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Research



Results



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Project Title:

Optimal Density Restrictions in the Los Angeles-Long Beach CSA

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Optimal Density Restrictions in the Los Angeles-Long Beach CSA

Analyze and summarize the existing knowledge in optimal design of an urban area and collect data for the Los Angeles-Long Beach CSA.

WHAT WAS THE NEED?

A successful completion of this project will enable Caltrans to answer the following questions:

- How can cities in the Los Angeles area adjust zoning and density restrictions to improve access to jobs and quality of life for the residents of the Los Angeles-Long Beach Combined Statistical Area(CSA)?
- How will optimal zoning and density restrictions change the shape of the urban area, particularly local density and landuse, commuting flows, urban congestion, property values, and other variables? Any concrete policy proposals that could improve welfare for residents of the metro area?

The research team will answer these questions by designing and completing quantitative counterfactual exercises in the framework of a state-of-the-art general equilibrium quantitative urban model.

WHAT WAS OUR GOAL?

The goal of this project is to identify zoning policy adjustments which could improve access to jobs and quality of life for the residents of the Los Angeles-Long Beach CSA. An important auxiliary goal is to make neighborhood-by-neighborhood projections for how changes to policy would affect a broad range of variables, including commuting flows, urban congestion, and property values, in order to guide the design and implementation of policy adjustments.



DRISI provides solutions and knowledge that improves California's transportation system

WHAT DID WE DO?

The research team built a quantitative general equilibrium model of internal city structure. Locations differ in local productivity, employment, and residential amenities and are linked by a transportation network that determines commuting times. Zoning policies increased the cost of building in some locations, constraining the equilibrium supply of floor space. The researchers modeled density restrictions as an endogenous function of existing density.

They used the model to back out local characteristics for the nearly 4,000 census tracts of the Los Angeles-Long Beach CSA, given data on the price of floorspace, wages at place of employment, the density of employment and residence, and commuting times.

They then conducted two counterfactual experiments. In the first experiment, they reduced density zoning restrictions to the level of downtown Los Angeles in all urban tracts in the metropolitan area. The second experiment simulated a tremendous improvement in transport infrastructure: the research team supposed that all commuters can drive directly to their destination at 65 miles per hour without slowing down either for traffic or curves in the road.

WHAT WAS THE OUTCOME?

The investigators found that relaxing zoning increased output per worker by 35% and welfare by 57%. At the same time, it reduced residential and commercial floor prices by 54% and 60% respectively, on average. It also slightly reduced the average daily commute--presumably because increased concentration meant there was less need to commute long distances.

Improving automobile infrastructure to the maximum increased output per worker by 2.2%, and nearly half of the average daily one-way commute to just 19 minutes. Simultaneously, it slightly raised the mean costs of residential and commercial floorspace by about 1% and 9% respectively--presumably because of improved transportation that increased the demand for floorspace in the most attractive tracts pushing the density to the limit.

The results of these two experiments suggest that the potential productivity and housing affordability gains from re-zoning may be more substantial. They also suggested that gains from improving transport infrastructure may have an upper bound, as even the best possible automobile-based improvement had limited impact on variables other than time spent commuting.

WHAT IS THE BENEFIT?

The project is relevant for the Caltrans' topic "Meeting transportation needs in the midst of changing California demographics." A successful completion of this project will provide Caltrans a tool to recommend policy adjustments, which can improve access to jobs and amenities, and quality of life for residents of the Los Angeles-Long Beach CSA