Station Area Planning for Mass Transit in India:

Discussions for the Indian Context

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bu Beyond Urban



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Glossary

Transit Oriented Development (TOD)¹

A planning and urban development strategy of compact, walkable, pedestrian-oriented, mixed-use areas within walking distance of a transit station.

• Area of influence/influence zone/local area/station area²

The area demarcated in the immediate vicinity of a transit station, which is within a walking distance, having high density compact development with mixed land use to support basic needs of the residents.

• Station Area Planning (SAP) ^{3, 4}

A planning process of incorporating the principles of TOD and implementing them as per the need and uniqueness of different areas around metro stations in a city.

Catchment area of a metro station ^{5, 6}

The area around a metro station that attracts most of the non-transferring passengers using that particular station for public transport.

- 1. <u>http://www.tod.org/</u>
- 2. https://www.itdp.in/wp-content/uploads/2013/01/Station-area-panning.pdf
- 3. https://www.itdp.org/library/standards-and-guides/tod3-0/what-is-tod/
- 4. http://www.reconnectingamerica.org/assets/Uploads/tod202.pdf
- 5. https://www.witpress.com/Secure/elibrary/papers/UT08/UT08017FU1.pdf
- 6. https://journals.sagepub.com/doi/abs/10.1177/03611981231189738

Introduction

Growing number of metro rail systems in India

MoHUA's National TOD policy

Station Area Planning (SAP) an important aspect of Transit Oriented Development (TOD)

Half-mile (approx. 800 m radius) circles around metro stations as a 'thumb rule' as per studies done in developed nations

Walking distance of 500-800 m around stations mentioned in National TOD policy

Question: Is replicating 500-800 m walking distance as the basis of demarcating transit influence zones appropriate in the Indian context?



Ridership of Metro in Indian Cities

Fig. 2: Ridership of Metro in India's Million+ Cities

(Sources: Projected daily ridership from DPRs and actual daily ridership from press articles)



5,347,000

Station Area and its Delineation as per National TOD Policy, 2017



Fig. 3: Area of influence around metro in a TOD

(Source: MoHUA's National TOD Policy, 2017)

What does MoHUA's National TOD Policy suggest about influence zones?

- The area in the immediate vicinity of the transit station, within a walking distance, having high density compact development with mixed LU to support all basic needs of the residents is called the **influence zone** of a transit station.
- It is generally up to a radius of nearly 500-800m of the transit station. Where the distance between the transit stations is less than 1 km and there is overlap in the influence area, it can be identified as a delineated zone (around 500m) on either side of the transit corridor within 10 12 minutes walking distance.
- The area of influence, should be demarcated and notified through **master plan** and **local area plans** before implementation.

Walking and SAP: Walking in India



* (Total walk to work trips/Total work trips)*100



Population Density 2011 (persons per sqkm)

Fig. 5: Denser cities have greater share of people walking to work

(Data Source: Census of India, 2011)

Walking and SAP: Walking in Indian Cities

Fig. 6: How many and how far do people travel for work in million+ cities? (*Data source: Census of India, 2011*)

8 out of the 11 cities studied, have more than 50% share of workers walking more than 1.5 km to work.

LEGEND % of people walking to work % of people walking <1.5 km as share of all walk to work trips % of people walking 1.5-5.5 km as share of all walk to work trips % of people walking 5.5-10 km as share of all walk to work trips



Diversity in Indian Cities

Table 1: Population density and its correlation with other variables(Sources: Census of India, 2011)

	Population Density, 2011	Projected Population Density 2020	Road Density	2-wheelers per 1000 people	% of People walking to work	% of men walking 6- 10 km for work
Population density, 2011 (per sq. km)	1	0.997**	0.707*	-0.667*	0.714**	0.604*
Projected population density, 2020 (per sq. km)	0.997**	1	0.738**	-0.671*	0.702*	0.594*
Road Density (per sq. km)	0.707*	0.738**	1	-0.236	0.459	0.366
2-wheelers per 1000 people	-0.667*	-0.671*	-0.236	1	-0.477	-0.732**
% of People walking to work	0.714**	0.702*	0.459	-0.477	1	0.331
% of people walking 6- 10 km for work	0.604*	0.594*	0.366	-0.732**	0.331	1

' Significant at α=0.05

** Significant at α=0.01



Fig. 7: Denser cities have lower private vehicle ownership (Source: Ministry of Road Transport & Highway's Road Transport Yearbook, 2019)



Fig. 8: Denser cities have denser road network (Source: Analysis on GIS using data from Open Street Map)

What can be done?



Importance of Context Specific Expanse of a Station Area



Results and Discussion

Findings

- Metro ridership in Indian cities is observed to be low in comparison to initial estimates
- Willingness to walk in Indian cities seems to be higher than the globally assumed threshold of 800 m (in 10 minutes)
- Recognizing the heterogeneity across Indian cities could hold crucial influence for plan and policymaking



Conclusion

- Being cognizant of the actual influence area sizes is important to maximize the ridership and development potential
- Although policies can give guidelines to carry out a SAP, but the approach needs to be context driven



Thank You

