28%	0.30%	4.80%	0.12%
2023	4.49%	4.62%	4.46%	4.68%	5.03%	4.68%	1.16%	0.01%	0.00%	4.80%	0.12%
2024	4.48%	4.61%	4.48%	4.71%	5.07%	4.71%	1.20%	0.03%	0.00%	4.80%	0.09%
2025	4.47%	4.60%	4.59%	4.82%	5.17%	4.82%	1.30%	0.10%	0.00%	4.80%	-0.02%
2026	4.45%	4.57%	4.76%	4.99%	5.35%	4.99%	1.47%	0.17%	0.00%	4.80%	-0.19%
2027	4.44%	4.56%	4.79%	5.03%	5.39%	5.03%	1.51%	0.04%	0.00%	4.80%	-0.23%
2028	4.43%	4.55%	4.77%	5.00%	5.36%	5.00%	1.49%	-0.02%	0.00%	4.80%	-0.20%
2029	4.43%	4.55%	4.74%	4.97%	5.33%	4.97%	1.45%	-0.04%	0.00%	4.80%	-0.17%
2030	4.43%	4.55%	4.71%	4.94%	5.30%	4.94%	1.42%	-0.03%	0.00%	4.80%	-0.14%
2031	4.43%	4.55%	4.68%	4.91%	5.27%	4.91%	1.39%	-0.03%	0.00%	4.80%	-0.11%
2032	4.43%	4.55%	4.66%	4.89%	5.25%	4.89%	1.37%	-0.02%	0.00%	4.80%	-0.09%
2033	4.43%	4.55%	4.64%	4.87%	5.22%	4.87%	1.35%	-0.02%	0.00%	4.80%	-0.07%
2034			4.62%	4.85%	5.20%	4.85%	1.33%	-0.02%	0.00%	4.80%	-0.05%
2035			4.61%	4.83%	5.19%	4.83%	1.32%	-0.01%	0.00%	4.80%	-0.03%
2036			4.60%	4.83%	5.18%	4.83%	1.31%	-0.01%	0.00%	4.80%	-0.03%
2037			4.60%	4.82%	5.18%	4.82%	1.31%	0.00%	0.00%	4.80%	-0.02%
2038			4.60%	4.83%	5.18%	4.83%	1.31%	0.00%	0.00%	4.80%	-0.03%
2039			4.60%	4.83%	5.18%	4.83%	1.31%	0.00%	0.00%	4.80%	-0.03%
2040			4.60%	4.83%	5.18%	4.83%	1.31%	0.00%	0.00%	4.80%	-0.03%
2041			4.61%	4.83%	5.19%	4.83%	1.32%	0.00%	0.00%	4.80%	-0.03%
2042			4.61%	4.84%	5.19%	4.84%	1.32%	0.00%	0.00%	4.80%	-0.04%
2043			4.61%	4.84%	5.19%	4.84%	1.32%	0.00%	0.00%	4.80%	-0.04%
2044			4.61%	4.84%	5.19%	4.84%	1.32%	0.00%	0.00%	4.80%	-0.04%
2045			4.61%	4.84%	5.19%	4.84%	1.32%	0.00%	0.00%	4.80%	-0.04%
2046			4.62%	4.84%	5.20%	4.84%	1.33%	0.00%	0.00%	4.80%	-0.04%
2047			4.62%	4.85%	5.20%	4.85%	1.33%	0.00%	0.00%	4.80%	-0.05%
2048			4.62%	4.85%	5.20%	4.85%	1.33%	0.00%	0.00%	4.80%	-0.05%

Source: DOR provided Moody's & IHS data; A&F analysis

New interest rate assumptions: \$90 M increase vs. FY19 and 3.85% growth FY25+





Transition to on-screen modeling & discussion