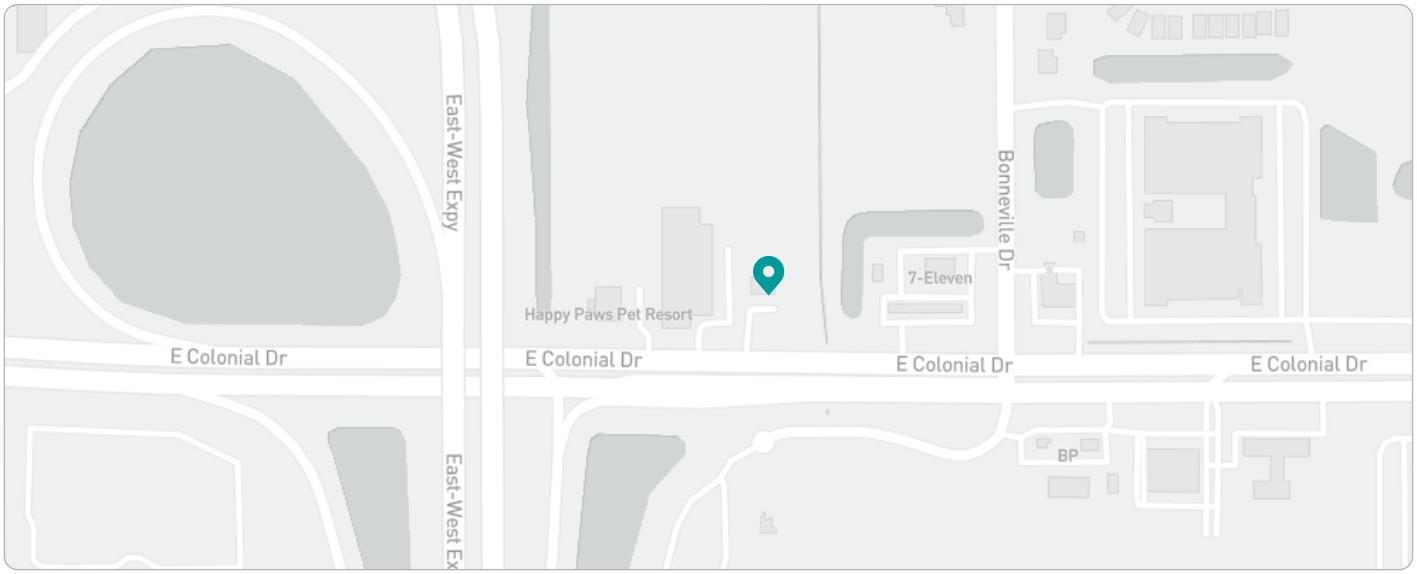
Orlando Student Housing Report



Property Name	Orlando Student Housing
Address	12727 E Colonial Dr
Property Type	Student Housing
Climate Model	CMIP6 Ensemble
Climate Scenario	SSP370
Access Date	19/03/2024
Data Version	March 2024

OVERVIEW

This report assesses the potential impact on an asset's location from physical climate hazards under multiple timeframes and scenarios. It provides the following information:

- Physical Risk: A summary of the projected climate risks across six indicators – Heat Stress, Hurricane Wind, Drought, Inland Flooding, Coastal Flooding, and Wildfire – from present until 2100.
- Resilience: A summary of six resilience indicators – Infrastructure, Energy Transition, Energy Reliability, Social Robustness, Economic Momentum, and Location Wellness – that correspond to a location's preparedness for physical climate risks. Currently, these indicators are only available for locations in the U.S. and Canada.

METHODOLOGY

Climate Alpha gathers raw, unstructured climate, socio-economic, and market data from an array of public and private sources. The data is engineered into curated features that offer distilled insights into the impact of climate change. Sets of related features are then consolidated into thematic indicators for calculation and analysis. These thematic indicators are bucketed into two main categories: Risk and Resilience.

Clusters of risk and resilience indicators are fed into a pipeline that aggregates them into two quantitative coefficients: Physical Impact Coefficient and Resilience Adjusted Impact Coefficient. **Physical Impact** projects the net financial impact of physical climate risks on a given location at a given time in the future and under a given climate change scenario and is expressed as a percent change from a location's projected market growth rate. **Resilience-Adjusted Impact** modifies the Physical Impact coefficient with the location's resilience profile to account for its capacity to offset physical climate risks. (It is also represented as a percent change from that location's projected growth rate.)

The full methodology can be found here: https://www.climatealpha.ai/methodology

PHYSICAL RISK SUMMARY

The Physical Risk Summary provides the projected climate risks across the six indicators (Heat Stress, Hurricane Wind, Drought, Inland Flooding, Coastal Flooding, and Wildfire) for four time periods.

Physical Risk Scores are based on the Relative Risk Profile which measures the deviation of a location's risk from the national mean. The scores are calculated by taking the Z-score (number of standard deviations by which an event is above or below the mean value) of a location against the risk profiles of all locations in the country.

	Current (2020-2025)	Early Century (2030-2035)	Mid Century (2045-2050)	End Century (2095-2100)
Overall Impact Score (0-100)	34	44	65	74
National Average (0-100)	37	40	50	74
Heat Stress Very High	51/100	65/100	82/100	92/100
Drought High	29/100	35/100	43/100	78/100
Hurricane Wind Medium	59/100	59/100	59/100	59/100
Inland Flooding Medium	26/100	25/100	41/100	16/100
Coastal Flooding Very Low	0/100	0/100	0/100	0/100
Wildfire Very Low	0/100	0/100	0/100	0/100

A. Heat Stress

Extreme heat and heatwaves significantly increase the energy consumption/operational costs required to maintain safe and comfortable building conditions and can also affect employee and tenant productivity. The Heat Stress Risk Score is comprised of the features below.

Features	Current (2020-2025)	Early Century (2030-2035)	Mid Century (2045-2050)	End Century (2095-2100)
Heat Stress Very High	51/100	65/100	82/100	92/100
National Average	37/100	40/100	50/100	74/100
Annual maximum temperature (°F)	101.41 °F	101.47 °F	105.57 °F	114.07 °F
Annual maximum temperature (°C)	38.56 °C	38.59 °C	40.87 °C	45.60 °C
Number of local hot days (90th percentile)	91 days	113 days	147 days	212 days
Number of days above 40°C (105°F)	0 days	0 days	3 days	86 days
Cooling degree days (CDD)	1336	1486	1802	2994

Best Practices

1. Energy Efficiency Improvements: Implement energy-efficient technologies in buildings and infrastructure to reduce heat-related energy consumption.
2. Green Infrastructure: Integrate green spaces and cool roofs into developments to mitigate the urban heat island effect.
3. Climate-Resilient Design: Incorporate climate-resilient design principles in new construction projects, considering heat-resistant materials and passive cooling techniques.
4. Diversification of Investments: Diversify investments to include assets less susceptible to the negative impacts of extreme heat, such as renewable energy projects or sustainable agriculture.

B. Drought

The increasing frequency and severity of dry spells and droughts imposes substantial stress on water systems in the form of reduced freshwater supply and chronic water shortages. The Drought Risk Score is comprised of the below features.

Features	Current (2020-2025)	Early Century (2030-2035)	Mid Century (2045-2050)	End Century (2095-2100)
Drought High	29/100	35/100	43/100	78/100
National Average	37/100	40/100	50/100	74/100
Maximum consecutive days without precipitation	13 days	16 days	17 days	15 days
Number of days above 40°C (105°F)	0 days	0 days	3 days	86 days
Water demand-supply ratio	0.66	0.59	0.62	0.59
Seasonal variability of water supply	0.25	0.26	0.19	0.16

Best Practices

1. Water Conservation Measures: Implement water-efficient technologies and practices in buildings, agriculture, and other operations.
2. Diversification of Water Sources: Explore alternative water sources, such as recycled water or rainwater harvesting, to reduce reliance on traditional water supplies.
3. Risk Assessment and Monitoring: Conduct regular assessments of water-related risks and monitor water availability in areas where assets are located.
4. Engagement with Stakeholders: Collaborate with local communities and authorities to develop and implement drought resilience strategies.

C. Hurricane Wind

Warmer ocean temperatures lead to more intense hurricanes and tropical cyclones with stronger winds that cause severe physical damage and operational downtime due to loss of power or barriers to entry. The Hurricane Wind Risk Score is comprised of the features below.

Features	Current (2020-2025)	Early Century (2030-2035)	Mid Century (2045-2050)	End Century (2095-2100)
Hurricane Wind Medium	59/100	59/100	59/100	59/100
National Average	37/100	40/100	50/100	74/100
Hurricane annual frequency	0.06 per year	0.06 per year	0.06 per year	0.06 per year
Hurricane return period	16.70 Years	16.70 Years	16.70 Years	16.70 Years
Maximum hurricane speed	86.31 mph	86.31 mph	86.31 mph	86.31 mph
Maximum hurricane category	1	1	1	1

Best Practices

1. Infrastructure Resilience: Ensure that infrastructure is built or retrofitted to withstand extreme weather events, with a focus on hurricane-resistant materials and design.
2. Insurance and Risk Transfer: Utilize insurance and risk transfer mechanisms to mitigate financial losses associated with hurricane damage.
3. Emergency Preparedness and Response Planning: Develop and regularly update emergency response plans to ensure the safety of assets and personnel during hurricanes.
4. Geographic Diversification: Avoid over-concentration of assets in regions prone to hurricanes and diversify investments across less vulnerable areas.

D. Inland Flooding

Intense precipitation and increased frequency of storms cause flash flooding that can have a devastating impact on buildings and other infrastructure, leading to higher costs through insurance premiums and deductibles. The Inland Flooding Risk Score is comprised of the features below.

Features	Current (2020-2025)	Early Century (2030-2035)	Mid Century (2045-2050)	End Century (2095-2100)
Inland Flooding Medium	26/100	25/100	41/100	16/100
National Average	37/100	40/100	50/100	74/100
Days with precipitation above local threshold	17 days	17 days	19 days	15 days
Average daily mean precipitation (mm)	3.45 mm	3.40 mm	3.88 mm	3.51 mm
Average daily mean precipitation (inches)	0.14 inches	0.13 inches	0.15 inches	0.14 inches
Proximity to FEMA NFHL flood zone	0.51	0.51	0.51	0.51
Maximum consecutive days with precipitation	38 days per year	47 days per year	50 days per year	41 days per year
Days with heavy rain (> 50mm)	1.27 days	0.33 days	1 days	0.40 days

Best Practices

1. Floodplain Management: Avoid development in flood-prone areas and implement sustainable land-use planning to reduce the risk of inland flooding.

2. Stormwater Management: Implement effective stormwater management systems to reduce runoff and control flooding in urban and suburban areas.

3. Early Warning Systems: Invest in advanced monitoring and early warning systems to provide timely information about potential flooding events.

4. Community Engagement: Work with local communities to develop and implement flood resilience measures, such as community-based flood preparedness.

E. Coastal Flooding

Global sea level rise increases the frequency and intensity of coastal inundations that cause structural damage to property and infrastructure, spike operational costs, and affect the ability to obtain insurance in vulnerable areas. Sea level rise may also lead to “stranded” assets in vulnerable areas. The Coastal Flooding Risk Score is comprised of the features below.

Features	Current (2020-2025)	Early Century (2030-2035)	Mid Century (2045-2050)	End Century (2095-2100)
Coastal Flooding Very Low	0/100	0/100	0/100	0/100
National Average	37/100	40/100	50/100	74/100
Mean sea level change	0 m	0 m	0 m	0 m
100-year coastal flooding inundation depth	0 m	0 m	0 m	0 m
250-year coastal flooding inundation depth	0 m	0 m	0 m	0 m
1000-year coastal flooding inundation depth	0 m	0 m	0 m	0 m

Best Practices

1. Adaptive Infrastructure: Build or retrofit infrastructure to be resilient to rising sea levels and storm surges, incorporating coastal protection measures.
2. Ecosystem-Based Adaptation: Invest in and protect coastal ecosystems, such as mangroves and wetlands, which act as natural buffers against coastal flooding.
3. Risk Modeling and Assessment: Use advanced modeling techniques to assess and understand the potential impacts of coastal flooding on assets.
4. Regulatory Compliance: Stay informed about and comply with local and regional regulations related to coastal development and climate adaptation.

F. Wildfire

Both natural and human-caused wildfires are magnified by dry spells and heatwaves, as well as topographical changes such as urban expansion, causing damage to buildings and utilities while affecting the ability to obtain insurance in vulnerable areas. Wildfires also impact occupant health due to air pollution. The Wildfire Risk Score is comprised of the features below.

Features	Current (2020-2025)	Early Century (2030-2035)	Mid Century (2045-2050)	End Century (2095-2100)
Wildfire Very Low	0/100	0/100	0/100	0/100
National Average	37/100	40/100	50/100	74/100
Percentage of burnable fuels in the area	0 %	0 %	0 %	0 %
Maximum consecutive days with no precipitation	13 days	16 days	17 days	15 days
Number of days above 40°C (105°F)	0 days	0 days	3 days	86 days

Best Practices

1. Vegetation Management: Implement vegetation management strategies, such as creating defensible space around assets to reduce the risk of wildfire spread.
2. Emergency Preparedness: Develop and regularly update emergency evacuation plans for assets located in wildfire-prone areas.
3. Collaboration with Authorities: Work closely with local firefighting authorities to enhance coordination and response capabilities.
4. Insurance Coverage: Ensure that assets in wildfire-prone regions are adequately covered by insurance that includes wildfire risk.

RESILIENCE SUMMARY

Resilience indicators reveal a location's readiness to absorb shocks as measured by its capacity across a holistic range of attributes that are historically significant and frequently updated.

	This Location	Regional Average	National Average
Overall Impact Score (0-100)	**72**	62	48
Infrastructure Very High	92/100	91/100	63/100
Energy Transition High	62/100	62/100	58/100
Energy Reliability Low	26/100	27/100	61/100
Social Robustness High	74/100	65/100	46/100
Economic Momentum High	75/100	73/100	50/100
Location Wellness High	78/100	77/100	43/100

A. Infrastructure

Dense, high-quality transportation infrastructure and robust public spending generate multiplier effects for locations over time.

Features	This Location	Regional Average	National Average
Infrastructure Very High	92/100	91/100	63/100
Number of airports in proximity	9	9.12	8.33
Percentage of bridges and tunnels in good condition	99.76 %	99.77 %	93.49 %
Miles travelled by vehicles	9598 miles	9154.03 miles	1167.59 miles
Total county public spending	172.17 million USD	163.96 million USD	23.33 million USD
Per capita public spending	121.01 USD	121.01 USD	213.22 USD

Best Practices

1. Comprehensive Location Assessment: Evaluate the local infrastructure, considering factors such as accessibility, emergency services, and connectivity to ensure resilience against various shocks.

2. Climate-Resilient Features: Prioritize properties in areas with effective climate resilience measures, including flood control, drainage systems, and a low susceptibility to natural disasters.

3. Reliable Energy and Digital Connectivity: Choose locations with reliable and diversified energy sources to mitigate power outage risks. Ensure access to high-speed internet and robust telecommunication networks.

4. Sustainable Practices and Community Engagement: Emphasize sustainable building practices, incorporating green infrastructure and energy-efficient features. Engage with local communities to understand their needs and contribute to overall community resilience.

B. Energy Transition

Reducing carbon emission intensity through efficiency measures and renewable energy generation is crucial for achieving a sustainable low-carbon future.

Features	This Location	Regional Average	National Average
Energy Transition High	62/100	62/100	58/100
CO2e emission rate	**836.33** lb/MWh	**836.33** lb/MWh	**865.88** lb/MWh
Percentage of energy from non-renewable sources	**94.71** %	**94.71** %	**71.24** %
Percentage of energy from renewable sources	**5.29** %	**5.29** %	**28.76** %

Best Practices

1. Energy Efficiency Measures: Prioritize properties with energy-efficient features and modern systems to decrease carbon emission intensity.
2. Renewable Energy Integration: Explore opportunities for on-site renewable energy generation, such as solar panels or wind turbines, in properties and areas that support sustainability.
3. Carbon Emission Reduction Strategies: Implement measures to measure and reduce carbon emissions within real estate portfolios, supporting broader initiatives for sustainable practices.
4. Stay Informed on Regulatory Changes: Keep abreast of evolving energy and environmental regulations, adapting investment strategies to align with emerging standards for energy transition.

C. Energy Reliability

A robust energy grid with minimal power loss and outages is essential to cope with the pressures of population growth, aging power plants and climate related stress.

Features	This Location	Regional Average	National Average
Energy Reliability Low	26/100	27/100	61/100
Number of hours without power per customer	**4.62** hours	**4.71** hours	**4.27** hours
Annual power outages for at least 1 hours	**91.94** outages	**90.93** outages	**46.75** outages
Annual power outages for at least 8 hours	**1.47** outages	**1.42** outages	**2.23** outages

Best Practices

1. Robust Energy Grid: Assess the reliability of the local energy grid, prioritizing properties in areas with well-maintained infrastructure.

2. Diverse Energy Sources: Explore locations with a mix of energy sources to minimize dependence on a single method, enhancing overall reliability.

3. Invest in Modern Infrastructure: Choose properties with updated energy infrastructure to ensure efficiency and reliability, supporting initiatives for upgrades.

4. Climate-Resilient Solutions: Consider the impact of climate-related stress on energy infrastructure, investing in properties with resilient energy systems for increased reliability.

D. Social Robustness

A composite of demographic and socio-economic features captures how well a community can adapt to and recover from climate-related hazards and other disruptions.

Features	This Location	Regional Average	National Average
Social Robustness High	74/100	65/100	46/100
Debt to income ratio	1.01	1.25	1.59
Percentage of population in poverty	7.50 %	8.74 %	9.90 %
Private insurance coverage	64 %	62.74 %	45.51 %
Public insurance coverage	13 %	14.55 %	22.50 %

Best Practices

1. Demographic and Socio-Economic Resilience Assessment: Evaluate the demographic and socio-economic characteristics of a community, considering factors such as population density, income levels, education, and employment opportunities.

2. Community Adaptability and Diversity: Prioritize properties in communities with a diverse and adaptable population, as diversity can contribute to resilience in the face of various challenges.

3. Invest in Social Infrastructure: Consider properties located in areas with well-developed social infrastructure, including schools, healthcare facilities, and community centers, which play a vital role in community resilience.

4. Engage in Community Development Initiatives: Actively participate in or support community development initiatives that enhance social cohesion, economic opportunities, and overall resilience.

E. Economic Momentum

Strong economic foundations in terms of employment, income levels, education and home price ratios indicate higher performance markets.

Features	This Location	Regional Average	National Average
Economic Momentum High	75/100	73/100	50/100
Annual household median income	74814 US dollars	85678.69 US dollars	60638.93 US dollars
Household income growth over the last year	-7.05 %	8.33 %	6.34 %
Ratio of house price and household income	4.62	3.79	3.03
Workforce employment rate	94.47 %	94.50 %	94.26 %
Population with bachelor's degree	35.47 %	25.07 %	14.51 %

Best Practices

1. Employment and Income Levels: Evaluate the local employment rates and income levels to gauge the economic vitality of the region. Prioritize areas with stable job markets and growing income levels.

2. Education and Skill Development: Consider properties in regions with a strong focus on education and skill development. A well-educated workforce often contributes to economic resilience and growth.

3. Home Price Ratios: Evaluate home price ratios in the market, considering factors like affordability and sustainability. Look for areas where home prices align with income levels to ensure economic stability.

4. Invest in Thriving Economies: Target investments in areas with thriving and diverse economies. Robust economic sectors and a mix of industries contribute to long-term economic momentum.

F. Location Wellness

Healthier communities as measured by longevity and access to healthcare correlate to higher prosperity and increasing property values.

Features	This Location	Regional Average	National Average
Location Wellness High	78/100	77/100	43/100
Life expectancy	80.16 years	80.03 years	77.28 years
Percentage of population with a major disease	17.12 %	19.06 %	22.01 %
Percentage of population with healthcare access	63.49 %	64.58 %	64.42 %

Best Practices

1. Longevity and Health Indicators: Assess community health indicators such as life expectancy, overall wellness, and healthcare accessibility. Prioritize properties in areas with a strong focus on residents' well-being.

2. Access to Healthcare Facilities: Consider the proximity and quality of healthcare facilities in the vicinity of the property. Properties in locations with easy access to hospitals, clinics, and medical services may be more attractive to tenants and buyers

3. Community Wellness Initiatives: Explore communities with active wellness programs and initiatives that promote a healthy lifestyle. Participation in such programs can enhance the overall well-being of residents.

4. Invest in Health-Conscious Environments: Target investments in areas that are designed to promote health and well-being, including green spaces, walking paths, and recreational facilities. These factors contribute to a positive living environment.