

# Affordable Housing Trip Generation Strategies and Rates

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## Executive Summary

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Communities in California are facing a housing shortage, with an estimated 1.8 million units needed by 2025 to meet future demand. This shortage has led to increased housing costs. The majority of Californians pay more than 30% of their income for housing and nearly one-third pay more than 50% (California Department of Housing and Community Development, 2017). These costs hit low-income households the hardest, contributing to a need for more affordable multifamily housing in particular. Efforts are underway to understand and address these shortages; however, there are many challenges to overcome, including the development process itself.

The California Environmental Quality Act (CEQA), California Senate Bills 375 and 743, and other state, federal, and local laws require the assessment of travel demand due to proposed developments and mitigation of any negative impacts, including affordable housing projects. The development review process has often relied on a process called trip generation—the first step in determining the transport demand for a development. Historically, this process has focused solely on vehicle trips and relied on rates published by the Institute of Transportation Engineers (ITE), a national professional organization, in their analyses. While the ITE approach has been updated recently, trip generation rates for multifamily housing remain insensitive to a diversity of urban contexts, the built environment, socio-economic conditions, and non-motorized vehicle modes and there are no rates available specifically for affordable multifamily housing.

Building on the methodologies and findings of previous Caltrans studies, this study addresses the deficiencies in trip generation rates for affordable multifamily housing using a triangulated research approach. Unlike other trip generation studies that rely solely on trip generation data collected from on-site counts and intercept surveys, our research design included two unique data collection efforts in the Los Angeles and San Francisco Bay regions: an on-site trip generation study of 26 affordable multifamily housing developments and a household survey mailed to residents of 109 affordable housing developments (including the 26 sites in the on-site data collection). In addition, the statewide Caltrans 2012 Household Travel Survey (HTS) enabled the analysis of household trip rates, vehicle miles traveled (VMT), and automobile ownership using a robust number of predictor variables. Using these data, we developed a planning tool - the California Affordable Housing Trip Generation (CAT) Tool - that will provide person and vehicle trip generation estimates. A discussion of our findings and conclusions follows. More detailed information about the study can be found in the accompanying report.

- Low-income households living in multifamily housing own fewer vehicles, make fewer motorized vehicle trips, and generate fewer vehicle miles traveled than their similarly situated higher income counterparts.
- The built environment matters. Vehicle ownership and use declined with increasing urbanization (population & employment density, street connectivity, and mix of uses). Employment density had a small but significant negative effect on motorized trip generation rates for affordable housing sites.

- Residents of affordable housing used walking and transit for nearly half of the trips generated in the morning and evening peak. Although the automobile was used for the majority of the trips, the high rate of non-automobile modes emphasizes the importance of planning for multimodal options. It also reinforces the need to collect person trip rates and mode information.
- Smart growth and transportation demand management (TDM) strategies may be more effective in curbing VMT if they target higher income households. But these strategies may provide critical multimodal transportation options for affordable housing residents. Lower income households generate 47% less vehicle miles traveled than their wealthier counterparts and it may be more challenging to realize larger reductions. Yet, affordable sites in this study generated more vehicle and person trips than smart growth and TDM sites during the morning and evening peak hour. This suggests that residents of affordable housing may have a reliance on the car but perhaps drive it for shorter distances overall. Higher person trip rates also may be due higher vehicle occupancy and greater use of transit and walking.
- The study revealed to important correlates with motorized trip generation at these sites. The greater the parking supply and the average number of bedrooms (as a proxy for household size) for a site were associated with higher rates of motorized vehicle trip making. These two attributes of the site have not been used in trip generation estimates in the past and the evidence here supports a change in the approach is needed.
- Trip making was more concentrated in the morning peak and the trip purpose information suggests that activities such as school and work with fixed start times may be the cause. Motorized vehicle mode shares were also higher for this period. Walking and transit were important modes in both peaks but walking mode shares were higher in the evening peak when more shopping and recreational activities were conducted.
- Affordable housing sites generate 35% fewer motorized vehicle trips in the PM peak hour, on average, than would be predicted using ITE data. There was little difference in the AM peak, however. Since the PM peak is more commonly analyzed in transportation impact studies, these findings support a greater reduction in ITE trip rates for affordable housing than currently given in models used to assess these impacts (e.g. CalEEMod).
- Further, the comparison of person trip data for affordable developments and those calculated from ITE's data using the recommended approach would underestimate this activity. Given the shortage of person trip data, current practice recommends relying on ITE vehicle trips rates (and assumptions about vehicle occupancy and mode share) to calculate an estimate of person trip rates. This finding warns that this approach may not be valid and should be exercised with caution.
- Our household survey revealed the merging use of shared mobility options, including ride hailing, car sharing, and bike sharing services. These services may provide an important substitute for personal vehicle ownership. These services may lend support for reductions in parking supply at affordable sites, given that vehicle ownership rates are lower for low-income households and shared mobility use is emerging. All of the sites had free parking

included in rent as there is a regulation that prohibits unbundling of parking. This regulation should be reconsidered if households use less parking and if other options exist.

- The ITE definition of peak hour rate uses the maximum trip rate over the peak periods, which tends to be 35% higher than using the average rate across the peak period. Using this maximum vehicle rate in performance measures may result in more auto-oriented design than necessary over the course of the day.

The sum of this research reinforces the greater need to re-examine current methods for evaluating trip generation, in general, and their sensitivity to socioeconomic conditions, site characteristics, and urban contexts. The recent shift to collecting person trip information and multimodal data with counts and surveys provides better support for understanding the full array of travel demand generated at sites. Coupling a household survey in addition to these approaches provides much needed insight into residents' characteristics and resources. But these methods are far from adequate to capture the rapidly changing transportation landscape and researchers should be careful not to overlook new modes and travel options as they strive for compatibility with other data and studies.

Specific to affordable housing developments and low-income population, results strongly suggested that applying the data and methods often used in development review processes would over-estimate automobile use and VMT for residents of affordable, multifamily housing developments, even in rural or suburban settings. Analysts who are aware of these limitations can, and should, input more sensitive travel values for relevant developments.

Future trip generation studies for residential land uses should consider the total person occupancy of a development, and not just the number of bedrooms per unit. In the end, it is not the land use itself that generates trips but rather the people living in these developments traveling to their daily activities.

The lower rates of vehicle ownership among low-income households suggest that they may generate less demand for residential parking. Therefore, reducing the parking requirements for affordable development or the unbundling of parking provision could help to increase the supply of housing and lower development costs. However, the automobile may provide critical mobility for those low-income households living in locations with poor local accessibility and fewer transportation options. More research is needed to link these revealed travel patterns with overall levels of satisfaction and well-being, as one should not assume that the observed level of mobility is sufficient to meet their needs. Further research is needed to provide an assessment for an appropriate reduction rate for parking ratios.