SAVING TAXPAYER DOLLARS ON INFRASTRUCTURE, PUBLIC HEALTH AND FIREFIGHTING COSTS

Sequoia Riverland Trust
427 S. Garden
Visalia, CA 93277
(559) 738-0211

Sequoia Riverlands Trust
Conserving California's Heartland

Southern Sierra Partnership

By Adam Livingston

A. REDUCED INFRASTRUCTURE COSTS

A major difference between the region's current pattern of development and a more compact alternative is the cost of infrastructure. Since the 1970s, studies have shown that it is less expensive per capita to provide roads, sewer service and other basic infrastructure for infill development in existing city centers than for low density greenfield developments.[1] For example, studies in the early 2000s found significant nationwide differences in the cost of water and sewer infrastructure, service delivery, road construction and per-unit development costs depending on how new homes fit into growth patterns:

Photo: Tomas Castelazo, 2009.

- If the U.S. built approximately 5 million homes in more compact developments than under a business-as-usual "sprawl scenario," there could be nationwide savings of $12.6 billion (over $16.8 billion in 2013 dollars)[2] in water and sewer costs by 2025.[3] Annual operations and service delivery costs could be reduced by $4 billion (over $5.3 billion in 2013 dollars).[4]

- Although a lane-mile of urban road is more expensive than a lane-mile of rural road, low density development creates a need for more roads to serve fewer people.[5] For this reason, a 2005 study estimated that a compact growth scenario could save taxpayers nearly $110 billion in roadbuilding costs (approximately $147 billion in 2013 dollars) by 2025.[6]

- Due in part to differences in land consumption, estimated national per-unit development costs are $154,035 under a compact growth scenario, compared to $167,038 under a sprawl scenario ($205,988 and $223,377, respectively, in 2013 dollars).[7]

More recent studies have shown similar differences on statewide, regional and local scales. For example, modeling conducted as part of the Vision California process found that compact growth scenarios ("Growing Smart" and "Green Future") could save the state's taxpayers $18 billion in infrastructure costs by 2035, and $32 billion by 2050, compared to a "Business as Usual" scenario.[8] Operations and maintenance costs—the continuing investments required to deliver service and keep infrastructure working—would be $6 billion less by 2035, and $15 billion less by 2050.[9] For these reasons, compact growth would result in higher cumulative local revenues, with cities and counties obtaining $53 billion more by 2035 and $120 billion more by 2050.[10] Applied to the San Joaquin Valley, the same modeling predicts infrastructure savings of $24,300 per new housing unit under the compact growth-oriented Valleywide Hybrid Scenario.[11] This amounts to over $20 billion by 2035.[12]

Photo: "Rishichhibber," 2012.

On a local scale, studies have shown that compact growth can minimize the cost of constructing and maintaining infrastructure in specific communities. For example, a 2001 study compared the cost of development in a community near Bakersfield's "center of gravity," or central service district, with the costs of development in two "far-distant suburban" communities.[13] Costs were consistently lower in the more centrally-located development:

- The cost of building an identical home was nearly $38,000 lower in the centrally-located development than in one of the suburbs, and more than $6,000 lower than in the other suburb ($49,000 and $8,000 lower, respectively, in 2013 dollars).

- One-time capital costs were up to $152 million lower in the centrally-located development (nearly $198 million lower in 2013 dollars).

- Annual operating costs were up to $3.7 million lower in the centrally-located development (over $4.8 million lower in 2013 dollars).[14]

Moreover, building near existing infrastructure not only saves money, but also increases the value of that infrastructure and of nearby land.[15] For example, a 1993 study found that approximately 33% of Bay Area residents living near BART stations commuted via rail, whereas only 5% of other Bay Area residents did.[16] And property values rise more rapidly near mass transit stations. In transit-oriented Portland, for example, values rose 112% to 491% from 1980 to 1991, compared to a national average of 67.5% over the same period.[17]

Thus, by directing new development into infill, instead of spending taxpayer dollars to build and service new infrastructure for greenfield construction, the region can save billions of dollars, and increase the value of existing infrastructure and homes.

B. REDUCED PUBLIC HEALTH COSTS (IMPROVED AIR QUALITY AND LOWER RATES OF CHRONIC DISEASE)

There are significant opportunities for land conservation and compact growth to save taxpayer dollars on public health costs. Today, for example, the region's economy is hobbled by some of the worst air quality in the country:

- Asthma afflicts over 16% of children in Fresno County and nearly 12% in the San Joaquin Valley.[18] In the Central Valley as a whole, up to 800,000 schooldays are lost annually as a result of childhood asthma, costing school districts at least $26 million.[19]

Photo: National Institutes of Health, 2013.

- Since 2005, toxic air contaminants such as diesel particulate matter (PM), formaldehyde, and acetaldehyde have increased in the San Joaquin Valley Air Basin.[20] PM from diesel engines alone is responsible for approximately 260 deaths per year in the San Joaquin Valley.[21]

- According to the American Lung Association, the Bakersfield-Delano metropolitan area has the nation's third worst ozone pollution,[22]

and absolute worst particulate pollution (both short-term and year-round).[23] Fresno-Madera is not far behind and, in spite of their much smaller populations, Visalia-Porterville and Hanford-Corcoran are among the five worst metropolitan areas for both ozone and year-round particulate pollution.[24]

These are not the only public health costs imposed by the region's current pattern of development. A 2003 study linked sprawl to weight gain, obesity and hypertension: on a county-compactness index going from 63 to 352, the authors found, each 50-point decrease is associated with a weight gain of one pound, a 10% higher chance of obesity, and a 6% higher chance of hypertension for the average person.[25] Low density development patterns are also associated with greater numbers of fatal car accidents—up to 18 deaths per 100,000 in the most sprawling regions, as opposed to 8 per 100,000 in the least sprawling.[26] In addition, children in car-dependent communities watch more TV, and play outside less, than those in walkable communities.[27]

Photo: John McColgan, 2000.

A different pattern of development can help the region to lower these costs. Conservation of forested areas can help the region to avoid land use patterns that produce obesity, hypertension and other illnesses by promoting compact growth, while directly reducing air pollution. By one estimate, each square meter of canopy cover can remove approximately 11 grams of ozone, PM-10, SOx, NOx and CO annually.[28] Trees can also reduce temperatures by providing shade and transpiring (i.e., releasing moisture into the air), thereby saving energy that would otherwise be used to cool buildings and reducing formation of certain pollutants.[29]

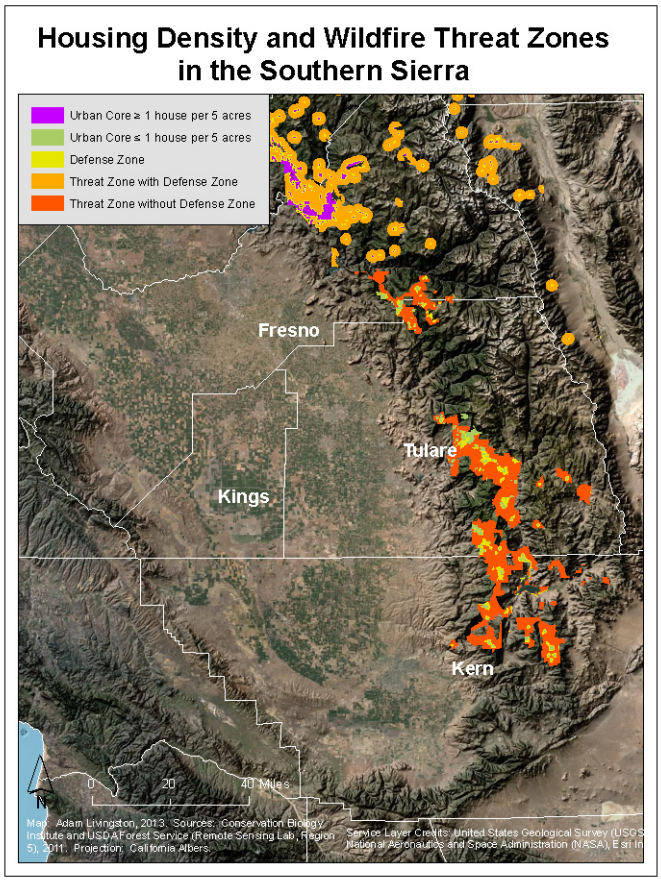
Health costs associated with air pollution can be further reduced through development patterns that allow people to drive less. A study conducted in Southern California, parts of which suffer from air pollution almost as severe as the Southern San Joaquin Valley, found that reducing vehicle miles traveled by 20% could save over $1.6 billion in health and other costs, due in part to reductions in respiratory symptoms and asthma attacks.[30] In these and other ways, land conservation and compact growth can help the region realize significant savings in public health costs.

C. REDUCED FIREFIGHTING COSTS

More than 1% of the region's homes are located in wildland-urban interface (WUI) areas, where development abuts fire-prone habitat such as forests.[31] Because these are often second homes in the Sierra foothills,[32] they may be left unattended for part of the year. In Fresno, Tulare and Kern Counties, WUI homes are often built on larger lots than non-WUI homes, which not only consumes more land, but also means that firefighters must protect (or insurers compensate for) a greater area.[33] Moreover, many areas threatened by wildfire lack adequate defensive zones to prevent fires from consuming structures.

This has significant implications for wildfire suppression costs borne by taxpayers. A study that examined 27 recent wildfires in the Sierra Nevada, ranging from the China-Back Fire near Yreka to the Piute Fire near Bakersfield, found that the presence of homes in the WUI is correlated with increased firefighting costs: for each 1% increase in the number of WUI homes within six miles, these costs go up by 0.07%.[34]

Climate change is likely to raise the costs of WUI development further by increasing the risk of fire. A 2009 study based on data from Western Montana found that a one degree Fahrenheit (0.55° C) increase in average spring and summer temperatures would increase home protection costs by 107% and area burned by 305%.[35] Current climate projections indicate



Housing density and wildfire threat zones in the Southern Sierra (Conservation Biology Institute and U.S. Forest Service, 2011).

that average temperatures will rise 3.1 to 7.2 degrees Fahrenheit (1.8° to 4.0° C) by the end of the century.[36] These projections also suggest that the region will have a slightly drier climate than it does now,[37] which may exacerbate the recent tendency toward larger and more severe wildfires.[38] If WUI developments in the Sierra Nevada experience even a fraction of the increased fire risk predicted for similar developments in Montana, firefighting costs borne by taxpayers will rise significantly.

These costs can be reduced through land conservation and compact development. While land conservation will not prevent wildfires, it can reduce the amount of development in fire-prone habitats, thereby minimizing the number of homes that taxpayers must pay to defend. Policies promoting compact growth, in turn, can direct new residential development into existing city centers, ensuring that those who wish to live in our region can do so without risking the loss of their homes to wildfire.

[1]Real Estate Research Corporation, 1974; Ewing, 1994; EPA, 2012.

[2]U.S. Bureau of Labor Statistics, 2013.

[3]Burchell et al., 2005; Ewing et al., 2002.

[4]Muro and Puentes, 2004.

[5]Burchell et al., 2005.

[6]Burchell et al., 2005; U.S. Bureau of Labor Statistics, 2013.

[7]Burchell et al., 2005; U.S. Bureau of Labor Statistics, 2013.

[8]Calthorpe Associates, 2011.

[9]Calthorpe Associates, 2011.

[10]Calthorpe Associates, 2011.

[11]Calthorpe Associates, 2010.

[12]Calthorpe Associates, 2010.

[13]Khé and Grammy, 2001.

[14]Khé and Grammy, 2001; U.S. Bureau of Labor Statistics, 2013.

[15]EPA, 2012; Zykofsky, 1998.

[16]Zykofsky, 1998.

[17]Zykofsky, 1998.

[18]Bedsworth, 2004.

[19]Gies, 2009.

[20]Great Valley Center and Sierra Nevada Research Institute, 2012.

[21]Bedsworth, 2004.

[22]Ozone pollution harms not only human health, but also plant health. Across the Central Valley, it is estimated to cause $270 million a year in crop damage. Gies, 2009.

[23]American Lung Association, 2013.

[24]American Lung Association, 2013.

[25]McCann and Ewing, 2003.

[26]Ewing et al., 2002.

[27]Zykofsky, 1998.

[28]Nowak, 2007. Results are similar in other parts of the country. A comparison between the PM reduction potential of mesquite trees and the cost of a street paving program designed to reduce dust in Tucson, Arizona for example, found that the value of each tree's dust control services was $4.16 annually ($5.41 in 2013 dollars). Krieger, 2001; U.S. Bureau of Labor Statistics, 2013.

[29]Nowak, 2007.

[30]American Lung Association, 2010.

[31]Headwaters Economics, 2012a.

[32]Headwaters Economics, 2012a.

[33]Headwaters Economics, 2012a.

[34]Gude et al., 2011.

[35]Gude et al., 2009.

[36]Union of Concerned Scientists, 2007.

[37]SSP, 2010.

[38]This tendency is in part a product of management decisions favoring dense stands of shade-tolerant trees, which are prone to catastrophic fires. SSP, 2010.