Site Suitability Analysis for Transit Oriented Development in Portland

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Introduction

With the increasing strain on Portland's infrastructure from the influx of new residents, it is becoming ever more important to encourage the use of alternative transportation methods. Portland's push towards Transit Oriented Development (TOD) has been years in the making. Transit Oriented Development (TOD) is a type of dense, mixed-use development located within walking distance to frequent transit stations. It is usually followed by commercial development such as grocery stores, office, and retail stores within a walkable neighborhood. TOD, when done right, may be able to capture the potential of quality transit and address Portland's increasing housing demand.

Some well-known TOD sites in the Portland Metro area include the Orenco and Quatama Max Station areas on the Max Blue Line, built in the late 1990's. Both sites are located in proximity to big employment centers, Intel and Nike campus in Hillsboro. The areas feature dense, mixed-use development and walkable street network, with destinations such as grocery stores and shopping malls nearby.

However, Portland's TOD typology is out of date, and one of the last applications of its framework was back in 2012. With the new investments in transit, the size of the traditional transit-catchment areas has vastly increased since then. We seek to update Portland's methodology in seeking sites for Transit Oriented Developments within city limits based on current practices (synthesized through a literature review). We will then identify potential sites with a tiered categorization to inform potential investors and city officials of which sites meet the criteria, and each of the sites' advantages and disadvantages.

Research Ouestion

What are some potential sites suitable for **Transit Oriented Development in Portland?**

Methodology

We applied a combination of buffering, network analysis (service area) and weighted overlay method to identify sites suitable for TOD within Portland city boundary. Previous research indicates the success of TOD projects depends partially on walkability, proximity to retail stores, population density, and appropriate change in zoning codes. To prioritize equity and minimize displacement, we added proximity to schools, parks, community centers, and libraries to the criteria. We then applied two additional sets of criteria to identify sites most suitable for equitable development and family-oriented development.

- 1. Identified general criteria and buffer/network analysis distance based on literature review. Criteria used are distance to transit stations, bike facilities, community centers, grocery stores, parks, libraries, and schools; availability of sidewalk; the size of taxlots and the year the structure was built.
- 2. Used Network Analysis—Service Area tool to create walksheds to amenities. Distances used were the following: Frequent Bus Stops (defined as serviced every 15 minutes during peak hours) - 1500 feet, MAX Stop - 1/2 mile, Community Centers - 1 Mile, Grocery Stores - 1/2 Mile, Schools - 1/2 Mile, Parks - $\frac{1}{2}$ Mile, Libraries - 1 Mile, Bike Facilities - $\frac{1}{2}$ Mile
- 3. These criteria, in addition to population density, intersection density and zoning, were weighted on a scale of 1-9 using the Weighted Overlay Tool to identify high-potential areas. For our Family Development scenario, we utilized ACS data on youth populations and prioritized distance to schools, as well as parks that have both playgrounds and 'recreational facilities' (basketball courts, tennis courts, soccer fields). The parks Service Area was also reduced to $\frac{1}{3}$ mile. For our Equity Development, we looked at Elderly populations (defined as 55 and above), Household Income below the City's average (under \$60,000), youth population
- 4. Select By Location and Select By Attribute were used to filter candidates based on taxlot size (larger than 0.60 Acres), age of the structure on the taxlot (2007 older), zoning (no existing Mixed Use Development or Multi-Family Residential due to diminishing returns on increasing housing stock), ownership (not owned by a church or the City, State or Metro), and with a total taxlot value of \$15,000,000 or less (to bring down the cost of the development).
- 5. Spatial Join was used to calculate the proximity to different Bus Lines. Taxlots that had access to either 2 Bus Lines or both a Bus Lines and MAX station were prioritized
- 6. 1 mile Buffers were created around the final candidates to determine intersection density and variety of zoning around the sites. These were ranked first by intersection density, then land use zoning diversity.





The City of Portland has high potential to continue its goal of dense, sustainable development. The projected Mixed Use Development patterns and increase in public transit investments outlined in the City's 2016 Comprehensive Plan will greatly expand viable areas for Transit Oriented Development. Our areas are split into two categories: Continuing Development and Catalytic Investment. Continuing Development Areas are areas of very high density and coverage by all walksheds, indicating complete neighborhoods and very high walkability. Catalytic Investments are areas that have potential for TOD, though these developments might necessitate the accommodation of parking due to the areas' lower rates of walkability and lack of access to advanced bike facilities



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Conclusions

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