

Efficient Transportation and Land Use Planning in a Historical Center

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Advisor:

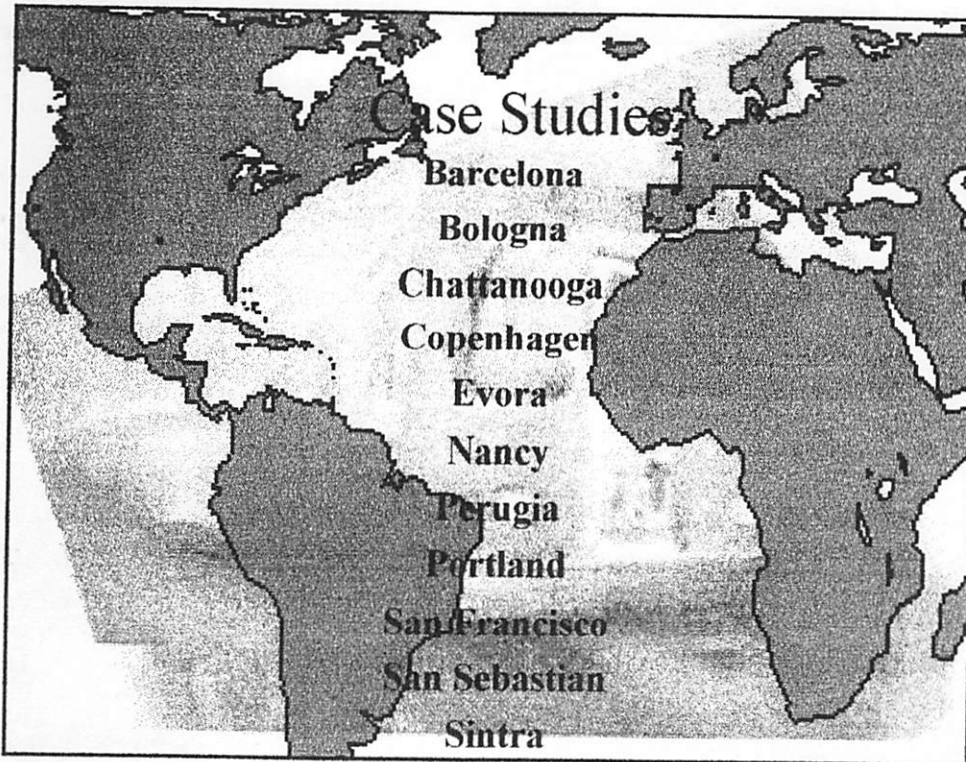
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Objectives

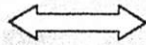
This research attempts to evaluate options for Transit-Oriented Developments (TOD) in Old San Juan (OSJ) that Tren Urbano (TU) could support. The scope of the project is summarized as follows:

- ◆ Study and present cities with similar characteristics to OSJ that implemented successful transit programs with improved pedestrian access and restrictions to car traffic
- ◆ Analyze how the studied strategies could be implemented in OSJ
- ◆ Recommend options that could achieve the integration of the historical district with the TU system, and that support the TOD in OSJ



Common Urban Problems

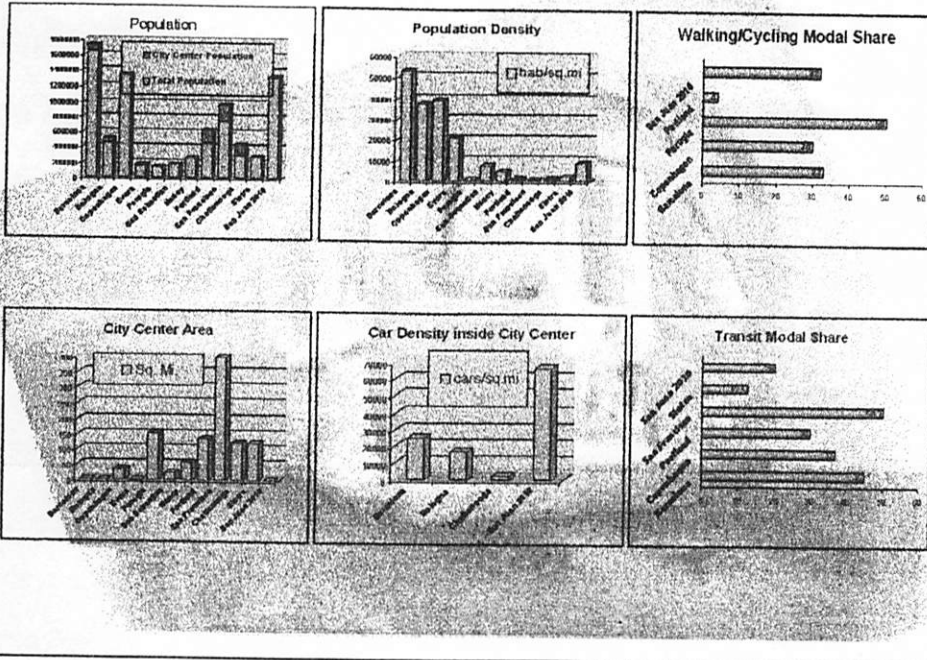
Case Studies



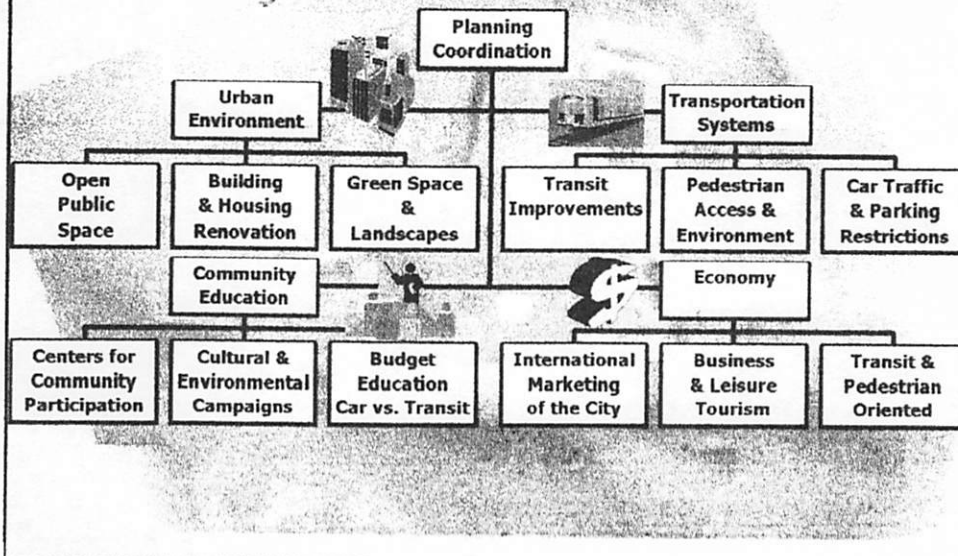
Old San Juan

- | | |
|--|--|
| • Traffic Congestion & Insufficient Parking (100%) | • Highest Vehicle Density & Parking Demand |
| • Lower Ridership (100%) | • Decreasing use of AMA & Metrobus |
| • Building Degradation & Destruction (64%) | • Abandoned Buildings & Damaged Pavement ("Adoquines") |
| • Topography & Narrow Streets (64%) | • High Slopes and Narrow Streets |
| • High Levels of Noise & Emissions (55%) | • Car Traffic Emissions and Noise in Narrow Streets |
| • Poor Urban Environment & Quality of Life (45%) | • Low Perceived Safety & Decreasing Population |
| • Inefficiency of Transit System (36%) | • Poor Trolley Mobility in Narrow Streets & Parked Cars at Intersections |
| • Lower Economic Activity & Unemployment (27%) | • High Percent of Population on Welfare or Unemployed |
| • Mobility Demand of Future Developments (18%) | • Golden Triangle Trip Generation |

Facts About Studied Cities vs. OSJ

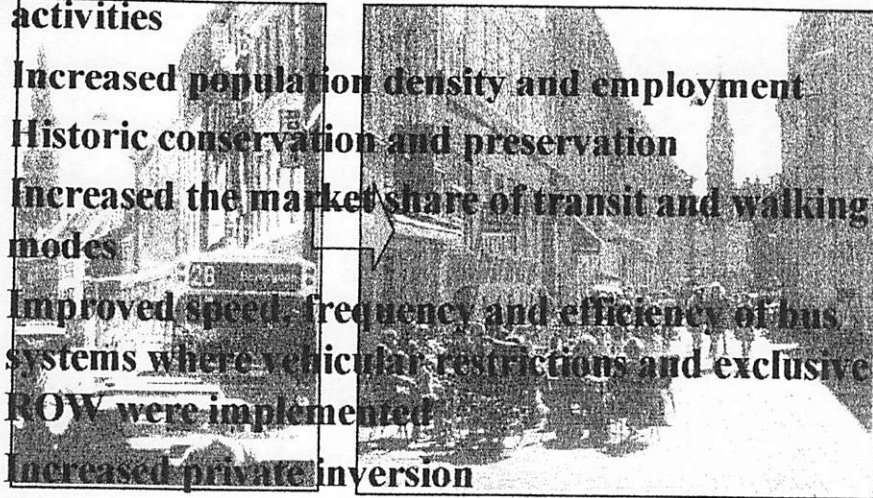


Successful Strategies Implemented at Studied Cities

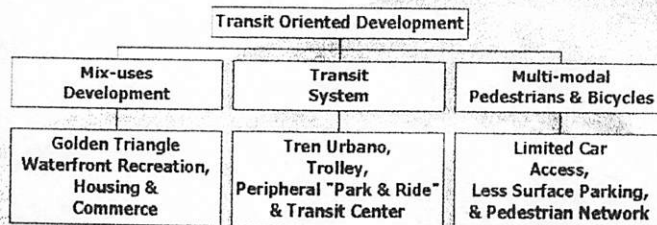


Results

- Increased quantity and diversity of economic activities
- Increased population density and employment
- Historic conservation and preservation
- Increased the market share of transit and walking modes
- Improved speed, frequency and efficiency of bus systems where vehicular restrictions and exclusive ROW were implemented
- Increased private inversion
- Reduced emissions, noise and energy consumption



What makes a TOD feasible in OSJ?



- **OSJ Community:**
 - 20% of the residents go to work walking.
 - 32% use the transit systems available, 15% use the trolley
 - Less than 50% own a car
 - The OSJ Community has a very active Residents Committee and Commerce Associations
- **OSJ historic and cultural character**
 - Attractive for residents, visitors, and investors
 - Tourist destination, mostly moving by foot, or transit
 - Important seaport area: high traffic of pedestrians from cruise lines
- **Aspects of physical design:**
 - size and relationship between buildings
 - uniformity
 - traditional human scale architecture
- **Funding Potential:**
 - FTA-21: Bike and Pedestrian Facilities
 - EPA and FHA: environmental technology vehicles
- **New developments:**
 - Golden Triangle will generate a traffic demand that exceeds the capacity of the available roads (Parmegiani, MII)
 - The Tren Urbano System could reach the Isleta and OSJ area or somewhere near

Future Work

- Evaluation & Recommendations on Trolley Service
 - Product Design Specifications (PDS) for Vehicle Selection
 - Traffic Generation for Routes
 - Vehicular Traffic Limitations
- Transit Center Location
 - Future Developments
 - Tren Urbano
- Life Cycle Assessment

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