CALCULATING ABSORPTION

LOCAL PLANNING HANDBOOK

WHAT IS ABSORPTION?

Absorption is the amount of space or units occupied within a market over a given period of time, typically one year. Absorption considers both construction of new space and removal of existing space and/or units. In general, absorption represents the demand for a type of real estate contrasted with supply. When demand is less than supply, vacancy increases and absorption is *negative*. Negative absorption can indicate changes in the larger economy, such as a decline in employment due to the closing of a business.

Generally, absorption should be separated by type and/or class of property, and tabulated over a period of several years to show trends in the local real estate market. These trends can support the forecasting of future absorption and real estate needs for particular property types.

PURPOSE AND ROLE IN PLANNING

Absorption analysis is a useful initial step in the forecasting of future land use. In addition to an understanding of demographic, household, and economic trends, an understanding of absorption trends is can be a key component in a well-grounded approach to planning how much and what type of land a community should plan for in the future. By calculating absorption, communities can inform everything from their own economic development strategy to capital improvements planning.

HOW TO CALCULATE ABSORPTION

Calculating absorption is a relatively straightforward mathematical process. Quite simply, absorption is the difference between the amount of occupied space in a particular market area at the beginning and end of a given time period. The most common units of measurement for absorption are square feet and/or acres (especially for non-residential uses) and number of units (generally, for residential uses). As noted above, the difference can be positive or negative, and should account for both new construction/redevelopment as well as demolition/repurposing. To calculate absorption, take the following steps:

STEP 1. Determine the total occupied space (O_b) at the beginning of the period. To do this, subtract vacant space at the beginning of the period (V_b) from all usable space at the beginning of the period (S_b).

$$O_b = S_b - V_b$$

STEP 2. Determine the total occupied space (O_e) at the end of the period. To do this, subtract vacant space at the end of the period (V_e) from all usable space at the end of the period (S_e).

$$O_e = S_e - V_e$$

STEP 3. Calculate the ABSORPTION. Subtract the total occupied space (O_b) at the beginning of the period from the total occupied space (O_e) at the end of the period. The result is the Net Absorption (A).

$$A = O_e - O_b$$

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EXAMPLE: Calculating Retail Absorption (Square Footage)

The local planning department conducted a retail space inventory in 2010, and maintains a permitting database for all development and demolition activity in the community. The inventory found that in 2010, the community had a total of 7,500,000 square feet (SF) of developed, rentable retail space, and 426,500 SF of that space was vacant. Their permitting database revealed the following activity, tracked annually:

YEAR	New Development	Conversion from Other Use (Occupied)	Other New Occupancy (Existing SF+ New SF)	Demolished SF	Vacated SF	NEW VACANT SF (V_x)	TOTAL SF (S_x)
2010						426,500	7,500,000
2011	-	16,000	8,400	60,000	36,500	454,600	7,456,000
2012	-	66,000	24,000	120,000	80,250	510,850	7,402,000
2013	80,000	13,000	54,600	14,200	14,500	550,750	7,480,800
2014	143,500	22,800	105,200	30,500	11,800	600,850	7,616,600
2015	64,500	35,600	155,600	16,800	22,500	532,250	7,699,900

For their comprehensive plan, the community wanted to determine overall retail absorption trend for the period of 2010 to 2015.

Step 1. Determine the total occupied space (O_b) at the beginning of the period.

$(O_b) = (S_b - V_b)$
$(O_b) = 7{,}500{,}000 \text{ SF} - 426{,}500 \text{ SF}$
$(O_b) = 7{,}073{,}500 \text{ ft}^2$

Step 2. Determine the total occupied space (Oe) at the end of the period.

$(O_e) = (S_e - V_e)$
$(O_e) = 7{,}699{,}900 \text{ SF} - 532{,}250 \text{ SF}$
$(O_e) = 7{,}167{,}650 \text{ ft}^2$

Step 3. Calculate the ABSORPTION.

$(A) = 7{,}167{,}650 \text{ ft}^2 - 7{,}073{,}500 \text{ ft}^2 = 94{,}150 \text{ ft}^2$