

Pipeline Sensitivity Analysis

Now that we are at or near a full recovery of most key economic indicators after the shutdown, market forces (versus government mandates) are driving supply and demand for most sectors, with office being the notable exception. Our vacancy rate forecasts are driven by three input factors: historical space usage (in each property sector) per worker, employment forecasts, and construction pipelines. Focusing on the construction assumption, our sensitivity analyses examine which markets have the greatest potential supply-side risk. For each property sector, we start with projected pipeline data from third-party sources and make adjustments based on our assessment of market conditions to arrive at our “base case” vacancy and occupancy forecasts. We also modify these assumptions to assess the relative level of exposure that each MSA has to its respective worst-case scenario construction pipeline. Our “base case” uses the most conservative construction pipeline assumptions, while the “strong case” assumes notably more aggressive pipeline assumptions.

For each property sector, we examined which MSAs had the greatest vulnerability by calculating the difference in projected vacancy or occupancy rates in 2025 between the base and strong cases. Summary results are in Figure 1. Within each sector, the green highlighting (go) indicates those markets with the lowest pipeline exposure, while the yellow highlighting (caution) indicates those markets with the greatest exposure from the strong pipeline scenario. Note that because vacancy rates are compared for the office, industrial, multifamily, and retail sectors, lower or negative numbers are more desirable, indicating minimal increases (or greater declines) in vacancies. On the other hand, higher or positive changes in hotel and seniors housing occupancy rates are more desirable, as they indicate greater increases (or smaller declines) in occupancy. For the office, industrial, multifamily, and retail sectors, the table indicates by how many basis points 2025 vacancy rates would increase from the base case if the strong case pipeline were to occur. Similarly, the table shows how many bps by which hotel and seniors housing occupancy rates would decline relative to the base case, should the strong case pipeline materialize.

Within each property sector, the yellow highlighting indicates the ten markets that have the greatest vulnerability to changes in pipeline assumptions, while the green highlighting indicates the ten markets with the lowest pipeline risk. In the office sector, the

greatest potential increases in vacancy rates would occur in Austin, Boston, Seattle, and Miami. On the other hand, Minneapolis, Pittsburgh, Orange County, North & Central NJ, and St. Louis have little to no pipeline risk (based on known conditions).

In the industrial sector, the greatest pipeline risks over the next two years are projected to be in Phoenix, Austin, Las Vegas, Orlando, and Denver, while the most insulated will be Fresno, Los Angeles, Baltimore, Cleveland, and Detroit. Of the multifamily markets, those with the greatest pipeline exposure include Miami, Nashville, Orlando, Charlotte, and Phoenix. Atlanta, Los Angeles, Louisville, Indianapolis, and St. Louis have the smallest multifamily construction pipelines, and therefore, the least exposure to supply-side risk. Retail markets in Austin, Phoenix, Orlando, Indianapolis, and Dallas have the greatest potential change in vacancy rates between the base and strong pipeline scenarios, while, San Francisco, Boston, Los Angeles, San Diego, and Cleveland have little to no retail pipeline risk.

In the hotel sector, the markets with the greatest pipeline risk include Nashville, Austin, Phoenix, San Diego, and Miami. At the other end of the spectrum, Minneapolis, Boston, Orange County, and Chicago have limited downside from the “strong” pipeline scenarios.

In the seniors housing sector, our base case forecasting model includes only units that are currently under construction and will therefore understate supply-side risks beyond two years. However, our strong pipeline scenario for seniors housing assumes that the pipelines grow through the duration of the 5-year projection period. As such, those markets with active near-term pipelines have the greatest occupancy differential between the base and strong cases. Those markets with no projects under construction register no pipeline risk, even for the strong case.

The IL markets that pose the greatest pipeline risk between the base and strong scenarios include Washington, D.C., Las Vegas, Boston, Los Angeles, and Dallas, while Pittsburgh, Cincinnati, the Inland Empire, San Francisco, and Orlando have little to no risk between scenarios. The AL markets with relatively high supply-side risk include San Jose, Miami, Denver, Washington, D.C., and Orlando. In contrast, the AL markets with little to no pipeline risk as of the fourth quarter of 2023 are Las Vegas, San Antonio, Pittsburgh, and Chicago.

Should the “strong” scenario pipelines materialize, a number of markets will no longer be balanced at the end of 2025. The affected office markets would be Ft. Lauderdale, New York City, and Seattle. In the industrial sector, Columbia,

**Strong vs. Base Case Construction Pipeline Sensitivity Analysis
Increase/(Decrease) through 2025 Vacancy/Occupancy Projections (bps)**

	Office	Industrial	Multifamily	Retail	Hotel	Indep. Living	Assisted Living
Atlanta	19	49	13	24	-270	-87	-213
Austin	146	190	135	79	-408	n/a	n/a
Baltimore	4	14	59	n/a	n/a	-243	-130
Boston	129	21	78	1	-97	-420	-214
Charleston	36	n/a	143	n/a	n/a	n/a	n/a
Charlotte	40	49	210	30	n/a	n/a	n/a
Chicago	-1	28	56	5	-119	-48	-109
Cincinnati	7	32	83	27	n/a	0	-243
Cleveland	15	4	72	1	n/a	-129	-132
Columbus	25	32	109	19	n/a	n/a	n/a
Dallas-Fort Worth	44	39	129	60	-316	-398	-261
Denver	51	62	102	6	-317	-265	-628
Detroit	14	5	53	10	-244	-296	-351
Fairfield County	3	n/a	n/a	n/a	n/a	n/a	n/a
Fort Lauderdale	32	n/a	n/a	n/a	n/a	n/a	n/a
Fresno	19	0	n/a	n/a	n/a	n/a	n/a
Houston	21	59	75	52	-167	-94	-247
Indianapolis	39	24	48	56	n/a	n/a	n/a
Inland Empire	12	n/a	n/a	n/a	n/a	0	-320
Jacksonville	15	n/a	n/a	n/a	n/a	n/a	n/a
Kansas City	n/a	n/a	n/a	n/a	n/a	-83	-304
Las Vegas	n/a	132	n/a	n/a	-99	-645	0
Long Island	2	21	n/a	n/a	n/a	n/a	n/a
Los Angeles	3	0	36	0	-238	-684	-265
Louisville	n/a	n/a	32	n/a	n/a	n/a	n/a
Memphis	11	n/a	n/a	n/a	n/a	n/a	n/a
Miami	123	51	247	20	-327	-263	-560
Minneapolis	-10	27	121	18	-19	-199	-131
Nashville	97	73	234	41	-433	n/a	n/a
New York City	16	n/a	79	7	-232	-160	-212
North & Central NJ	-6	18	n/a	n/a	n/a	n/a	n/a
Orange County	-4	n/a	77	n/a	-112	n/a	n/a
Orlando	37	90	219	55	-229	0	-537
Palm Beach	46	n/a	n/a	n/a	n/a	n/a	n/a
Philadelphia	1	36	129	17	-135	-79	-218
Phoenix	22	180	164	63	-386	-56	-185
Pittsburgh	-5	n/a	n/a	n/a	n/a	0	0
Portland	8	28	98	6	n/a	-289	-335
Raleigh-Durham	58	n/a	69	n/a	n/a	n/a	n/a
Richmond	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sacramento	n/a	n/a	n/a	n/a	n/a	-365	-275
St. Louis	-3	31	49	11	-188	-281	-312
Salt Lake City	24	59	n/a	n/a	n/a	n/a	n/a
San Antonio	27	40	n/a	n/a	n/a	-31	0
San Diego	115	36	61	-2	-350	-98	-134
San Francisco	33	47	51	-7	-130	-31	-314
San Jose	68	47	107	7	n/a	-273	-1,158
Seattle	125	43	123	2	-169	-269	-304
Tampa Bay	20	56	84	18	-213	-225	-236
Washington, D.C.	4	63	104	9	-130	-1,046	-386

Legend:

- 10 MSAs with greatest pipeline exposure (greatest negative impact on vacancy/occupancy rates).
- 10 MSAs with smallest pipeline exposure (smallest negative impact on vacancy/occupancy rates).
- n/a indicates no sector forecast for that MSA.

figure 1

Miami, Philadelphia, and St. Louis would fall out of balance in 2025 if the strong pipeline occurred. Multifamily markets that would fall out of favor if the strong pipeline occurred include Atlanta, Austin, Baltimore, Boston, Columbus, Dallas-Fort Worth, Minneapolis, Phoenix, Portland, St. Louis, San Francisco, San Jose, and Seattle. The relatively large number of affected markets indicates that multifamily developers are still confident about the strength of markets.

In the retail sector, no markets would fall out of balance in 2025 due to the strong pipeline scenario. In the hotel sector, Denver, Las Vegas, Nashville, and Washington, D.C. will fall out of balance compared to the base case should the strong pipeline come to fruition. Of the IL seniors housing markets, only Boston would fall out of balance under the strong pipeline scenario, while no AL markets would be affected by such conditions.

The following sample sensitivity tables (Base, Moderate, and Strong cases) for each property sector (office, industrial, multifamily, retail, hotel, independent living, and assisted living) are updated and posted to the subscriber page each quarter.



Pipeline Sensitivity Analysis

We are in a period of exceptional global market circumstances as a result of the COVID-19 pandemic. We remind our readers of the limitations of statistical forecasting models (which rely on historical trends) in such atypical circumstances and urge you to read our fundamental insights in the first article of this issue.

Office Vacancy Rates - Base Case Pipeline

Market	YE 2023	YE 2024 Est	YE 2025 Est	YE 2026 Est	YE 2027 Est
Atlanta	15.2%	14.3%	12.9%	11.2%	10.1%
Austin	16.6%	15.5%	12.9%	8.8%	6.1%
Baltimore	12.6%	11.7%	11.6%	11.4%	11.1%
Boston	11.2%	10.3%	10.7%	9.5%	8.0%
Charleston	7.7%	7.3%	7.0%	6.0%	4.2%
Charlotte	13.5%	11.0%	9.9%	8.2%	6.5%
Chicago	16.5%	14.6%	13.5%	12.7%	11.9%
Cincinnati	9.9%	8.1%	7.6%	7.1%	6.7%
Cleveland	9.9%	8.6%	8.4%	7.4%	6.6%
Columbus	10.1%	9.3%	8.7%	8.1%	7.5%
Dallas-Fort Worth	17.8%	18.3%	16.2%	14.5%	14.0%
Denver	16.1%	15.2%	13.5%	11.8%	10.1%
Detroit	11.8%	10.2%	8.8%	6.7%	4.9%
Fairfield County	14.4%	13.2%	12.3%	11.4%	8.1%
Fort Lauderdale	10.1%	9.8%	9.6%	8.6%	7.8%
Fresno	7.4%	6.7%	6.2%	5.8%	4.2%
Houston	18.6%	16.2%	14.6%	12.8%	12.4%
Indianapolis	9.1%	9.6%	9.0%	8.5%	7.4%
Inland Empire	6.0%	3.7%	3.2%	2.7%	2.3%
Jacksonville	10.0%	9.0%	8.4%	7.6%	6.2%
Long Island	9.0%	8.4%	8.1%	7.6%	7.0%
Los Angeles	15.4%	15.0%	14.1%	13.2%	13.8%
Memphis	10.8%	9.4%	8.3%	7.4%	5.6%
Miami	8.5%	8.7%	7.8%	6.2%	5.1%
Minneapolis	11.1%	10.3%	9.9%	9.3%	8.5%
Nashville	11.8%	9.8%	9.2%	7.6%	6.4%
New York City	13.7%	12.7%	12.0%	11.3%	10.4%
North & Central NJ	13.6%	12.4%	11.1%	10.8%	10.1%
Orange County	13.3%	11.4%	10.5%	8.4%	5.9%
Orlando	8.5%	7.6%	7.1%	6.6%	5.8%
Palm Beach	7.8%	8.3%	7.6%	6.6%	4.9%
Philadelphia	11.0%	10.6%	10.1%	9.8%	9.4%
Phoenix	15.8%	14.5%	13.5%	12.4%	12.1%
Pittsburgh	11.8%	10.0%	8.6%	8.0%	7.3%
Portland	12.6%	11.5%	10.9%	10.1%	9.1%
Raleigh-Durham	10.3%	9.0%	8.2%	7.4%	6.3%
St. Louis	10.4%	8.8%	7.8%	7.4%	4.8%
Salt Lake City	9.9%	9.3%	8.9%	8.6%	7.1%
San Antonio	12.6%	11.4%	8.8%	6.4%	4.4%
San Diego	11.0%	11.9%	11.3%	9.8%	8.0%
San Francisco	21.6%	21.1%	19.1%	16.7%	15.2%
San Jose	15.3%	13.2%	11.7%	9.8%	6.6%
Seattle	13.9%	12.7%	13.3%	12.3%	10.8%
Tampa Bay	9.0%	7.9%	7.4%	6.8%	5.7%
Washington, D.C.	16.4%	14.4%	13.6%	12.9%	12.0%

Highlighted entries indicate market at supply-demand balance with vacancy or 10% or better.

* Inland Empire = Riverside/San Bernardino Metropolitan Area; Source: Linneman Associates, CoStar

Note on Negative Vacancy: In order to calculate estimated vacancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show negative vacancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, negative vacancies cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of negative vacancy should be viewed as a strong excess demand indicator.

Pipeline Sensitivity Analysis

Office Vacancy Rates - Strong Case Pipeline

Market	YE 2023	YE 2024 Est	YE 2025 Est	YE 2026 Est	YE 2027 Est
Atlanta	15.2%	14.5%	13.0%	11.3%	10.1%
Austin	16.6%	16.6%	14.4%	10.5%	8.0%
Baltimore	12.6%	11.7%	11.6%	11.4%	11.3%
Boston	11.2%	11.1%	12.0%	10.8%	9.3%
Charleston	7.7%	7.6%	7.3%	6.4%	4.6%
Charlotte	13.5%	11.5%	10.3%	8.6%	7.2%
Chicago	16.5%	14.6%	13.5%	12.6%	11.7%
Cincinnati	9.9%	8.1%	7.7%	7.3%	6.9%
Cleveland	9.9%	8.6%	8.6%	7.4%	6.5%
Columbus	10.1%	9.4%	8.9%	8.4%	7.9%
Dallas-Fort Worth	17.8%	18.6%	16.6%	15.2%	15.0%
Denver	16.1%	15.6%	14.1%	12.4%	10.7%
Detroit	11.8%	10.3%	8.9%	6.8%	5.1%
Fairfield County	14.4%	13.3%	12.3%	11.3%	8.0%
Fort Lauderdale	10.1%	9.9%	9.9%	9.0%	8.2%
Fresno	7.4%	6.9%	6.4%	6.1%	4.5%
Houston	18.6%	16.3%	14.8%	13.1%	12.9%
Indianapolis	9.1%	9.9%	9.4%	9.0%	8.0%
Inland Empire	6.0%	3.8%	3.3%	2.9%	2.7%
Jacksonville	10.0%	9.1%	8.5%	7.8%	6.5%
Long Island	9.0%	8.5%	8.1%	7.6%	7.0%
Los Angeles	15.4%	15.1%	14.1%	13.2%	13.7%
Memphis	10.8%	9.6%	8.4%	7.5%	5.8%
Miami	8.5%	9.7%	9.1%	7.4%	6.3%
Minneapolis	11.1%	10.3%	9.8%	9.1%	8.2%
Nashville	11.8%	10.4%	10.2%	8.7%	7.7%
New York City	13.7%	12.9%	12.2%	11.3%	10.4%
North & Central NJ	13.6%	12.4%	11.0%	10.7%	9.9%
Orange County	13.3%	11.4%	10.4%	8.3%	5.9%
Orlando	8.5%	7.9%	7.5%	7.1%	6.6%
Palm Beach	7.8%	8.8%	8.1%	7.0%	5.3%
Philadelphia	11.0%	10.7%	10.1%	9.9%	9.4%
Phoenix	15.8%	14.7%	13.7%	12.8%	12.6%
Pittsburgh	11.8%	10.0%	8.5%	7.9%	7.1%
Portland	12.6%	11.5%	11.0%	10.2%	9.2%
Raleigh-Durham	10.3%	9.5%	8.7%	8.1%	7.1%
St. Louis	10.4%	8.8%	7.8%	7.6%	5.0%
Salt Lake City	9.9%	9.5%	9.1%	9.0%	7.8%
San Antonio	12.6%	11.6%	9.0%	6.8%	4.9%
San Diego	11.0%	12.7%	12.4%	10.9%	9.3%
San Francisco	21.6%	21.3%	19.4%	17.0%	15.6%
San Jose	15.3%	13.7%	12.4%	10.4%	7.2%
Seattle	13.9%	13.2%	14.5%	13.5%	11.9%
Tampa Bay	9.0%	8.0%	7.6%	7.0%	6.1%
Washington, D.C.	16.4%	14.4%	13.6%	12.9%	11.9%

Highlighted entries indicate market at supply-demand balance with vacancy or 10% or better.

* Inland Empire = Riverside/San Bernardino Metropolitan Area; Source: Linneman Associates, CoStar

Note on Negative Vacancy: In order to calculate estimated vacancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show negative vacancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, negative vacancies cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of negative vacancy should be viewed as a strong excess demand indicator.

Pipeline Sensitivity Analysis

Industrial Vacancy Rates - Base Case Pipeline

Market	YE 2023	YE 2024 Est	YE 2025 Est	YE 2026 Est	YE 2027 Est
Atlanta	6.2%	6.4%	5.6%	5.1%	5.4%
Austin	9.5%	10.8%	10.4%	8.7%	8.4%
Baltimore	6.3%	4.8%	4.6%	4.2%	3.5%
Boston	5.2%	5.5%	4.9%	4.4%	4.2%
Charlotte	6.2%	4.1%	4.5%	4.5%	4.5%
Chicago	5.0%	3.7%	3.2%	3.2%	3.4%
Cincinnati	4.7%	5.3%	4.6%	3.9%	3.4%
Cleveland	3.6%	3.7%	3.3%	3.0%	3.0%
Columbus	6.6%	5.5%	4.9%	4.5%	4.0%
Dallas-Fort Worth	8.5%	9.3%	7.3%	6.8%	7.6%
Denver	7.3%	7.4%	6.8%	6.3%	6.1%
Detroit	3.8%	2.5%	2.1%	1.8%	1.5%
Ft. Lauderdale	4.2%	4.1%	3.6%	3.4%	3.5%
Fresno	4.2%	3.9%	3.4%	3.2%	2.6%
Houston	6.9%	6.4%	5.6%	4.6%	5.3%
Indianapolis	7.9%	8.4%	7.5%	7.1%	5.6%
Inland Empire*	5.5%	3.3%	3.0%	2.7%	2.5%
Las Vegas	3.3%	4.0%	4.0%	4.4%	4.6%
Long Island	4.3%	3.9%	3.5%	2.8%	1.9%
Los Angeles	4.3%	4.0%	3.5%	2.8%	3.2%
Miami	3.2%	3.7%	3.3%	2.8%	2.4%
Minneapolis	3.7%	3.0%	2.9%	2.9%	2.4%
Nashville	4.1%	3.0%	2.7%	2.2%	2.2%
North & Central NJ	4.2%	3.9%	3.2%	3.3%	3.2%
Orlando	4.7%	4.6%	4.6%	4.3%	3.7%
Philadelphia	6.9%	6.5%	5.2%	4.2%	3.6%
Phoenix	8.1%	9.1%	8.7%	6.9%	7.5%
Portland	4.5%	4.1%	3.6%	3.4%	3.0%
St. Louis	4.3%	3.8%	3.9%	4.4%	4.0%
Salt Lake City	6.6%	7.2%	7.2%	7.3%	5.8%
San Antonio	7.3%	6.3%	5.7%	5.3%	5.2%
San Diego	5.8%	6.4%	6.2%	6.0%	5.6%
San Francisco	9.2%	9.7%	8.9%	7.9%	6.2%
San Jose	9.2%	9.7%	8.9%	7.9%	6.2%
Seattle	6.3%	5.2%	4.2%	4.4%	4.3%
Tampa Bay	4.5%	4.0%	4.1%	4.5%	4.3%
Washington, D.C.	4.7%	4.3%	4.4%	4.8%	5.1%

Highlighted entries indicate market at supply-demand balance with vacancy or 6% or better.

* Inland Empire = Riverside/San Bernardino Metropolitan Area; Source: Linneman Associates, CoStar

Note on Negative Vacancy: In order to calculate estimated vacancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show negative vacancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, negative vacancies cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of negative vacancy should be viewed as a strong excess demand indicator.