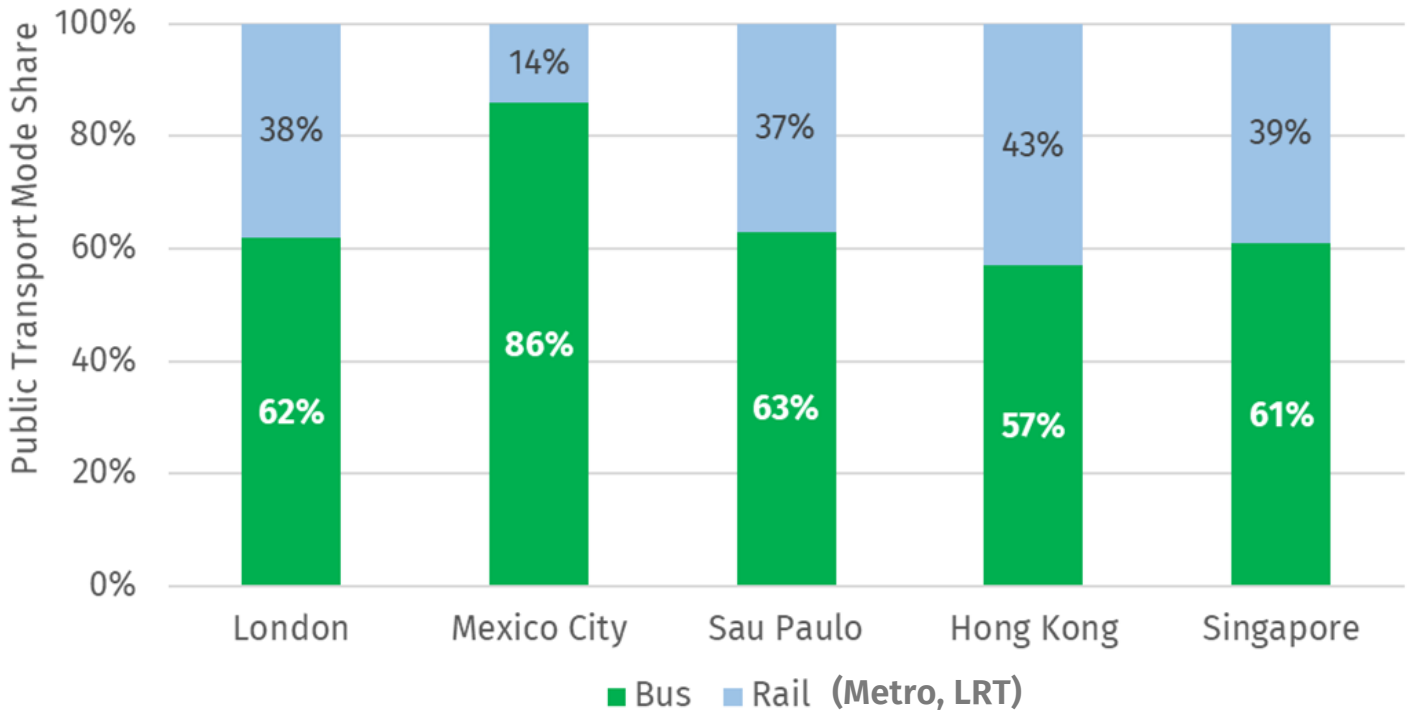
Location: Finolex Chowk | Image Source: ITDP

BRT & Metro Integration for the Mumbai-Pune Highway

ITDP India | 2024

Public Transport mode share Rail vs Bus in major world cities



Various modes of Mass Rapid Transit can easily coexist, complementing each other and ultimately maximizing the overall public transport usage.

Source: CoE, CRDF, CEPT University

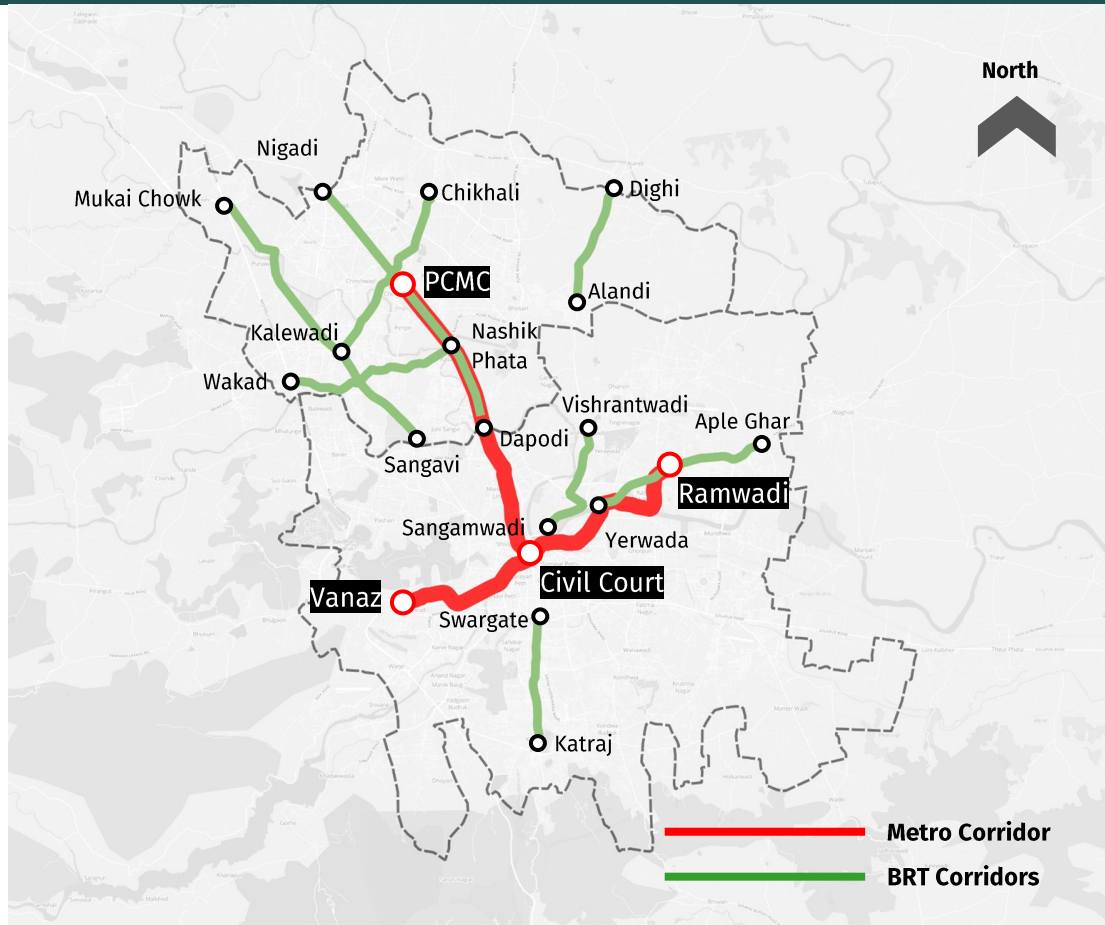
What's happening around the world

Cities	City Area (sqkm)	Population (lakhs)	PT Network (km)			Buses / 1 Lakh Pop	% PT of 100% Motorised Share
			Metro	LRT / Tram	BRT/BPL		
London	1572.2	78.3	404	59	250	96	59%
New York	783.83	81.8	394		25	32	33%
Hong Kong	80.6	13.2	175	30		57	84%
Singapore	714.3	56.4	139	8		77	50%
Paris	105.8	22.5	213	31.4	41.7	30	68%
Copenhagen	74.7	5.5	21			124	22%
Seoul	605.2	102.5	350		43	73	63%
Tokyo	622	88.5	291	22		11	81%

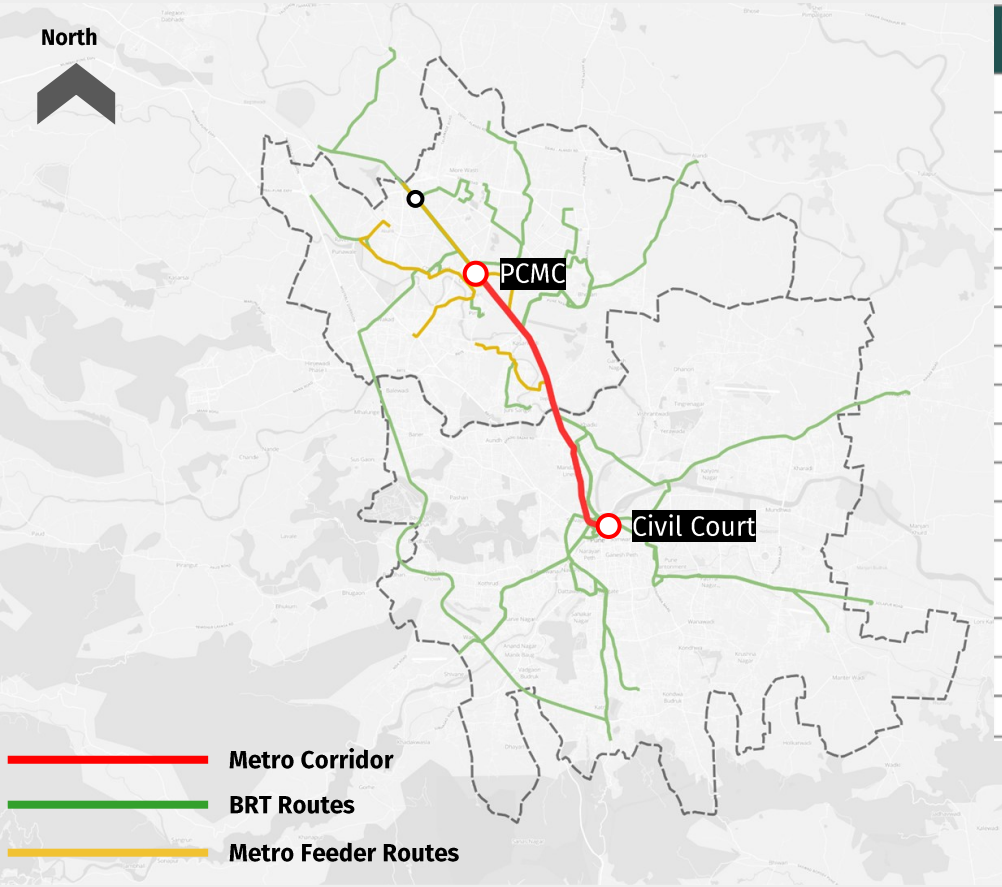
Source: CoE, CRDF, CEPT University

Nigdi - Dapodi :2nd highest Ridership BRT Corridor

S. No	Corridor	Total Trips	Daily Ridership	Buses/ Hour
1	Swargate - Katraj	2023	118775	56
2	Nigdi - Dapodi	2047	116500	57
3	Yerwada - Wagholi	1832	96527	51
4	Dighi - Alandi	1157	73202	32
5	Sangavi - Kiwale	1157	66688	32
6	Sangamwadi - Vishrantwadi	564	25532	16
7	Kalewadi - Chikhali	398	22202	11
8	Nashik Phata - Wakad	148	11570	4
Total		**9326**	**5,30,996**	



Routes operated through Dapodi - Nigdi BRT Corridor

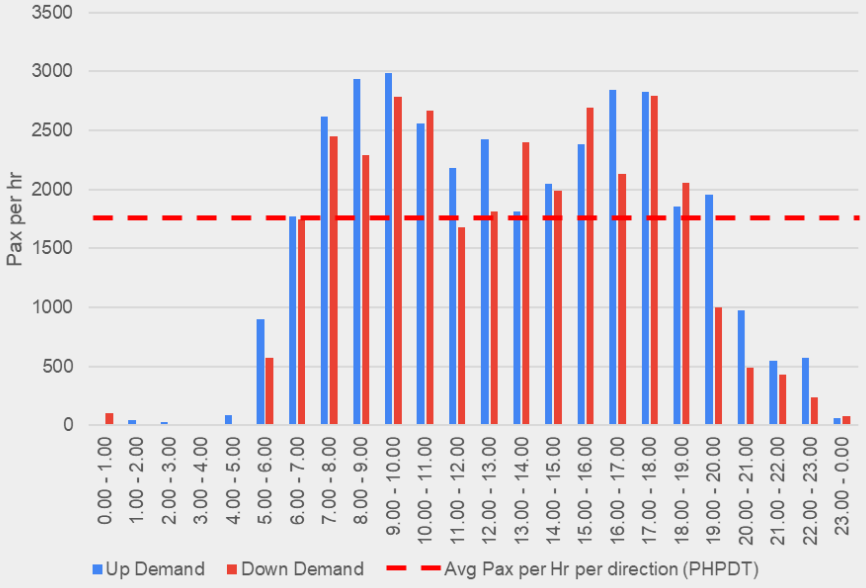


Route No.	Origin	Destination	Ridership	Headway In min
121	Manapa	Bhosari	10072	10
123	Manapa	Nigadi/Bhakti Shakti	8628	15
299	Katraj	Gokhalenagar	8073	150
357	Pune Station	Bhosari	7711	10
12	Upper Depot	Nigadi	7477	25
139	Bhekarai Nagar	Bhakti Shakti/Nigadi	5707	30
323	Chikhali	Manapa	4079	40
122	Manapa	Chinchwadgaon	3191	20
42	Katraj, Gujarwadi Stand	Nigadi	3016	15
281	Varje Malwadi	Nigadi/Bhakti Shakti	2827	50
366	Pune Station	Nigadi	2266	35
317	Pune Station	Sambhajinagar	2192	40
312	Pune Station	Chinchwadgaon	2100	25
262	Manapa Bhavan	Dehugaon	1160	135
339	Katraj Gujarwadi	Sant Nagar, RTO	960	90
347	Sangavi	Alandi Darshan	259	165
311	Pune Station	Pimprigaon	245	75

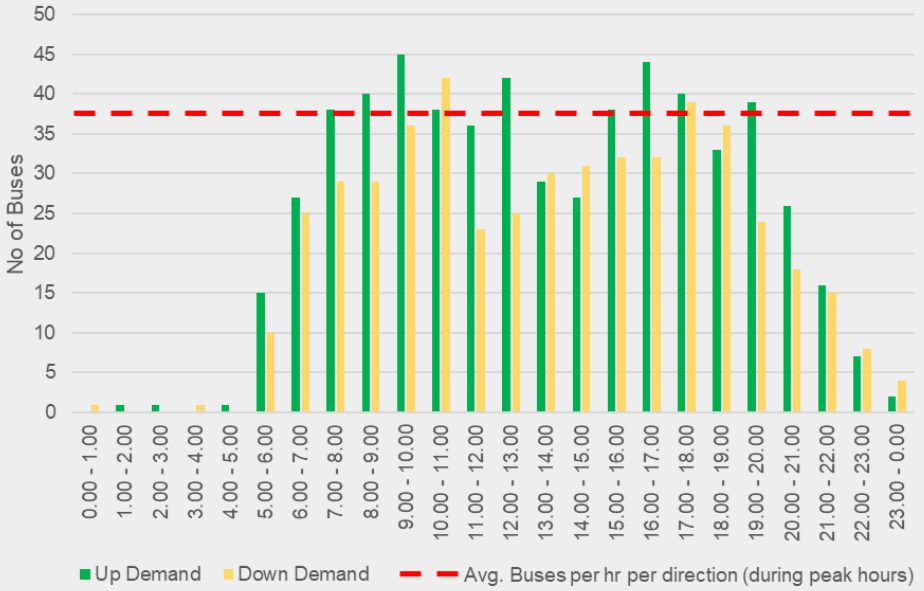
Currently, 17 routes run through the BRT corridor - catering to 1.16 lakh people per day

Demand Profile of Dapodi - Nigdi Corridor

Passenger Demand/hour



Buses operated/hour

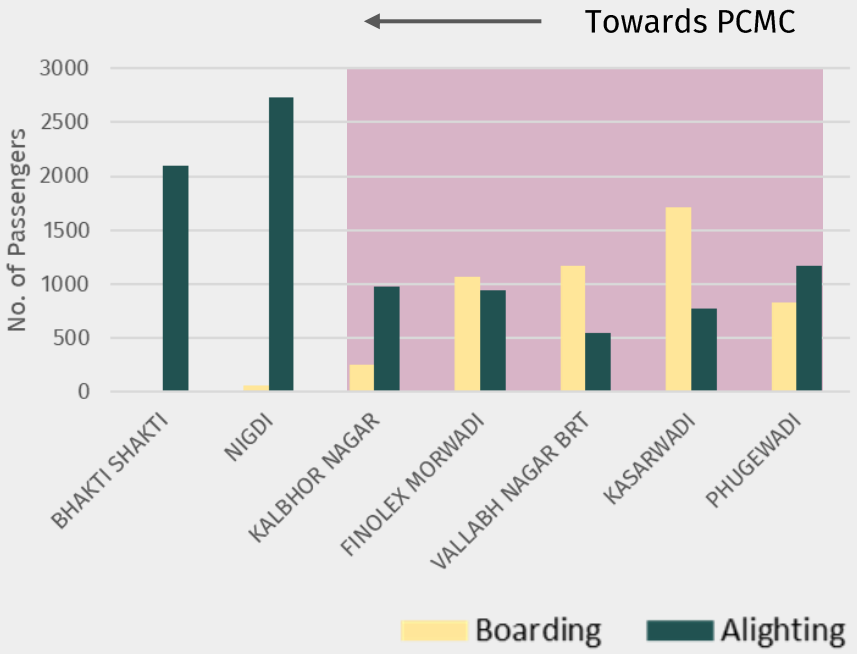


On an average 2000 passengers travel on both sides each every hour

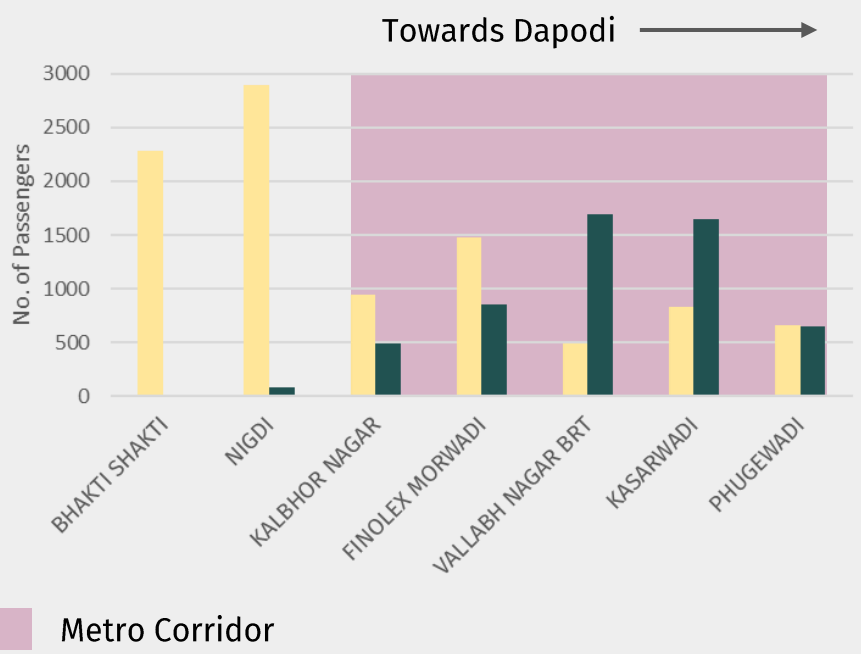
On an average 37 buses (1.6 minutes) are operated per hour per direction (during peak hours)

Boarding and alighting on BRT between Metro Corridor

Up Direction (Full Day)



Down Direction (Full Day)



Boarding Alighting Metro Corridor

From the total ridership of BRT along Nigdi-Dapodi corridor, only 27.88% are Alighting / Boarding in the Metro Corridor.

Why do people use BRT?

User Perception survey to understand user Characteristics

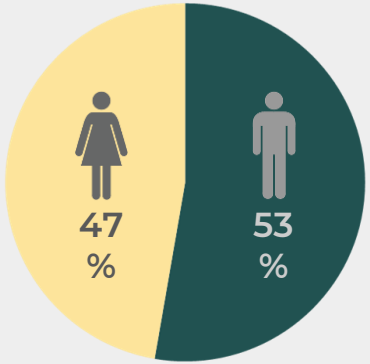
Gender

Access

Origin-Destination
+
Trip Length

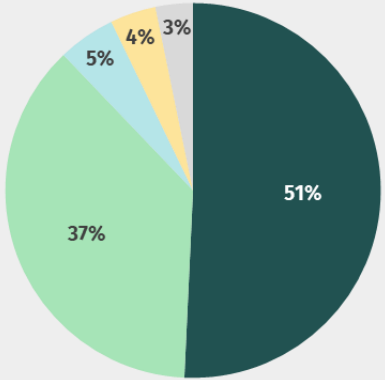
Affordability

Who are the BRT Users



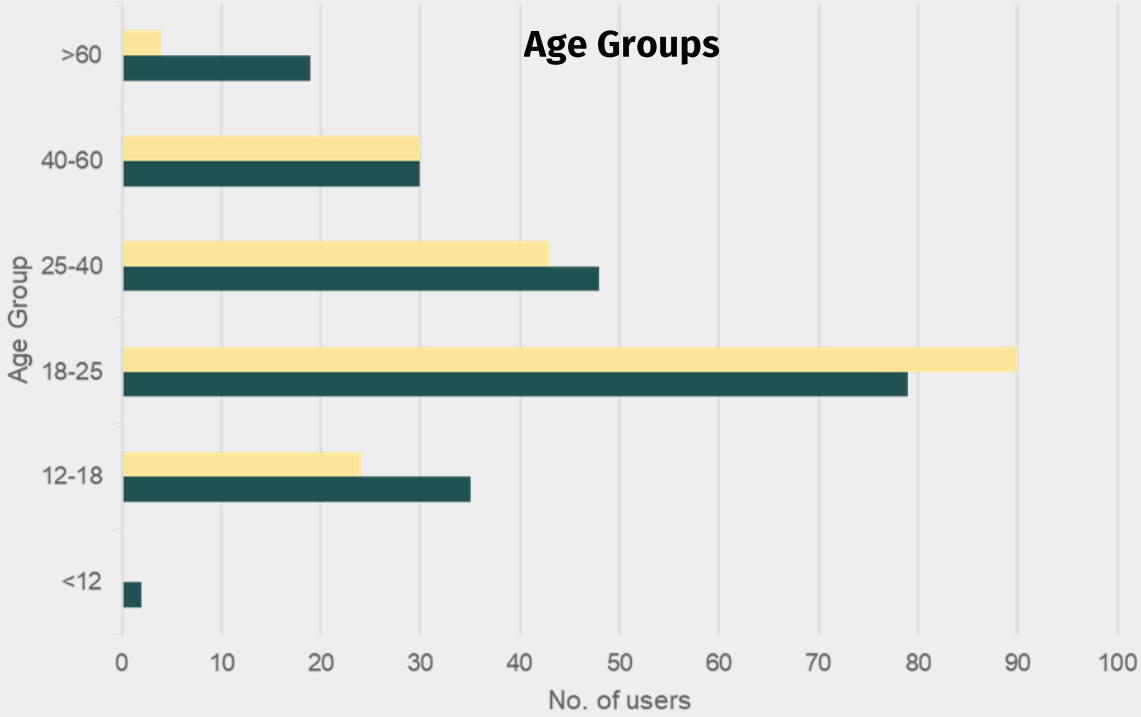
Gender Distribution taken for survey

Total sample size: 450 (1% of corridor ridership)



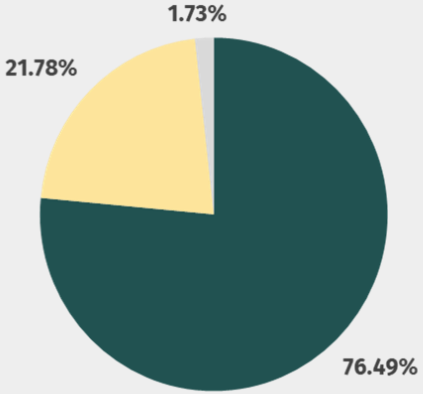
Occupation

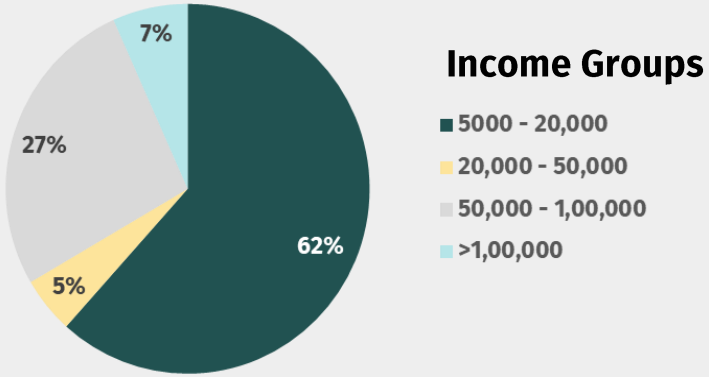
- Student
- Service
- Retired
- Homemaker
- Self Employed



The survey results determined that the majority of BRT users are students from age 18-25 group

How much BRT user spend of travel cost?





How much BRT and Metro would cost for income group below ₹20,000?

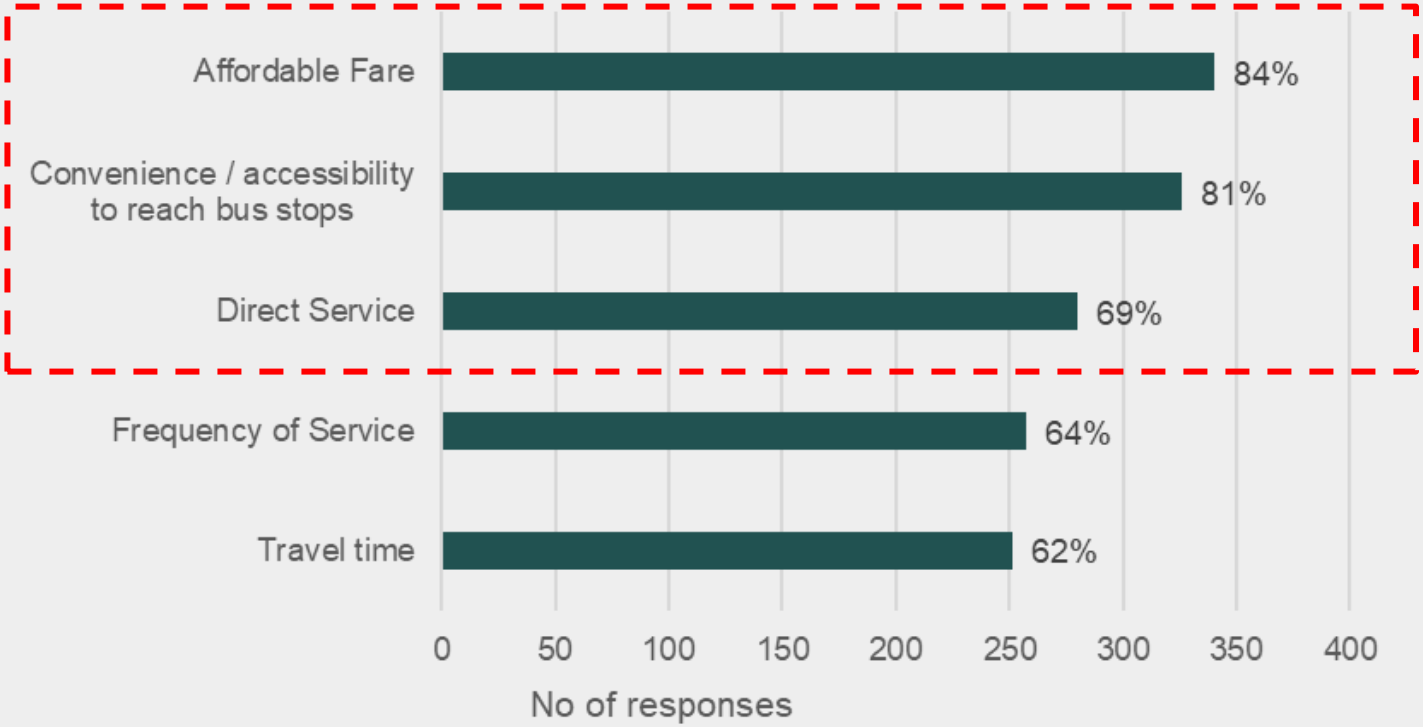
Avg Trip length of BRT user: 11km (one way)

	BRT	Metro
Daily round trip cost	₹30	₹50
Last mile connectivity (30%)	₹0	₹15
Daily round trip cost	₹30	₹65
Per month travel cost	**₹750**	**₹1625**
% of avg. monthly travel cost for income group of ₹5000 - ₹20000	**6%**	**13%**

BRT offers an affordable travel solution for those earning below ₹20,000, especially laborers and household workers, eliminating the need for last-mile connectivity.

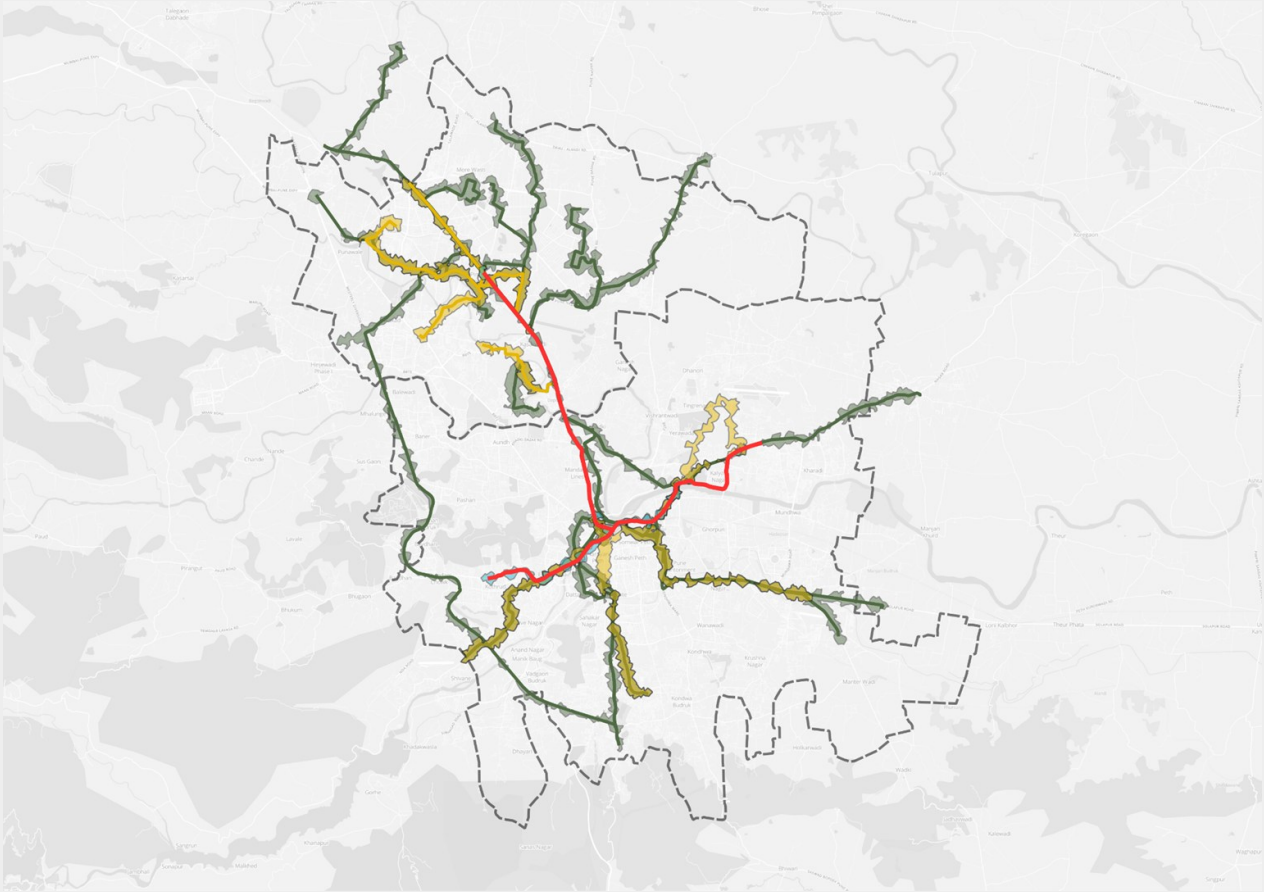
Why commuters prefer BRT over Metro?

What factors influence people to choose the BRT over the Metro for your commute?



Catchment Area of Metro and BRT

Metro + Bus + Feeder - Catchment Area



The area in 500m radius from the Metro Station is suitable to be accessed on foot.

Transit Service	Catchment Area of 500m radius (Area in km)
Metro	5.05
Metro + Feeder	40.34
Metro + Feeder + BRT	87.26

Metro Catchment Area

BRT routes Catchment Area

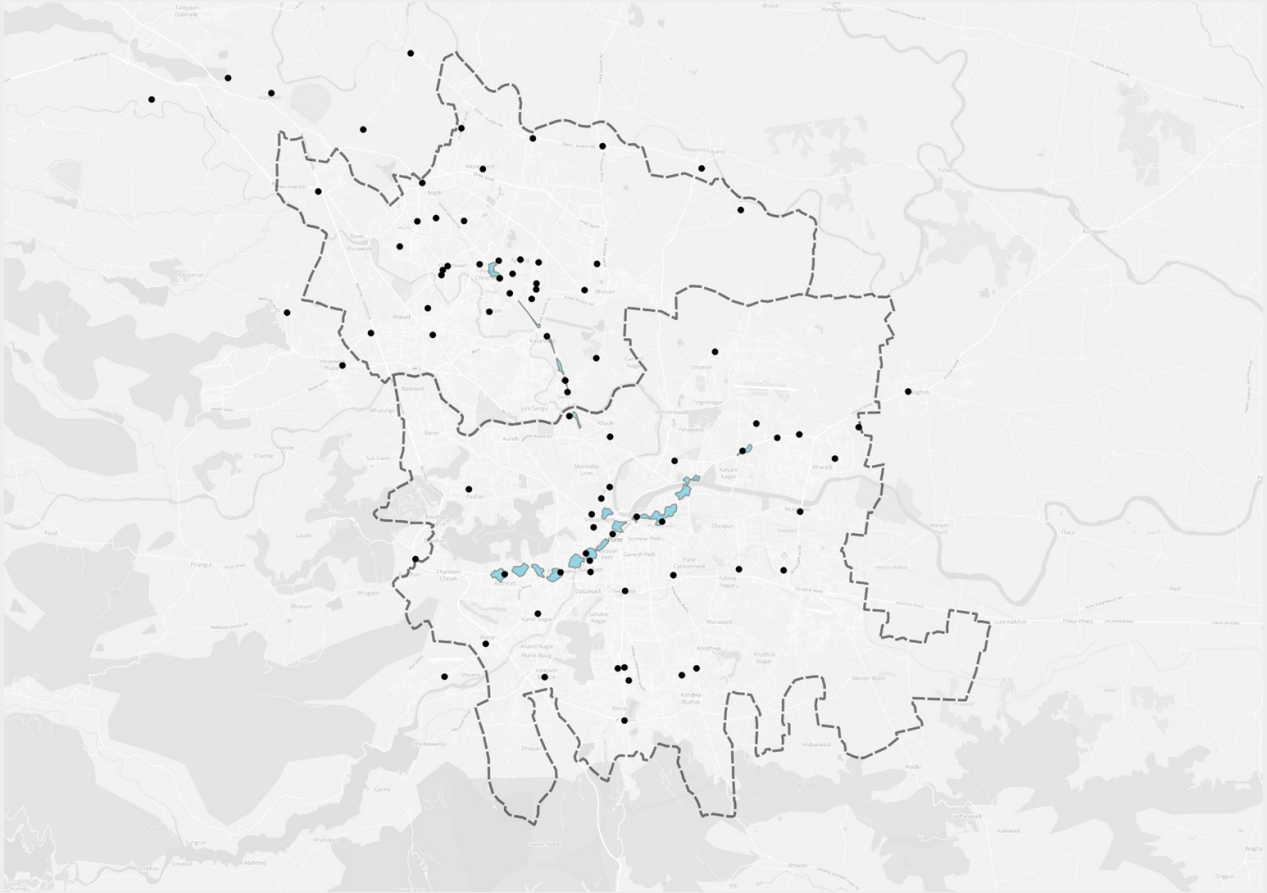
Feeder Routes Catchment Area

Metro Corridor

Bus Routes

Feeder Bus Routes

Origin Destination points under Metro Catchment

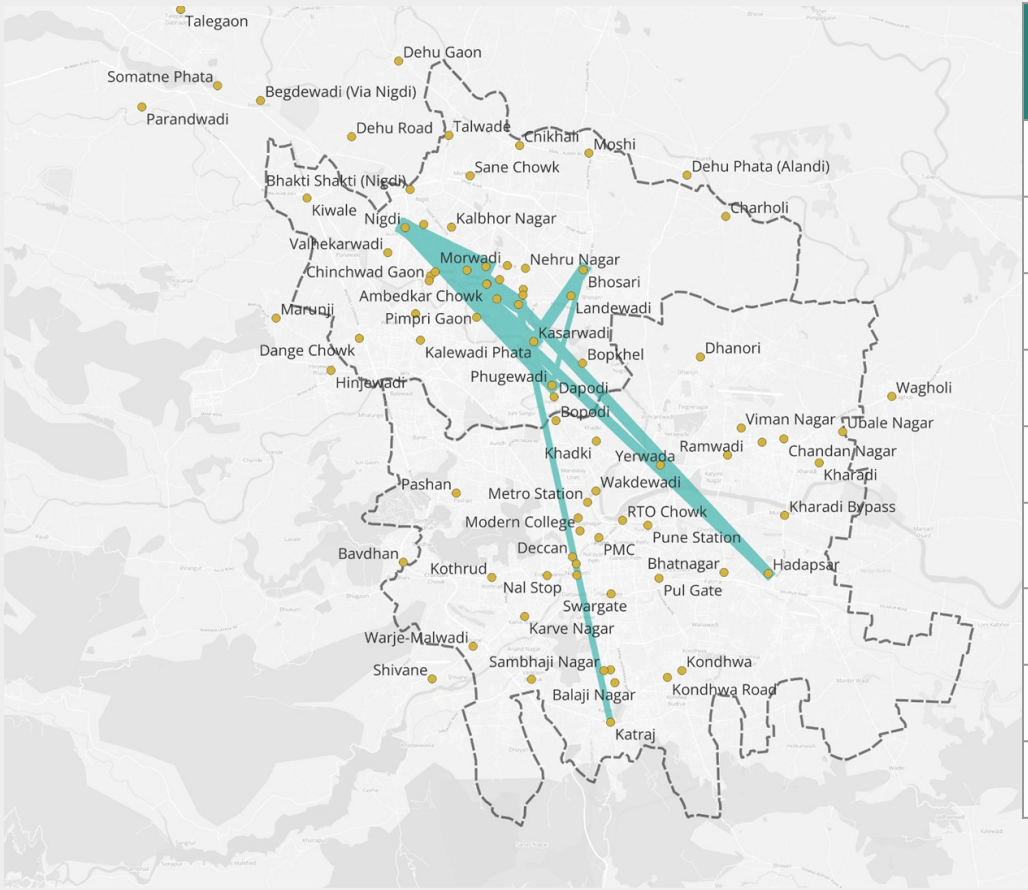


Only 10% of the Origin Destination points of BRT Users fall under the Metro Catchment Area.

Metro Catchment Area

OD Points

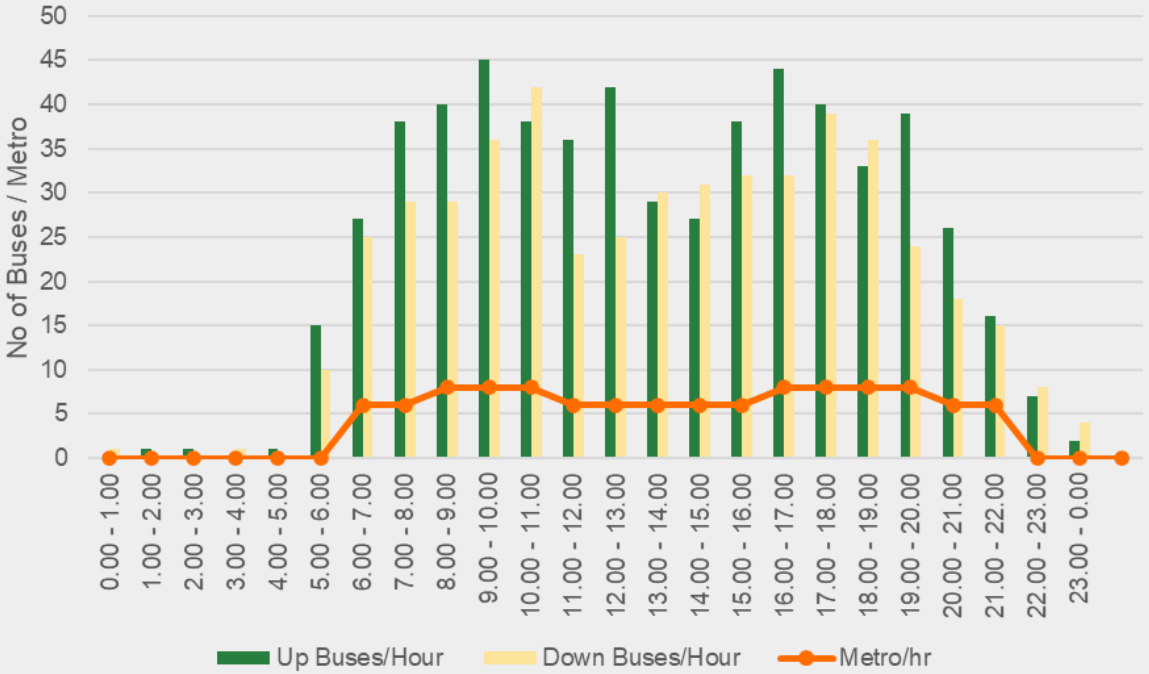
Top 10 Origin Destination Points of BRT users



Origin-Destination	% of trips	Distance (in Km)
Vallabh Nagar-Nigdi	8.91%	7.5
Morwadi-Nigdi	5.94%	4.5
Kasarwadi-Nigdi	3.71%	7.9
Phugewadi-Nigdi	2.97%	12.1
Kasarwadi-Bhosari	2.48%	6.2
Vallabh Nagar- Hadapsar	2.23%	19.3
Nigdi-Hadapsar	1.49%	25.5
Pimpri Chowk-Nigdi	1.24%	5
Nigdi-Katraj	1.24%	32.8

Good frequency but not physically integrated

Buses per Metro Rail Operated per hour



For every Metro Rail operated at the interval of 10 min, nearly 5 buses are operated. These buses could act as a good feeder to Metro.

Distance between Metro Station & BRT Stop

Metro Stop	Distance between Metro and BRT Stop (in mts)	
	North	South
PCMC	210	300
Sant Tukaram Nagar	250	270
Bhosari	-	192
Kasarwadi	196	373
Phugewadi	-	158
Dapodi	100	330

On an average, BRT stops are located 250m away from the Metro Station. Which makes them invoinent for user to access them directly from Metro Station

Bus Routes along Nigdi-Dapodi BRT Corridor

ITDP INDIA

Route No.	Ranking				Share of Ridership	Ridership	Headway in Min	% Route Parallel to BRT
	Ridership Rank	Headway Rank	% of Route Parller to BRT	Total Rank				
121	3	4	2	9	14%	7711	10	50%
357	2	4	2	8	11%	10072	10	49%
123	2	3	3	8	12%	8628	15	69%
122	1	3	4	8	5%	3016	15	69%
12	2	2	4	8	11%	3191	20	83%
139	2	2	4	8	8%	2100	25	57%
42	1	3	3	7	4%	7477	25	83%
312	1	2	3	6	3%	5707	30	70%
317	1	1	4	6	3%	2266	35	69%
262	1	1	4	6	2%	4079	40	57%
366	1	1	3	5	3%	2192	40	83%
323	1	1	3	5	6%	2827	50	69%
281	1	1	3	5	4%	245	75	48%
299	2	1	2	5	12%	960	90	36%
311	1	1	2	4	0%	1160	135	83%
339	1	1	2	4	1%	8073	150	34%
347	1	1	1	3	0%	259	165	22%

Multimodal integration: BRT with Metro

Frequency

Behind every Metro Rail which is operating at interval of 10 minutes, 5-6 buses ply through the BRT Corridor, which is sufficient to cater to the demand.

Quick Feeder

BRTS can provide quick feeder service to the Metro without getting delayed in mix traffic.

Seamless Transfer

Physical, Fare and information integration with BRT can enable seamless transfer from one Rapid Transit to another

Improvement in Metro Ridership

With seamless transfer and quick feeder service, BRT can bring more passenger to the Metro those who travel for long distance

Recommendations

Actions to be taken by PMPML, MahaMetro & PCMC

The focus should be on overall improvement of Public transport (BRT & Metro combined) by increasing user convenience and accessibility to attract more users and improve ridership.

Service Integration	**MahaMetro** **PMPML**	Align Bus time table with Metro's arrivals departures accurately
Information Integration	**MahaMetro** **PMPML**	Provide offline information about bus/metro services at exit gate of metro station/bus stops
Physical Integration	**MahaMetro** **PCMC**	Relocate BRT Stops at 50 m close to Metro entry/exit. Install way findings at Metro Station
Fare Integration	**MahaMetro** **PMPML**	Common ticketing platform for seamless journey