Overview of Local Public Transportation in the City Chandigarh, India

Facts, Issues, Evaluation and Suggestions

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1 Introduction

Chandigarh, also called '*The City Beautiful*', is the capital of two north Indian states, Punjab and Haryana. The foundation of the city was laid in 1952. It is also among seven Union Territories of India and directly under the control of the Central Government. It was a dream city of the first Indian Prime Minister, Mr. Jawarlal Nehru and it was planned by the renowned French architect Mr. Le Corbusier. Scenically located at the foot hills of the Shivalik Mountains, it is known as one of the best experiments in urban planning and modern architecture in the twentieth century in India (Chandigarh Administration, 2014).

The city exists on the gentle sloping plains which was a wide lake surrounded by marsh in the ancient past. The fossil remains found at several sites indicate a large variety of aquatic and amphibian life, which was supported by that environment. About 8000 years ago it was also known to be the home of the Harappans, *one of the ancient civilizations* (Chandigarh Administration, 2014).

The figure 1.1 shows the geographical location of the city Chandigarh.

Figure 1.1 Location Map – Chandigarh

Source: (www.mapsofindia.com, 2012)

The table 1.1 shows the basic demographic profile of Chandigarh:

Table 1.1 Basic demographic profile of Chandigarh

Area	114 square kilometers
Total Population (2001 census)	900635
Density of population/sq.km	7900
Literacy rate	81.9%

Source: (Chandigarh Administration, 2014)

This study aims to give an overview of the local public transport in the city of Chandigarh and details shall be discussed in subsequent sections. In order to evaluate the issues from my personal experience and knowledge, the comments are written in separate paragraph in Italics with '⇨' symbol (in the left margins). The intension is to discuss them during the course of the report rather than in a separate section. Suggestions are provided in the last section.

1.1 Urban Structure

The basic urban structure of the city of Chandigarh is grid iron pattern. Vertical and high rise buildings have been ruled out in the master plan, keeping in view the socio economic conditions and living habits of the people. The city's primary module is 'Sector', a neighborhood unit of size 800 meters X 1200 meters. Sectors 1 to 30 are low density for 150,000 people in an area of 9000 acres and sectors 31 to 47 are high density for 350,000 people in an area of 6000 acres. It is strategically planned to have adequate number of shops, schools, health centers, recreational areas and places of worship. The shops are located along the V4 street (shopping street), which runs North-West to South-East across the sector. The green areas of one sector stretch to the next sectors as well. (Chandigarh Administration, 2014).

⇨ *According to the lectures on 'Integrated land use and transport', it can be alleged that it is easy to understand a city with grid structure but the public transport operations are difficult to operate. The various concepts and their evaluations shall be discussed within every section.*

2 Organizational Structure

2.1 Organization

The local public transport in Chandigarh is owned by the government company "Chandigarh Transport Undertaking" which is under the Chandigarh Administration. The Chandigarh Transport Undertaking functions under the supervision of the Home Secretary who is also the Secretary, Transport, Chandigarh Administration. The Director, Transport, carries out day-to-day management, assisted by four General Managers in addition to works managers and other staff. When the CTU[1] came into existence on 01.11.1966, as a result of trifurcation of Punjab Roadways at the time of re-organization of Punjab State it had a fleet of only 30 buses; today there are 468 buses. (Chandigarh Transport Undertaking, 2015)

⇨ *In my personal opinion, total government control is good because all the decision are taken with a social perspective and profit making does not become the prime motive. There are no private bus operators or companies that have been allowed to operate local public transportation of Chandigarh. But, sometimes the lack of competition limits the growth and fails to achieve the intended goal. While I was in this city for 5 years, I have not used public transport (buses) for more than 10 to 20 trips. I preferred to use my bike or two wheeler for commuting and rickshaws for all other trips. The main reason was lack of ease to get the information of route and schedule of the buses.*

[1] CTU- Chandigarh Transport Undertaking (in the whole document)

2.2 Company's Vision

"To provide safe, eco-friendly, cost-effective and efficient modes of Transportation."

(Director Transport)

2.3 Fleet

Total fleet of CTU is 468 buses, 329 buses run on local/suburban routes (which are of our interest), 73 buses run on Interstate routes covering Punjab, Haryana, Himachal, Uttar Pradesh, Uttaranchal, Rajasthan, Delhi & J&K .CTU buses traveled approx. 95,000 kilometers per day and approx. 168000 commuters commutes daily in CTU Buses (Chandigarh Transport Undertaking, 2015).

⇨ *In my opinion, the fleet size is sufficient to cater the present demand and supplementing the demand can be expected by changing other aspects of the operations and increasing awareness.*

2.3.1 Characteristics in context of local transportation

Daily operations (kms) (CTU, 2012)

- City services 43000kms[2]
- Sub-urban services 15000kms

Local Routes (City service) (CTU, 2012)

- In grid system 29
- Point to point 25
- AC Bus routes 16
- No.[3] of routes (with 256buses) 70

Sub-urban routes (CTU, 2012)

- No. of routes (with 75buses) 20

2.4 Contracting

2.4.1 Mass public transport

The Chandigarh Transport Undertaking (CTU) which is a public sector local transport operator is solely responsible for all services. It has its own depots, maintenance workshops and all other services that are needed to run the transport in a city effectively. It releases timely advertisements in mass media for the recruitment of drivers, conductors and other positions needed to carry out operations, maintenance and administration (Chandigarh Transport Undertaking, 2015).

⇨ *As mentioned earlier, public control has its advantages, but in my opinion tendering to find new public information strategies would be a nice idea to improve the existing situation. A committee under the present Transport Department can be formed to explore new ways to promote the awareness and easily available information; tendering can allow gathering new ideas and options in a competitive manner, which could be realized in the later stage to pull people to use public transport.*

[2] kms - kilometers (in the whole document)

[3] No. – Number (in the whole document)

2.4.2 Informal public transport

The informal public transport is described separately in the section 3. The motorized modes of informal transport needs license and permit to operate the services in Chandigarh and government bodies responsible for this are:

- RLA (Registering & Licensing Authority)
  It is responsible for registration of the vehicles and issue driving licenses to the qualified drivers (Chandigarh Administration, 2015).
- STA (State Transport Authority)
  It is responsible to issue new and renewal of the permits to operate taxis, auto rickshaws, etc. in the city. It is also responsible to check illegal operation in the city (Chandigarh Administration, 2015).
- Transport Unions
  These are separate bodies which are created by the operators of shared as well as other auto rickshaw operators of the city. The main purpose is to represent the concerns of the operators.

⇨ *In my personal opinion, the informal public transport is playing a good role as it is; some changes can be implemented to check the registration and licensing of operators to enhance the traffic safety and security. Present prices that are asked and negotiated are acceptable.*

2.5 Route Planning

The route planning is done by the organization itself. Route planning covers the three neighboring cities (Chandigarh, Mohali and Panchkula) and connects every sector with ISBT-17[4], ISBT-43[5] and other important institutions of the city. Details into the planning have not been made public. Route search facility has been made available on the company's website (CTU, 2012).

⇨ *As the city is developing and mobility paths are changing, it is essential to understand the new variations and develop the routes accordingly. Outsourcing the tasks of periodic surveys competitive tendering can help to understand the mobility of the people and formulate new action plan accordingly.*

2.6 Staff

CTU's staff ratio per bus is the lowest in the country: just 3.90 employees per bus compare with Bombay 10.99, Delhi's 9.16, Calcutta's 11.66 and Ahmedabad's 10.33 (Chandigarh Transport Undertaking, 2015).

⇨ *Chandigarh is operating at lowest cost per bus in terms of the staff employed; this is one of the strengths of the CTU. But it is of vital importance to ensure reliability, so an internal analysis*

[4] ISBT-17: Inter State Bus Terminus, Sector 17, Chandigarh
[5] ISBT-43: Inter State Bus Terminus, Sector 43, Chandigarh

should be conducted to see if it is affecting the operations or are there some concerns associated to staff.

2.7 Social obligation

Freedom fighters, War Widows, Blind persons, thalassemia patients along with one attendant with each category and journalists can travel free in CTU buses within U.T. Area and concession has been extended to handicapped persons and senior citizens, students and employees in CTU Buses within the U.T area. Concessions cost bared by the CTU is around INR[6] 30 million (441,176 €) per year (Chandigarh Transport Undertaking, 2015).

- *It is one of the great benefits of the public control that the policies are made after understanding the general needs of the people, but concern is, if the information is easily available and how easy it is to avail the services. As discussed previously, CTU lacks to inform people about the policies that exist for them. At present, this area needs a lot of improvement.*

2.8 Finances

CTU is a profit-making concern. As of November 30, 1996, CTU made an overall profit of INR 25.29 lakh (37,000 €). 1996 was the first year since the inception of the Chandigarh Transport Undertaking that the Undertaking earned a profit. As per report of the Ministry of Surface Transport, New Delhi till the quarter ending September, 1996 only three undertakings i.e. Kattabomman TCL, Pimpiri Chinchiwad and Chandigarh Transport Undertaking have registered profits. A CTU bus earns on average INR 2,056 per day (30€)[7]and CTU's total receipts were INR 24.04 crore (3.5 million €) in 1996 (Chandigarh Transport Undertaking, 1996).

2.9 Sources of revenue

2.9.1 Ticketing

The fare structure of local buses is tabulated as under:

Table 2.1 Fare structure of CTU

Category	Ordinary bus fare	Air conditioned bus fare
Up to 3 kms	INR 5 (0.07€)	INR 15 (0.22€)
3 kms – 10 kms	INR 10 (0.14€)	INR 20 (0.29€)
Above 10kms	INR 15 (0.22€)	INR 25 (0.37€)
Daily pass	INR 30 (0.44€)	INR 50 (0.73€)
General monthly pass	INR 500 (7.35€)	INR 1000 (14.70€)
Senior citizen monthly pass	INR 250 (3.68€)	INR 500 (7.35€)
Student pass (3months)	INR 300 (4.41€)	--
Student monthly pass	--	INR 500 (7.35€)

Source : (Transport department (CTU), 2014)

- *The current prices are reasonable and affordable to the lowest earning sector of the society as well. To make the travelling comfortable, air conditioned buses are also operated, which attract*

[6] INR- Indian Nation Rupee, 1€ = INR 68.25 on March 25,2015 (Google conversion) (in the whole document)
[7] Accounting to 123€ in 2015 (discount rate of 7.75%)

the people willing to spend more to get additional benefits. The monthly passes make the travel budget for the resident certainly economical. The whole price structure is good in my personal perspective. I have witnessed the increasing number of students using two wheelers, which is not very safe mode as many youngsters lack maturity of driving skills. Actions to attract students to use public transport shall have a long lasting effect on the society.

2.9.2 Advertisement

CTU every two years releases the tender for advertisement on the fleet of CTU buses. Presently, the revenue generated per bus per month is INR 3582 (53 €). The contribution is small to the overall profits, which clearly explains how underpriced these tenders are and it has been highlighted in the media to revise the bids. The losses have been estimated to be at least INR 160,000 (2350 €) per month (Gill, 2014).

Due to limited information shared by Chandigarh Transport Undertaking, it is hard to estimate the share of revenue sources. The table below shows the total revenue generated annually.

Table 2.2 Statistics

Year	No. of Buses	No. of Employees	KMS Operated(million)	Traffic Revenue(Cr.)	Traffic Revenue (Million Euro)
2000-01	417	2316	46.616	48.75	7.17
2005-06	417	2350	48.853	64.79	9.53
2010-11	517	2096	43.947	92.83	13.65
2013-14	468	1826	33.52	86.91	12.78

Source: (Chandigarh Transport Undertaking, 2015)

- *In my personal opinion, there is a huge potential to generate revenue from the advertisement sector. The advertisements are seen on some of the buses which have the promotions of advertiser's product or services, but I have not seen the single bus stop with advertisements; also the infrastructure quality of bus stops is quite not up to the mark. CTU can easily improve this, by tendering the advertisers to use the area for promotion and in return improve and maintain the condition of the bus stops.*

3 Different modes of transportation

The table3.1 shows the modal share of public transport available in Chandigarh, 2009.

Table 3.1 Modal Split - 2009 (Motorized Trips)

S. No.	Mode	No. of trips/day	Percentage
1	Car	358352	21.90
2	Two Wheeler	841025	51.39
3	Auto	30728	1.88
4	Shared Auto	139040	8.50
5	Bus	267268	16.33
	Total	**1636413**	**100.00**

Source: (RITES LTD., 2009)

- *The modal share of the public transport by bus is very low in Chandigarh. Despite of the great quality of the transport infrastructure (wide and regularly maintained roads, all intersections are either signalized or rotary, good people's adherence to traffic rules, etc.) available in the city, the public transport share is underdeveloped. City has a huge potential to improve this share, some of the actions shall be discussed in 'Suggestions' section.*

The various informal modes of transportation available in the city are discussed in the sections below:

3.1 Auto rickshaws

Auto rickshaws are very famous mode of informal public transport in India and they have their presence in Chandigarh too. Regional Licensing Authority (RLA) is responsible for the approval of the permits of vehicles and licenses of drivers. Local Transport authorities have fixed the prices of the Auto rickshaws too, but that is hardly seen on ground. Auto rickshaws, the small, motorized three-wheeled vehicles are a popular mode of transport in Chandigarh besides buses. Public Transport users prefer auto rickshaws to travel to and from the Bus terminals as they offer services to specific requested destinations and are less expensive when compared to taxis. (Chandigarh Guide) Nevertheless, these vehicles contribute to high amount of pollution as they are running on LPG and lack important safety features for both passengers and drivers (Jensen). Furthermore, users are often exploited by the use of faulty meters and over-charging. To curb the exploitation by auto rickshaw drivers, prepaid auto rickshaw system was introduced with pre-determined fares for all routes and has been successful over time (Roy, 2012).

3.2 Shared Auto rickshaws

Auto rickshaws that serve a group of passengers at once are shared auto rickshaws. The government has the same control on them and Auto rickshaws. They are diesel run and are much cheaper than auto rickshaws. They are preferred over rigid public transport systems like buses as they cater to passengers' request stops. They pose a higher risk to passenger and driver safety as they are usually run over-crowded. Further, their contribution to air and noise pollution is quite significant.

3.3 Cycle-Rickshaw

Cycle-Rickshaws today form an integral mode of transportation in the Indian cities and are seen plying in every city (Ecocabs India, 2013). Cycle-Rickshaws are manually driven three wheeled carriages best suited for travelling short distances (Chandigarh Guide). They are eco-friendly, cheap and serve stretches that other modes of public transport cannot. They have proved to be quicker over some routes and also create jobs for poor. Till date government has least involvement with the rickshaw drivers, as they pose no threat to existing transport modes. Despite of great advantages, like zero carbon emission, they use existing bike infrastructure, low fares; they are not promoted. Now days, government has started to register drivers on

government record. However, they are slow, lack passenger safety features and have no systematic fare charging mechanisms (Gloucestershire Echo, 2012).

Figure 3.1 Auto rickshaw, shared auto rickshaw and cycle rickshaw (left to right)

Source: (Google images)

3.4 Eco cabs

Ecocabs were first launched in the world on 20th June 2008 in Fazilka, a small town in Punjab, India located near the India Pakistan border. It was then that cycle rickshaws were made available to the common public for the first time via a phone and a network of call centers. It's a community based initiative working on the concept of 'by the people' and 'for the people'. It was launched in Chandigarh in 2013 and since then it is serving people and growing its network (Ecocabs India, 2013).

3.4.1 Benefits of Ecocabs

"A single rickshaw travel about 40-50 km in a day. When compared to a car of average mileage 15km/liter, Ecocab can help in saving up to 3 liters of fuel daily and its related emissions. Also, burning of one liter of fuel requires 15.2 kg of fresh air. Therefore, other than exhaust gases, Ecocab also helps in saving 45.6 kg of fresh air per rickshaw on a daily basis. Informally operating in every nook and corner of our cities, Ecocabs have added a new dimension to the existing transport systems especially in terms of first and last mile connectivity. This modified form of rickshaw operations can help to maintain and enhance its demand and reverse the declining trend of rickshaw operations observed in the recent past" (Ecocabs India, 2013).

3.4.2 Operational Concept

"Dial-a-rickshaw service will help in reducing the number of empty trips on the part of the operator and hence, improve the overall efficiency of the system. It has been observed that 1 to 2 calls per day increase the income of a rickshaw operator by 25-30%. This substantial increase in income can help him improve his living standards and afford a better quality of life. Further, he doesn't need to stand at a particular place and wait for customers; he can now park his rickshaw anywhere in parking or open areas and move to his client only after a phone call of customer. This will help in reducing the traffic burden on roads" (Ecocabs India, 2013).

4 Suggestions

4.1 Increasing public awareness and improving the ease of getting information

4.1.1 Basic route maps should be available

If the aim is to reach to every sector of the society, including old and less educated population, creation and making interactive route maps of the city should be the first step. The maps can be distributed to people or can be sold at newspaper or book shops at a very reasonable price. This would definitely attract new riders to public transport. While I was in this city, I could not find any information regarding the route maps and this is a basic thing that is missing. CTU has published a route map (see image below) of the city on their website, which can be made available to public in hard copy. The maps can actually help them plan their journey and decide the adequate transfer stations.

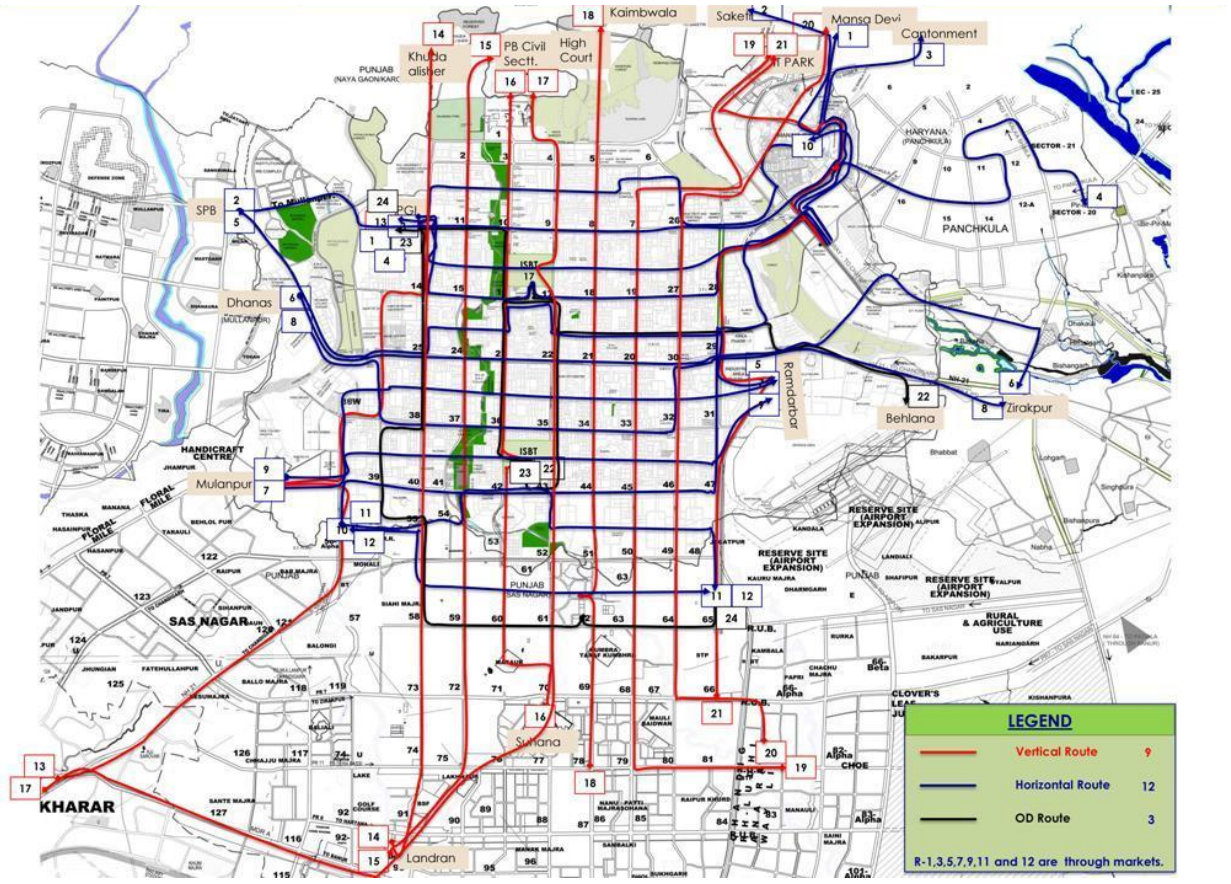

Figure 4.1 Route map of public bus network

Source: (Chandigarh Transport Undertaking, 2015)

4.1.2 Schedule and route information on the bus stops

As Chandigarh transport timetable model is not based on the fixed time table but on the frequency of service, so the paper posters (A4 size) should be fixed on all bus stops for all the buses passing through that bus stop. This can further be integrated to intelligent transportation

system to provide real time information, but that is too much to hope for citing the present condition.

4.1.3 Mobility application for mobile phones

The effective way to increase the ridership share of young generation is the mobility applications for mobile phones and computers. The route search tool is available on the CTU's website but the information provided by it is very limited and not easily understandable. Mobile applications can help to plan the journeys in an effective way.

4.1.4 Promotion of services or offers

The various offers that have been created for students and commuters need to reach more audience to make them aware of the available options. In order to do so, basic promotion is necessary. Organizing awareness camps in schools, central business districts (Sector 17 and 34), public advertisement on local newspaper, etc. can be some of the ways to reach to society at large.

4.2 Tendering / outsourcing

In order to improve the services and information availability, opening the tender to below mentioned options (as discussed in the paper) and infill the transport company with new ideas

- Public information systems/options
- Mobility application for mobile phones
- Route planning
- Mobility survey

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