

The three most important things in real estate and ecology are...



# Location, Location, Location

LEED does not give enough points for Project Location

## SUPPLEMENTAL INFORMATION FOR POSTER #17

The following is an expanded version of the poster submitted for the USGBC Greenbuild Conference held in Portland, Oregon November 9-12, 2004. This text provides expanded information on the facts presented in the graphical version. If you would like to obtain a full graphic version of the poster, please contact Mogavero Notestine Associates.

This is not intended to be a comprehensive view of the issue. Our hope is to encourage the USGBC to undertake a reevaluation of the current LEED system and allocate more weight to project location.

**Mogavero Notestine Associates**

building communities through architecture, planning, and development

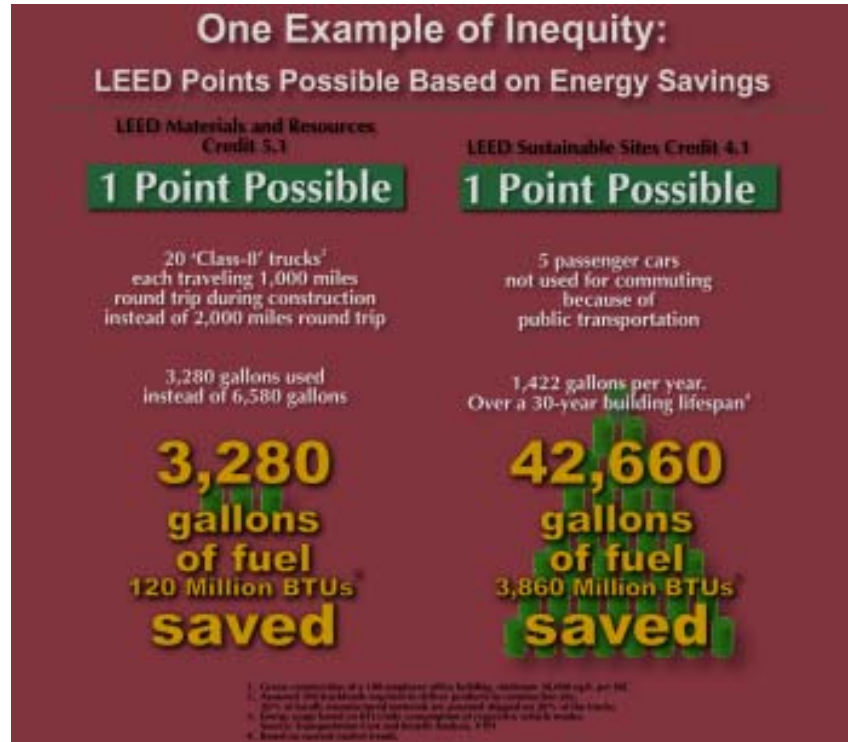


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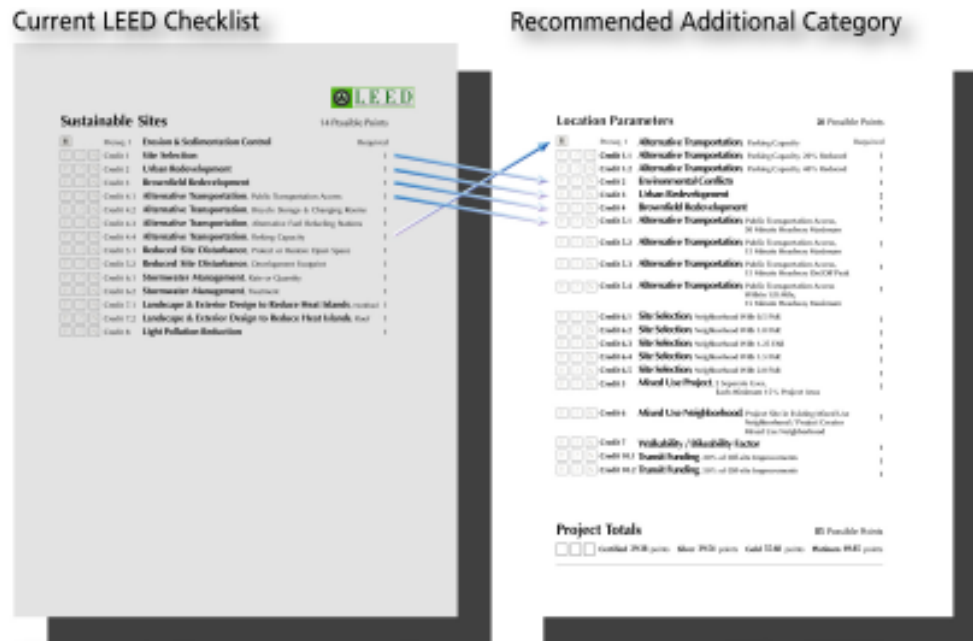


### Why Change LEED?

The location of a project is the prime determinant of auto dependency for building users. Automobile based transportation is the largest user of resources and the largest creator of pollution in the U.S. It has a major impact on the social, economic and ecological sustainability of communities. A "green" building in a remote location is the ultimate ecological oxymoron. Based on known facts relevant to site location, LEED should embrace the full proportion of implications created by a project's location in the points system.

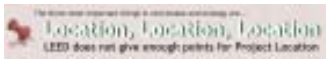


### HOW COULD LEED BE IMPROVED?



**Sustainable Sites and Location Parameters would receive 35% of LEED points.**

In addition to the 'Sustainable Sites' category, the addition of a 'Location Parameters' category will appropriately address the value of dense, mixed-use urban development.



## LOCATION BASED IMPACTS FOR BUILDING PROJECTS

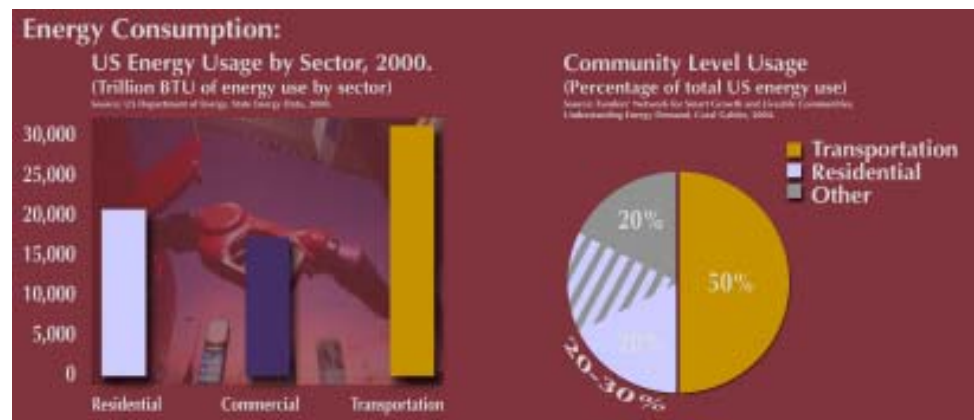
The following is a summary of some of the ecological, social and economic issues pertinent to the location of a project, which in some cases, overlaps other LEED categories.

### A. AUTO DEPENDENCY

#### (1) Energy Use

Transportation uses about 30 trillion BTUs of energy and buildings use about 40 trillion BTUs of energy per year in the USA.

- On a community level, transportation can account for 40-50% of energy use. In 2000, cars and trucks accounted for 43% of all petroleum consumed in the U.S. According to the National Resources Defense Council (NRDC), as density doubles, per capita vehicle miles traveled decreases by 25-30%. Nonetheless, a LEED registered project can get up to 13 points for energy efficiency and two or three points for locational parameters.



#### (2) Commuting

Remote building locations increase commuting and auto use.

- Locating an office building in an existing mixed-use, a higher density neighborhood and/or an area that needs transit facilities can dramatically impact the transportation mode used for commuting. The building's location can have synergistic effects.



For example, in a 1990 study prepared by John Holtzclaw for presentation to the California Energy Commission, it was demonstrated that a 3% increase in transit ridership would result in a 25% reduction in vehicle miles traveled because of increased walking and reduced travel needs.

#### (3) Driving/Personal Time

Households in dense mixed-use urban neighborhoods drive less than suburban households.

- Americans spend excessive hours sitting in traffic congestion. Families that live in somewhat denser mixed-use neighborhoods drive substantially less. A study prepared by John Holtzclaw for the Sierra Club and NRDC found that households living in the midtown district of Sacramento (approximately 15 Dwelling Units per Acre (DUA)) drive approximately half the miles of the metropolitan average (where densities are 4-5 DUA).

Another NRDC study comparing MNA's Metro Square project and two suburban communities confirmed these results. See case studies (provided at the end) for more information.

## B. HEALTH AND SAFETY

### (1) Obesity

Residents in dense, mixed-use urban neighborhoods are less likely to be obese than suburban residents.

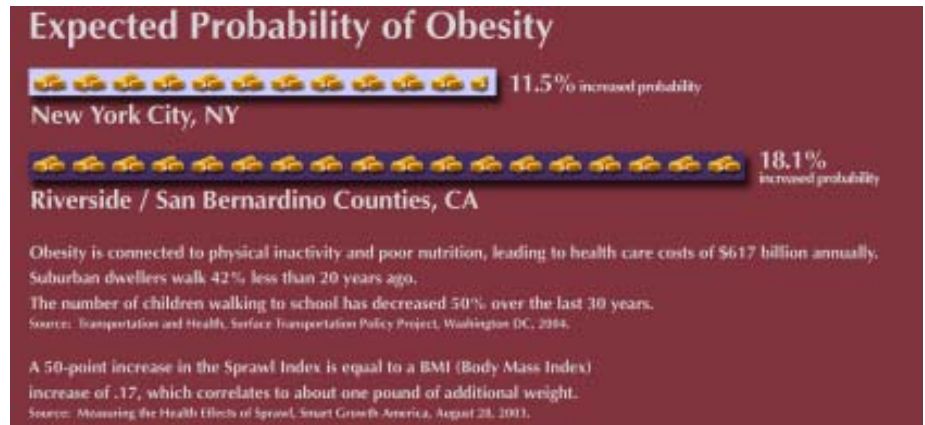
- Obesity is quickly becoming the number one cause of preventable death in the U.S., surpassing tobacco use.

Last year, the American Journal of Health Promotion and the American Journal of Public Health dedicated their entire fall issues to the connection between health and urban form. Obesity is connected to physical inactivity and poor nutrition, which has health care costs of 617 billion dollars per year.



One published study demonstrated a clear connection between increased obesity and suburban living. Suburban dwellers walk 42% less than 20 years ago and drive more. Twenty percent of children walked to school 30 years ago, now it is only 10%. Children are growing up psychologically and functionally less independent.

We are not aware of any fatality rates attributed to poor Indoor Environmental Quality (IEQ) relative to LEED. Nonetheless, we believe it would be substantially less than obesity. IEQ can account for 15 LEED points. Factors related to obesity get 2 or 3.



### (2) Accidents

Residents in dense, mixed-use urban neighborhoods are 82% less likely to be in injurious accidents than suburban residents.

- Traffic crashes are the leading cause of death among people from age one to 34.
- In a brief study completed by our office, we consolidated statistics from the combined data of the California Insurance Commissioner and the U.S. Census Bureau data for a Central City and a suburban neighborhood. The results demonstrated that a Central City neighborhood resident was 82% less likely to be in an auto accident that involves injury.

The 82% difference can be explained by two factors:

1. Vehicle miles traveled by Central City households is approximately half of a suburban household.
2. Driving velocity is higher on suburban roads.

### (3) Air Pollution

93.49 billion dollars are spent yearly on health costs related to automobile exhaust pollution.

- Motor vehicles are the largest source of air pollution in American cities. In sunbelt cities, this percentage can be as high as 60% to 75% of total emissions. As discussed above in "Auto Dependency", auto vehicle miles traveled and thus emissions can be dramatically reduced when a project is properly located.

## C. COMMUNITY ECONOMICS

### (1) Infrastructure Efficiency

Compact communities have less infrastructure per capita.

- There are numerous acres of empty land with all the infrastructure in place in a vast majority of American cities. Infrastructure needed for new development on infill sites preserves resources far beyond the project boundary. For those living and working in higher density places and/or transit accessed mixed-use places vehicle miles traveled are greatly reduced and road capacity throughout the community doesn't need to be increased.

Increased density in existing neighborhoods (primarily existing commercial strips) enhances the economic viability of transit by increasing ridership on existing routes. This in turn allows more frequent service encouraging even greater ridership.

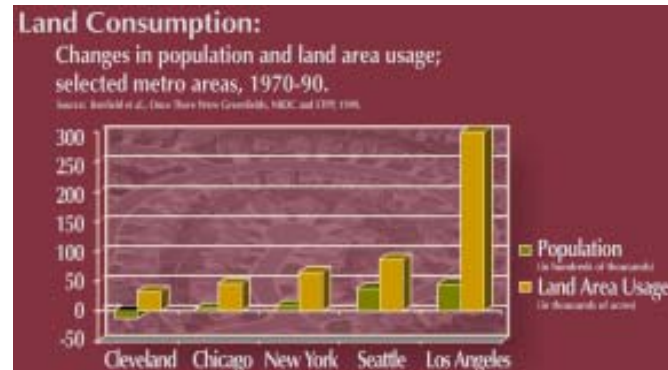
According to Scott Bernstein at the Center for Neighborhood Technology, the infrastructure cost for a new unit in a Greenfield project is \$50,000-\$60,000 versus \$5,000-\$10,000 in an existing developed area. This represents a dramatic reduction in resources consumed.



The difference in public infrastructure maintenance cost for housing at 3 DUA versus 7 DUA can be \$300 - \$800 per year per house. The smaller per capita urban footprint also results in less water pollution. Why shouldn't cities be like businesses and accomplish more activity with less urban infrastructure?

### (2) Land Consumption

Precious agriculture, wildland and recreation land is lost to sprawl.



American development consumes three to five times more land per usable square foot of building area today than 40 years ago.

Do we now have more beautiful communities as a result?

### (3) Reinvest in Existing Neighborhoods

Reinvesting in existing neighborhoods creates economic benefits throughout a region.

- Locating projects on unused or underutilized urban land is a better way to obtain the highest social, ecological and economic value for the community. Local economies that minimize the transport of goods and services can then be nurtured. Correspondingly, private investment into building construction (and rehabilitation) uses more local labor.

### (4) Cost of Car Ownership

The US household expenditure for transportation has risen from 11% of income to more than 20% of income over the last 30 years.

- Families in dense urban communities in the 1950's owned fewer cars than suburban families do now. Buses and trolleys were private and profitable. Sprawl has created the need to own more cars and all the environmental impacts that come from it. Housing costs have remained a constant source of equity.
- Money spent on a car does little for wealth creation. Money spent to purchase real estate is important for wealth building, especially among the low-income population.

## CASE STUDIES: Projects with appropriate location parameters.

### CORDOVA CITY CENTER

Located across the street from a Light Rail Transit Station in the City of Rancho Cordova, California (a suburb of Sacramento), this project is a mixed-use, medium- to high-density, new transit-oriented community. The site is currently occupied by an under-utilized shopping center on a busy suburban style boulevard at the heart of a newly incorporated city. This is the first transit-oriented transformation of a suburban site in the Central Valley.

The commercial program includes 37,000 s.f. of office, 11,000 s.f. of retail in the first phase, configured to begin the transition to a more urban character streetscape and to reinforce the town square form that is part of the light rail station across the street.

The residential program includes 207 residential units in a three-story geometry with townhouses on the second and third floors, and a  $\pm 75$  unit independent living senior housing facility. The residential units are clustered around large courtyards with play areas for children and a community center is placed as the link between the residential area and the commercial street area.

Parking is situated either as street parking or as structured parking behind the office and retail. There are no surface parking lots and joint-use parking (residential and office) is being used to reduce the amount of parking spaces.

In addition to the transit-oriented character, many other ecological building strategies are being incorporated including daylight, solar controls, indirect evaporative cooling, and provisions for bike-use, stormwater detention and purification and photovoltaic panels.

The project received a \$1.7 million grant from the Sacramento Area Council of Governments for its creative approach to transit oriented mixed-use infill development.



**CASE STUDIES: Projects with appropriate location parameters.**

**METRO SQUARE**

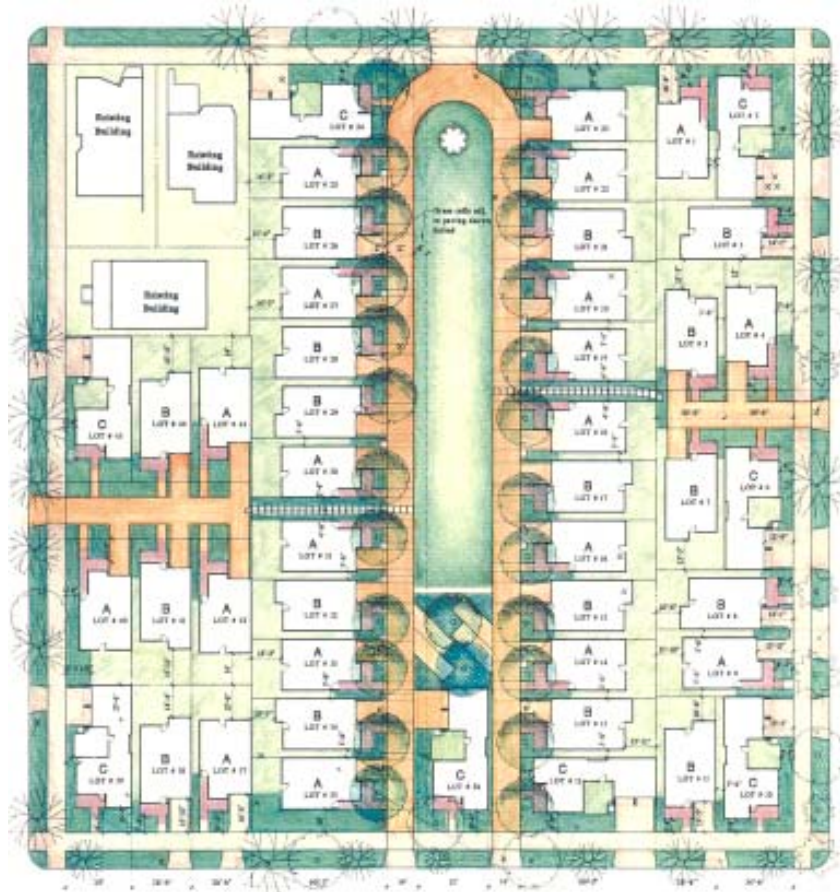
Metro Square features 45 single-family homes on 2.2 acres ranging in size from 1,150 square feet to 1,550 square feet. Each unit has similar amenities to a single family suburban home. The architectural design balances contemporary construction needs with the existing character of the neighborhood.

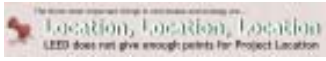
The project includes primarily one-car garages to discourage auto ownership, roof orientation for photovoltaic retrofits and surface drainage to reduce water pollutants.



**Statistics**

- Location: 26th & H Streets, Sacramento, CA
- Construction Cost: \$4.5 million (\$54/sq.ft.)
- Completion Date: 1998
- Market: 100% market rate for-sale units





## **NRDC Study – Metro Square**

A study was commissioned by the National Resources Defense Council (NRDC) in cooperation with the U.S. Environmental Protection Agency (EPA). Two conventional residential projects were selected for comparison against Metro Square.

Metro Square's "smart" features include its location one mile from Sacramento's city center, its compact lots situated around a common green space, and its conventional grid-pattern streets.

Compared to two conventional suburban developments with the same number of single-family homes, Metro Square consumes only roughly one-quarter as much land, and, unlike the case with the suburban developments, no agricultural land was converted in its construction.

Despite the use of alleys and wide sidewalks in Metro Square, the development contains less paved surface per household and per capita than the conventional developments, reducing surface water runoff. Its more compact lots also reduce the need for pesticides and fertilizers, as well as water for irrigation during Sacramento's dry summers.

Metro Square has many neighborhood amenities within walking distance, including a convenience store, a supermarket, a school, a park, and public transit service. It also features connected streets, bicycle network markings, crosswalks and other traffic controls at intersections, traffic calming measures, and shade trees along its sidewalks, all of which make it more inviting to pedestrians and bicyclists than conventional developments.

Survey results indicate that Metro Square residents may be over four times as likely as residents in conventional Sacramento developments to accomplish daily tasks by walking and may take only half as many driving trips, driving a total of between only 50 and 60 percent as many miles. This translates into fuel and energy saved, as well as fewer emissions of greenhouse gases and unhealthy air pollutants.

Metro Square households occupy about 1/4 of the land area that their suburban counterparts use. Metro Square's homes are built at a density of 20 DUA versus 6-7 DUA in Natomas and Antelope. The former is a highly supportive density for frequent transit service, while the latter falls at what most experts consider a bare minimum for infrequent transit service.

### **Infrastructure**

Metro Square's construction required no new infrastructure of any kind, whereas the suburban sites required a full complement of water, sewer, streets, drainage, and other improvements that represent enormous amounts of embodied energy and upstream pollutant emissions.

### **Built Environments**

Compared to the conventional developments, Metro Square uses much less land, in a location much closer to jobs and amenities, with superior access to multi-modal transportation systems.

### **Diversity**

Due to the richness of its urban setting, Metro Square has a diversity of nearby services and amenities unmatched by Natomas and Antelope in their single-use suburban settings. In terms of neighborhood completeness, the percent of specific key uses within one-quarter mile is 72 percent versus 5 percent for the suburban sites. An architect's survey found that 10% of units had families with children.

### **Agricultural Land Preserved**

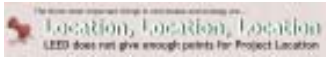
Metro Square's construction required no conversion of productive resource land, whereas productive agricultural land was permanently lost at both suburban sites.

### **Water Use Reduction**

Metro Square households use about 20-30 percent less water than their suburban counterparts because of smaller yards, and more rainfall and other surface water is returned to ground aquifers at Metro Square because of its smaller amount of impervious surface per capita.

### **Vehicle Miles Traveled (VMT) Reduced**

In a 1991 regional travel survey, residents of the travel analysis zone (TAZ) that now includes Metro Square were found to drive only 57% as many miles per day as did residents of the TAZ for Antelope.



## OTHER CASE STUDY EXAMPLES OF PROPERLY LOCATED PROJECTS

- Marshall Place
- Olive Drive
- City Walk Condominiums

See MNA's website [www.mognot.com](http://www.mognot.com) for more information on these projects.

## RESOURCES

Transportation Cost and Benefit Analysis, VTPI

Measuring the Health Effects of Sprawl, Smart Growth America, August 20, 2003

McGinnis & Foege, JAMA, 270, 1993

DeLuchi et al., A Comparative Analysis of Future Transportation Fuels, Institute of Transportation Studies, Berkeley, 1987

Insurance Research Council, 2001

Characteristics of auto accidents- an analysis of auto injury claims, Malvern, PA.

American Farmland Trust, Reinvesting in Existing Neighborhoods

Benfield et al., Once There Were Greenfields, NRDC and STPP, 1999

McCann, Barbara, Driven to Spend; The Impact of Sprawl on Household Transportation Expenses, STPP ([www.transact.org](http://www.transact.org)), 2000

Transportation and Health, Surface Transportation Policy Project, Washington, D.C., 2004