

Ludhiana Municipal Corporation, India



EcoMobility SHIFT+ Assessment Report

Overview

The EcoMobility SHIFT+ is a methodology designed for cities to measure the performance in urban mobility and make informed decisions based on the areas that need improvement. Ludhiana is the fastest growing city in the State of Punjab, India, with a population of 1.6 million. It is the largest business hub in Punjab and the second largest bicycle manufacturing city in the world.

Ludhiana Municipal Corporation gathered key stakeholders, including representatives from the municipal authority, traffic police, and private sector, to form the EcoMobility SHIFT+ Working Group to analyze the transport system of Ludhiana and discussed the short- and long-term interventions.

The EcoMobility SHIFT+ indicator score for Ludhiana is 39%, which reflects a passive environment with many challenges. This is primarily due to the lack of an institution to plan, implement, and enforce transport policies and laws, although policies and some directions are available.

Facts & Figures

Population
1,618,879 (2011)

Land area
159.37 square kilometers (km²)

Modal split

| Mode | Percentage |
|-----------------------------|------------|
| Motorized transport and IPT | 53% |
| Walking | 31% |
| Cycling | 16% |

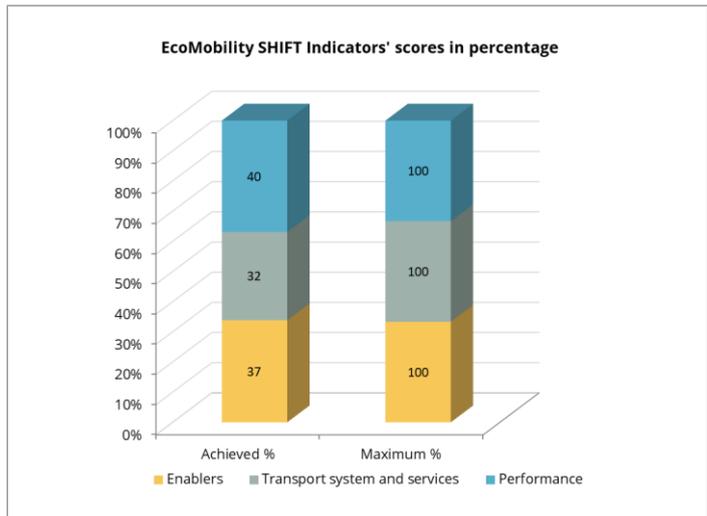
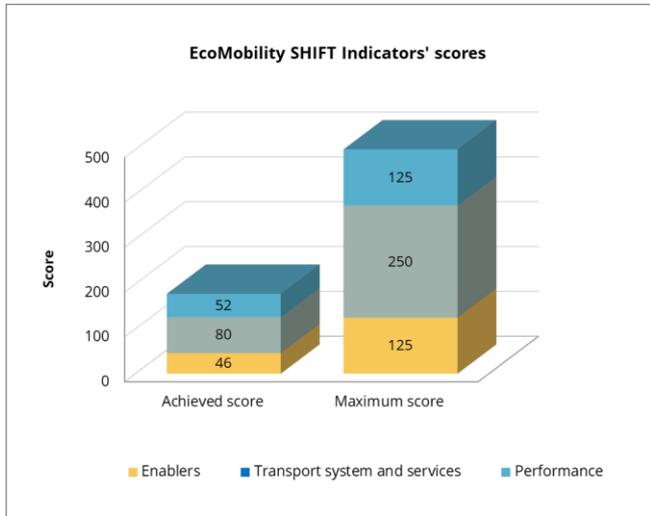


Figure 1: EcoMobility SHIFT+ Indicator scores and in percentage for each category

Overview of the 23 EcoMobility SHIFT+ indicators' ranking is presented below.

EcoMobility SHIFT+ indicators' ranking

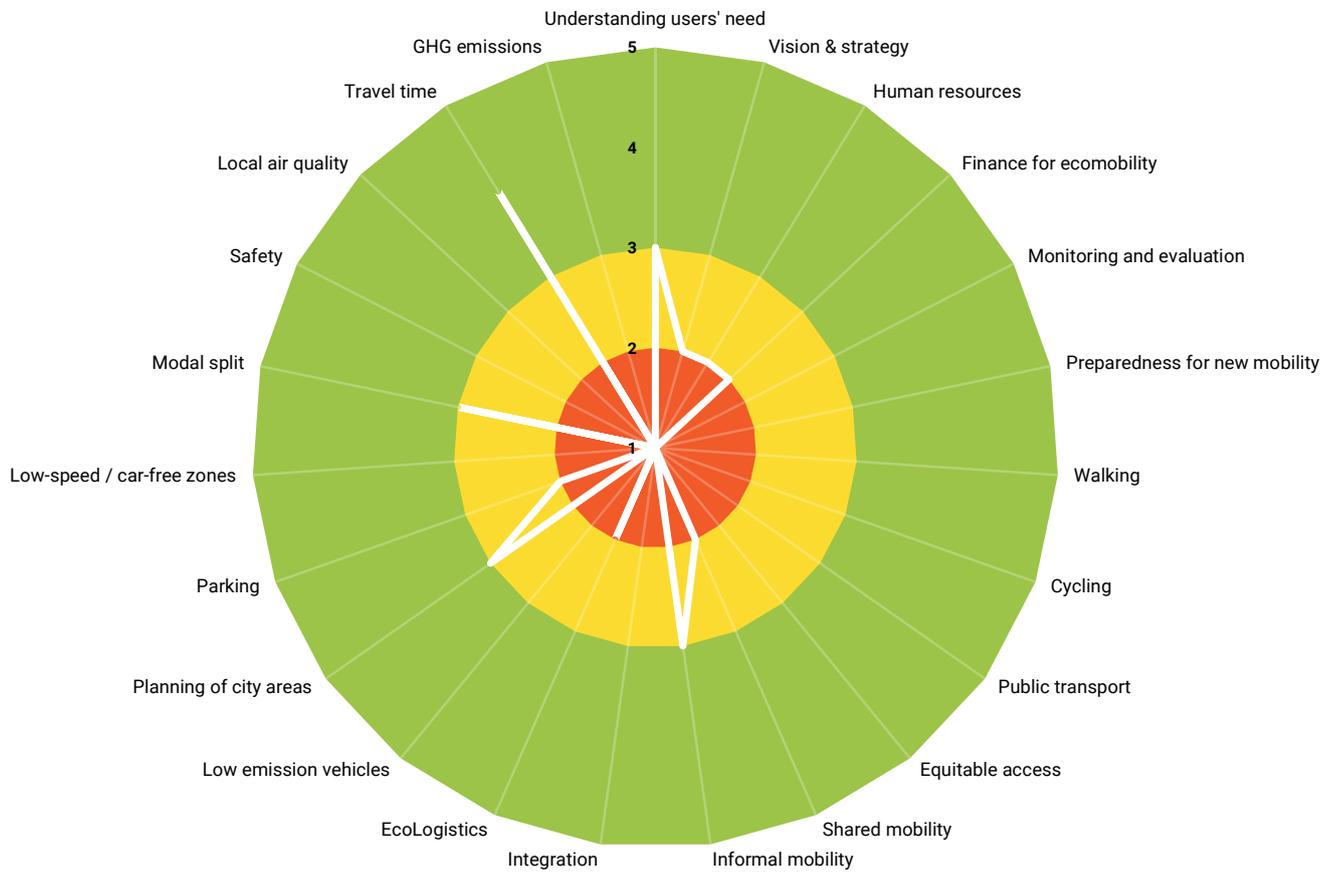


Figure 2: Overview of the EcoMobility SHIFT+ Indicators ranking

EcoMobility SHIFT+ Results based on Category

Enablers

As Ludhiana is chosen as one of the Smart City Mission cities in India, the city conducted a city-wide public consultation process in 2015 to understand the residents' concerns and the top concerns are: poor public transportation (89%); severely polluted air quality (85%); unsafe at night (76%); inadequate parking facilities (65%)¹. It is noticed that improving transportation appears as the topmost concern to be improved. The city adopts traditional methods such as conducting surveys, focus groups to understand the residents' needs as well as using online Facebook and official governmental portal to connect with residents and gather suggestions and complaints. The Comprehensive Mobility Plan (2015 – 2031) for Ludhiana was prepared in 2014. However, implementation is significantly lacking.

The Plan is designed to be implemented over four phases to enhance connectivity and steer the future of transportation with public transportation as the backbone and promotion of active mobility for last-mile connection. However, it is observed that implementation is still challenging and lacking. Most of the new mobility systems are ride-hailing or food delivery applications such as Uber, Ola, Zomato, Swiggy, etc. that are privately driven with no support or regulation from the municipal. The only form of formal public transport in the city is the city buses that are contracted and operated by a private company.

Ludhiana does not have proper transportation or urban planning department. All issues related to transport falls into the fringes of the different departments and responsibilities for road designs are assumed by the engineering department or the Traffic Police Department. Urban planning is only at the regional level under the Greater Ludhiana Area Development Authority (GLADA) with a lack of involvement from the Ludhiana Municipal Council. The city conducted one-off monitoring and evaluation of the traffic data in 2009 but no periodic monitoring or assessment was conducted.

In general, although there is a mobility plan, implementation is challenging and limited to the Smart City Mission coverage area only. This is mainly due to a lack of political will to improve mobility, although it is a significant issue in Ludhiana. As a result, not much investment of resources is given to urban planning and transportation.

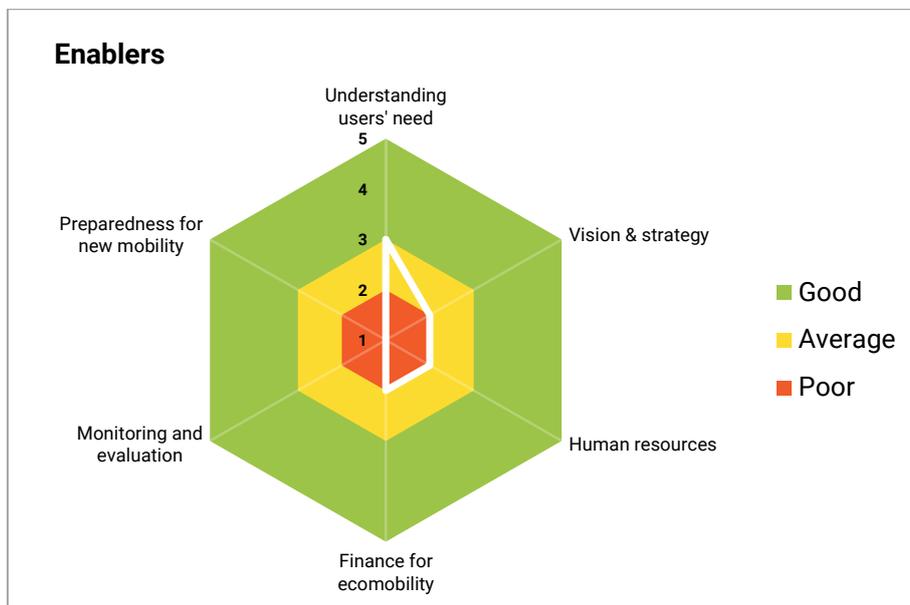


Figure 3: Enabler category's indicators' ranking

¹ Smart City Proposal Survey (2017) conducted by AECOM to 99,687 Ludhiana residents.

Transport system and services

The transport system and services category's indicators' ranking is presented in Figure 4 below.

A transport system that is heavily reliant on automobiles and intermediate passenger transport

Most trips in Ludhiana are with motorized transport and intermediate passenger transport (IPT) (53%) while walking and cycling constitute 31% and 16%, respectively. Amongst the motorized transport, the share of two-wheelers (78%), cars (16%) and auto-rickshaws (0.82%) are the highest². IPT consisting of auto-rickshaws, informal taxis and cycle rickshaws forms the backbone of the passenger and even goods movement in Ludhiana City. Currently, there are about 30,000 auto-rickshaws in the city and are gradually increasing yearly, especially auto-rickshaws that are registered in other districts but illegally operate within Ludhiana.

Due to the lack of a functioning public transportation system, auto-rickshaws fulfill the demands to transport passengers. Auto-rickshaws drivers are self-regulated by operators' unions but the lack of formal regulation results in reckless driving. They are observed swerving through the already uncoordinated traffic on the road, exacerbating traffic congestion. Engagement with the municipal corporation to improve the system is also minimal.

Ludhiana's formal public transportation system consists of five routes over 62 kilometers (km) of public buses contracted to a private company to operate. It mainly services the intercity routes from the fringes of Ludhiana and migrant workers working in the industrial parks. However, the private company is losing money due to low ridership and high operational costs. Therefore, 200 buses are just placed at the depot and operate only 50 buses. The city does not have a mechanism to enforce the private company or to subsidize public transport. Although there are plans to implement the Bus Rapid Transit (BRT) system, but the idea is dissolved due to road constraints. Most of the riders are average to low-income migrant workers from the surrounding region, which raises equity issues if a well-functioning public bus system is not provided to them, while investment favors car-centric development.

Walking and cycling conditions are weak, and facilities are inadequate although a significant number of residents walk or bike, especially the middle to the lower class. The lack of active mobility infrastructure combined with mixed traffic such as cars, auto-rickshaws, cycle rickshaws, rickshaw pullers, and bicycles competing for road space make it increasingly challenging and unsafe for the pedestrians, especially at the inner part of the city. Poor road designs and poor driving behavior also exacerbate congestion and poses enormous safety risks for pedestrians and cyclists. Furthermore, although the proposed vision for the Smart City Project is for Ludhiana to be a "clean and green bicycle capital of the country," implementation is not apparent or limited to the Smart City project area which is more affluent and the population is more dependent on cars.



² Source: Regional Transport Office, Ludhiana (2017)

Poor cycling and walking condition due to a high barrier that disconnects different roads (left); poor pedestrian safety and comfort (right)



Man transporting wood panel on cycling rickshaw (left); in front of Ludhiana's train station with many locals and migrants gathering (right)



Bus depot but many buses are not operational (left); and auto-rickshaw paratransit service (right)

In 2017, a private investor introduced the Global Positioning System (GPS) enabled 'smart' electric rickshaws and replaced auto-rickshaws. Rs 57.50 crore (around 6,737,850 Euro) was proposed for the initiative, and subsidies are provided to the auto-rickshaw drivers, prioritizing the population living below the poverty line. The door-to-door data collected from the e-rickshaws are analyzed in an integrated platform and can be used for street design and planning to improve users' experience.

Parking and public space

Parking is one of the significant challenges for the city as the supply does not satisfy the demand for parking. The regional government of Punjab developed a Public Parking Policy for Municipal Corporation Towns of Punjab, which Ludhiana is part of, the implementation is seen lacking although some efforts are in place to improve. Ludhiana does not maintain sufficient formal on-street and off-street parking lots. Thus vehicles are haphazardly parked at the side of the road or wherever there is space, affecting road capacity to the already narrow and

extremely congested city center. Parking charges imposed by the LMC are not forcefully imposed. Currently, eleven parking locations have been identified by Ludhiana.

There is neither low- emission zone nor reduced- or car-free center in Ludhiana. Encroachment of road spaces by roadside hawkers is also noticeable within the city center, near the Clock Tower and at sporadic areas throughout the city, mainly below overpasses, thus blocking the junctions. The creation of public space for residents is notable towards the northeastern part of the city where more affluent residents live. Otherwise, open space appears to be unorganized or unsafe.



One of the new carparks leased to be managed privately

Integration, equity, and connectivity

There is no relevant data available to understand access to public transport. Based on visual observations, the provision of public transport is insufficient, which is also the reason auto-rickshaws exist to fulfill the unmet demand. As the public buses are not profitable, there have been discussions to increase the fare with the State Government. The lower-income population spends an estimate of 20% of their income on public buses, slightly higher than the Indian average. On the other hand, transport investments are primarily car-centric. For example, the flyover exacerbated the congested marketplace and severely impacted the movement of people.



Poor road conditions with no boundary of lanes resulting in mixed traffic and low road capacity (left); encroachment by informal fruit sellers on pushcart also occupy precious road space and flyover built impacted the road and junction (right)

Investment in upgrading the system under the Smart City Project is concentrated at the more affluent part of the city because it is perceived to be easier to implement. However, this raises an equity issue as the most urgent need where improvements are needed at the center of the city where more migrant workers or low- to medium-income population live or work. No disincentives are established to discourage middle-class residents from owning a car.

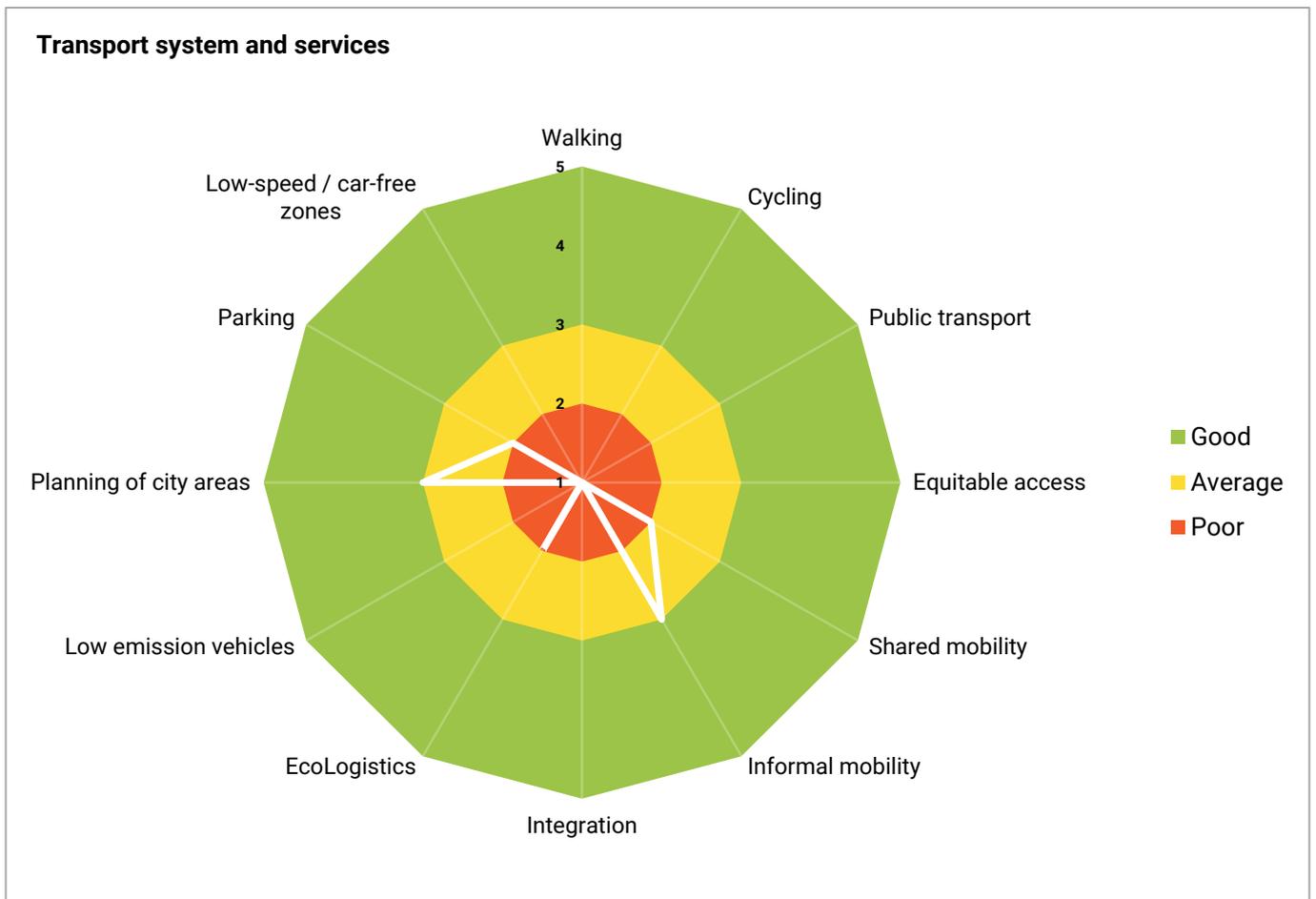


Figure 4: Transport system and services category's indicators' ranking

Performance

Most trips in the city are motorized transport and IPT (53%), followed by walking (31%) and cycling (16%). It is noted that the safety of pedestrians and cyclists is a major concern due to reckless driving and poor road demarcation. As the bar of acquiring a driving license is low, many drivers on the road are not well-trained to obey the law. In the past years, Ludhiana has been implementing the “Safe City Project” to develop smart solutions for public spaces with street lighting and video surveillance through the installation of 1,700 CCTV cameras in phases covering 25 locations. According to the local traffic police, there is a staggering number of deaths due to road accidents, about 600 per year.

Local air quality is poor, mainly due to the industrial nature of the city. Most vehicles on the road are also old fossil-based vehicles. There is no consideration of measuring GHG emissions yet.

As the city is relatively compact, travel time across the city is not long, and most trips can be made within 60 minutes. However, trips on public transport are notably longer than private cars or auto rickshaws. Performance indicators’ ranking is illustrated in Figure 5.

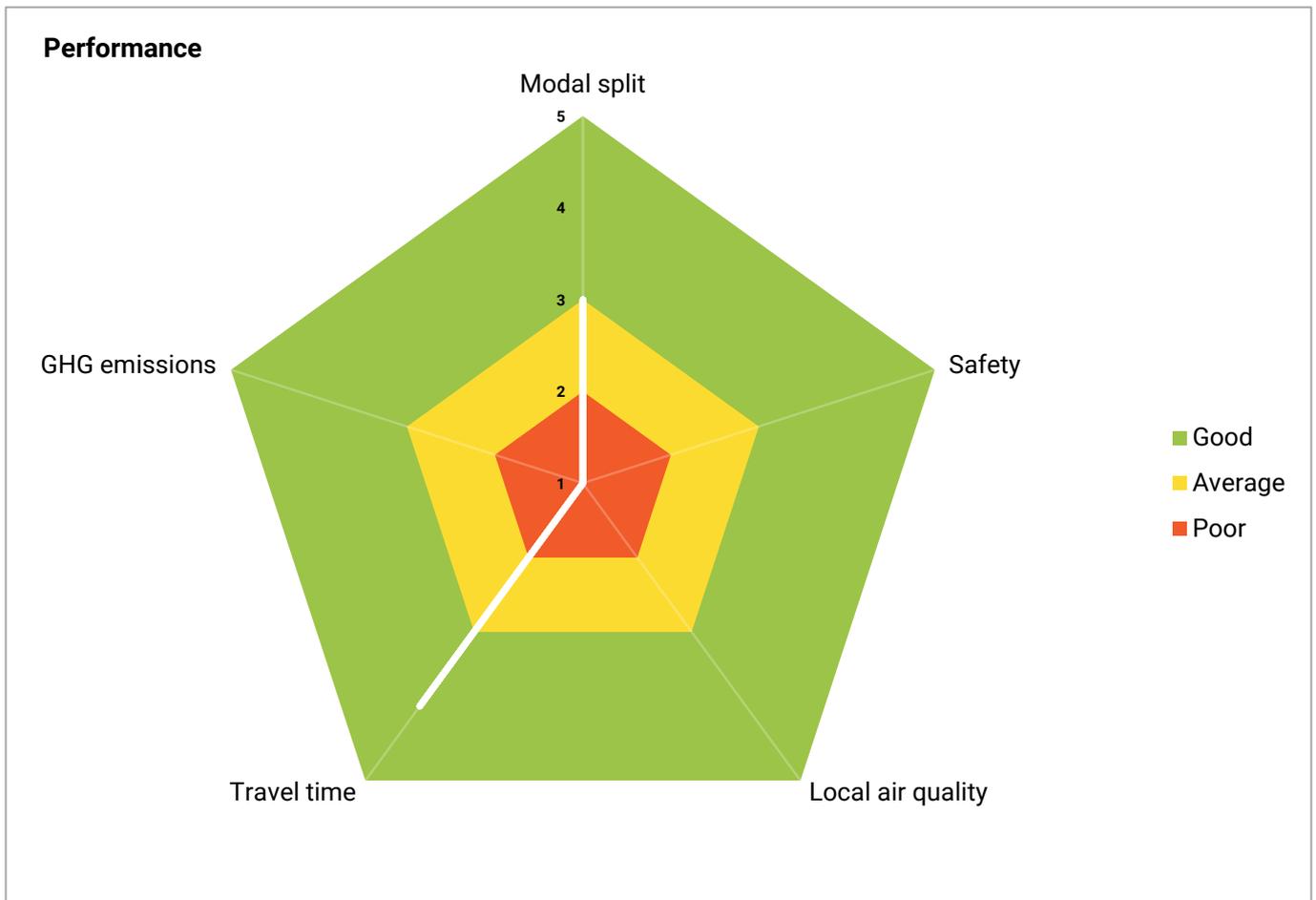


Figure 5: Performance category indicator ranking

Barriers and enablers

| Factor | Opportunities | Challenges |
|-----------------------|--|---|
| Policy | Smart City project could enable more opportunities and learning experience | <p>Policy exists but not recognized politically, thus political interference that favors a car-centric policy</p> <p>A mentality that prefers construction of expensive flyovers which exacerbate traffic congestion especially at junctions</p> |
| Institutions | As an industrial city and the second-largest bicycle manufacturer in the world, more engagement between the public and private sectors could be facilitated to encourage cycling within the city and establish a bike-sharing system | <p>Lack of proper urban and traffic department and the municipal level to plan and implement sustainable mobility. Hence, a strong reliance on the private consulting company to design and implement projects for the city</p> <p>Insufficient traffic police for enforcement</p> <p>Behavioral change across the population is critically needed to improve civic-mindedness on the road and public space</p> |
| Finance | The central government provides funds for public transport | Although funding is provided, implementation and management of the public bus operator is poor |
| Infrastructure | Ludhiana is historically built as a compact city and a city of short distance so improvements could be made easier | Lack of use of technology to improve transportation |

Actions planned

The SHIFT+ Working Group committee members invited the different stakeholders for discussion, and about 11 key measures were proposed during the meeting. All stakeholders are given a chance to propose short- and long-term actions and vote for its priority (1- least; 5 – highest priority).

| Goals | Actions | Priority | Timeline |
|--|---|----------|---|
| Strengthening institutional capacity | 1. Dedicated staffs for planning and implementation of the Comprehensive Mobility Plan and joint monthly meeting with the State urban planning department | 4 | In the next six months |
| | 2. Improving enforcement | 3 | |
| | 3. Creating awareness of the public and educate better driving skills, including imposing traffic education as a subject in the school | 3 | |
| Improving pedestrians' and cyclists' comfort and safety | 4. Demarcation of car-reduced or car-free zone around the clock tower and establish vehicle-free market | 4 | Within the next 24 months |
| | 5. Realigning traffic lanes and provide walking and cycling path along roads especially at areas with high pedestrian traffic, e.g. old market area | 3 | |
| | 6. Prevent encroachment to road lanes but reallocating small shops | 5 | |
| | 7. Tree planting along the roads to increase foliage | 2 | |
| Enhance public transport | 8. Improving access to public transport for all, with frequent service | 5 | To begin consideration within the next six months |
| | 9. Ensure that buses at the bus depots are operational – could consider subsidy scheme or bidding of the contractor | 4 | |
| | 10. Improving information system to inform passengers on the timetable | 3 | |
| Improving parking | 11. Enforcing on-street and off-street parking fee particularly within the city center | 4 | Within the next 18 months |
| | 12. Higher parking charge to disincentive cars | 5 | |
| Organizing traffic flow | 13. Proper marking of road lanes and signage for smooth traffic movement | 3 | Within the next 18 months |
| | 14. Proper driving school to reeducate drivers (Work with the Central Government) | 2 | |

Some of the hotspots proposed for improvement

- Central train station: Long-distance business travelers rely on this station but traffic outside this area is congested due to reduced traffic flow, partly due to the busy old market area
- The bus terminal in the city center: Better signage and organization since 2,000 buses enter the city daily but there is no proper station

Best Practices: Inspiration from Leipzig, Germany

Torben Heinemann, the Director of the Transport Planning and Road Construction Office from Leipzig, Germany, shared the experience of Leipzig which transformed the city from a car-centric city to an ecomobile city. Some of the learnings can be transferred to Ludhiana because of the similar characteristics between Leipzig and Ludhiana cities, in terms of how the city was historically designed and the industrial nature of the economy.

Car-free and car-reduced zones

Leipzig is a city of 29,760 hectares with 601,737 populations, which is one of the fastest-growing cities in East Germany.

The inner core of the city (about 900 meters x 700 meters) is designed as a car-reduced zone with the inner core as a pedestrian zone where no other motorized vehicles are allowed, while limited access for cars is permitted at the surrounding area (Figure 6). Meanwhile, more than 30 covered walkways were constructed throughout the inner city to connect between buildings and provide a comfortable walking environment. This attracts more pedestrians to enjoy the streets and walk into the shops, creating better social and economic opportunities for the locals and shop owners.

Parking in the inner city is limited to 10,400 parking spots within the inner city. The parking fee is raised by 200% to 2 Euro per hour, and in the last ten years, on-street parking in the city center reduced from 870 spots to 220 to control the number of cars entering the city.

An extensive tram system is established to connect the entire city, making Leipzig's tram network the ten most protracted in the world with 148 km. The tram system is more favored as the primary public transportation system compared to mass rapid transit (MRT) because of the size and the urban form of the city.

Increasing bicycle trips

While parking for cars reduced, bike parking in the inner city almost tripled with the opening of bicycle garages. Good cycling infrastructure is continuously developed, and it presently maintains 499 km of the bicycle network. A Bicycle Specialist is employed by the administration to oversee the task of improving the cycling network of the city. The efforts have been successful, leading to almost five times more cycling trips in the city.

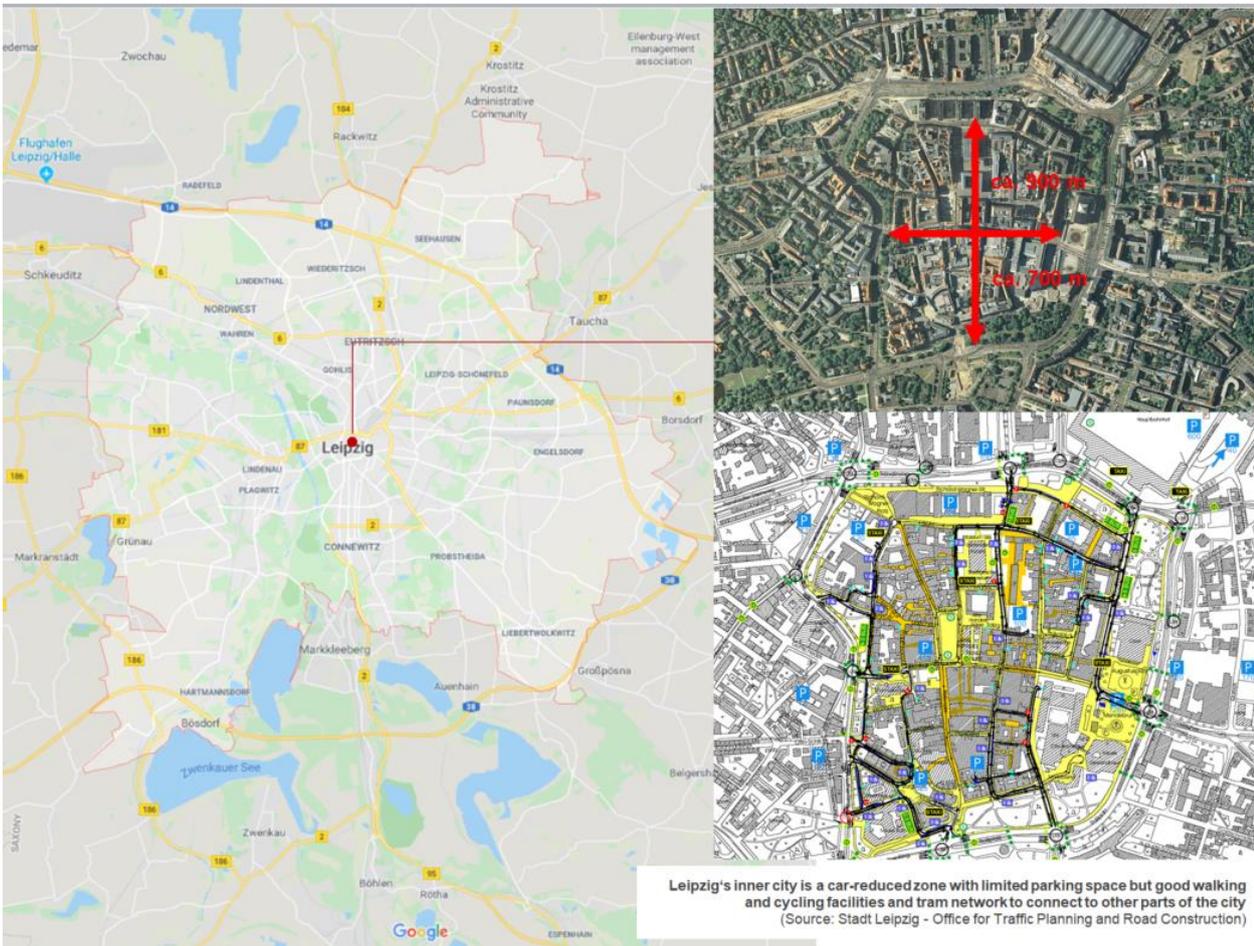


Figure 6: Map of Leipzig city (Top and bottom inserts: Leipzig's inner-city that is a car-reduced zone)

Key Takeaways or Recommendations

In Ludhiana, there is a considerable potential to demarcate a car-reduced or car-free zone around the radius of the old city area, specifically where the Clock Tower and the market are located (Figure 8). This is one of the busiest areas in the city with many activities surrounding the market and railway station. However, the mixed traffic including pushcarts, auto-rickshaws, cars, and other vehicles, resulting in horrible congestion and poor walking conditions. A car-reduced or car-free zone is ideal for redesigning the traffic by giving priority to pedestrians or cyclists while stimulating the local economy.

According to the BRT proposal, the city also envisages installing a metro system. Metro system is favored in many Indian cities but the cost feasibility and sustainability should be considered and compared to other types of the public transportation system. Public transportation should be provided based on customer needs and demand, rather than the desired technology and enforcing it on the users. Thus, a rational projection and decision to evaluate the feasibility of the different options and costs incurred are necessary. An example of the initial cost of investment against the various public transport system according to the different capacity and speed is illustrated in Figure 7.

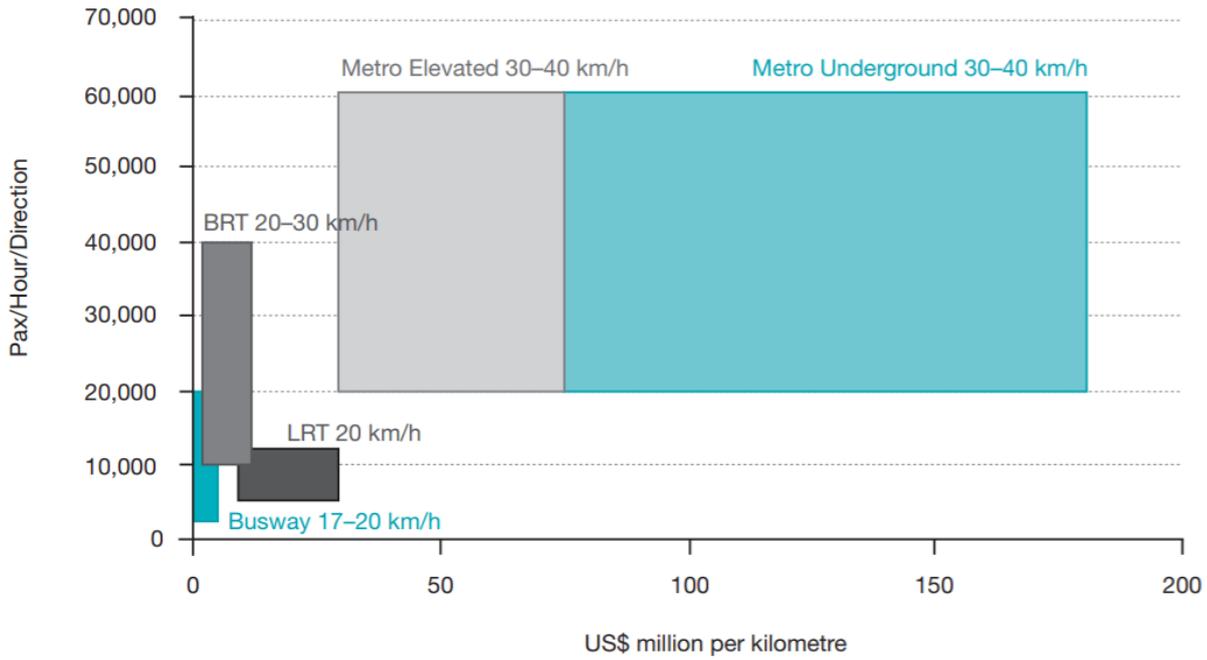


Figure 7: Initial investment cost versus capacity and speed of the different transportation system

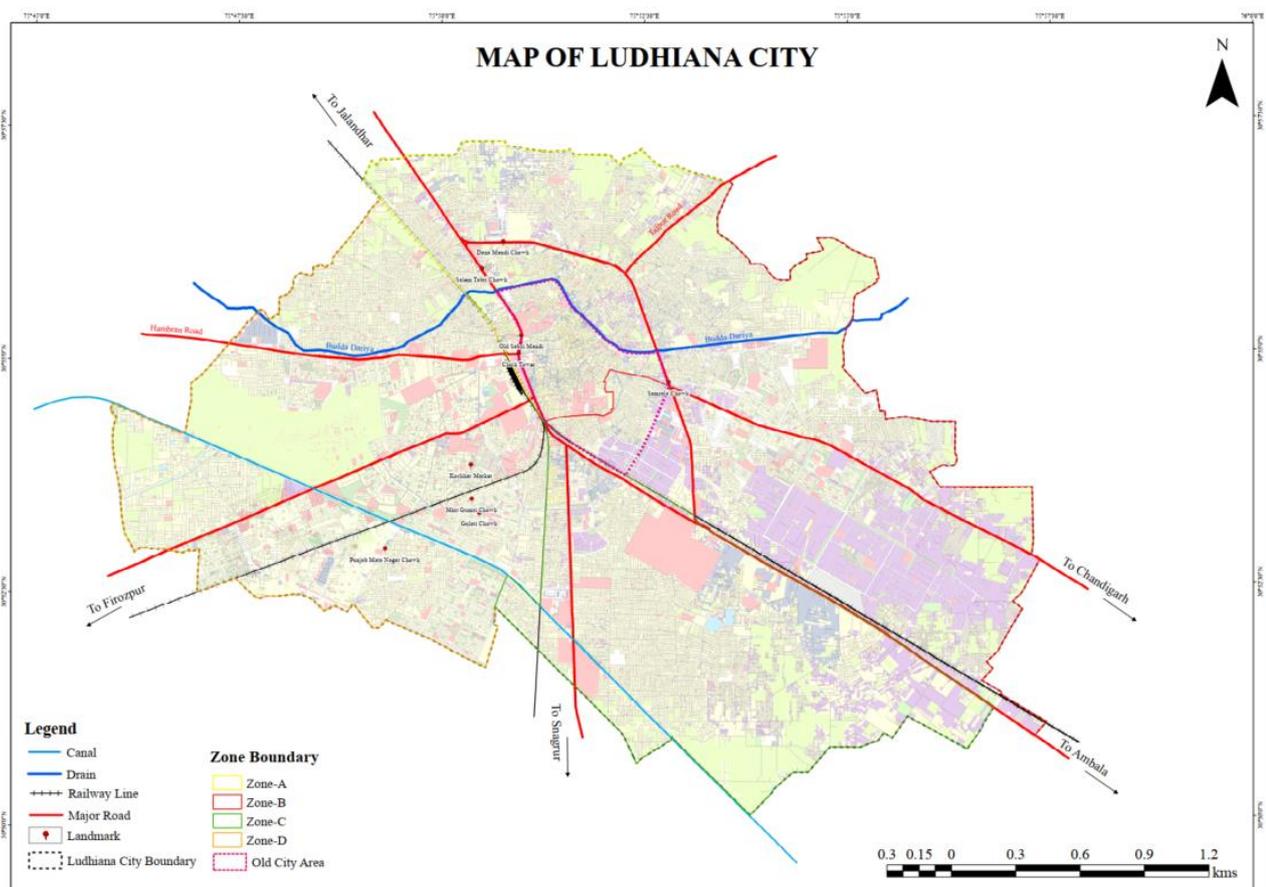


Figure 8: Map of Ludhiana City, India



The market area near the Clock Tower with high pedestrian traffic, this area could be considered for a car-reduced zone to attract more visitors to the shops.

Vision Zero as a goal

The high number of road fatalities is a huge concern, demanding attention and actions from the city. This is timely considering the ongoing Safe City project.

Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries while increasing safe, healthy, equitable mobility for all. First implemented in Sweden in the 1990s, Vision Zero has proved successful across Europe – and now it's gaining momentum in major American cities. – Vision Zero Network

Cities like New York are adopting Vision Zero as a goal and an approach to address this complex problem, treasuring each human life, especially the vulnerable group. It brings together different stakeholders from engineers to policymakers to traffic police and health professionals to design better and safer road system and policies to achieve zero fatalities. This process can start with collecting and organizing incident data and identify hotspots to implement change.

Summary

Due to the lack of technical and financial capacity, the city needs to be more proactive in improving the safety and accessibility of people to create a more livable city. Currently, there are too many stakeholders to manage transport but the key institutions to be held responsible and accountable cannot be identified. Therefore, a unified Transport Authority or Department in the likes of the Kochi Metropolitan Transport Authority needs to be set up to plan and implement mobility policies and projects. This enables the authority to maintain sustainable financial revenue to subsidize public transport and charge car users.

The main recommendations upon the stakeholder discussions include:

- Land-use and transport planning with equitable access as a core goal. The Bus Rapid Transit (BRT) Proposal or other public transport plans must be considered together with urban planning to ensure effectiveness
- Change of mindset is critical to change the development paradigm from car-centric to people-centric, while behavioral change could improve current driving behavior to improve traffic flow and road safety
- The Smart City projects learnings can be replicated in other parts of the city, concentrating on the inner city area where more low- to middle-class residents reside and work
- Leverage on the Safe City program to enforce safe driving and traffic laws
- Vision Zero approach can be adopted
- Universally-accessible walking and cycling infrastructure and network to relieve congestion and improve the safety of pedestrians and cyclists

About EcoMobility SHIFT+

The EcoMobility SHIFT+ scheme is developed by ICLEI-Local Governments for Sustainability to provide local authorities with a useful tool to *assess, analyze, and act* to improve sustainable mobility. By working with the public and private stakeholders, this tool analyzes the ecomobility performance and status quo to identify short-term and long-term interventions and making informed decisions. The backbone of this system is 23 indicators categorized into three main dimensions: Enablers, Transportation System and Services, and Performance. This is a powerful tool for policymaking by capturing and synthesizing complex data into meaningful information.



About CitiesSHIFT: Capacity building and networking for climate- and people-friendly mobility project

Funded by Hewlett Foundation, the overarching goal of this project is to support cities to identify challenges and opportunities of urban mobility system in the hope that the city could shift towards more ecomobile modes of travel, i.e., walking, cycling, public, and shared transport. Six project cities from China, India, and Uganda participates in this project.



Scan the QR code and download the reports about the project and project cities.

Contact us

If you are interested in conducting EcoMobility SHIFT+ for your city, please contact us
Sustainable Mobility Team
ICLEI-Local Governments for Sustainability World Secretariat

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