INDIA RESOURCES TRUST

Hubli City Bus and Auto rickshaw Service Analysis

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Acknowledgement

I would also like to acknowledge the integral support from **India Resources Trust (IRT)** towards the project who have constantly been working to lead change for a sustainable world, and I would like to thank **IRT** for providing me this opportunity to work on this project.

Introduction: Hubli City Public Transport Scenario

The Public transportation in Hubli relies primarily on city buses run by the NWKRTC and IPT including private auto rickshaws which run as taxis and on specific routes. The auto rickshaws are a flexible mode that provides point to point services which are currently not metered but instead fares are decided by the drivers and can be negotiated by the users before hiring them. Alternatively they can be shared along high density corridors where drivers usually accommodate five passengers but may accommodate as many as seven or eight passengers at a time.

The NWKRTC operates different services for Hubli-Dharwad which include intra-city services for Hubli and Dharwad, Inter-city services between Hubli and Dharwad and Sub-Urban services. The following figure compares the services provided in each of the operations.

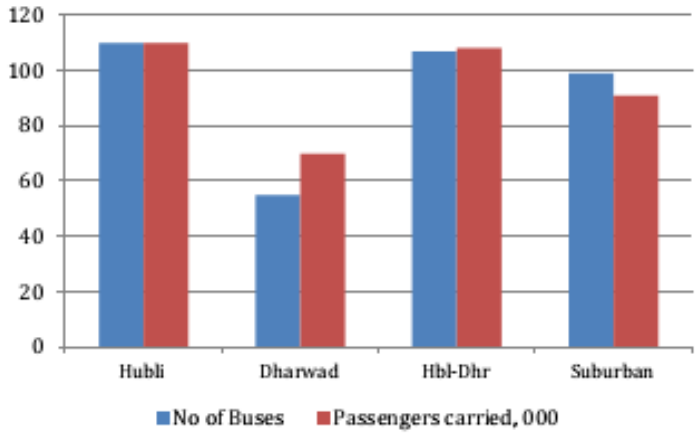


Figure 1: NWKRTC Services Statistics

The NWKRTC has two bus depots in Hubli and one in Dharwad which accommodates buses for inter-city as well as intra-city operations. The depot wise fleet size has been presented below. The city services of Hubli are served by 114 buses.

Depot	Hubli-Dharwad Intercity	City Services
Hubli-I	8	94
Hubli-II	102	20
Dharwad	0	55
Total	**110**	**169**

Table 1: Bus Fleet Details

The majority of intra city routes in Hubli originates from the CBT and radiate towards the residential neighborhoods of the city. In addition there is a circular route from the CBT via Laxminagar and Mantur Colony. The route network for the services has been shown below. For the purpose of the study specific corridors have been identified and analysis of each corridor has been presented later in the report.

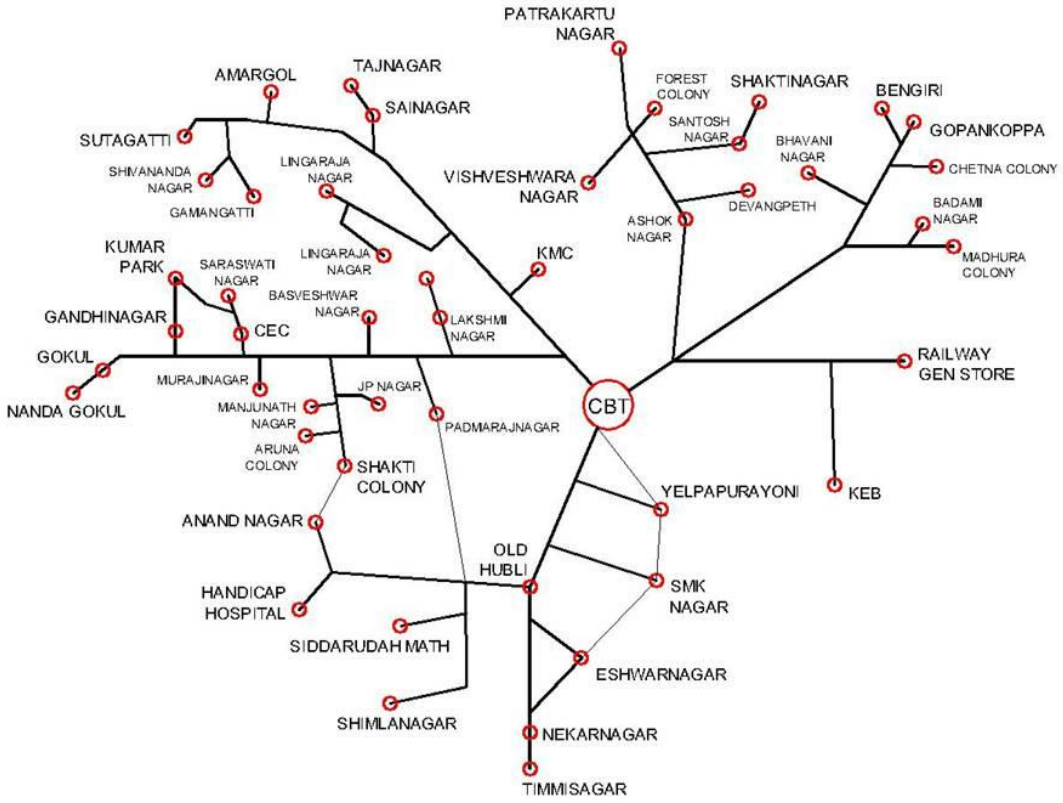
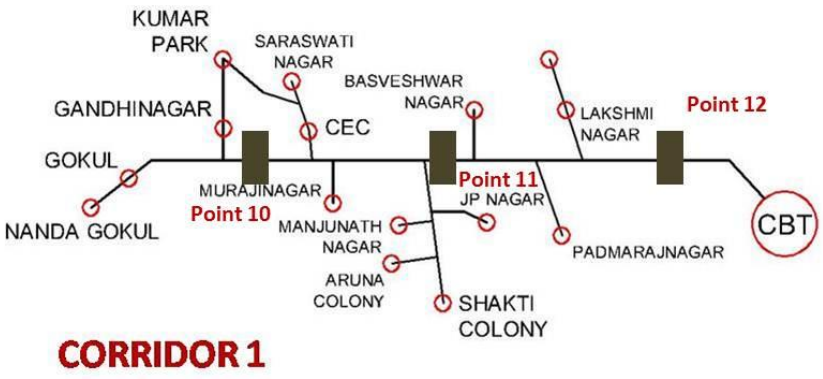


Figure 2: Route Network of Hubli City Bus Services

Corridor analysis

Gokul road corridor:

The corridor serves a number of residential neighborhoods along the route. The most important residential areas services are Gokul, Gandhinagar and surrounding areas which combined are serviced by 50% of the bus trips on the route. Three points to capture traffic were chosen. The point 12 at Hosur captured the complete traffic directed to the corridor. The point 10 was aimed at capturing traffic exclusively directed towards Gokul and Gandhinagar. Counts were conducted at an intermediate point to accommodate traffic towards Shakti Colony and Saraswati Nagar (Point 11).



Characteristics of the Corridor:

Vehicle counts

The bus frequency during peak hours is sufficient and frequency during peak hour is higher than the average number of buses per hour for the entire corridor calculated for the day (calculated for a period of 15 hours- 0600 to 2100 hrs).

		Section 1		Section 2		Section 3	
		Observed	Scheduled	Observed	Scheduled	Observed	Scheduled
Number of buses/hr	From CBT	13	11	36	14	26	18
	Towards CBT	15	11	31	14	24	18
Number of autos/hr	From CBT	43		94		250	
	Towards CBT	46		110		230	

Table 2: Vehicle Counts along Corridor 1: Towards Gokul

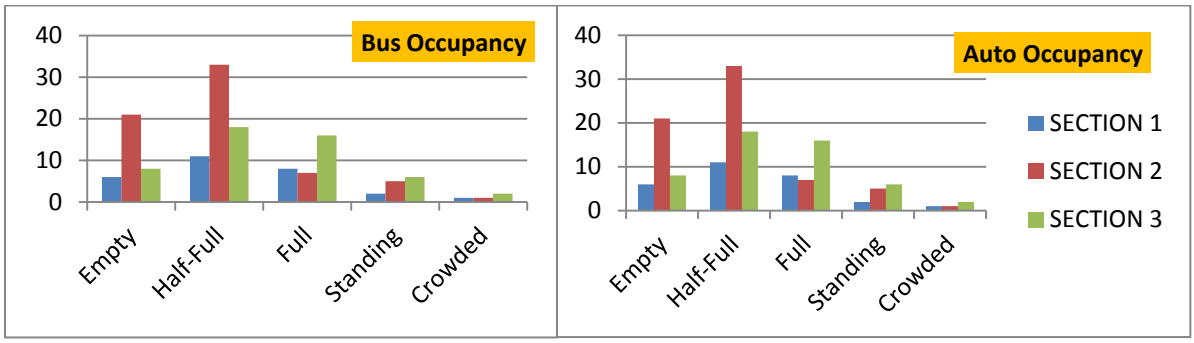


Figure 3: Vehicle Occupancy along Corridor 1: Towards Gokul

Passengers Catered

Despite a number of buses running empty and half empty, the buses cater to a large volume of passengers as compared to auto rickshaws. Moreover the frequency of buses is reasonable and density of auto rickshaws is low, therefore improvement in bus frequency is not required.

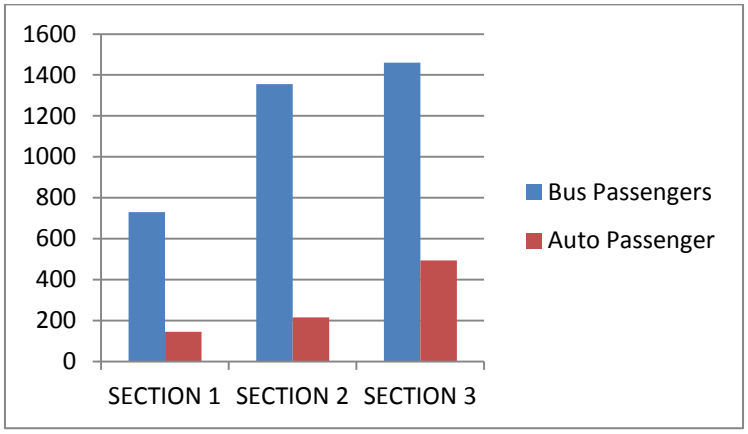
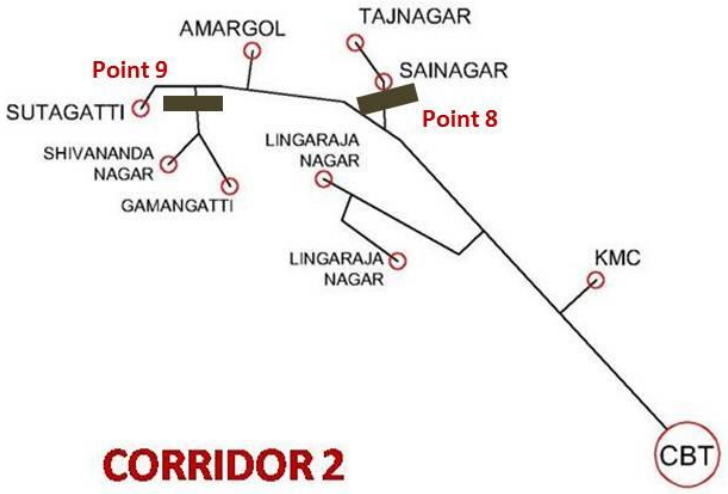


Figure 4: Passenger Volumes along Corridor 1: Towards Gokul

Navanagar corridor:



The Navanagar corridor has high volumes of inter-city buses along the corridor and therefore counts along the trunk corridor was avoided due to ambiguity. The counts were taken on routes of important destinations for the city bus services: Tajnagar(Point 8) and Gamangatti(Point 9).

Characteristics of the Corridor:

Vehicle counts

The corridor has low volumes of auto rickshaws and a good frequency of buses to the destinations.

		Section 4		Section 5	
		Observed	Scheduled	Observed	Scheduled
Number of buses/hr	From CBT	9	7	4	5
	Towards CBT	7	7	8	5
Number of autos/hr	From CBT	30		34	
	Towards CBT	41		34	

Table 3: Vehicle Counts along Corridor 2: Towards Navanagar

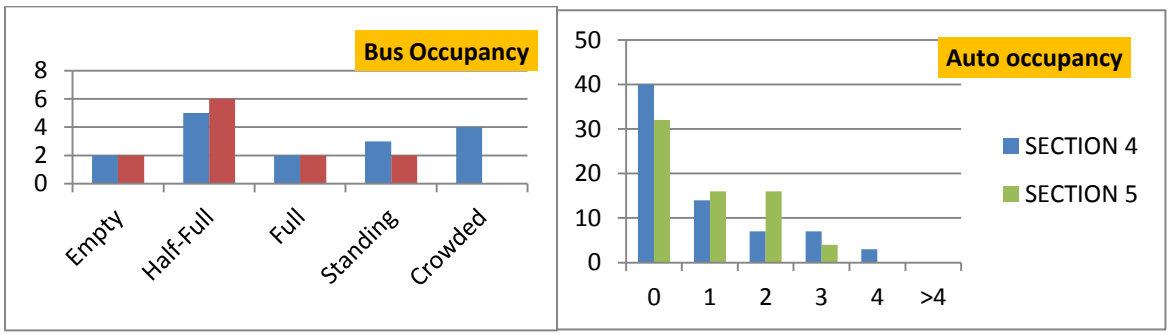


Figure 5: Vehicle Occupancy on Corridor 2: Towards Navanagar

Passengers Catered

The buses cater to the majority of the passengers on the routes and with the low availability of auto rickshaws on the route, additional service of buses is not required.

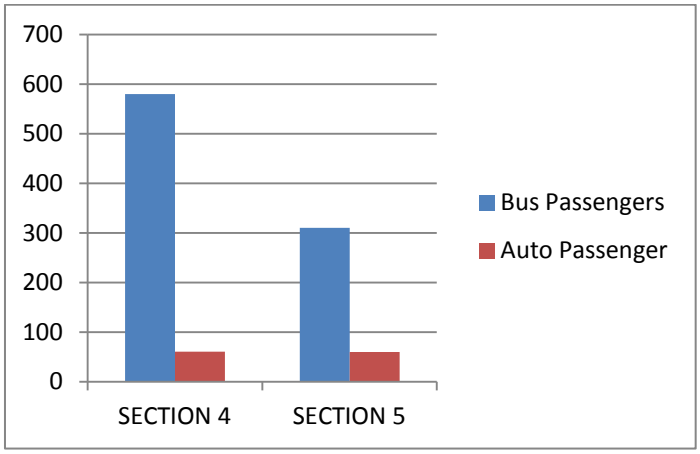
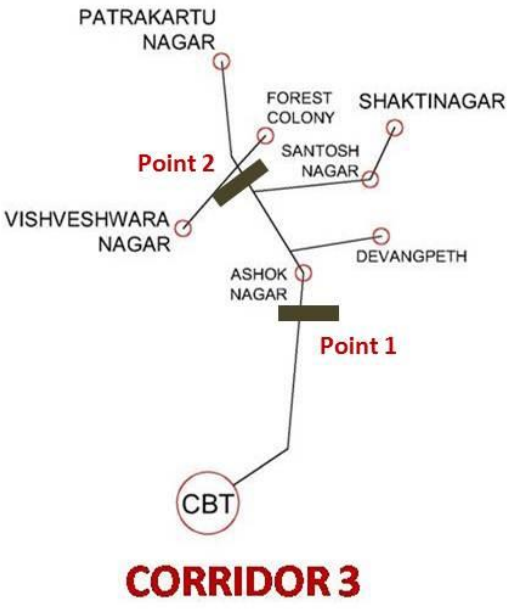


Figure 6: Passenger Volumes on Corridor 2: Towards Navanagar

Devangpeth corridor:

The corridor connects a number of residential colonies towards the north of Hubli to the CBT. The bus services are primarily directed towards Vishveshwar Nagar and Devangpeth. Counts were taken to capture the trunk volumes and volumes diverted from Devangpeth.



Characteristics of the Corridor:

Vehicle counts

The corridor primarily passes through residential neighborhoods and has low volumes of all forms of traffic. Buses were observed to be the primary mode for longer trips to the CBT while smaller trips were undertaken by autos. The frequencies of buses observed were corresponding to the scheduled frequencies on the routes.

		Section 6		Section 7	
		Observed	Scheduled	Observed	Scheduled
Number of buses/hr	From CBT	8	9	7	5
	Towards CBT	6	9	5	5
Number of autos/hr	From CBT	59		36	
	Towards CBT	50		36	

Table 4: Traffic Volumes on Corridor 3: Towards Devangpeth

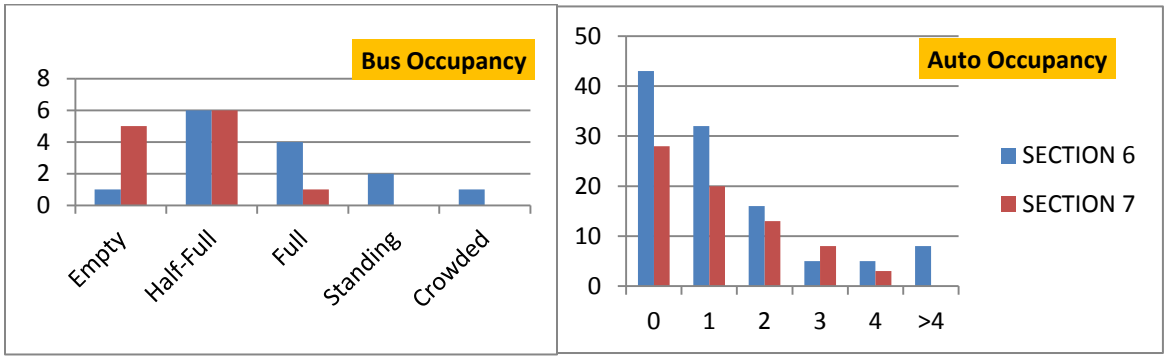


Figure 7: Vehicle occupancy on Corridor 3: Towards Devangpeth

Passengers Catered

The passenger volumes were favorable towards the buses and therefore improvement in frequencies is not necessary on the corridor.

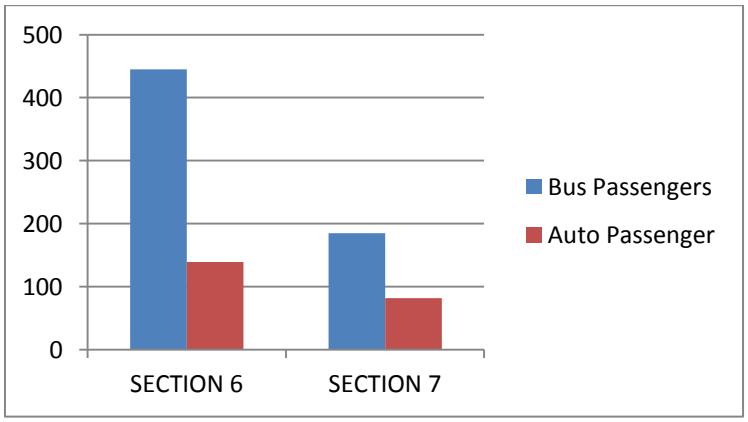
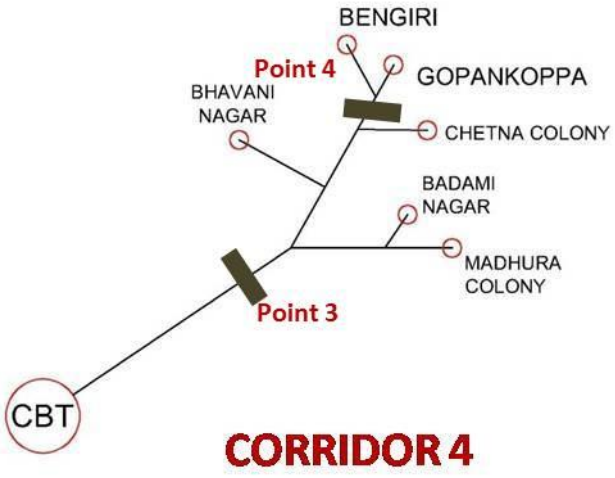


Figure 8: Passenger volumes on Corridor 3: Towards Devangpeth

Gopankoppa corridor:



Characteristics of the Corridor:

The corridor is a high density corridor as it leads to the Solapur Road where most of the traffic is diverted towards. The counts captures traffic on the trunk corridor(Point 3) and traffic diverted towards the residential areas Gopankoppa and Bengiri.

Vehicle counts

		Section 8		Section 9	
		Observed	Scheduled	Observed	Scheduled
Number of buses/hr	From CBT	33	7	14	6
	Towards CBT	25	7	14	6
Number of autos/hr	From CBT	180		230	
	Towards CBT	199		220	

Table 5: Volume counts on Corridor 4: Towards Gopankoppa

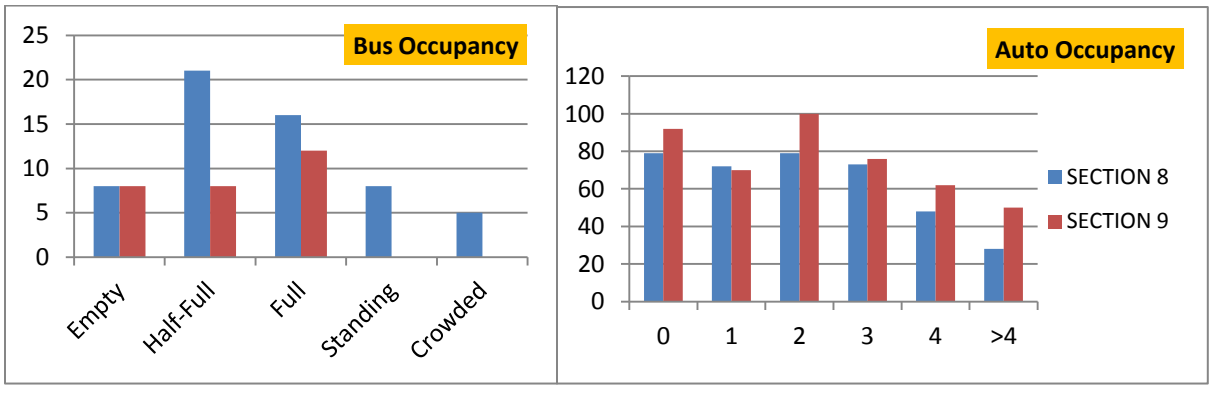


Figure 9: Vehicle Occupancy on Corridor 4: Towards Gopankoppa

Passengers Catered

The volumes of auto rickshaws were higher at point 4 as compared to other corridors and so is the volume they carry which is more than the volumes carried by the buses at the point. The occupancy survey also show that there are a large fraction of buses that are empty and half empty and therefore increasing frequency alone on the corridor alone may not increase bus ridership. Along with increase in frequency reliability of bus service needs to be improved to increase ridership on buses.

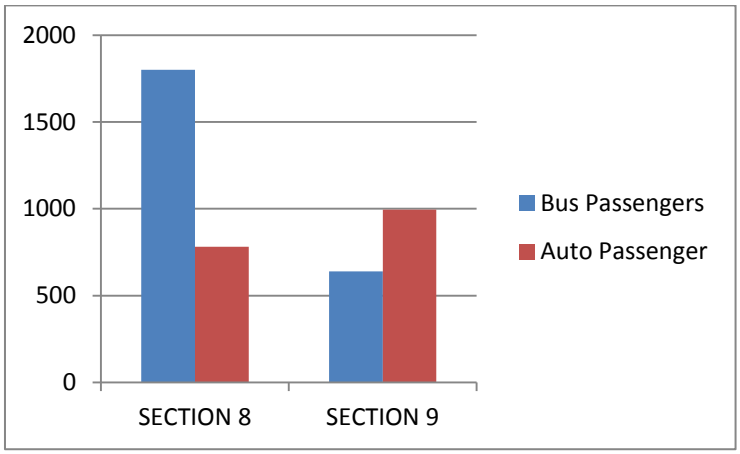
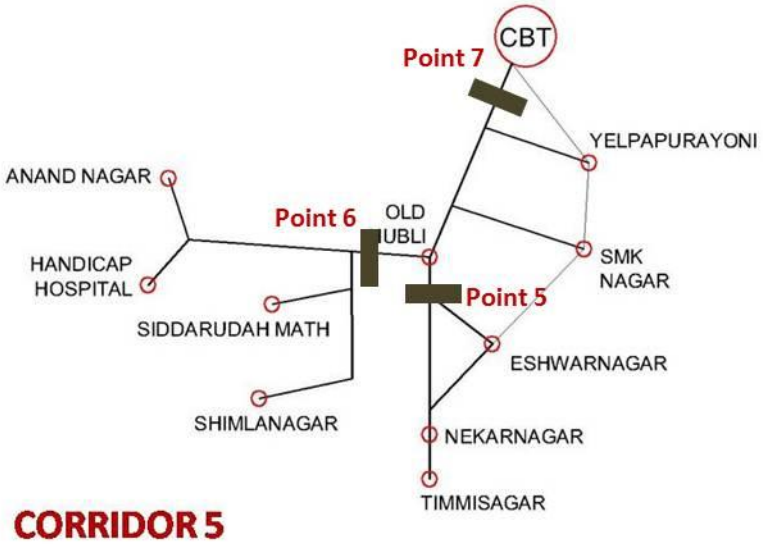


Figure 10: Passenger Volumes on Corridor 4: Towards Gopankoppa

Nekarnagar corridor:

This is an important passenger corridor which leads to Old Hubli and bifurcates towards Nekarnagar and SiddarudahMath. The route lies on SH130 and also is the route for a number of intercity and sub-urban buses.



Vehicle counts

Vehicle Counts along the trunk (Point 7) have high volumes of auto rickshaws which compete with the buses on the route. Major traffic diversion takes place at Old Hubli but the volumes of auto rickshaws are high on all routes and the frequency of the buses is inadequate to cater to the passenger volumes.

		Section 10		Section 11		Section 12	
		Observed	Scheduled	Observed	Scheduled	Observed	Scheduled
Number of buses/hr	From CBT	4	3	11	7	24	10
	Towards CBT	3	3	15	7	32	10
Number of autos/hr	From CBT	153		225		506	
	Towards CBT	244		291		346	

Table 6: Volume Counts on Corridor 5: Towards Nekarnagar

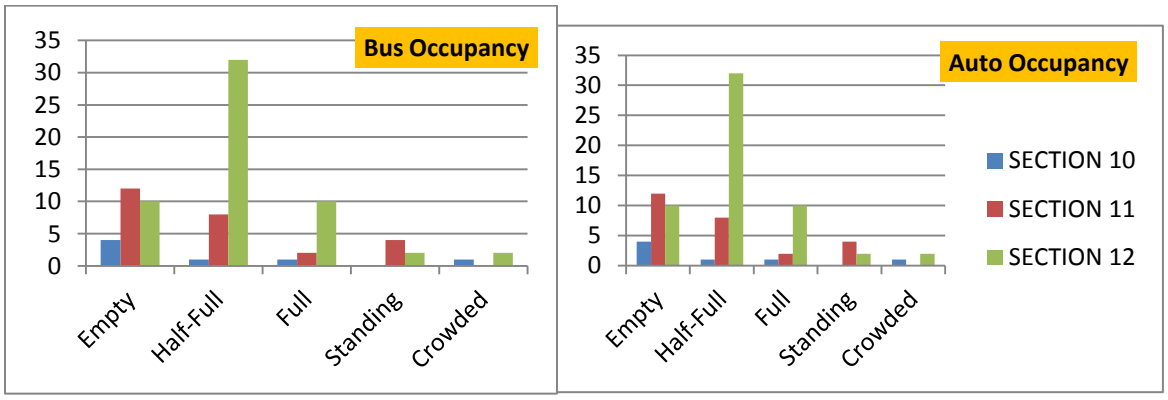


Figure 11: Vehicle Occupancy on Corridor 5: Towards Nekarnagar

Passengers Catered

The number of passengers from Old Hubli towards NekarnagarandSiddarudahMath drop with more people preferring auto travel rather than bus. Therefore in addition to acting as an intermediate point, it also acts as origin and destination points for trips where commuters prepare to take the autorickshaw instead of the bus which has low frequency on the route. Therefore strengthening the service from Old Hubli to Nekarnagar and towards Anandnagar may help in increasing ridership along the routes

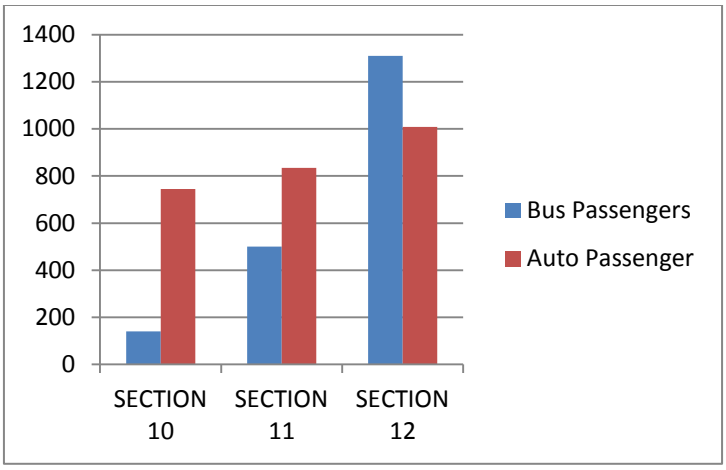


Figure 12: Passenger Volumes on Corridor 5: Towards Nekarnagar

Analysis for all corridors

The figure below compares the passenger volume counts for auto and bus passengers on all the corridorsof the network. The corridors 1,2 and 3 already have high volumes of passengers by bus as compared to auto rickshaws and user shift from auto to buses further is difficult. However the Gopankoppa and Nekarnagar corridor has high potential for increasing ridership on the buses by providing better levels of service and improving frequencies along the corridors.

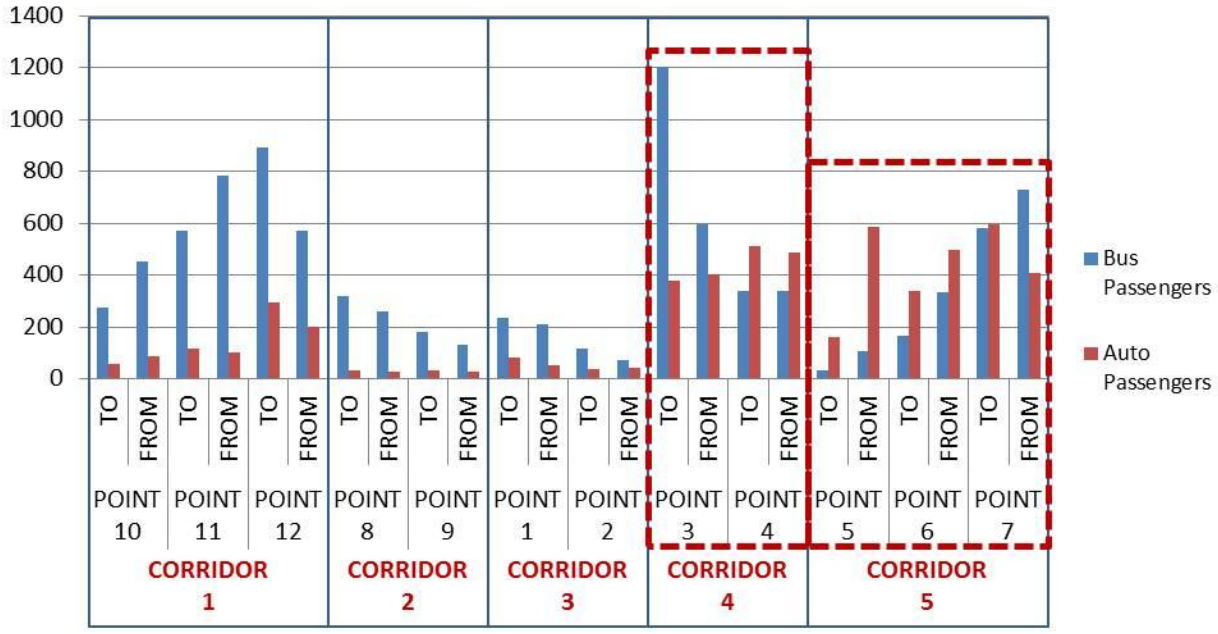


Figure 13: Comparison of Passenger Volumes on Corridors

Discussion

Issues with transfer – regularity of buses, frequency of buses, fares on bus

The auto rickshaw has inherent advantages for its users as compared to other modes of public transport. The most important of all is probably its ability to provide door to door service to the users. The advantage gains further when accessibility to other modes of public transport is not well designed. Unlike other systems auto rickshaws are flexible in terms of routes and have the ability to penetrate neighborhoods spatially to a greater extent. The bus services are route bound and in many cases do not cover the origin and destination in a single trip and require transfers. In the absence of coordinated schedules and poor transfer policies, transfers can become inconvenient which the user tries to avoid and instead prefers a mode with a single journey.

The operations of auto rickshaws can be classified as hiring and sharing. While hired auto rickshaws take you from point to point, shared autos ply along specific high density routes and can be shares by up to 5 or more passengers, thereby bringing down the cost of travel to each user. The sharing of autos makes the fares competitive with the bus fares, and usually run parallel to the bus routes.Currently in Hubli shared auto rickshaw services have been observed on Gokul Road, CBT to Solapur road going towards Gopankoppa and on the SH 130 moving towards Old Hubli. The auto fares are flat fares which are comparable to bus fares.

The frequency and availability of auto rickshaws is much higher on these routes as compared to buses. The high waiting time for buses and uncertainty of bus schedules at a particular stop induces public transport users to prefer autos against buses. The following table compares the frequency of buses to auto rickshaws on three major corridors.

	Bus Frequency (min per direction)	Auto Frequency (min per direction)
Gokul Road	2.5	0.24
Gopankoppa	2.5	0.30
Old Hubli	2.5	0.12

Table 7: Frequency Comparison between Buses and Autos

It is obvious that despite a decent volume of buses plying along the routes, buses can never compete with the autos in terms of frequency; however the regularity of buses on the routes is low. In such a case the absence of reliability on the buses decreases and public transport users switch to autos. This can be overcome by adopting better schedules so as to keep a constant headway between buses plying on a single corridor so the users are aware of the maximum waiting time for the next bus.

Conclusion

- The fare structure for buses can be revised to a distance based kilometric fare structure which incentivizes short distance travel and provide a cheaper alternative to auto rickshaws for short distance trips.
- Improve bus frequencies on the Gopankoppa/Bengiri corridor and along Nekarnagar corridor
- Higher frequency required from Old Hubli to Anandnagar and Nekarnagar which may be in the form of introduction of a new short route between them so as to increase frequency on the route.