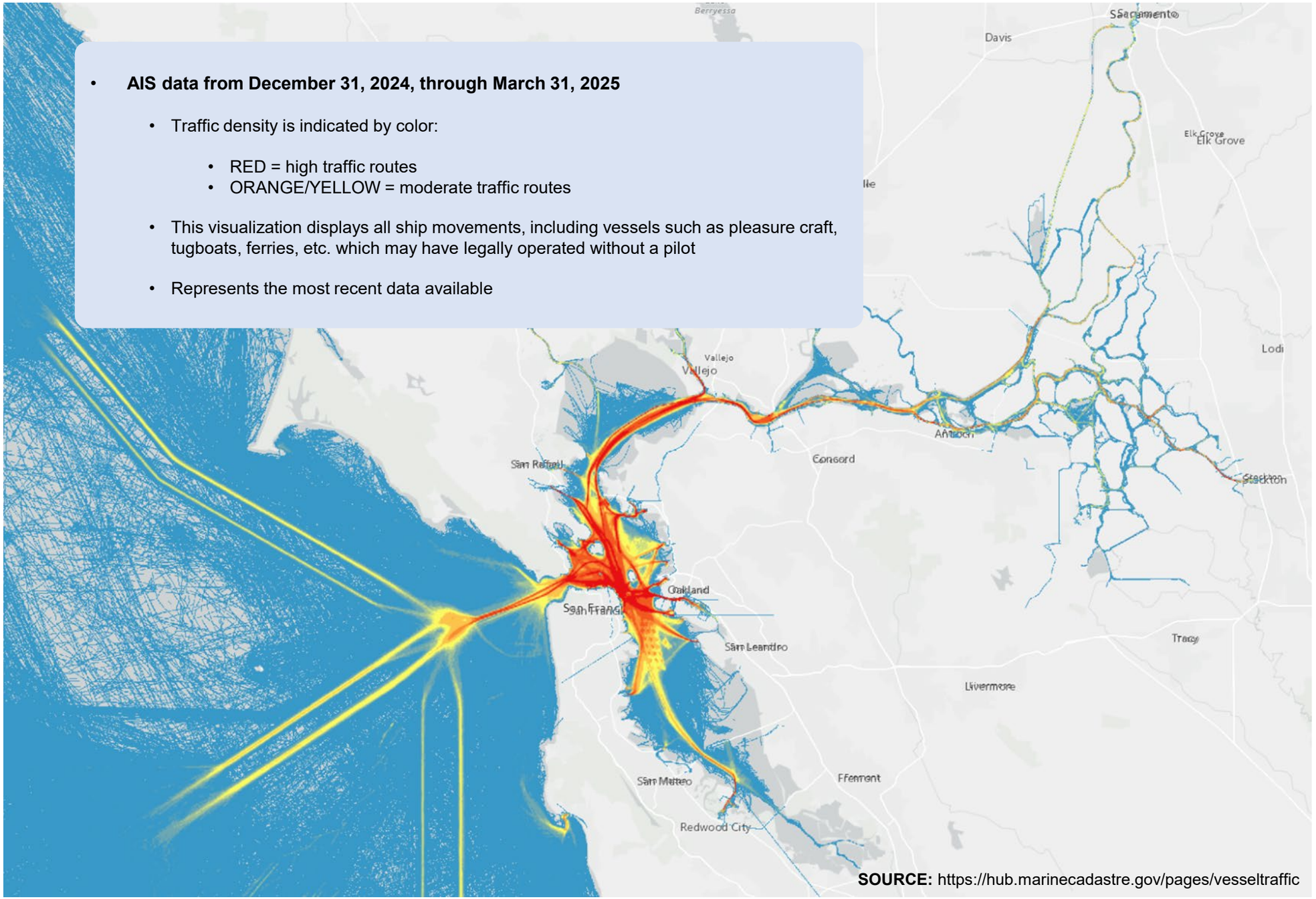
An Analysis of Section 237(d) Data, 2017 through 2025

Board of Pilot Commissioners
March 26, 2026

Maritime Traffic Heat Map: Visualizing Density/Complexity



- **AIS data from December 31, 2024, through March 31, 2025**
  - Traffic density is indicated by color:
    - RED = high traffic routes
    - ORANGE/YELLOW = moderate traffic routes
  - This visualization displays all ship movements, including vessels such as pleasure craft, tugboats, ferries, etc. which may have legally operated without a pilot
  - Represents the most recent data available

SOURCE: https://hub.marinecadastre.gov/pages/vesseltraffic

About this Data

Vessel traffic data, or Automatic Identification System (AIS) data, are collected by the U.S. Coast Guard through an onboard navigation safety device that transmits and monitors the location and characteristics of vessels in U.S. and international waters in real time.

The Bureau of Ocean Energy Management, the National Oceanic and Atmospheric Administration, and the U.S. Coast Guard Navigation Center have worked together to repurpose some of the most important records and make these records available to the public.

These records are sourced from the U.S. Coast Guard's national network of AIS receivers called the Nationwide Automatic Identification System.

Information such as location, time, vessel type, speed, length, beam, and draft have been extracted from the raw data and prepared for analyses in desktop geographic information system (GIS) software.

Demand and Capacity Ratio Model

Number of Licensed Pilots (Capacity)	Total Annual Moves, including Bar Crossings, Bay and River Moves (Demand)								
	7,200	7,400	7,600	7,800	8,000	8,200	8,400	8,600	8,800
50	144.0	148.0	152.0	156.0	160.0	164.0	168.0	172.0	176.0
51	141.2	145.1	149.0	152.9	156.9	160.8	164.7	168.6	172.5
52	138.5	142.3	146.2	150.0	153.8	157.7	161.5	165.4	169.2
53	135.8	139.6	143.4	147.2	150.9	154.7	158.5	162.3	166.0
54	133.3	137.0	140.7	144.4	148.1	151.9	155.6	159.3	163.0
55	130.9	134.5	138.2	141.8	145.5	149.1	152.7	156.4	160.0
56	128.6	132.1	135.7	139.3	142.9	146.4	150.0	153.6	157.1
57	126.3	129.8	133.3	136.8	140.4	143.9	147.4	150.9	154.4
58	124.1	127.6	131.0	134.5	137.9	141.4	144.8	148.3	151.7
59	122.0	125.4	128.8	132.2	135.6	139.0	142.4	145.8	149.2
60	120.0	123.3	126.7	130.0	133.3	136.7	140.0	143.3	146.7

2. However, now that the number of annual moves has decreased, how does that impact licensing?

1. 60 licenses was established as a benchmark when moves were in the 8,800 range.

Demand and Capacity Ration Model: Historical Ratios

Period: 2017 through 2025; Data Sources: San Francisco Bar Pilots 237(d) Reports and SFBP Audited Financial Statements

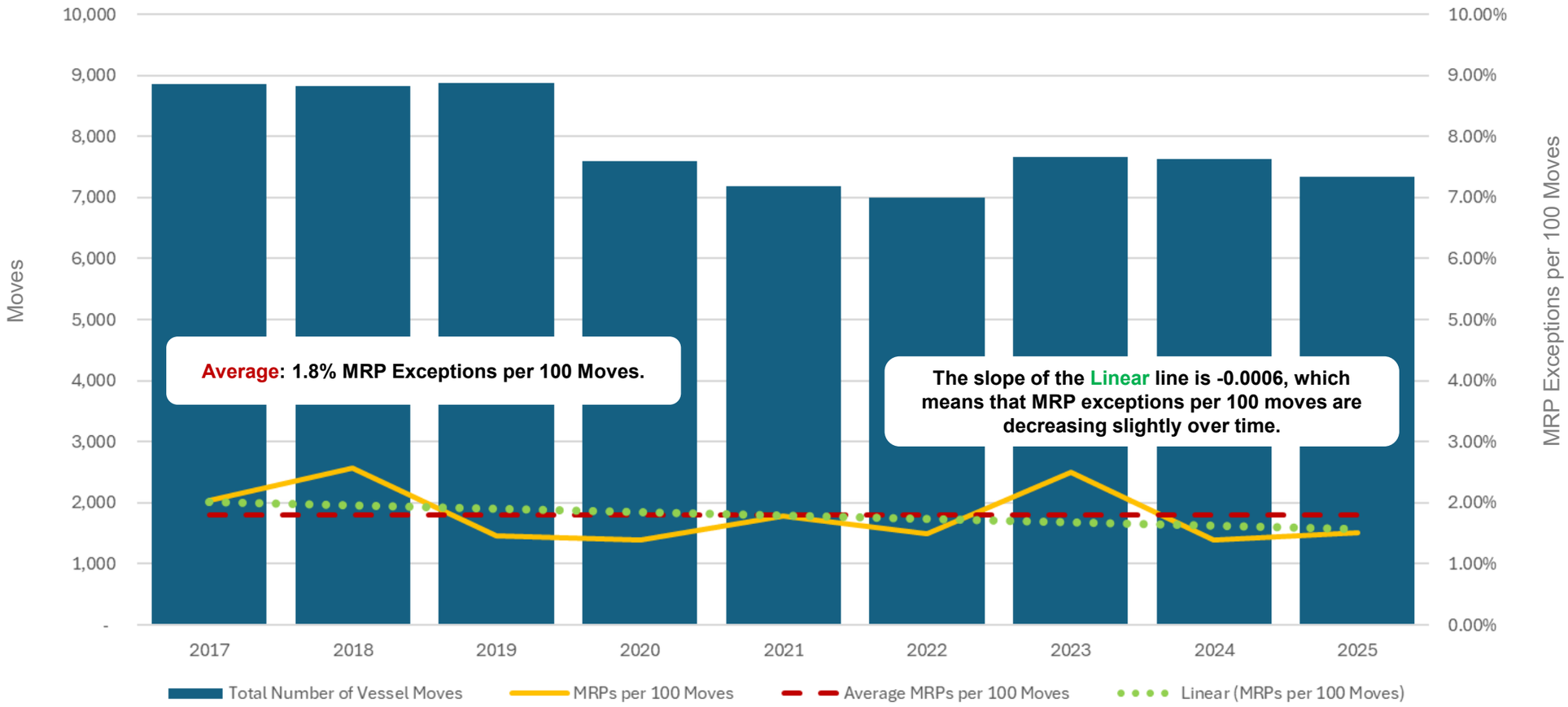
Final number pending release of 2025 SFBP audited financial statements.

Year	Total Number of Vessel Moves (Demand)	Total MRP Exceptions	Average Number of Pilots (Capacity)	Moves per Pilot
2017	8,862	180	59	150.2
2018	8,818	226	57	154.7
2019	8,879	130	56	158.6
2020	7,596	106	54	140.7
2021	7,179	128	53	135.5
2022	6,997	104	50	139.9
2023	7,670	192	51	150.4
2024	7,635	106	52	146.8
2025	7,338	111	52	141.1
Average	*7,886*	*143*	*54*	*146.4*

- Vessel moves (demand) are a strong workload metric because they reflect the workforce needed to support:
  - Operations pilots,
  - Off-route pilot work,
  - NFFDs, and
  - Overall support/coverage requirements.

Understanding Minimum Rest Period Exceptions Relative to Demand

Period: 2017 through 2025; Data Source: San Francisco Bar Pilots 237(d) Reports

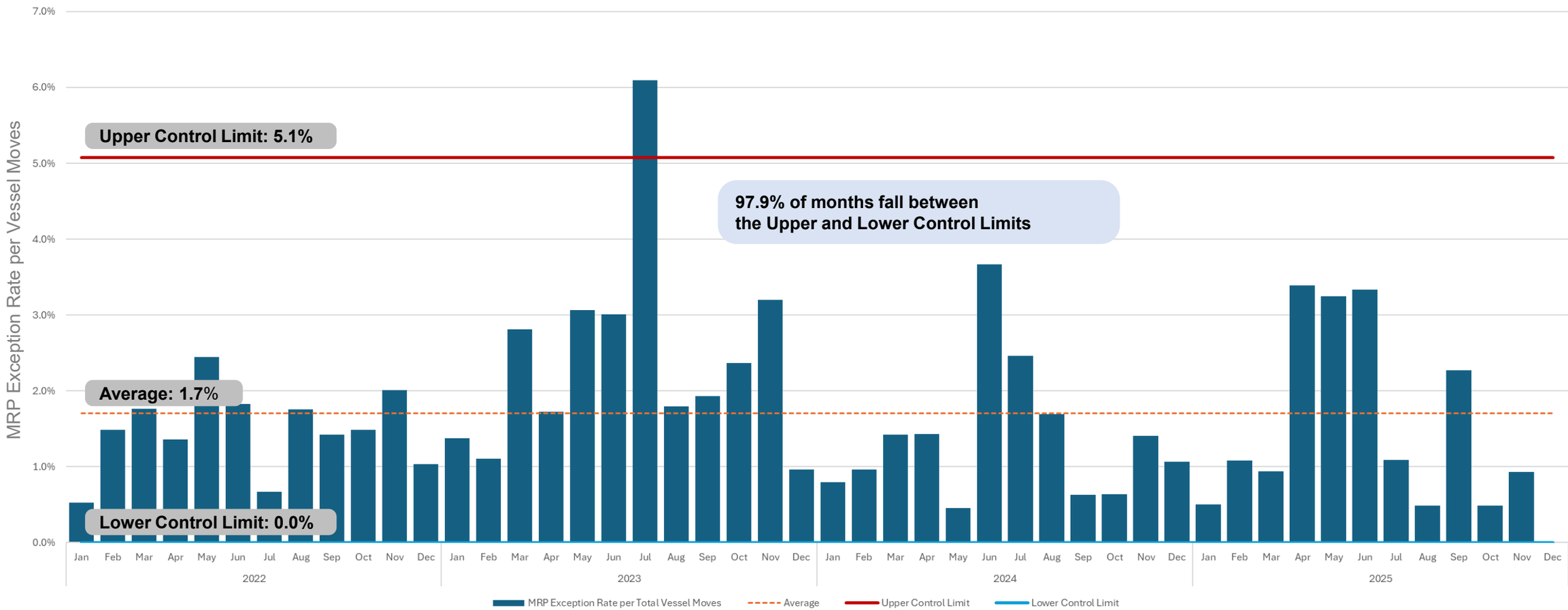


- Minimum Rest Period (MRP) exceptions per 100 moves illustrates the number of times the required minimum rest rule was not met, normalized to every 100 moves.
- Lower = better adherence to rest requirements; higher = more frequent exceptions.

Statistical Process Control

Period: 2022 through 2025; Data Source: San Francisco Bar Pilots 237(d) Reports

MRP Exception rates over the past four years have been stable, averaging 1.7%

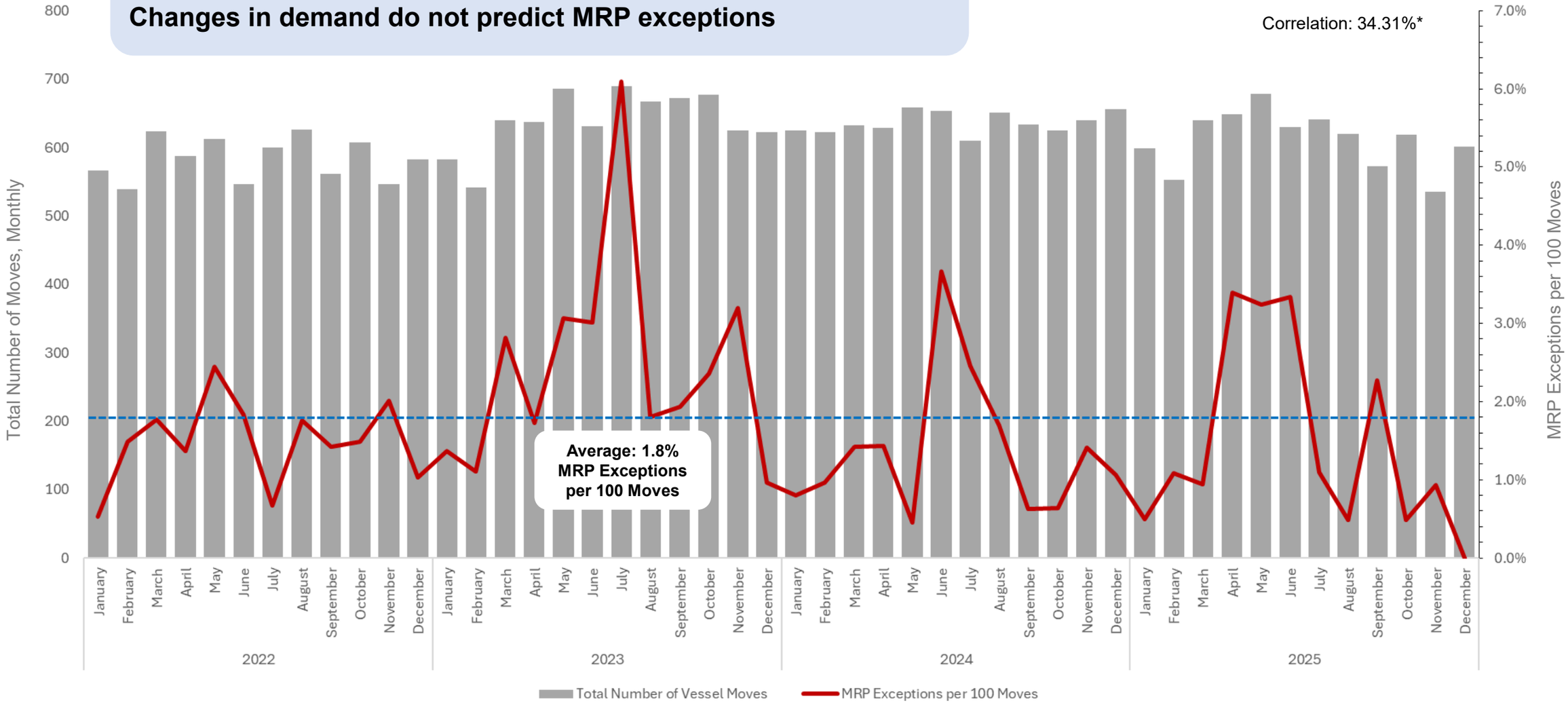


Upper and Lower Control Limits are tools that tell us when something unusual is happening. Statistically, they are three standard deviations away from the average, meaning about 99.7% of the normal data should fall between these limits.

Minimum Period Exceptions vs Vessel Traffic (Demand)

Period: 2022 through 2025; Data Source: San Francisco Bar Pilots 237(d) Reports

Changes in demand do not predict MRP exceptions



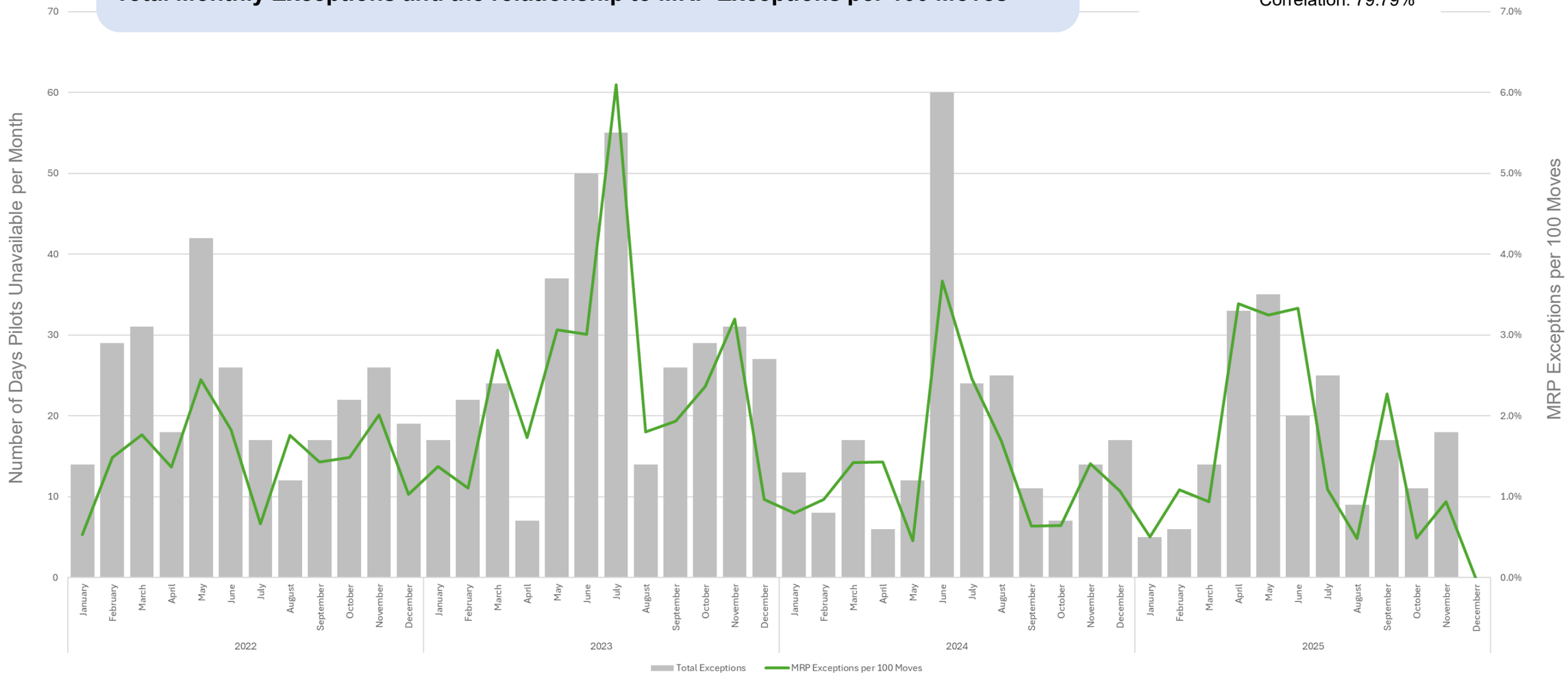
* Mathematical correlation is a measure of how closely two sets of numbers move in relation to each other.

Minimum Period Exceptions vs Pilot Availability (Capacity)

Number of Days Pilots Unavailable by Reason per Month; Period: 2022 through 2025; Data Source: San Francisco Bar Pilots 237(d) Reports

Total Monthly Exceptions and the relationship to MRP Exceptions per 100 Moves

Correlation: 79.79%*



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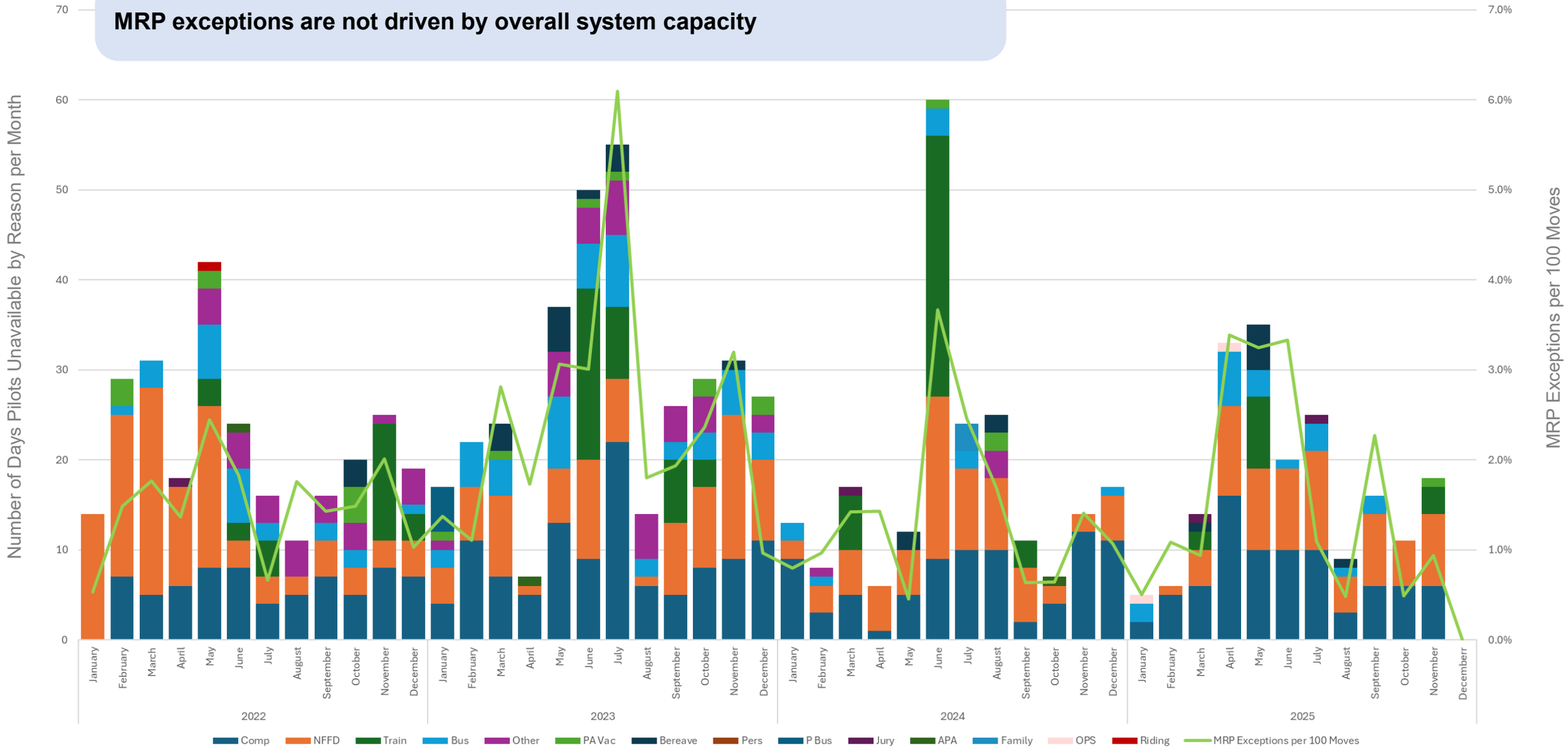
Reasons for Minimum Rest Period Exceptions

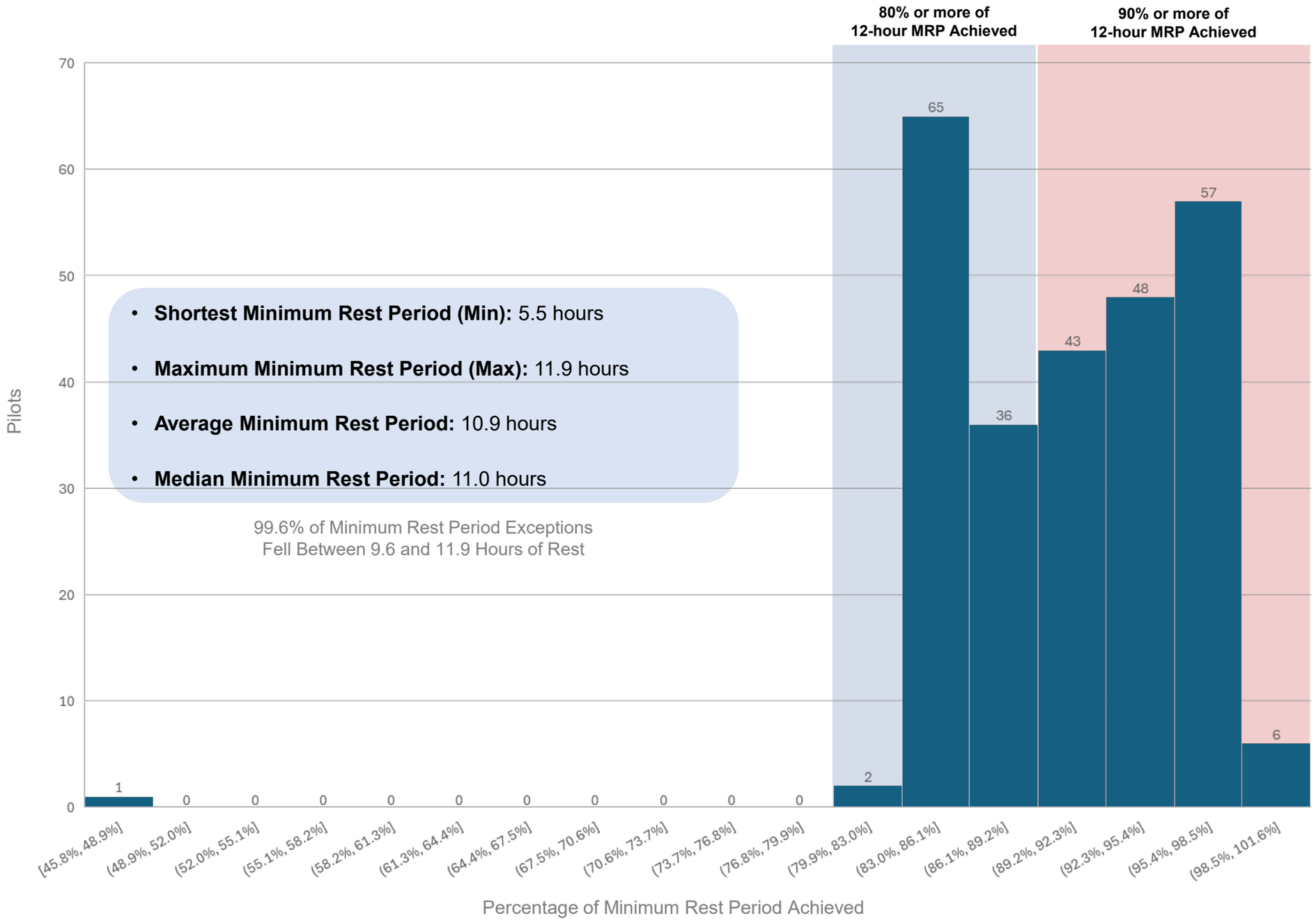
Number of Days Pilots Unavailable by Reason per Month; Period: 2022 through 2025; Data Source: San Francisco Bar Pilots 237(d) Reports

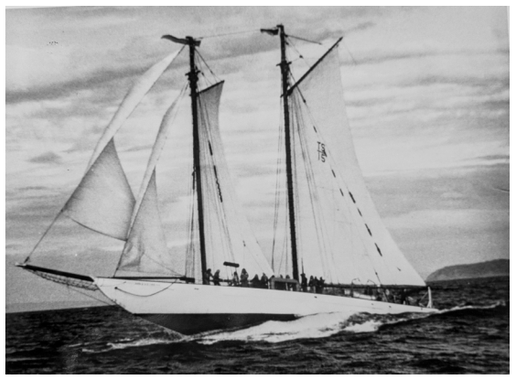
MRP exceptions are not driven by overall system capacity



Minimum Rest Period “Achieved”

Period: 2022 through 2025; Data Source: San Francisco Bar Pilots 237(d) Reports





Appendix

Supporting Schedule: Moves, Pilots, and MRPs Exceptions per 100 Moves

Year	Total Number of Vessel Moves (Demand)	Total MRP Exceptions	Average Number of Pilots (Capacity)	Moves per Pilot	MRPs per 100 Moves
2017	8,862	180	59	150.2	2.0%
2018	8,818	226	57	154.7	2.6%
2019	8,879	130	56	158.6	1.5%
2020	7,596	106	54	140.7	1.4%
2021	7,179	128	53	135.5	1.8%
2022	6,997	104	50	139.9	1.5%
2023	7,670	192	51	150.4	2.5%
2024	7,635	106	52	146.8	1.4%
2025	7,338	111	52	141.1	1.5%
Average	*7,886*	*143*	*54*	*146*	*1.8%*