MODELING

FOR THE PERMANENT FUND PROTECTION ACT

Randall Hoffbeck, *Commissioner of Revenue*

Senate State Affairs Committee
Thursday, February 15, 2017

SCENARIOS MODELED

1. **Status Quo**: ad hoc use of permanent fund earnings to fill budget deficit

2. **Permanent Fund Protection Act** (PFPA)
   - With Full Fiscal Solution
   - With No Fiscal Solution for remaining budget deficit

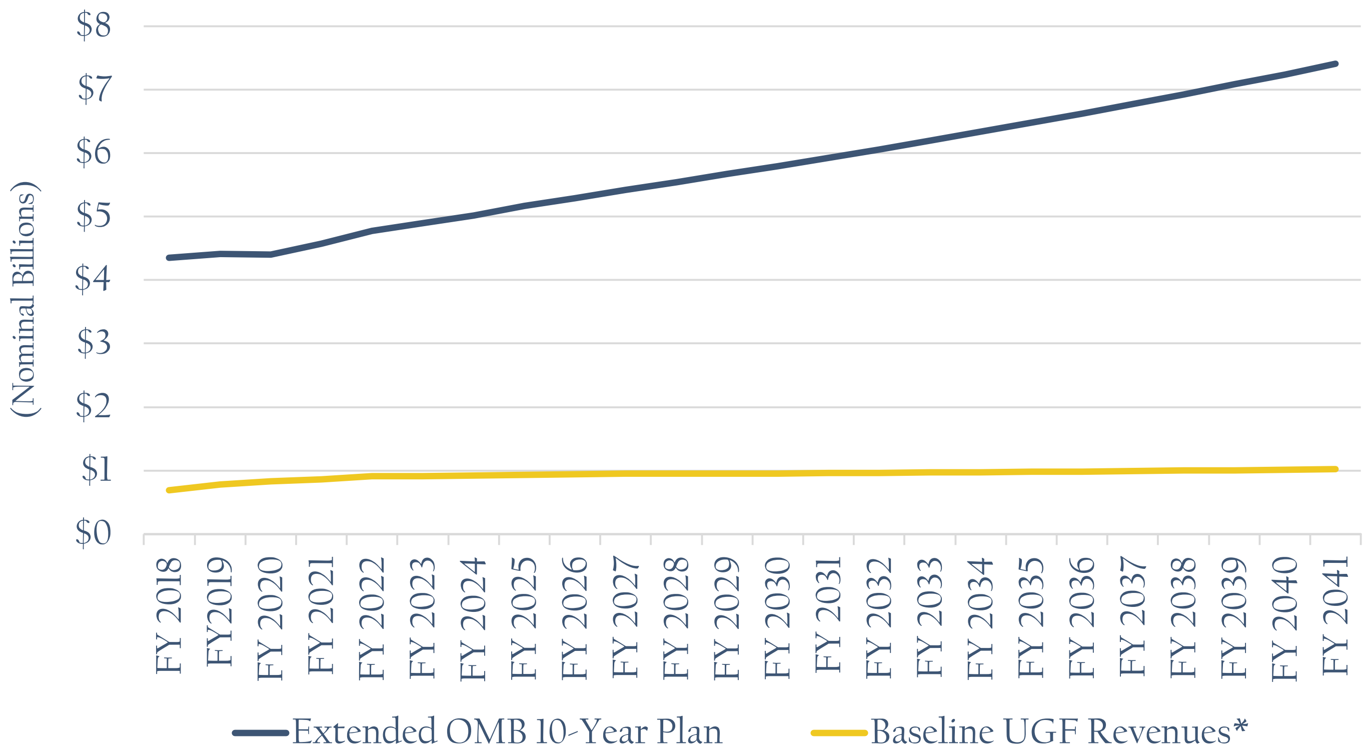
3. **SB21**
   - With Full Fiscal Solution
   - With No Fiscal Solution for remaining budget deficit

Model Sophistication and Vetting

- Key aspects of the model
  - Probabilistic treatment of oil prices, oil production, investment returns
  - Focus on detail of how money flows between permanent fund, general fund, and dividends
  - Assumptions from objective sources
  - Monte Carlo simulations

- Vetted by McKinsey last year
  - Found no major mechanical errors, reasonable assumptions
  - Approved of Monte Carlo probabilistic method
  - Suggested improvements, some of which the Department of Revenue (DOR) has incorporated (for example, probabilistic oil production, autocorrelation)

BUDGET ASSUMPTIONS



- Baseline UGF revenues are the DOR's Fall 2016 total UGF forecast less unrestricted royalties and production tax forecasts. Production and royalty UGF figures are estimated in the model.

METHOD, INPUTS, AND ASSUMPTIONS

- **Permanent Fund Starting Value**: $54.9 billion
  - Realized portion of corpus: $40.7 billion
  - Realized portion of earnings reserve account (ERA): $7.9 billion
  - Unrealized earnings held by the fund: $6.3 billion
  - Starting value was estimated based on the following:
    - $54.9 billion estimated end of year (EOY) 2017 balance of permanent fund (PF) under status quo from Alaska Permanent Fund Corporation (APFC)
- **Investment Return**: Callan Associates' 10-year forecast
  - Total return: 6.95% geometric, 12.32% standard deviation
  - Statutory return: 6.24% mean, 2.24% standard deviation
  - Inflation rate: 2.25%

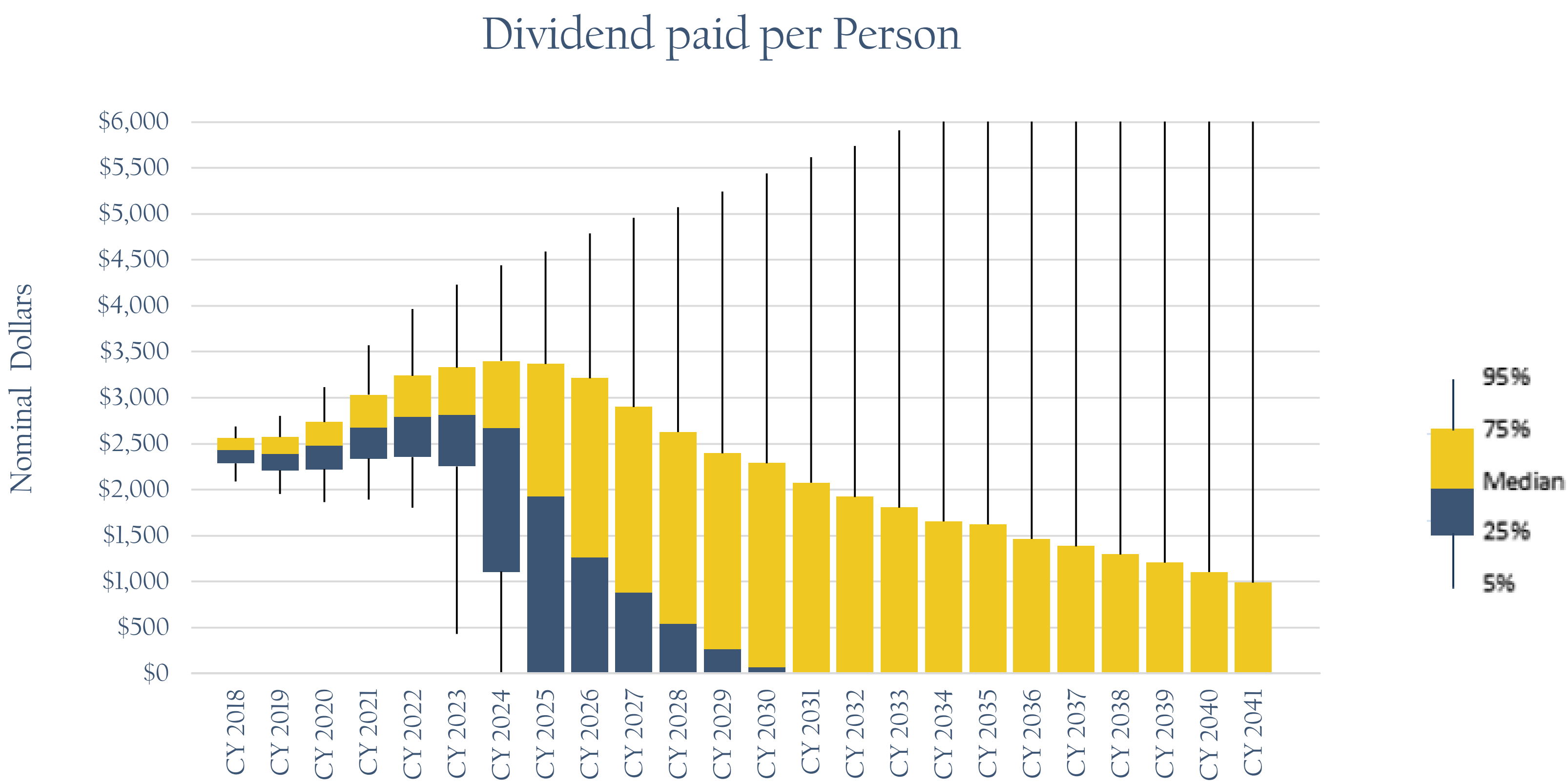
METHOD, INPUTS, AND ASSUMPTIONS

- **Petroleum Revenues:**
  - **Oil price**: Probabilistic analysis of ANS oil prices using a PERT distribution from the fall 2016 price forecasting session.
  - **Production**: Probabilistic analysis of ANS oil prices using a PERT distribution from the DNR provided Fall 2016 RSB
- **CBR:** $4.4 billion beginning of year 2018 balance & a 2.25% rate of return.

STATUS QUO: SCENARIO

- **Deposits:** 31% of royalties deposited into the permanent fund.
- **Payout Calculation:** No planned payout to the general fund.
- **Unplanned Payouts:** After the CBR is depleted, budget deficits are filled from the ERA.
- **Dividend Calculation:** Total appropriated = half of the sum of the last 5 years' statutory net income multiplied by 0.21 or half of the ERA, whichever is less
- **Inflation Proofing:** The fund's principal is inflation proofed at the forecasted inflation rate.

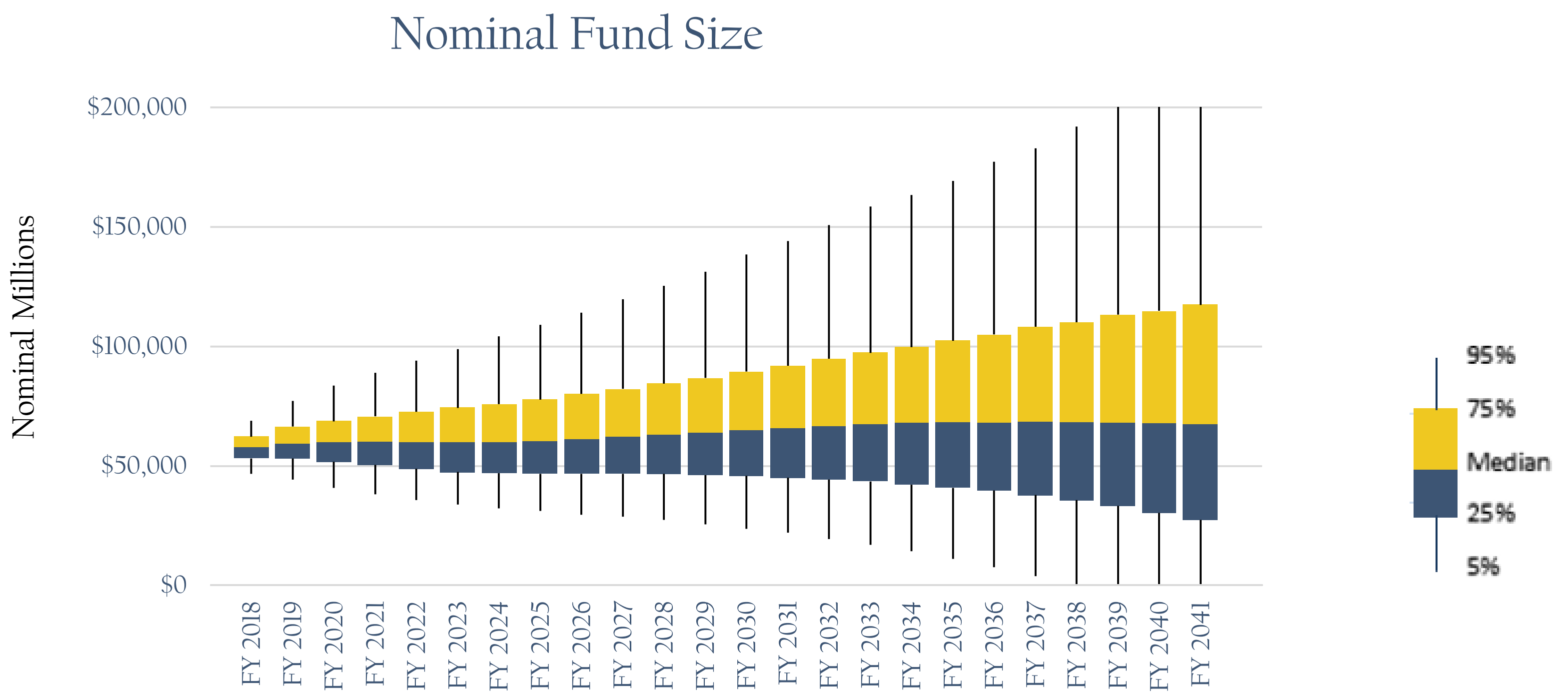
STATUS QUO, NO FISCAL PLAN



2018 median value: $2,432

2041 median value: $0

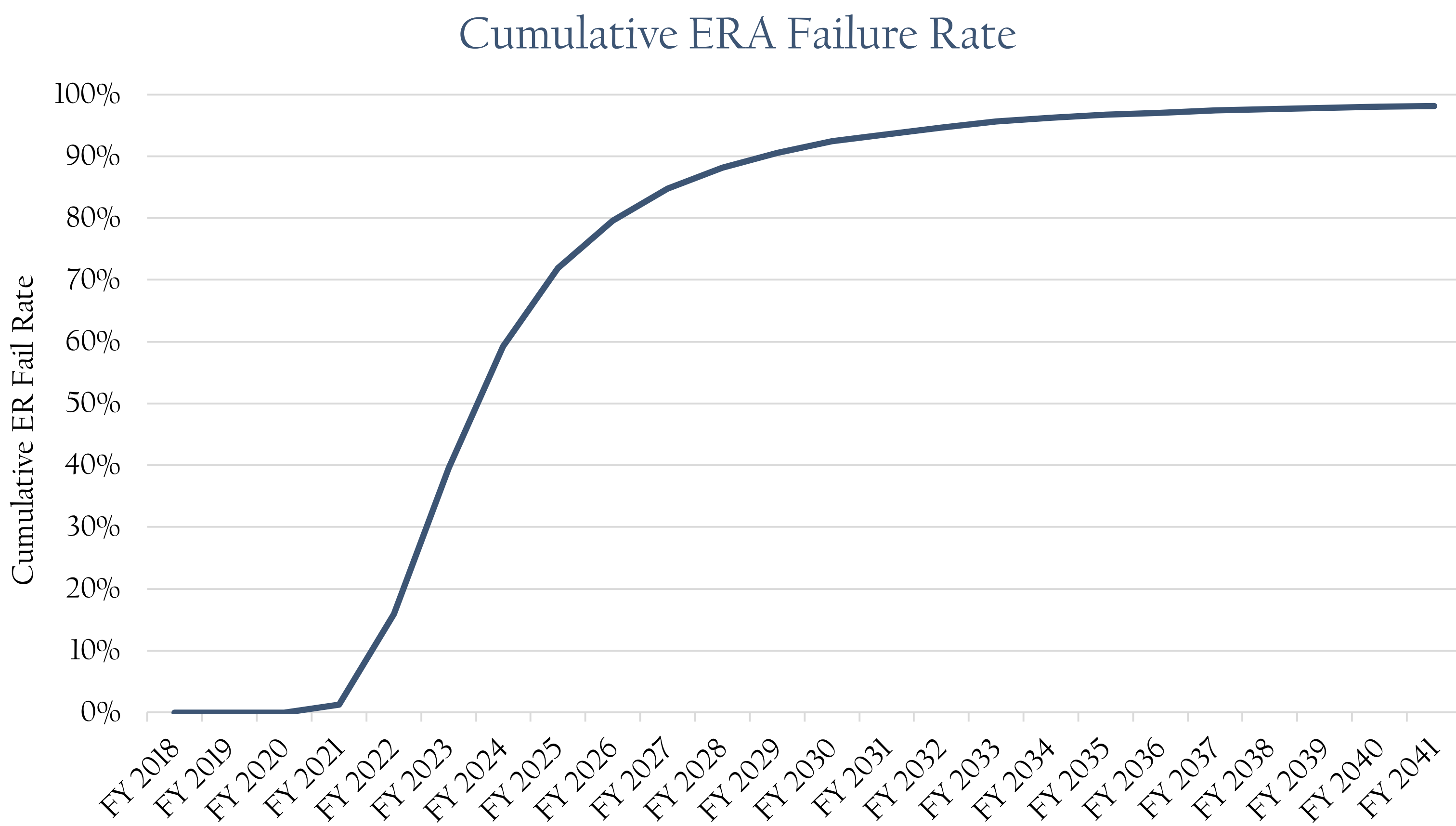
Status Quo, No Fiscal Plan



2041 median value: $ 62,061 nominal ($36,383 real) million

ER Fail Rate over 24 Years: 98.11%

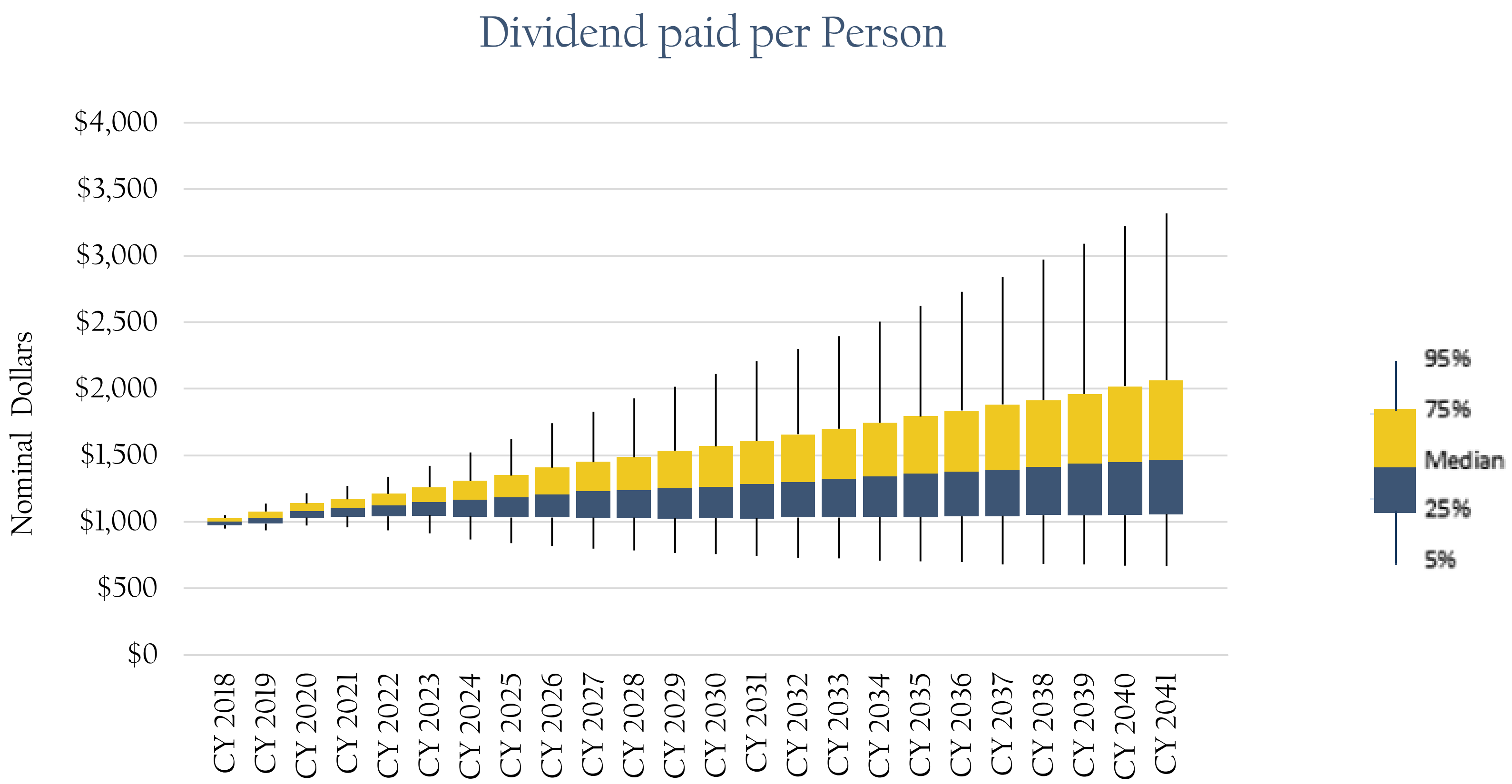
STATUS QUO, NO FISCAL PLAN



PFPA: Scenario

- **Deposits:** 25% of royalties deposited into the permanent fund.
- **Payout Calculation**
  - Maximum POMV: 5.25% of the average of first 5 of the last 6 years' total fund size.
  - Draw Limit: If the combined UGF royalty and production tax revenues for the year are above $1.2 billion, the maximum POMV amount is reduced by the amount of those revenues over $1.2 billion.
- **Unplanned Payouts** (no full fiscal plan scenario)**:** After the CBR is depleted, budget deficits are filled using the ERA.
- **Dividend Calculation:**
  - 20% of the maximum POMV payout before reductions, plus 20% of UGF royalties
  - Overwriting the above calculation, the dividend for CY2018 is $1,000/person.
- **Inflation Proofing:** If four times the 5.25% POMV payout remains in the ERA after the POMV transfer, the amount over the four times the POMV is transferred into the corpus.

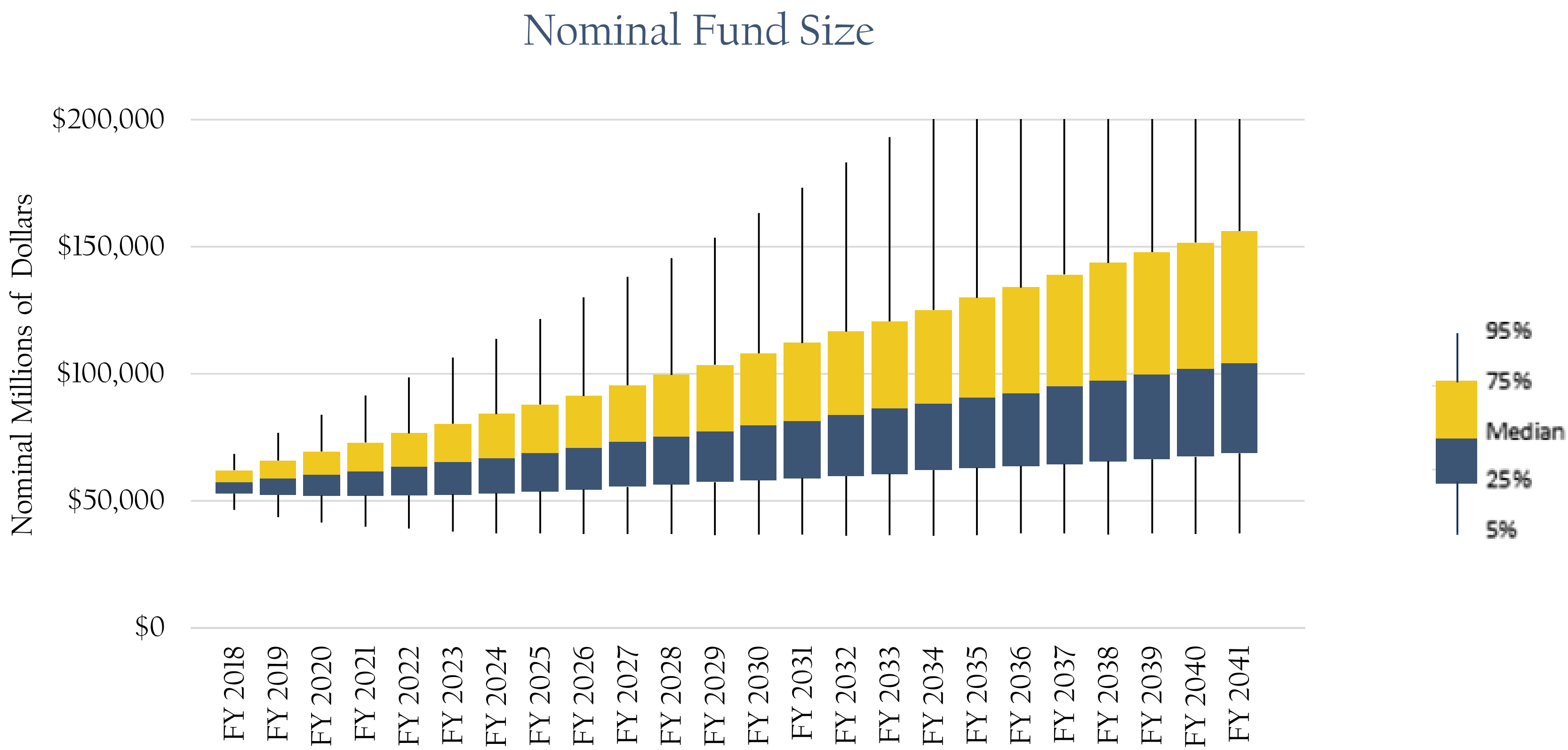
PFPA, FULL FISCAL PLAN



2018 median value: $1,000

2041 median value: $1,468 nominal ($861 real)

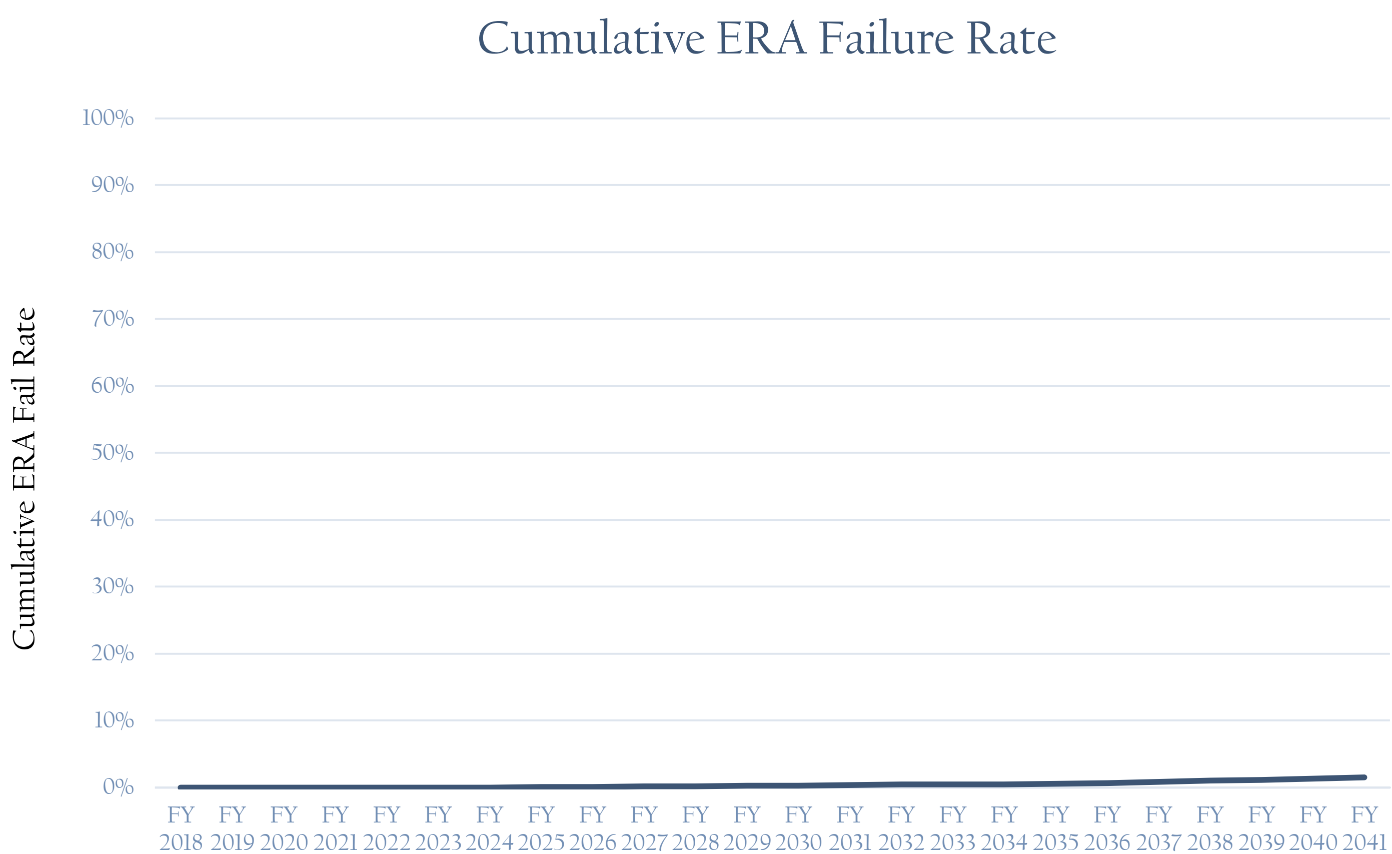
PFPA, Full Fiscal Plan



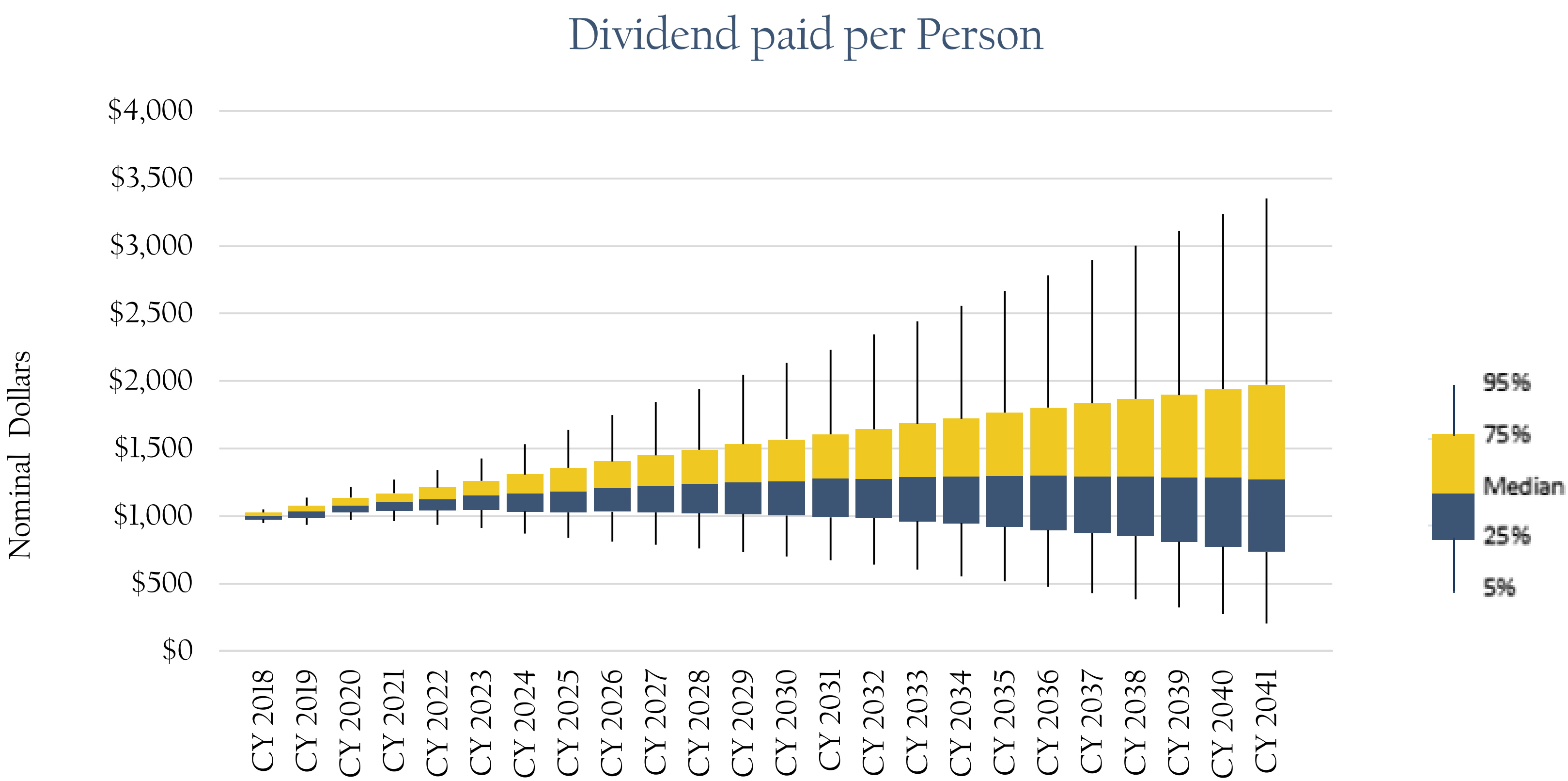
2041 median value: $104,079 nominal ($61,016 real) million

ER Fail Rate over 24 Years: 1.52%

PFPA, Full Fiscal Plan



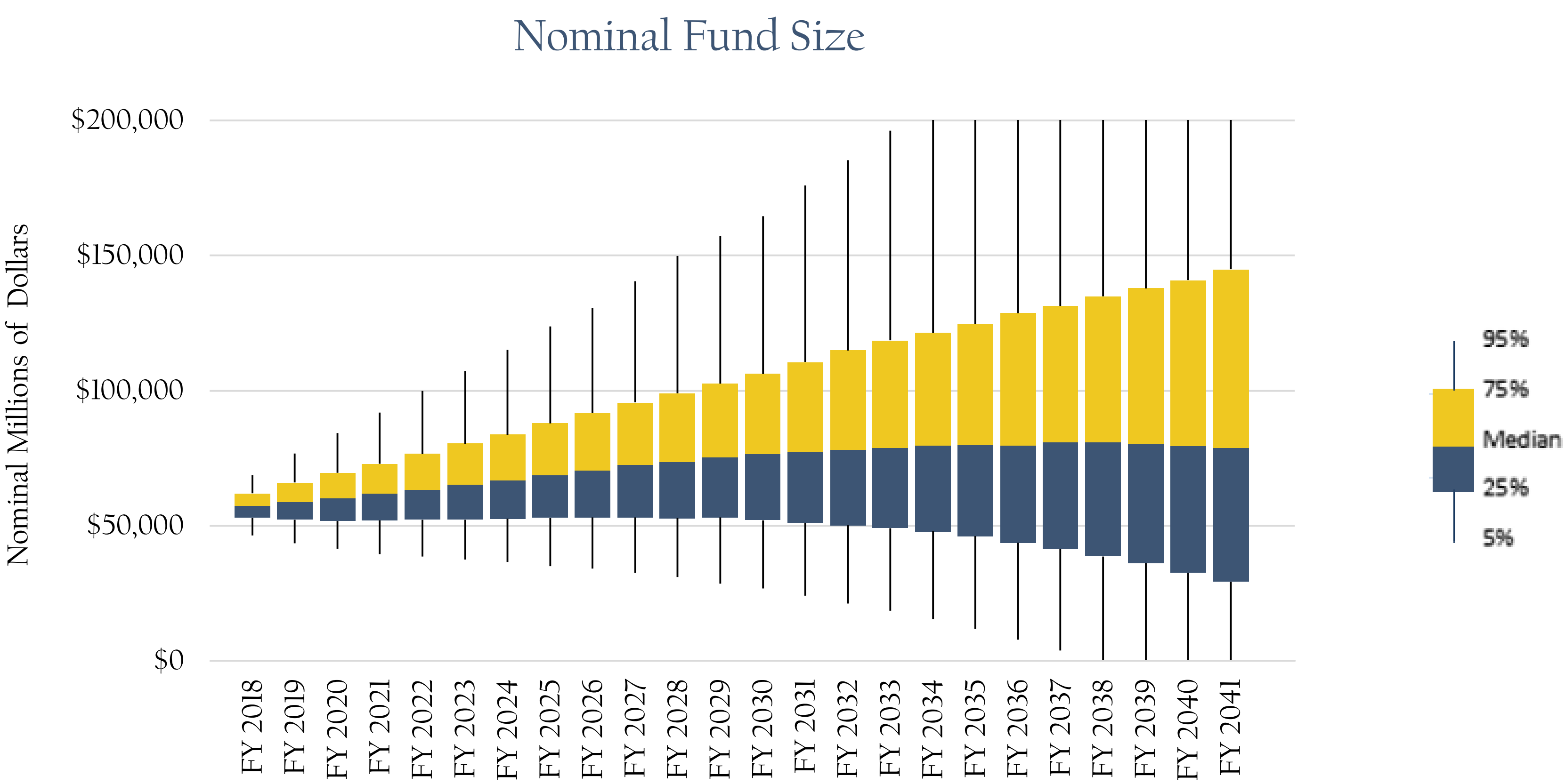
PFPA, No Fiscal Plan



2018 median value: $1,000

2041 median value: $1,271 nominal ($745 real)

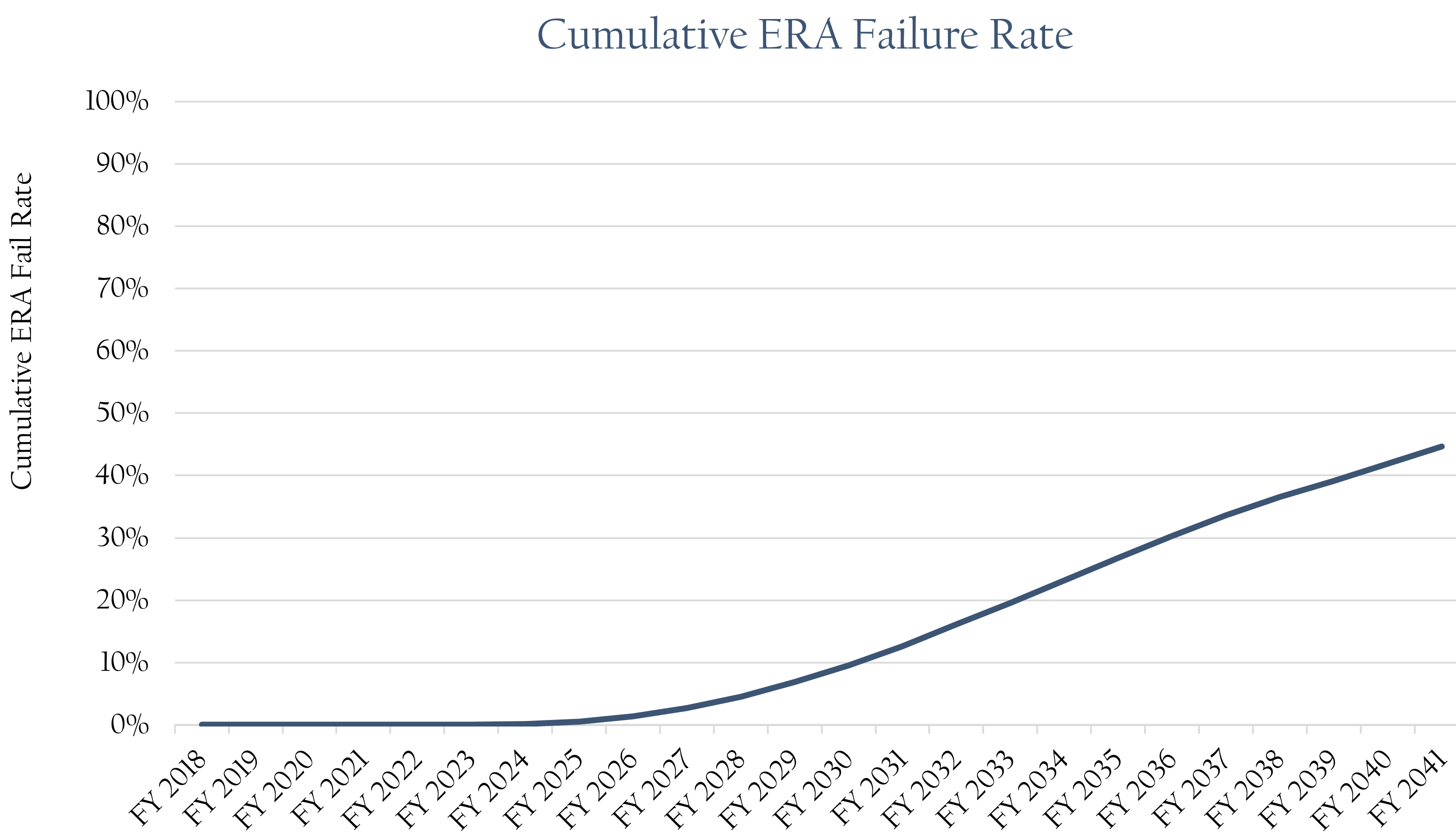
PFPA, No Fiscal Plan



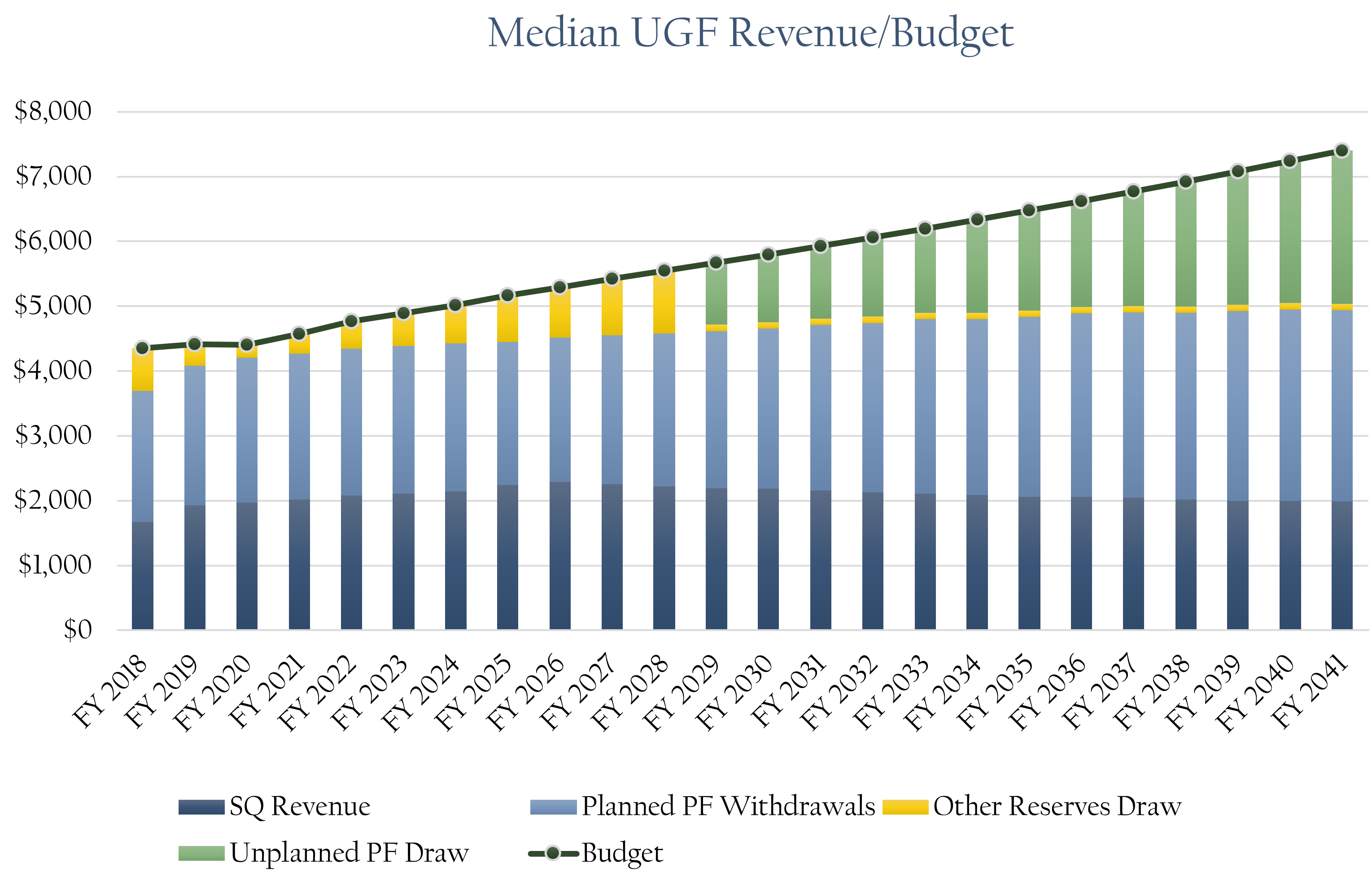
2041 median value: $78,926 nominal ($46,270 real) million

ER Fail Rate over 24 Years: 45.61%

PFPA, No Fiscal Plan



PFPA, No Fiscal Plan

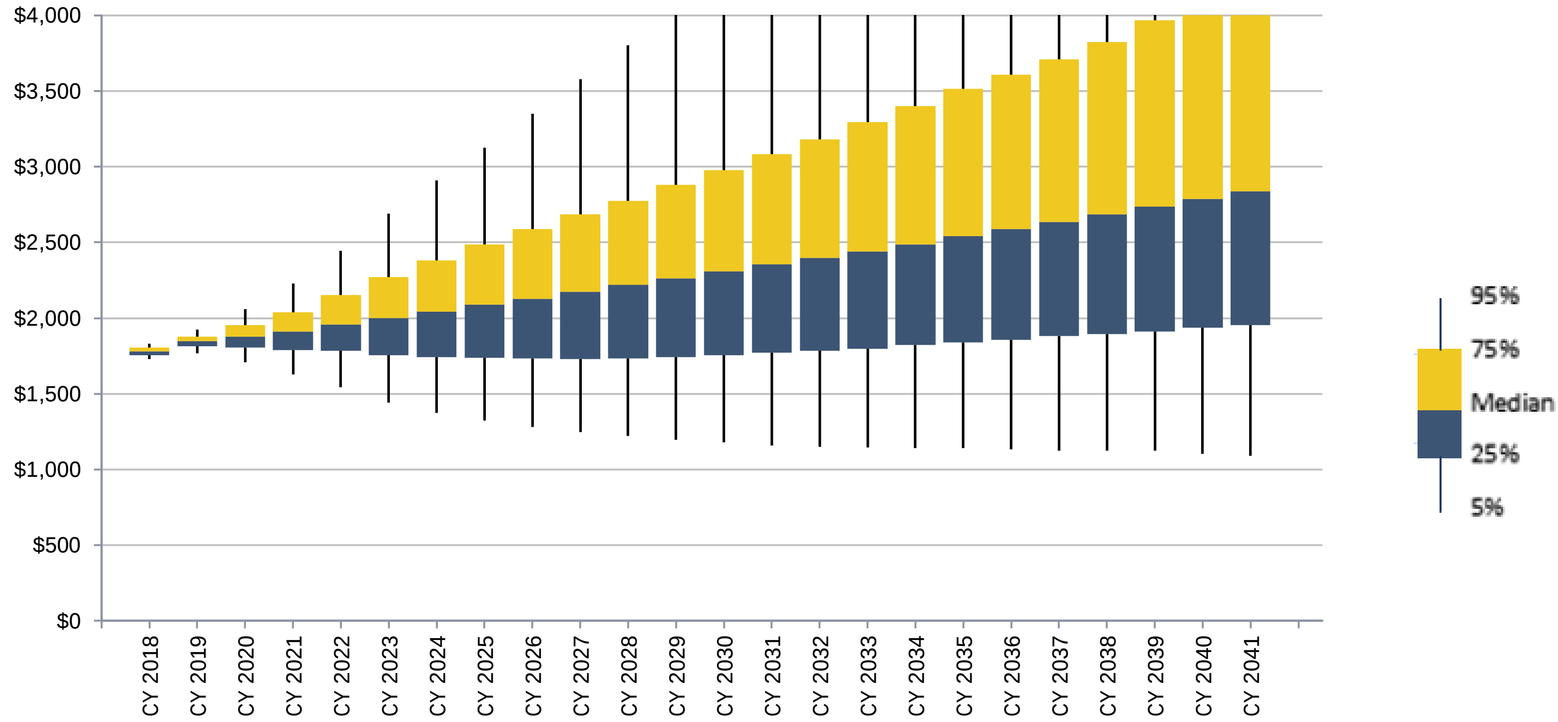


SB21: Scenario

- **Deposits:** 31% of royalties deposited into the permanent fund.
- **Payout and Dividend Calculation**:
  - 4.5% of the average market value of the fund over the last 5 fiscal years. At least half of that payout goes to dividends and up to half can go to the general fund.
  - The model assumed
    - Half of the 4.5 POMV goes to dividends and
    - The other half goes to the general fund.
- **Unplanned Payouts** (no full fiscal plan scenario)**:** After the CBR is depleted, budget deficits are filled using the ERA.
- **Inflation Proofing:** No inflation proofing transfers to the corpus

SB21, Full Fiscal Plan

Dividend paid per Person

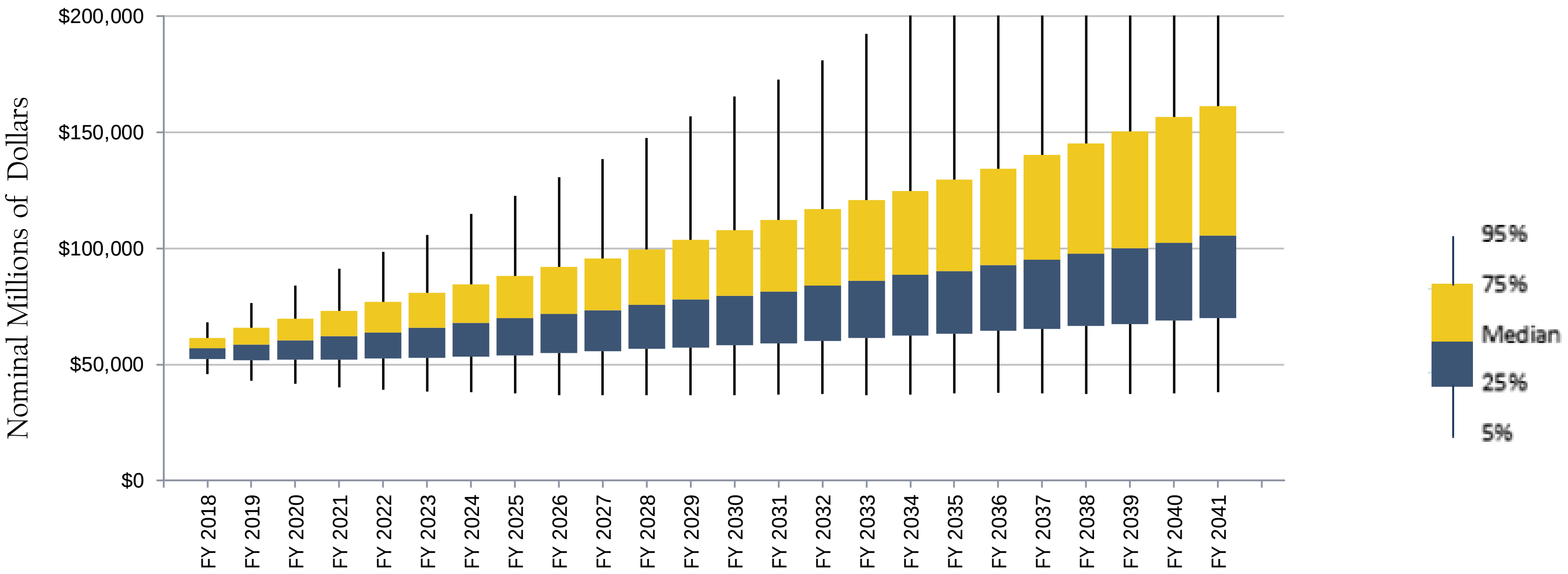


2018 median value: $1,781

2041 median value: $2,837 nominal ($1,663 real)

SB21, Full Fiscal Plan

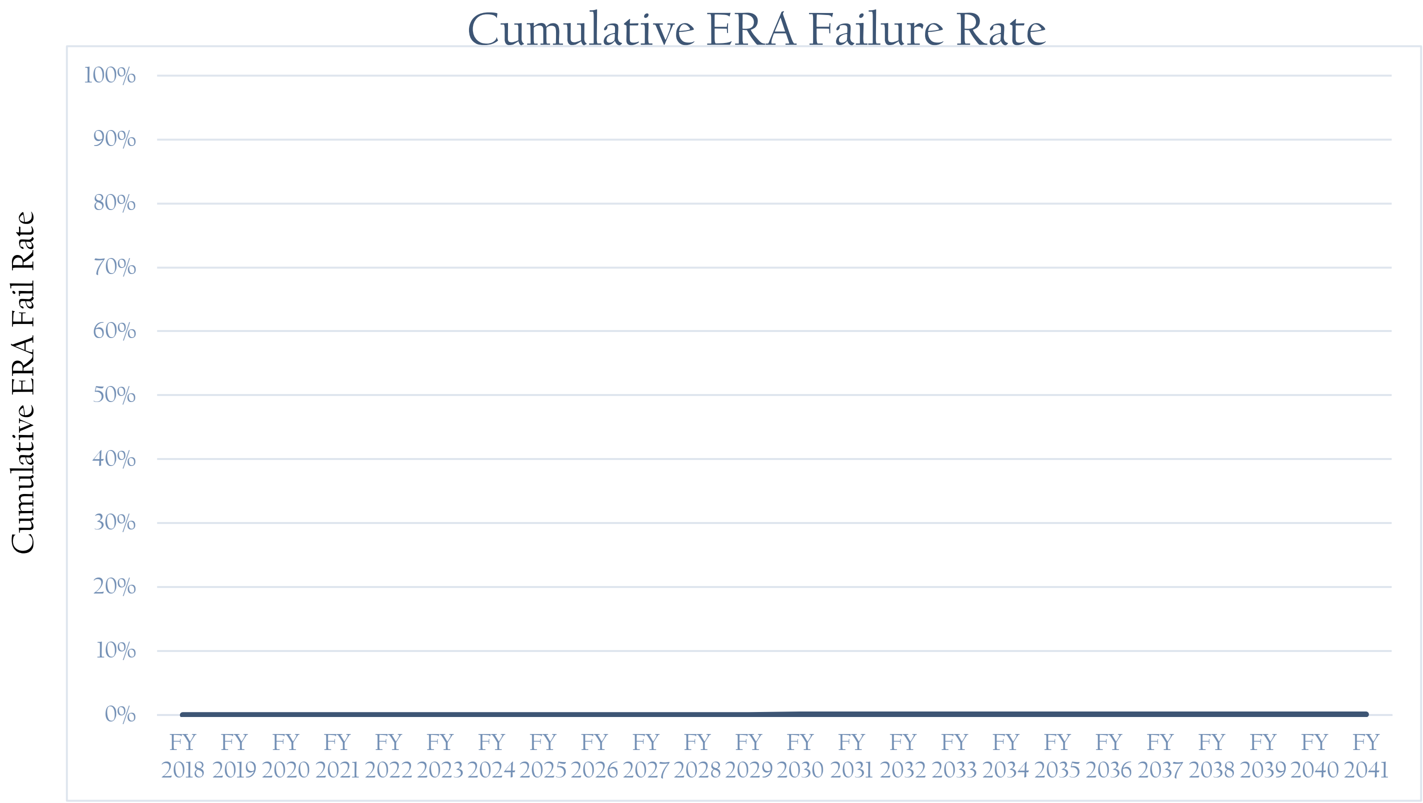
Nominal Fund Size



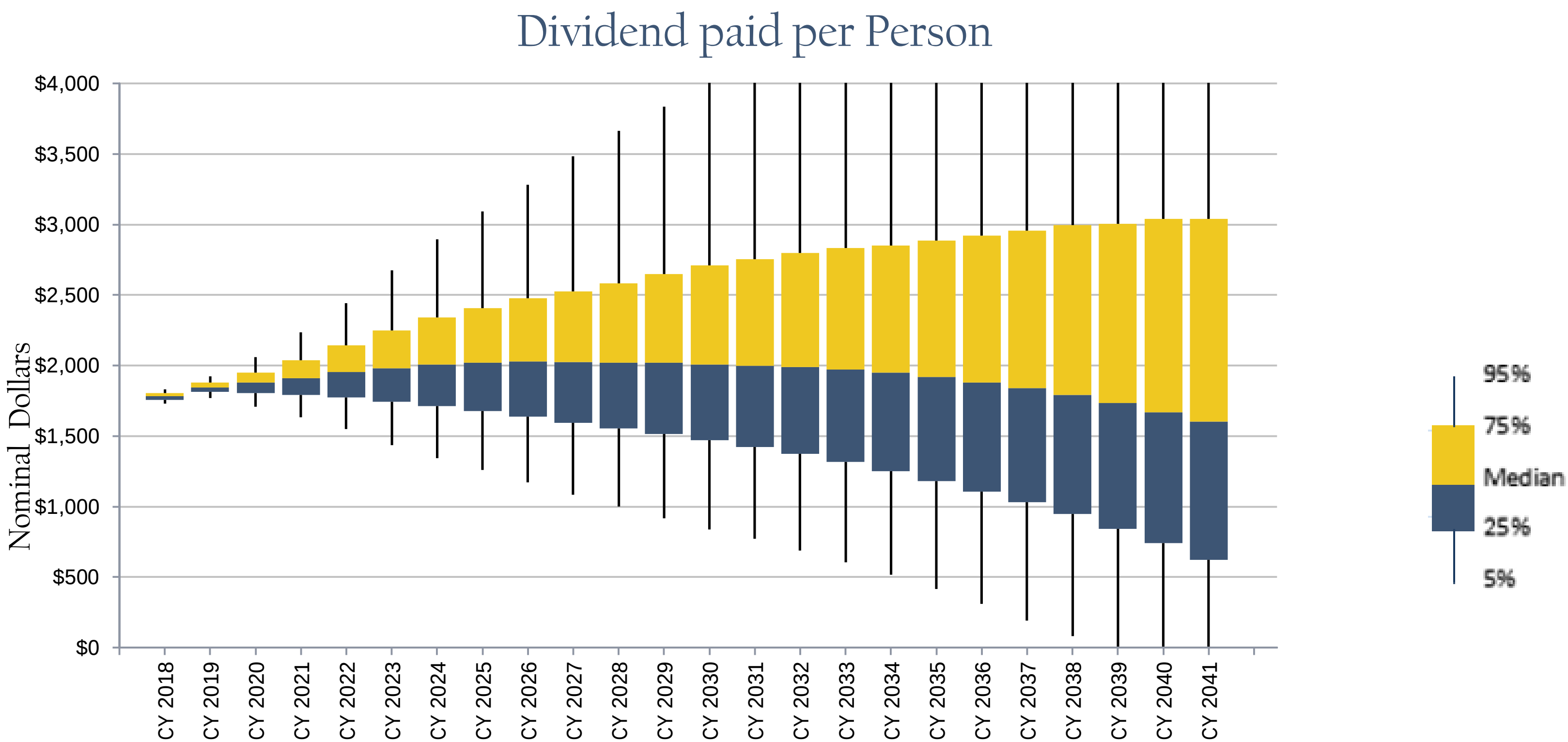
2041 median value: $105,372 nominal ($61,774 real) million

ER Fail Rate over 24 Years: 0.03%

SB21, FULL FISCAL PLAN



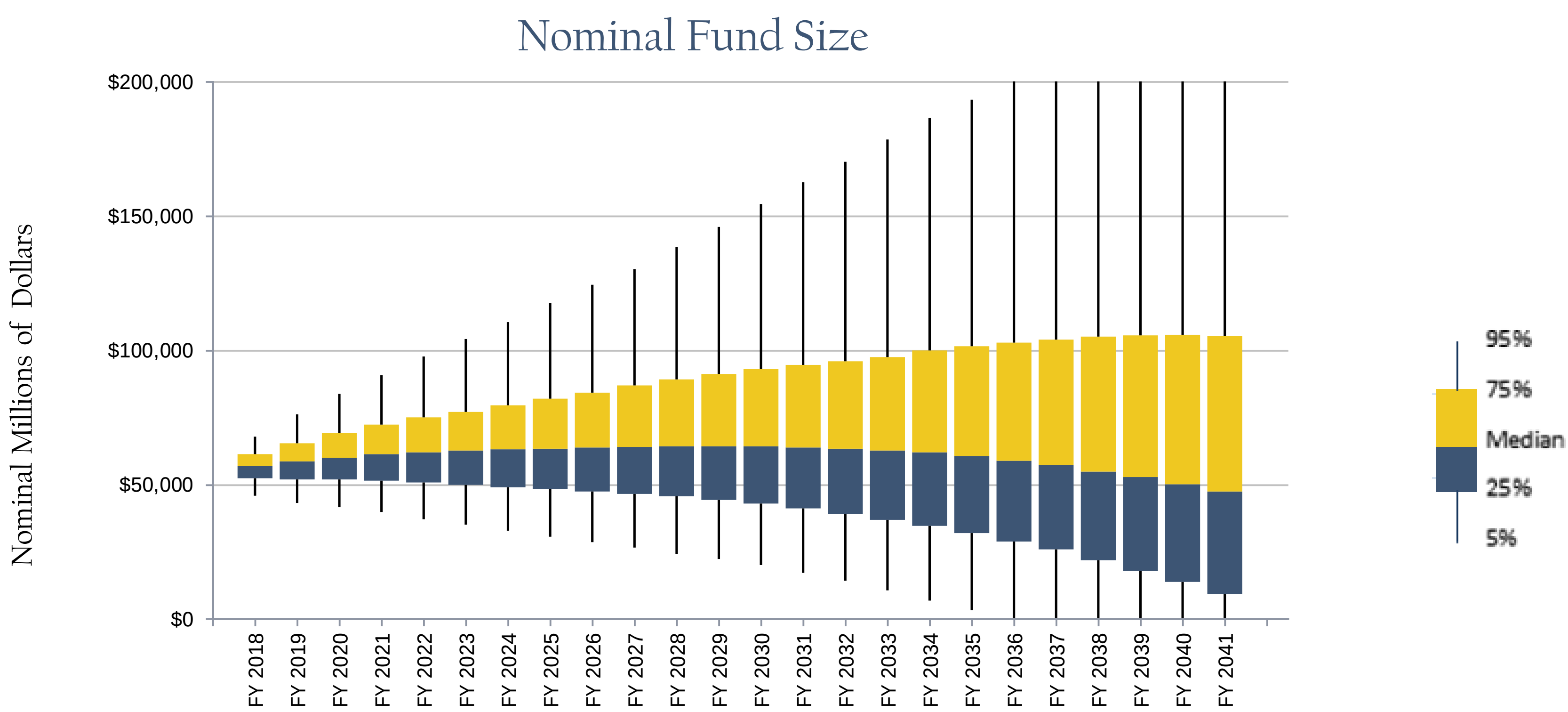
SB21, No Fiscal Plan



2018 median value: $1,781

2041 median value: $1,603 nominal ($940 real)

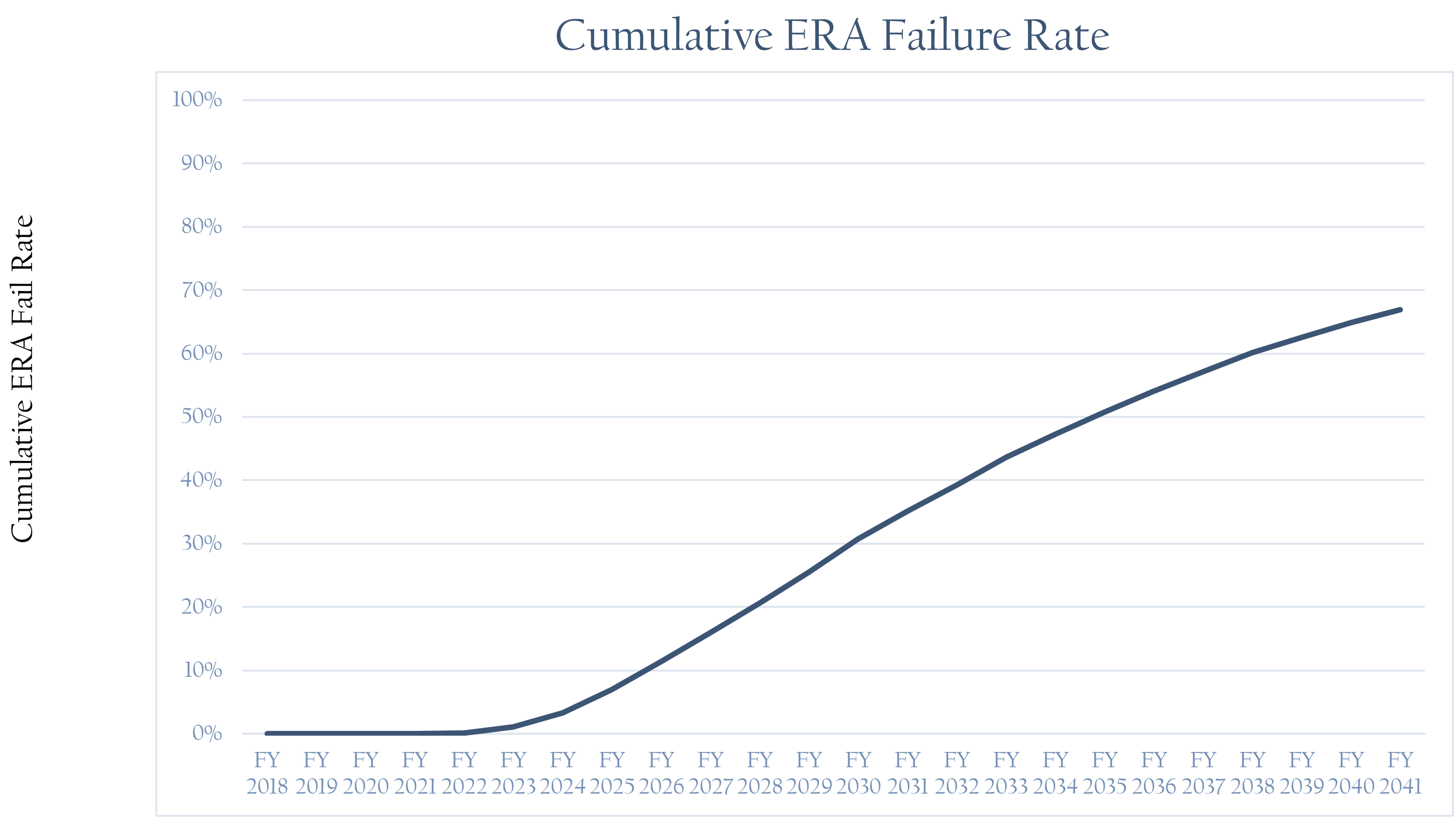
SB21, No Fiscal Plan



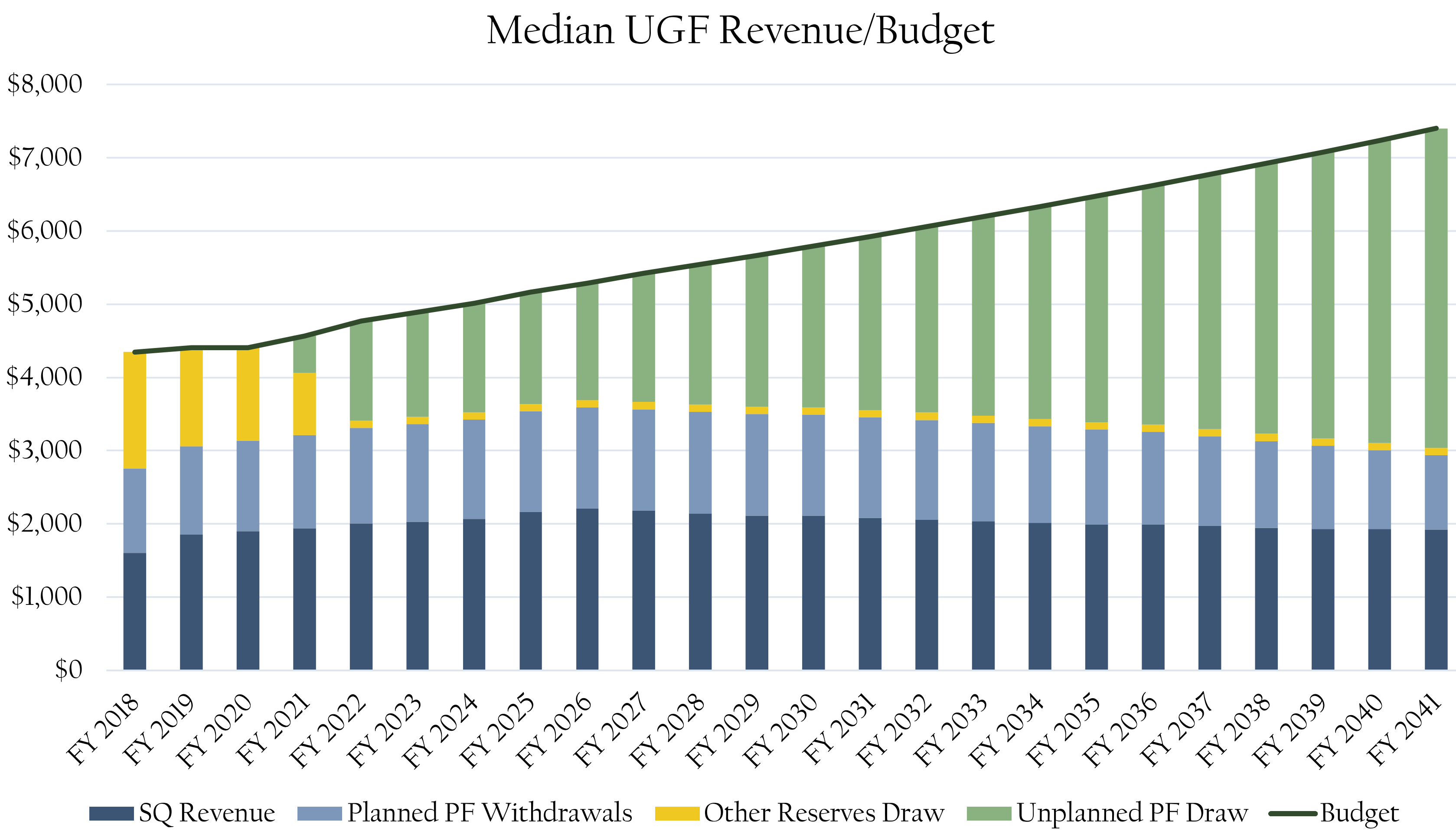
2041 median value: $47,616 nominal ($27,915 real) million

ER Fail Rate over 24 Years: 66.90%

SB21, No Fiscal Plan



SB21, No Fiscal Plan



COMPARISON

	Status Quo	PF Plan Only (any plan)	Full Fiscal Plan with PFPA	Full Fiscal Plan with SB21
1. Rule-Based	Only until CBR is depleted.	Only until CBR is depleted.	Yes.	Yes.
2. Stabilizing				
- Investment Income	No, not addressed.	Not after ERA depleted.	**Partial**, 5-year averaging in POMV	**Partial**, 5-year averaging in POMV.
- Total Revenue	No, not addressed.	Not after ERA depleted.	**Partial**, addressed in a mid-range of oil prices.	No defined plan.
3 & 4. Sustainable				
- Protect the Dividend	Dividend at risk when ERA depleted.	**Dividend at risk** when ERA depleted.	Yes.	Yes.
- Protect the Fund (total & corpus)	No. Value of fund and corpus greatly degraded.	No. Value of fund and corpus eventually degraded.	Yes. Maintains value of the fund and corpus over the long term.	**Partial**, the total fund value is maintained but the growth is not protected in the corpus.
5. Maximize ERA Use	Over use. High risk of depleting ERA in short-term.	Over use. Substantial risk of depleting ERA in all scenarios.	Yes. Withdrawing less when oil revenues are high allows higher draws when oil revenues are low.	**Partial**. Withdraws same percent each year regardless of budget need.

COMPARISON

($ in billions)	Status Quo	PFPA	SB21
FY18 UGF Budget	$4.2 billion		
FY18 Existing UGF Revenues	$1.4		
Planned ERA Draws for UGF	N/A	$2.0	$1.2
Additional Measures required for a Full Fiscal Plan	$2.8 billion	$0.8 billion	$1.6 billion