A Comprehensive Study of Impacts of "Q" Bus Rapid Transit System on Blackstone Avenue

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Introduction

In 2015, Fresno Area Express (FAX) took a transformative step toward addressing socioeconomic challenges by initiating the construction of the 15.7-mile Bus Rapid Transit (BRT) system, known as the Q Line. Stretching along Blackstone Avenue from North Fresno to downtown and Ventura/Kings Canyon from downtown to Clovis Avenue, the Q Line replaced traditional bus services, significantly enhancing efficiency through fewer stops and more frequent service. The project introduced modern features such as transit signal priority; queue jump lanes; and low floor, compressed natural gas (CNG) vehicles, offering a cleaner, eco-friendly transit option. Passengers benefit from real-time information, boarding platforms, fare machines, and a distinct Q Line branding, elevating the commuting experience. Initially studied in 2008, construction began in June 2016, and the service officially launched in February 2018. Since its inception, the Q Line has surpassed 12.2 million riders, solidifying its role as a cornerstone of Fresno's public transit network. This study examines the impacts of the Q Line on passenger satisfaction and the housing market.

Study Methods

This study focuses on two core objectives: analyzing the housing market in Fresno and assessing passenger satisfaction on the Q Line. The first objective examines residential properties sold between 2012 and 2024 to explore the Q Line's influence on the housing market. Using Geographic Information System (GIS) mapping, we segment properties into three spatial regions: the Q Line corridor, an outer buffer zone, and the remaining Fresno areas. This segmentation enables comparisons of housing market dynamics, including property prices, sales trends, and appreciation rates, across these regions. Our analysis seeks to uncover trends or changes in housing values that suggest the Q Line's impact on market activity in its proximity.

The second objective evaluates passenger satisfaction based on FAX survey data. To identify factors affecting satisfaction, we perform statistical independence tests to determine relationships between survey attributes and satisfaction outcomes. Furthermore, with a specific emphasis on Q Line service, advanced machine learning models are then employed to analyze the full dataset, uncovering complex patterns and interactions within the data. These models highlight key factors driving satisfaction, such as timeliness, comfort, cleanliness, customer service, and reliability, providing a nuanced understanding of their relative influence on passenger experiences.

Through this dual focus, the study offers a comprehensive assessment of the Q Line's impact on Fresno. It sheds light on its potential effects on the housing market and identifies factors influencing passenger satisfaction, contributing valuable insights into the broader social and economic implications of this transit investment.

Findings

The analysis of housing prices within the Q Line corridor reveals a slight increase in selling prices; however, this change is not statistically significant. Thus, the Q Line's implementation has not yet shown a measurable impact on residential property values in its vicinity.

Regarding passenger satisfaction, independence tests reveal no significant differences in satisfaction scores across demographic factors such as age, work, gender, and education. This suggests that satisfaction with FAX services is consistent regardless of these variables. However, Household Size and Income test result indicates

that passengers from larger households report higher satisfaction levels, suggesting that the service better meets their needs. Conversely, smaller households tend to express greater dissatisfaction, possibly due to unique challenges or unmet expectations. Income also significantly affects satisfaction. Passengers with higher incomes report greater satisfaction with FAX services, while those with lower incomes express higher levels of dissatisfaction.

Using advanced machine learning models, we identified eight influential factors driving passenger satisfaction on the Q Line: audio visual quality, value, closeness to home, comfort, driver helpfulness, disability access, closeness to destination, and weekend hours. These factors collectively emphasize the importance of providing a passenger-centered, inclusive, and well rounded transit service to ensure higher satisfaction rates. By addressing these factors, FAX can further enhance the overall passenger experience and better serve the community

Results indicate no statistically significant increase in property values within the Q Line corridor, challenging assumptions that public transit improvements substantially influence housing prices.

Policy/Practice Recommendations

The analysis of residential property selling prices within the Q Line corridor reveals no significant changes compared to other regions in Fresno. This finding challenges the common assumption that housing prices rise substantially with improvements in public transportation. As such, policymakers are encouraged to continue advocating for public transit enhancements, as these improvements are unlikely to lead to significant housing market changes in Fresno. Additionally, the study highlights disparities in service perception among lower-income riders, underscoring the importance of addressing their concerns to improve overall satisfaction. The research also identifies key factors influencing passenger satisfaction on the Q Line. Together, these factors emphasize the need for a passenger-centered, inclusive, and well-rounded transit service. By prioritizing these elements, FAX can enhance the overall passenger experience and better meet the needs of the community.

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