STARWOOD REAL ESTATE INCOME TRUST, INC. SUPPLEMENT NO. 2 DATED MAY 9, 2023 TO THE PROSPECTUS DATED APRIL 7, 2023

This prospectus supplement ("Supplement") is part of and should be read in conjunction with the prospectus of Starwood Real Estate Income Trust, Inc., dated April 7, 2023 (as supplemented to date, the "Prospectus"). Unless otherwise defined herein, capitalized terms used in this Supplement shall have the same meanings as in the Prospectus. References herein to the "Company," "we," "us," or "our" refer to Starwood Real Estate Income Trust, Inc. and its subsidiaries unless the context specifically requires otherwise.

The purpose of this Supplement is to disclose an update regarding changes to our management.

Management Update

Effective May 9, 2023, our board of directors appointed Sean Harris, our President since January 2021, to serve as our Chief Executive Officer and as a member of our board of directors. Mr. Harris will take over as Chief Executive Officer from John McCarthy, who has served in such role since our inception in November of 2017. Mr. McCarthy will continue to serve as one of our directors, and effective May 9, 2023, our board of directors appointed Mr. McCarthy to serve as Vice Chairman of our board of directors. Mr. Harris will replace Christopher D. Graham on our board of directors and will continue to serve as our President. Mr. Graham will no longer serve as a director or as our Chief Investment Officer.

The following disclosure updates the biographies for Messrs. Harris and McCarthy in the section of the Prospectus entitled "Management—Directors and Executive Officers" and all other similar disclosure.

Sean Harris has served as our Chief Executive Officer and as a member of our board of directors since May 2023 and as our President since January 2021. Previously, Mr. Harris served as our Senior Vice President of Acquisitions from October 2017 to January 2021. In addition, Mr. Harris has served as a member of the Advisor's Investment Committee since March 2022. Mr. Harris serves as a Managing Director of Starwood Capital. Mr. Harris served as an Acquisitions Associate and Assistant to Mr. Sternlicht, the Chairman and CEO of Starwood Capital, from August 2016 to September 2017. Prior to joining Starwood Capital in 2016, Mr. Harris served as a Director of Acquisitions and Investment Management at Monday Properties since December 2012, where he co-led acquisitions, investment management, and capital markets. Before joining Monday Properties as an Associate in July 2010, Mr. Harris was employed by Ernst & Young in the Transaction Real Estate group. Mr. Harris received B.S. degrees in finance and accounting from East Carolina University and a MAcc from the Max M. Fisher College of Business at The Ohio State University. Mr. Harris provides our board of directors with extensive investment management experience.

John P. McCarthy, Jr. has served as our Vice Chairman since May 2023 and as a member of our board of directors since November 2017. Mr. McCarthy previously served as our Chief Executive Officer since our formation in June 2017 until May 2023 and as our President from June 2017 until January 2021. In addition, Mr. McCarthy has served on the Advisor's Investment Committee since November 2017. Mr. McCarthy has served as Managing Director of Starwood Capital since July 2015, where he was responsible for managing and expanding relationships with Starwood Capital's investors around the world. Mr. McCarthy previously served as Global Head of Asset Management for Starwood Capital from March 2009 to May 2012, during which time he also served on Starwood Capital's Investment Committee. Prior to rejoining Starwood Capital, Mr. McCarthy served as Deputy Head of Europe for the Abu Dhabi Investment Authority ("ADIA") from June 2012 to May 2015. During this time, Mr. McCarthy served on ADIA's Executive and Global Strategy committees. Prior to this, Mr. McCarthy served as Global Co-Head of Asset Management for Lehman Brothers Real Estate Private Equity from June 2005 to February 2009 and was a Partner at O'Connor Capital Partners ("O'Connor") and the Co-Head of the Europe Business. Prior to joining O'Connor, Mr. McCarthy worked for GE Capital where he held a variety of positions, including managing the firm's real estate investing activities across Central Europe. Mr. McCarthy has previously served on several boards throughout his career, including ERE, a Paris, France based developer of European Shopping Malls, Deutsche Annington, a listed German based residential rental

platform encompassing more than 180,000 units and McCarthy & Stone, formerly the UK's largest developer of homes for seniors. Mr. McCarthy received a B.S. in Finance from the University of Connecticut, and an M.B.A. from Fordham University. Mr. McCarthy provides our board of directors with extensive investment management experience, particularly related to international markets and operating platforms.