

**Summary of Research Proposal**

**Topic**

**Developing High Density Residences Near Tren Urbano Stations:  
Financial Feasibility for Transit Supportive Apartments and Condominiums**

**Student Name**

**Colin M. Riley  
MIT Center for Real Estate and Department of Urban Studies and Planning**

**MIT Faculty Advisors**

**Ken Kruckemeyer  
Center for Transportation Studies**

**Qing Shen  
Department of Urban Studies and Planning**

## Introduction

The decision by the Puerto Rico government to invest over \$1 billion in Tren Urbano provides new opportunities for transit-supportive real estate investment projects at stations along the alignment. One of the aims of the Puerto Rico Highway and Transport Administration (PRHTA) in building Tren Urbano is to reduce congestion on San Juan's highways by providing commuters with a clean, efficient alternative to the private automobile. Transit Oriented Development (TOD) is proposed as a property development strategy that Tren Urbano needs to actively pursue, as system is built-out in future years. TOD projects advocated by groups such as the Congress for the New Urbanism (CNU) and Partners for Smart Growth propose mixed-use communities in which several property types (residential, office, retail, lodging, entertainment) diversify the origin and destination points in the transit trip generation matrix.

Theoretically, while TOD should work well to support transit ridership, the investment objectives of San Juan's private developers do not appear to include significant levels of this type of development. If TOD projects are to be realized in San Juan forecasts of relevant risk and return patterns need to be incorporated into the planning for new property development proximate to Tren Urbano stations and effective strategies developed to merge the interests of developers with those of Tren Urbano.

## Purpose of the Research

The purpose of the research is to estimate San Juan's real estate developers' reaction to new opportunities for Transit Oriented Development proximate to Tren Urbano stations. The focus is on the residential sector of the market. The limitation of the analysis to the potential for new housing that supports transit is imposed for two reasons. First, other sectors of the real estate development market related to San Juan's new transit system are being analyzed by colleagues at MIT and UPR and though each researcher's perspective is unique, the results will provide Tren Urbano with a range of perspectives on the relevant real estate sectors.

The second reason for the limitation to the housing development as a part of future mixed-use projects is that the behavior of each sector of a city's real estate market tends to exhibit unique economic characteristics. For example, the hotel sector in San Juan could experience a decline in building activity at the same time that housing projects are being built throughout the city. This strengthens the case for separate studies of real estate investment markets.

## Research Questions

The main research questions are:

- What is the expected level of developer reaction to Tren Urbano property development opportunities over the period 2000-2005 given the current structure of the San Juan housing development and financial markets?
- What role can Tren Urbano play in developing a successful transit supportive real estate development program?

### **Research Methods**

This research will use both quantitative data and qualitative information to estimate developer reaction to Transit Oriented Development proximate to Tren Urbano stations. The main research tools are drawn from corporate real estate finance, real estate economics, architecture, and urban transportation planning. The focus will be economics and finance and three models will figure prominently in the research. These are the Stock-Flow Model to estimate demand for housing, the Hedonic Model to forecast apartment rents and condominium prices in local areas near stations, and the Capital Asset Pricing Model to estimate the risk-adjusted discount rate for housing development in San Juan. The research will include interviews with developers, bankers and other real estate financiers, Tren Urbano staff, and San Juan city planners.

### **Information Gathered**

This research is the early stage and will attempt to build on the extensive body of research findings of previous UPR and MIT students who assessed TOD for Tren Urbano since the technology transfer program was implemented. The approach uses methods common to real estate economics and finance to forecast the level of developer interest in train station area property development programs. Most of the information gathered to date includes preliminary data on the range of investment asset classes available to Puerto Rican developers, the dynamics of real estate capital markets, profiles of property development companies, and recent transactions in San Juan real estate. This information shows that there is a well-developed real estate investment environment in San Juan. Based on newspaper reports and telephone interviews it is reasonable to conclude that the retail, industrial, and office sectors are the most active sectors of the real estate market. The residential development sector is dominated by for sale housing with both single family units and multifamily condominiums quite common. Demand forecasts and real estate industry indexes have not yet been collected but the trend shows that there are several large projects being built or about to begin construction. The 330-acre housing development at Caguas that includes 1,600 housing units to be built in eight separate communities between 2000 and 2007 is one example of the level of development in the San Juan market. None of these new developments is focused on Tren Urbano,

which means that demand for new housing program being built with high access as the main transportation mode.

### **Information Requested Being Gathered**

Information on the following areas is needed to advance the research to a mature stage.

- Aggregate demand for San Juan real estate sectors.
- Condominium prices and apartment rents for San Juan separated into smaller geographic units.
- Vacancy rates for apartments for a 20 to 30-year period.
- Building permits for apartments in San Juan Metropolitan Region.
- Construction cost estimates for recent housing developments
- Macroeconomic data and forecasts.

### **Future Work**

Three stations will be chosen as the points around which developer reaction will be estimated. The housing and land markets around these stations will be mapped so that vacant parcels can be identified and priced. The next stage is to propose a building program that best fits the profile of Transit Oriented Development for that area. Demand and prices will be estimated for the range of programs proposed and profits calculated using Discounted Cash Flow technique.