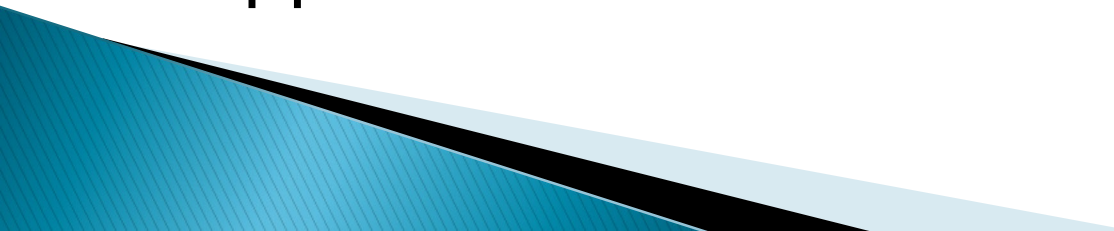


Prison Forecast Model – A Brief Overview

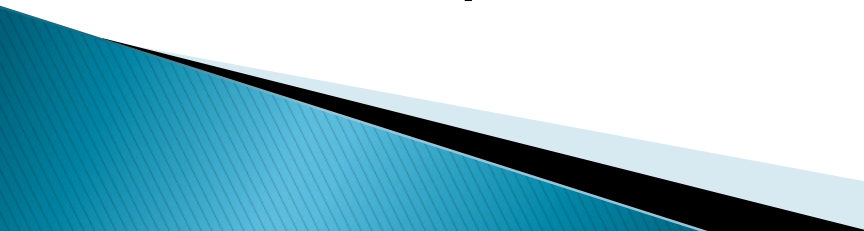
August 7th, 2019



Outline

- ▶ Forecast Specifics
 - ▶ Subpopulations
 - ▶ Forecast Mechanics / Components
 - (1) Most Recent Census of Inmate Population
 - (2) Forecast of Future Intakes
 - (3) Release Profile of Future Intakes
 - (4) Law Change Add Factors
 - ▶ April 1, 2019 Forecast
 - ▶ Seasonal Adjustment
 - ▶ Margin of Error
 - ▶ Appendices
- 

Specifics

- ▶ Prison Forecast is a product of the Office of Economic Analysis, Department of Administrative Services.
 - ▶ Produced semi-annually, April 1 and October 1
 - ▶ Key input to the budget of the Department of Corrections.
 - ▶ Key input for planning for new prison capacity.
 - ▶ Produced with input from the Prison Forecast Advisory Committee.
- 

Subpopulations

- ▶ Forecast is delineated by Gender and by Crime Type.
- ▶ Crime Types are Person, Property, and Statutory.

Inmates – Person Crimes*

Crime Group	Male	Female	Total
Sex Crimes	3,843	46	3,889
Assault	1,891	174	2,065
Murder	1,650	156	1,806
Robbery	1,416	115	1,531
Other Person	486	76	562
Kidnapping	270	12	282
Weapon	271	10	281
Theft	9,827	589	10,416

* August 1, 2019 Census

Inmates – Property Crimes*

Crime Group	Male	Female	Total
Burglary	1,226	144	1,370
Theft	381	100	481
Stolen Vehicle	323	57	380
ID Theft	238	107	345
Other Property	68	14	82
Forgery	27	9	36
Grand Total	2,263	431	2,694

* August 1, 2019 Census

Inmates – Statutory Crimes*

Crime Group	Male	Female	Total
Drug Crimes	595	96	691
Weapon	424	17	441
DUII	133	9	142
Other Statutory	111	26	137
Court Crimes	97	19	116
Escape	36	6	42
Sex Crimes	8	0	8
Grand Total	1,404	173	1,577

* August 1, 2019 Census

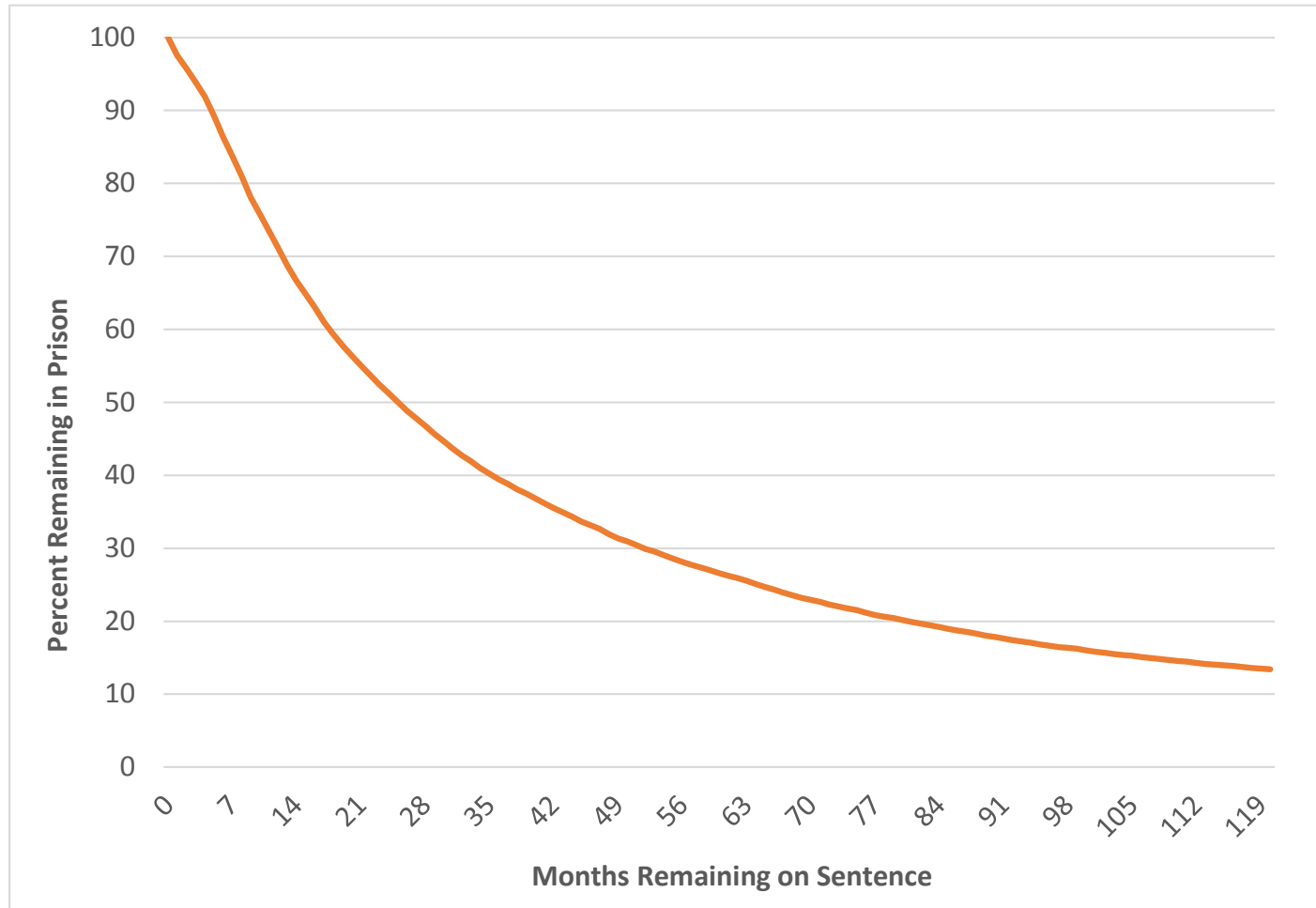
Forecast Calculation

- ▶ $\text{Inmates}(t) = \text{Inmates}(t-1) + \text{Intakes}(t,t-1) - \text{Releases}(t,t-1) + \text{Law Change Add Factor}(t)$
 - Where t = future date being forecasted (e.g., October 1, 2014).
 - Forecast for date t is the first day of the month.
 - Where $(t-1)$ = month prior to month being forecasted.
 - Where $(t,t-1)$ is the month between $t-1$ and t .
 - t is between 1 and 120 months (ten-year forecast).

Forecast Components

- ▶ (1) Latest Inmate Census
 - By Remaining Months of Sentence (0 to 120)
 - Calculated by Projected Release Date, coded in the DOC data file
 - Adjustment made for historical variance between Projected Release Date and Actual Release Date – Variance caused by Alternative Incarceration Program, Transition Leave, Death, Resentencing, Etc.

Release Profile of Current Inmates*



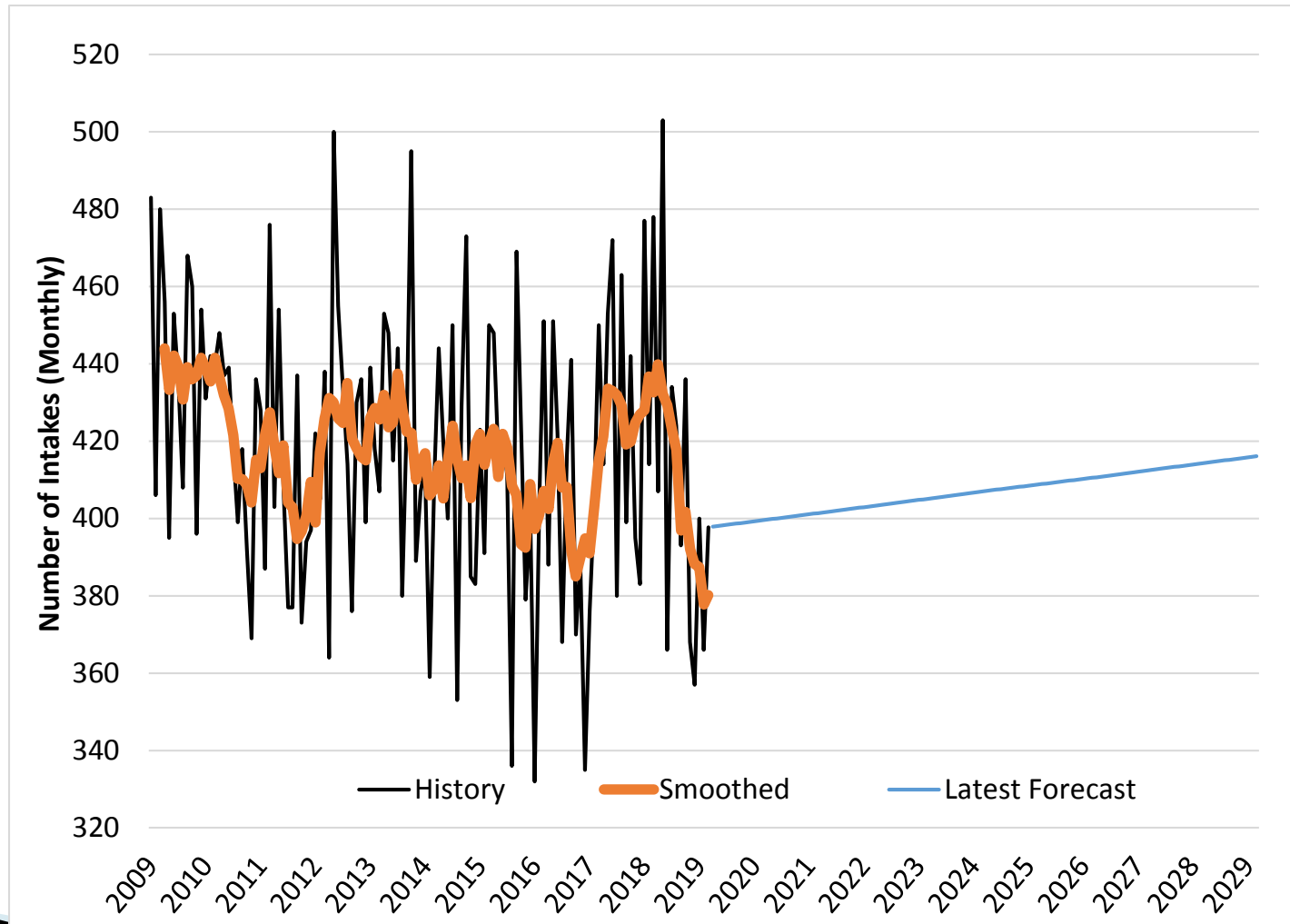
* August 1, 2019 Census

Forecast Components

▶ (2) Intake Forecast

- Function of various factors, including:
 - Projected population growth, Oregon population aged 18–39 (at risk).
 - Recent intake trends
 - Crime rates
 - Prosecutorial and Judicial discretion

Intakes, Recent History and Forecast*

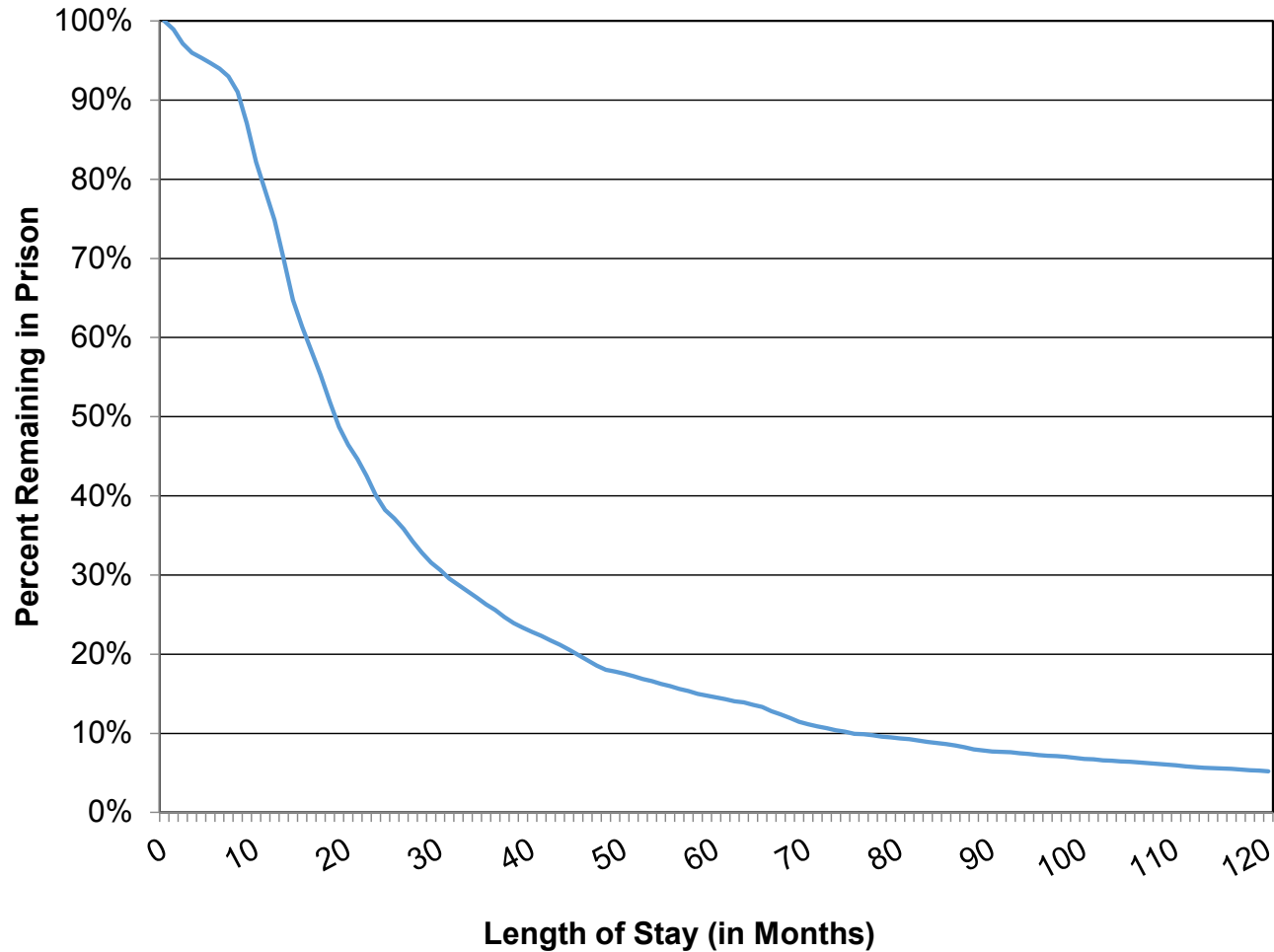


* August 1, 2019 Census

Forecast Components

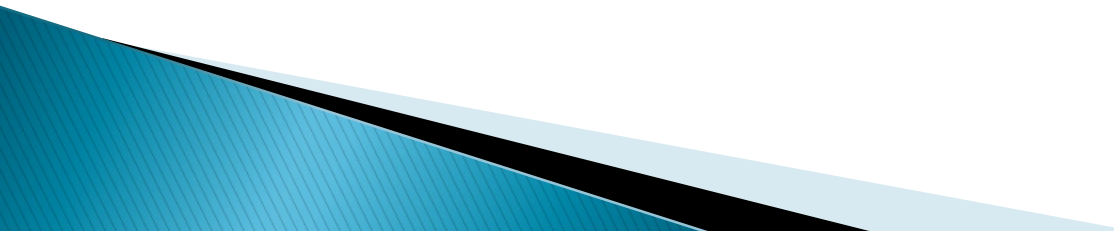
- ▶ (3) Release Profile of Future Intakes
 - Based on the sentence lengths of recent, incoming inmates
 - Timeframe is determined to reflect stable periods not unduly influenced by law changes and other factors.
 - Single release profile, for each subpopulation, is used to “age out” future inmate intake cohorts.

Release Profile of Future Intakes*

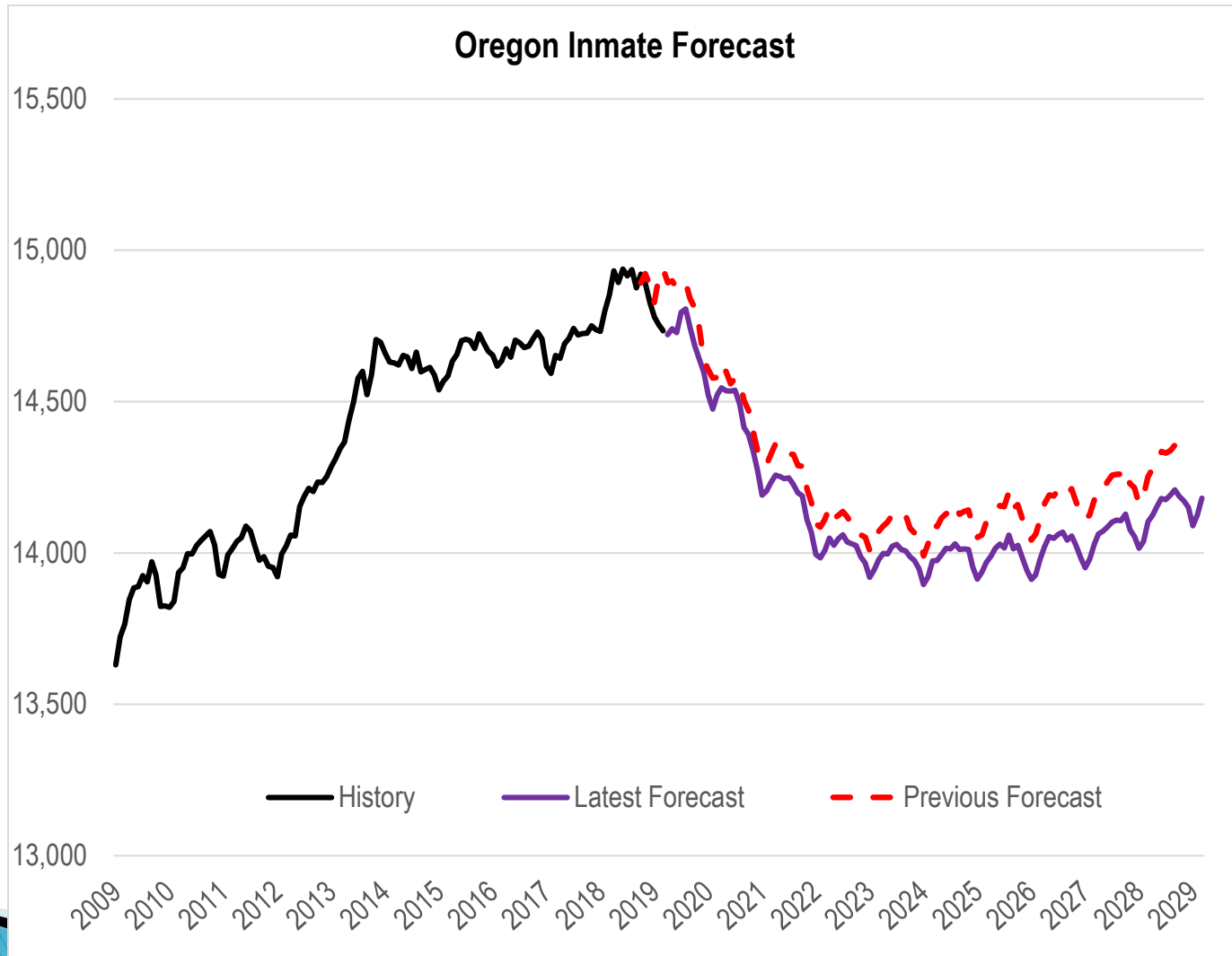


* August 1, 2019 Census

Forecast Components

- ▶ (4) Law Change Add Factors
 - Produced by the Criminal Justice Commission, with input from the Department of Corrections, Office of Economic Analysis, and Other Relevant Parties.
 - Equal the expected deviation from the current law forecast as a result of each distinct component change in a given law (e.g., Measure 11, Measure 57, House Bill 3194, House Bill 3078, etc.)
 - Updated periodically as the law's impact phases into the data.
- 

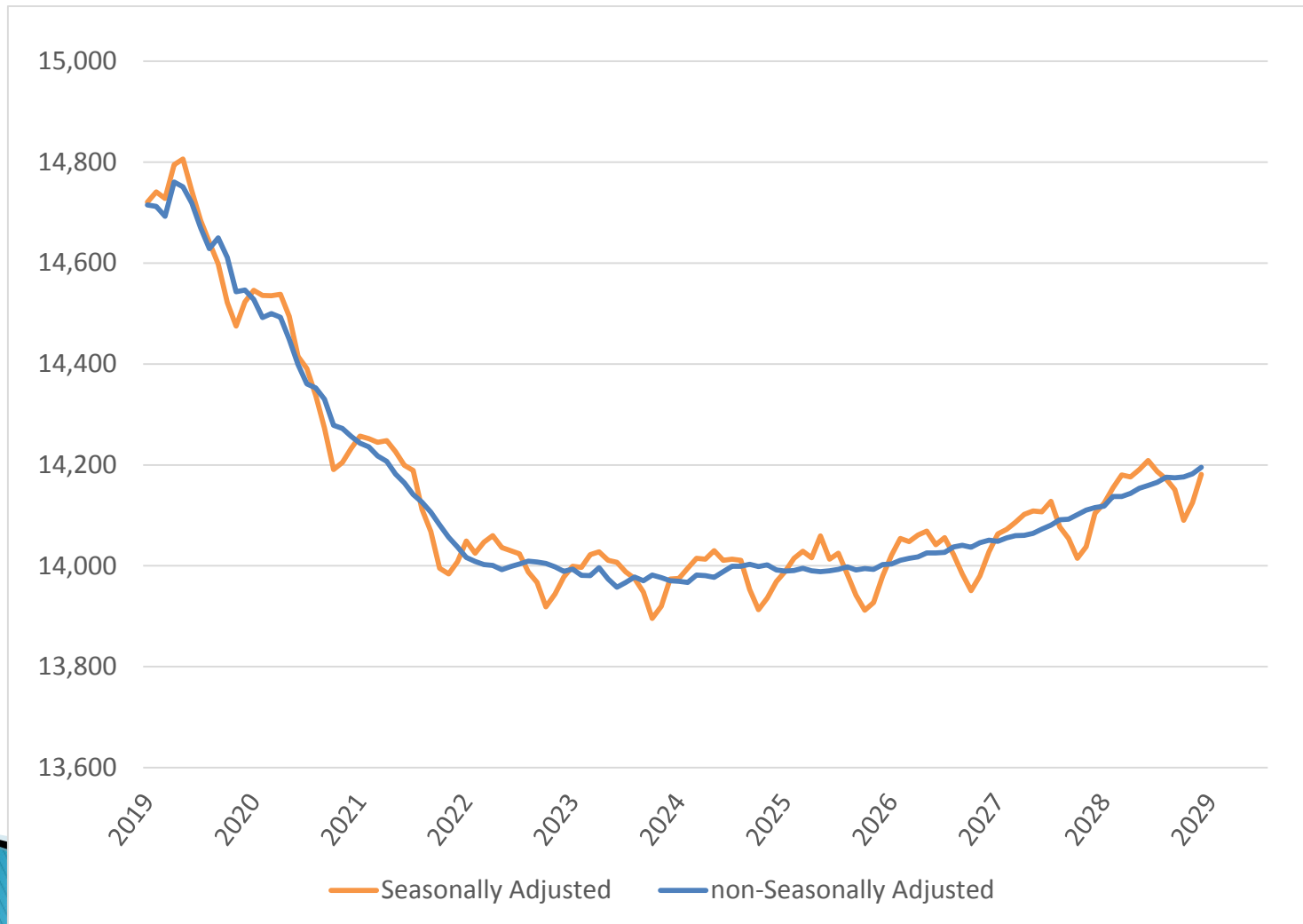
April 1, 2019 Forecast



Seasonal Adjustment

- ▶ Adds seasonality to the baseline (non-seasonally adjusted) forecast.
- ▶ Purpose is to minimize forecast errors.
- ▶ Based on historical variation in the prison population:
 - Month to month variation.
 - Court downtime during the holidays results in fewer inmates on January 1st, than at other times during the year.
 - Day of the week variation.
 - Adjustment for holiday variation (i.e., the forecast date falls on a holiday).

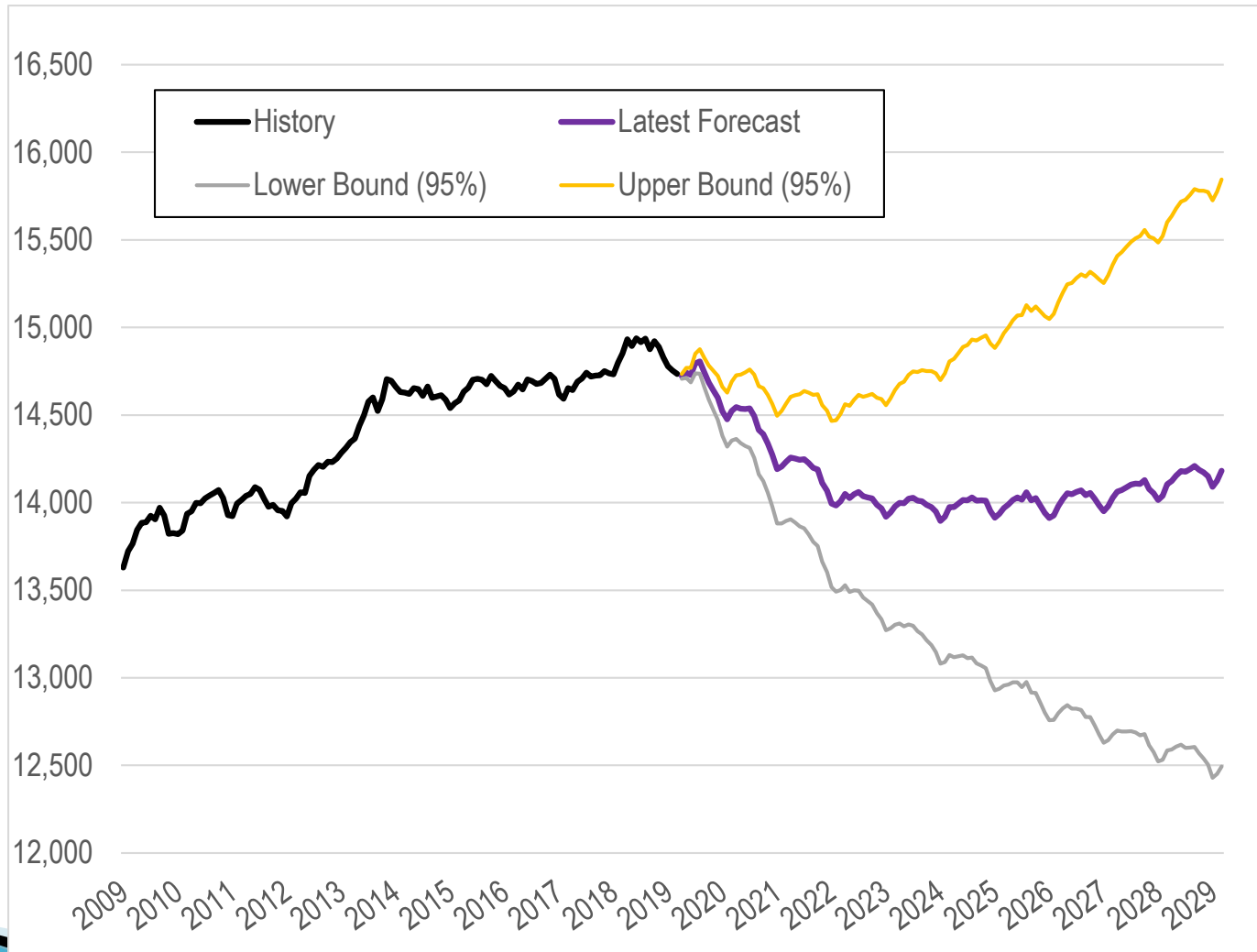
Seasonal Adjustment (April 1, 2019 Forecast)



Margin of Error

- ▶ In addition to the baseline point estimates.
- ▶ Characterizes potential variation between forecast and actual inmate counts.
- ▶ Near-term (one biennium out) error derived from average historical errors (2000–2018).
- ▶ Long-term error derived from historical variance in growth
 - Uses period devoid of major law and crime rate changes (2010–2011).
 - Used to compute probability that prison capacity will need to be activated and/or built within the forecast horizon (10-year forecast).

Latest Forecast and Error Bounds*



Appendices

- ▶ Forecast Computation (Example)
- ▶ Prison Forecast Advisory Committee

Forecast Computation (Example)

	M-PERS	M-PROP	M-STAT	F-PERS	F-PROP	F-STAT	Total
March 1, 2019 Inmate Count	9,791	2,374	1,361	564	455	189	14,734
March 2019 Intakes	175	106	66	16	23	12	398
March 2019 Releases	-123	-81	-33	-8	-8	-6	-260
April 1, 2019 Law Change Add Factor*	-42	-48	-29	-6	-19	-7	-125
April 1, 2019 Inmate Forecast	9,800	2,351	1,364	566	451	189	14,721
* The majority of law change impacts result in a release (as opposed to one less intake).							

Prison Forecast Advisory Committee

Jeffrey Howes (Chair)	Multnomah County Deputy District Attorney
Michael Hsu	Board of Parole & Post-Prison Supervision
Jessica Kampfe	Marion County Public Defenders Office
John Haroldson	Benton County District Attorney
Michael Schmidt	Criminal Justice Commission Executive Director
Debra Vogt	Lane County Circuit Court
Colette Peters	Director Department of Corrections
Jeffery Wood	Director Marion County Community Corrections
Jason Myers	Marion County Sheriff

Questions?

- ▶ Contact Michael Kennedy
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 - Email: michael.kennedy@oregon.gov
 - website:
<https://www.oregon.gov/das/OEA/Pages/forecastcorrections.aspx>