uses. "Courtyards serve buildings of nearly every imaginable function. Residences are [often] . . . designed around courtyards, because courtyards offer both privacy and access to nature. Commercial activities also benefit. For example, restaurants offer shaded courtyards as escapes from oppressive small offices and the midday heat. Hotels use flowering courtyards as the first impression for their guests, and the surrounding arcades for lobby functions."[3]

Using the interstitial space of the solar envelope can expand the potential of courtyards, offering architects a powerful tool for designing in cities. With so many possible functions and endless variations of size and shape, there are numerous ways to make courtyards serve as dynamic spatial intersections, domains of choice that are both culturally and climatically responsive.

Building on the example of the Spanish toldo, modern ways can be found to achieve comfort in courtyards. Reynolds points out that, as traditionally applied in Spain, the toldo nearly fills the sky opening of the courtyard, interfering with ventilation.[4] It might thus be seen as disadvantageous despite its obvious advantage for shade. However, by taking advantage of the interstitium, a courtyard cover can rise above the building to shield from summer sun and, at the same time, to direct cooling winds downward to the patio floor. In winter, the cover withdraws so that the courtyard can receive sunshine and less direct wind.

Los Angeles, like Spain, has a long history of courtyard buildings. The era of courtyard buildings in Los Angeles dates from the 18th century Spanish missions to elegant housing of the 1920s. Then the building boom after World War II mostly rejected this history in favor of air-conditioned tract houses and high-rises. Now, concerns for earthquake safety and for energy conservation, as well as the need for greater density, have awakened interest in midrise courtyard buildings for many different applications.

The climate of Los Angeles is sometimes described as Medi-

terranean. Rainfall is light and seasonal, coming mostly in late fall and early winter. Seasonal temperature transitions are modest. Summers are warm, requiring light clothing, but are rarely uncomfortably hot, especially if one can find some shade. Winters are cool but almost never freezing and, in the sunshine, can be quite pleasant. At all seasons, daily temperature changes average about 20°F (11.2°C), a very useful difference for "flushing" the house at night before the next daily cycle of heating.

To achieve year-round comfort in Los Angeles courtyards, the traditional modes of migration and transformation are useful adaptive strategies. People can move daily seeking either sun or shadow, engaging the entire space. Toldo-like structures can rise and fall, changing space completely with the seasons. But how and when these time-honored strategies come into play depend on the site and its surroundings.

The circumstances of sun and wind that provide comfort in Los Angeles courtyards vary seasonally. Prevailing winds from the west are desirable for summer ventilation and cooling. Winter sun in the courtyard is desirable while summer sun is not. Orientation of a courtyard makes a big difference for the entry of both sun and wind.

Courtyards Elongated North to South

Daily changes of light and shadow are the most persistent influence when the courtyard is elongated north and south. There are, of course, seasonal changes as well but as in the Gothic transept or a north–south running street, it is the daily rhythm that is most intensely felt. The longer courtyard walls on the east and west cast the bigger shadows and are the overriding influence on where people are likely to stroll or to sit.

The diagrammatic example shows simple courtyard walls of equal height on all sides, but massing will affect courtyard