

Foshan New City, China

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. Foshan City is a prefecture-level city in southern China’s Guangdong Province. It is located at the hinterland of the Pearl River Delta (PRD), adjoining Guangzhou on the east and Hong Kong and Macao in the south. As a junction of PRD’s transportation system, Foshan is well connected with other cities via air, rail, highways, and water transport.

Due to its strategic location, Foshan New City was established in 2003 in the south-central part of Foshan City, with a demarcated zone known as the Foshan Sino-German Industrial Services Zone. As a national cooperation platform, it has been acknowledged in the “Joint Declaration to Further Advance Two-way Investment” under the strategic partnership between China and Germany. Foshan New City is poised as a critical economic development catalyst and has invested in physical developments to attract high value-added international investments. Its industry is based on three pillars: advanced manufacturing, convention, and exhibition as well as the pharmaceutical industry.

Foshan New City gathered key stakeholders, including representatives including the urban planning department and transport research division, to form the EcoMobility SHIFT+ Working Group to analyze the transport system and discussed the short- and long-term interventions. ICLEI’s Sustainable Mobility team moderated the stakeholder discussions and provided constructive feedbacks according to the observations and discussions. A representative from the Barcelona Metropolitan Government was also present to share Barcelona’s experience, enriching the discussions. The EcoMobility score for Foshan is 79%, indicating a proactive environment with various best practice achievements. This is primarily due to the robust implementation to execute plans and enforce transport policies with the support of the national government. The survey area includes Foshan City.

Facts & Figures

Population

7.19 million (Foshan City)
1.1 million (Foshan New City)

Land area

88.60 square kilometers (km²)

Modal split (2017)

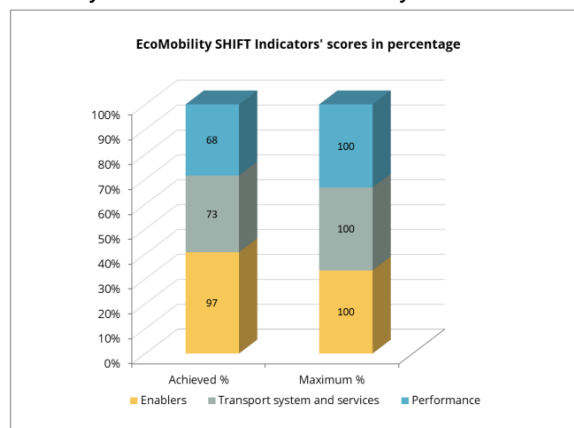
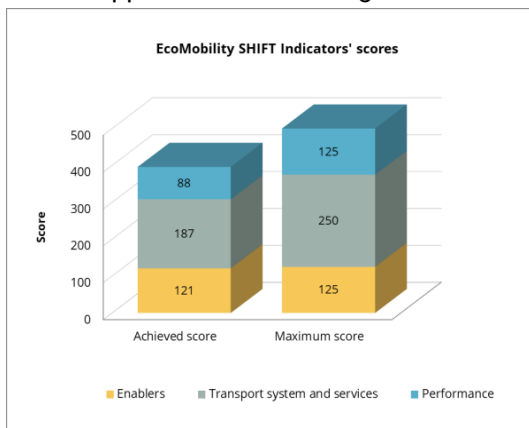
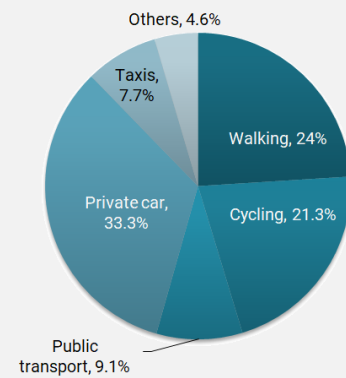


Figure 1: EcoMobility SHIFT+ Indicator scores and in percentage for each category

Overview of the 23 EcoMobility SHIFT+ indicators' ranking and the city's achievement in relation to global cities is presented below.

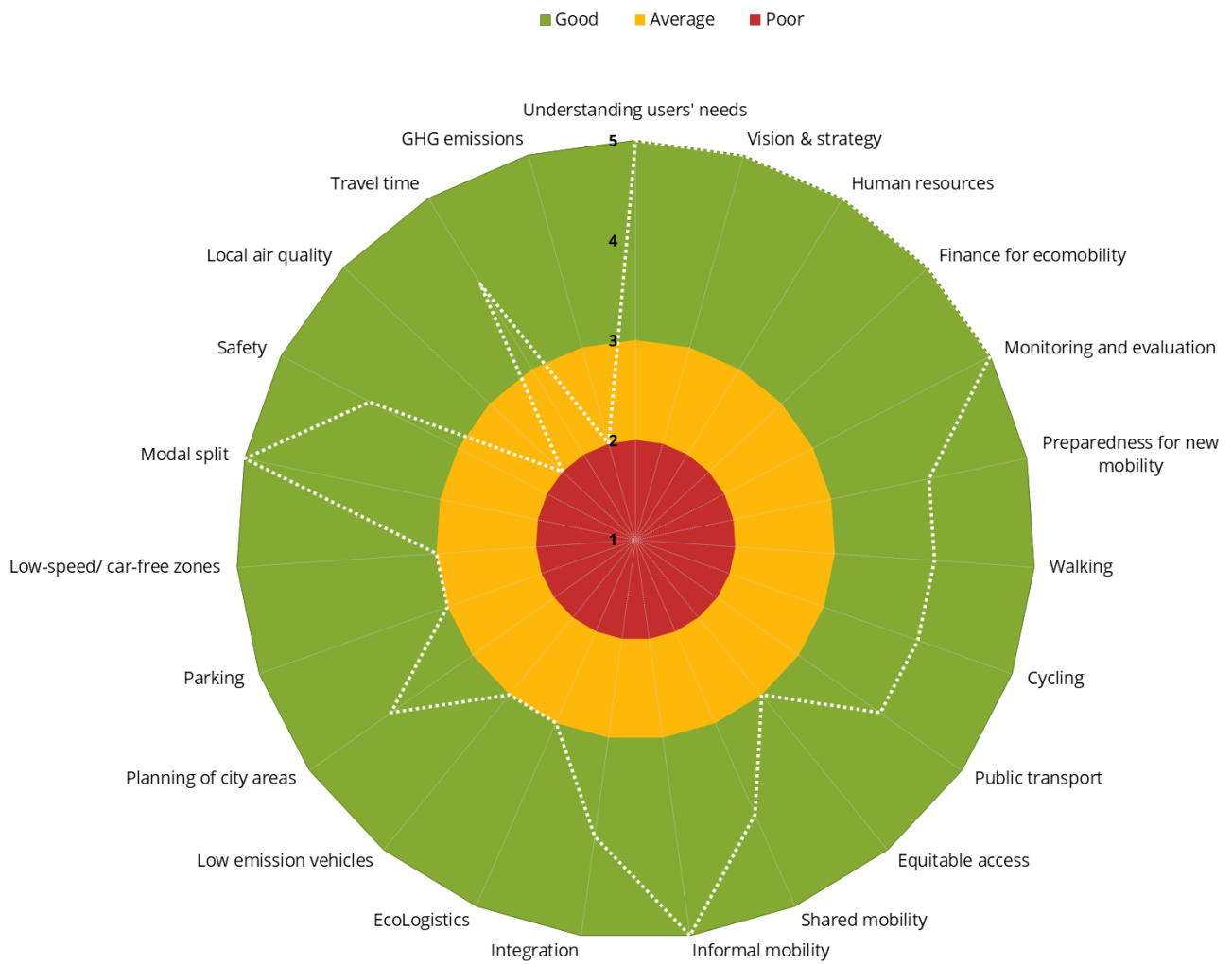


Figure 2: Overview of the EcoMobility SHIFT+ Indicators ranking

EcoMobility SHIFT+ Results based on category

Enablers

Foshan is excellent in developing strategic documents and vision for the city in terms of transport, and it has a reliable and capable team including a Research Institute to support the research, data collection and surveys to understand the needs of the residents and the latest developments in sustainable mobility nationally and internationally. The first Foshan Integrated Transport Plan 2009 identified public transport as the backbone of the transportation system. In 2013, the plan was updated to strengthen connectivity with the city's Masterplan and promote integrated multimodal transportation. This is also complemented by the Foshan's Transport Development White Paper 2013, the first White Paper on transport in China, which advocated for "seamless, green and equitable" mobility as the core of a healthy mobility vision. While it encourages the integration of the mobility system city-wide, tailored-made solutions will be provided according to each district.

Some of the vital development plans include:

- Foshan City Masterplan including the Sanlongwan New Development Conceptual Development Plan
- Foshan City Public Transport Plan
- Foshan City Active Mobility Plan
- Foshan City Cycling Development Plan
- Foshan City Parking Strategy and Plan
- Foshan City Light Rail Transit (LRT) Design Plan
- Foshan – Guangzhou LRT Connectivity Plan
- Foshan New Airport Feasibility Study

Each year, the city conducts assessments to evaluate the transport performance and trends as well as satisfaction surveys. The report is also publicly available. This reflects the city's openness to new mobility technologies, business models, and trends by continually reviewing and evaluating the different types of options to suit the city's needs and goals. This is supported by a Transport Bureau and Foshan Research Institute. A dedicated task force is also formed to plan for the new Sanlongwan development, including urban and transport planning, with close cooperation from different departments. Financial support for new construction projects such as the LRT is from the city or provincial government.

In general, Foshan maintains excellent human and financial capital to plan for sustainable mobility and deliberate on new mobility models and systems, which is reflected by the various planning and evaluation documents.

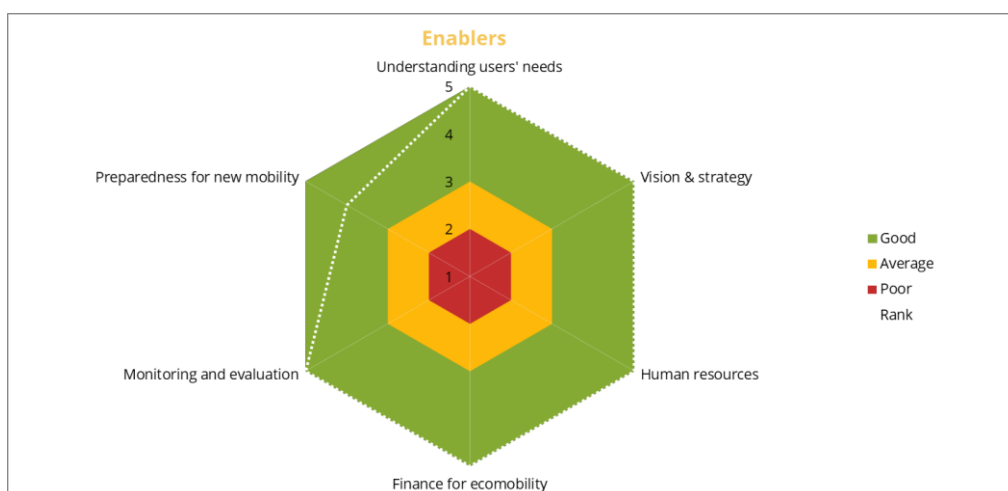


Figure 3: Enabler category's indicators' ranking

Transport system and services

The transport system and services indicators' ranking is presented in Figure 4 below. More than half of the trips made in Foshan are in an ecomobile manner, i.e., walking (24%) and cycling (21.3%) and public transport (9.1%). Private car usage is 33.3%, and taxi is 7.7%. Other transport modes such as motorcycle, electric scooters represent 4.6%.

Active mobility and micro-mobility

Foshan City Active Mobility Plan is a very detailed planning document that analyzes the active mobility network of Foshan and guides the future development of Foshan, drawing experiences from local and international cities. The pedestrian coverage network in the five central districts of Foshan is high, averaging at 89%, while lanes for active mobility are lower, averaging at 67%. In some parts of the city, cycling lanes were reduced to make room for roads for cars. Electric motorcycles or mini electric freight delivery vans are observed sharing walking or cycling lanes.

The quality of the walking and cycling infrastructure is mainly good with separated pavement in most areas, as well as seating and lighting. In most areas, the sidewalks are also friendly for the blind, averaging at 60% except for the Guangming District. However, 50% of the walkway is about 2 to 6 km wide, which is sufficient for fast-moving motorcycles or mini freight vans contravene the space. Such competition between the fast-moving vehicles and pedestrians or cyclists endangers the pedestrians and cyclists as well as deteriorates the quality of the sidewalk materials due to heavy load. A study conducted by the city showed that the lower-income group relies on walking and cycling more than a higher-income group, but 10 to 15% of walking is still necessary for most trips made by the residents, regardless of the income¹.

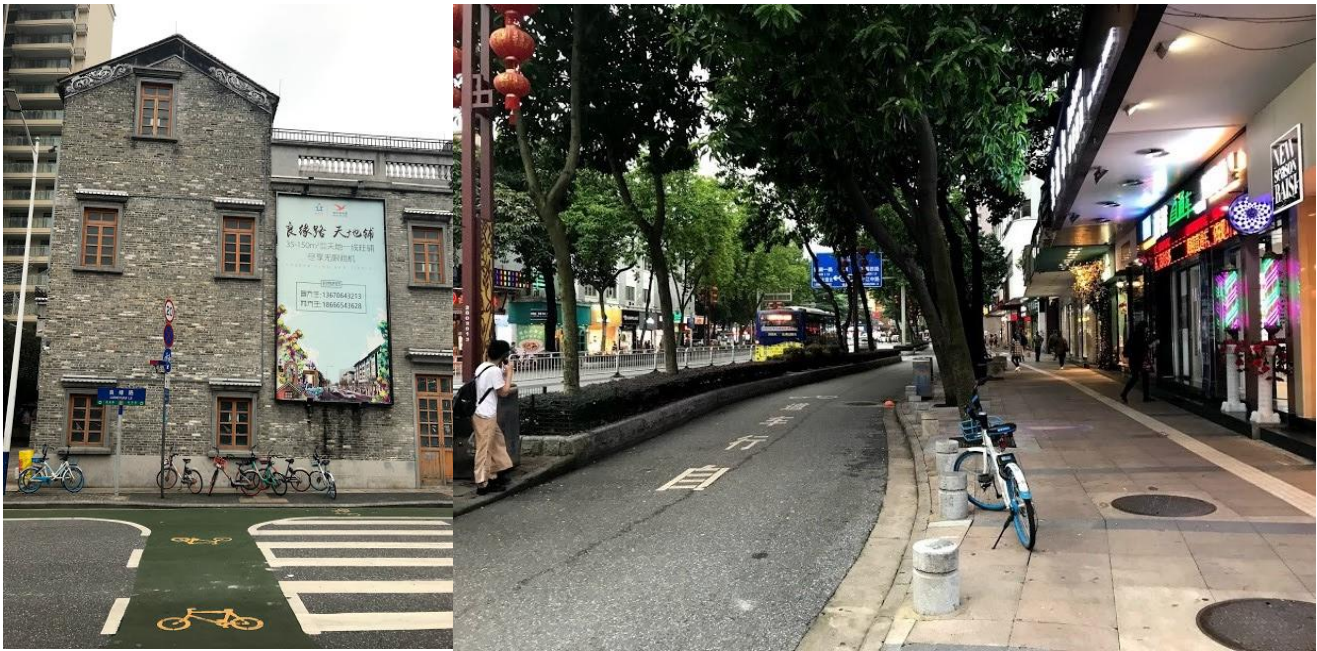
Cycling sees the fastest growth in the city with the introduction of bike-sharing. The city started public bike-sharing since 2010 to solve the last-mile connectivity problem. To date, there are 652 stations with about 21,270 bikes. The public bike-sharing became a popular demand for the residents with each bike turnover as 5.81 trips/day and increases to 10.21 trips/day at the Changcheng District¹, making public bike-sharing an important mobility mode for the residents. Today, dockless bikes are almost omnipresent in the city core. At certain parts of Foshan, damaged public bikes piled up along the streets or lousy parking. The city counters this by drawing boxes for bike parking and work with private companies to enforce better parking through technology.

Part of the increase in cycling is not from private car users but rather public transport users where shorter distance trips are replaced by renting a shared bicycle.



Separated pedestrian walkway (left) and separated lane for walking and cycling (right)

¹ Foshan Slow Mobility System Plan



Painted cycling lane (left) and segregated cycling lane (right)

Public transportation and new mobility services: A new transport ecosystem

Public transportation is the backbone of their transportation system, complemented by active and shared mobility. The existing public transport services connecting the city and the surrounding region include:

- Public buses covering 11,650 km
- Mass rapid transit serving within the city and between Guangzhou and Foshan, 37.96 km
- The light rail system in Gaomeng District, 6.5 km
- High-speed rail, known as the Guangzhou-Foshan Ring Line of the Pearl River Delta Intercity Track (Foshan West Station to Guangzhou South Station), 45.5 km
- Guangzhou – Zhuhai Intercity Track, 32 km
- Guangfo – Zhao Intercity Railway, 59 km
- Ferry from Shunde District to Hong Kong

Different state-owned transport companies operate these services. The city is actively expanding the city public transportation system by constructing a light rail and metro system (14 additional lines are being planned). The first light rail that is powered by hydrogen in China started operation at the end of 2019, connecting the north and south of Gaomeng District. The public transport system also focuses on connecting to the neighboring cities such as Guangzhou, Zhuhai, and even Hong Kong as these are economic powerhouses that many intercity commutes. Many commutes between Guangzhou and Foshan for work (1,630,000 trips/day in 2017²), using the metro or high-speed rail.

There are various forms of new mobility services in Foshan, as follows:

- Public bike-sharing system with 1,113 stations and 35,000 bicycles (built in 2010)
- Dockless bike-sharing with 400,000 bikes (owned by various operators since 2016)
- Car sharing with 323 stations and 1,348 cars (owned by private operators since 2017)
- Ride-hailing services by Didichuxing, Caocao, and Shenzhou companies (since 2015)
- Carpooling services by Didi (since 2014)

² Foshan Transport Development Annual Report 2017

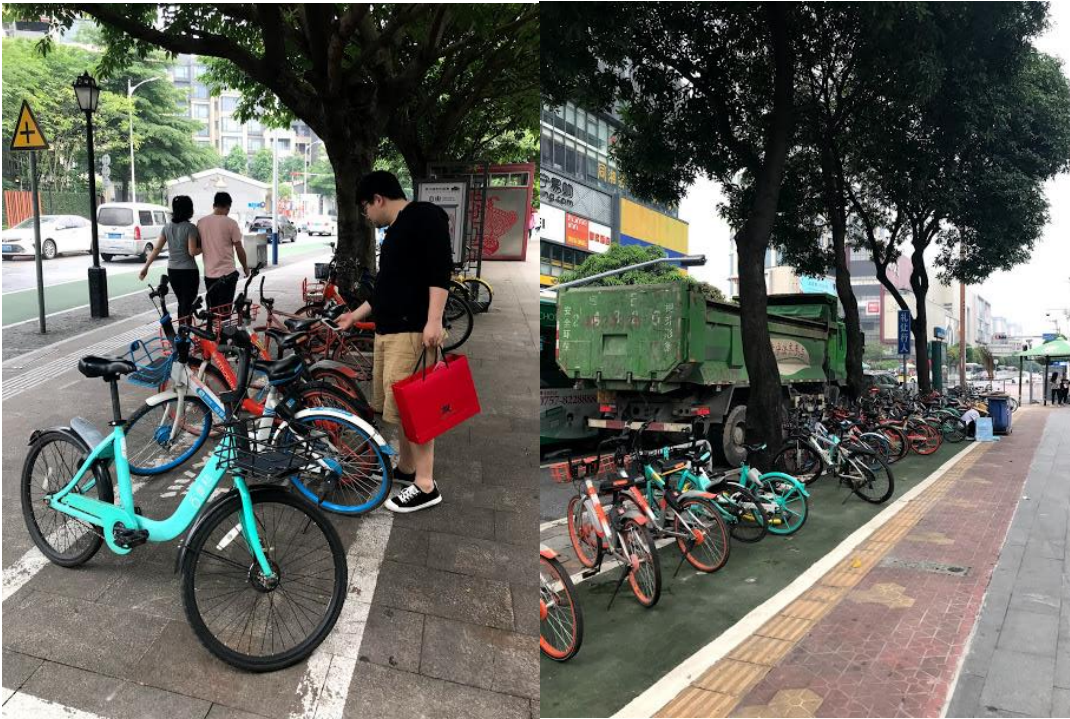
These new mobility services have drastically impacted how residents move. Based on the study, public transportation ridership has been increasing in the past few years but suffer a modest decline since 2017 due to the emergence of popular new mobility services such as Didichuxing ride-hailing services and bike-sharing. More passengers are choosing dockless bikes for shorter distance trips due to the convenience, while ride-hailing services serve longer distance trips. The bike-sharing system has proven useful for last-mile connectivity, representing almost 25% of the trips in 2017, while bike-sharing trips for daily life such as shopping, work, dining represent 75%, showing that bike-sharing has become a new form of mobility for the residents.

On the other hand, ride-hailing services have induced more automobile trips. Up to 78.9% of ride-hailing passengers would have used public transport, walk, or cycle if ride-hailing services did not exist. Only 12.3% of passengers are former car-users and 7.4% of taxis (2017). Instead of replacing car trips, ride-hailing services increased car trips by 3.2%, equal to 80,000 cars². While there is a policy guide to manage ride-hailing and car rental services, registration of drivers is still not complete.

In general, Foshan offers quality multimodal transportation to residents with public transport as the backbone. The city hopes to strengthen sustainable mobility through transit-oriented planning.



Dockless shared bikes are abundant in the city core (left); broken bikes are placed aside (right)



A user unlocking a dockless bike (left) and demarcated bike parking to organize dockless bikes (right)

Integrated, equitable and clean mobility

With the various mobility modes offered by Foshan, integration is essential. Mobility-as-a-Service is not fully mature yet as integration is done for public-owned transportation services while private services such as car-sharing are not available. However, with different map applications such as Gaode Map, Baidu Map, or public transport app, Chelaile, users quickly receive live information about the different transport modes, fares, and expected time. The GuangFoTong transport card is used for all public transportation services within Guangzhou and Foshan, also available to purchase food at the convenience stores. Fares are considerably low, ranging between 2 and 7 Chinese Yuan (CNY, less than 1 Euro), for public bus and local transit services. Users pay half for the subsequent transit trips within 45 minutes. Special fares are offered to the elderly and students but not yet for people with reduced mobility². Likely, expenditure on public transport is not significant for the average population.

Transit times average at 15 minutes, with 50% of transit occur in less than ten minutes². This is achieved because of the study of each transit station design that takes into consideration of the different transport modes and needs. Public transport stations maintain bike or car parking. MRT stations care for people with reduced mobility, but this is overlooked at bus stations and even buses.

In line with the Chinese government's efforts to green and electrify public transport fleets, many charging stations are installed throughout the city to charge public buses and private vehicles. The city fully electrified public transportation in 2019, one year ahead of the goal. By the end of June 2019, there are about 4,000 new energy buses that are fully electric or hydrogen-fueled. The city hosts 10 hydrogen energy stations and 39 charging stations with 934 charging poles. The first hydrogen energy tram in China is also built-in Gaoming District.

Foshan achieved through visionary planning and high investment based on the Foshan Hydrogen Energy Industry Development Plan (2018 – 2030). Foshan will invest 900 million CNY (11.8 million Euro) between 2013 and 2030 under the Regulation of Financial Subsidy for New Energy Bus and Infrastructure Construction, providing subsidies for charging stations, hydrogen energy stations (1.5 – 3 million CNY, 198,000 to 394,000 Euro), and electric or hydrogen-powered buses.

Furthermore, the city tightened the control of private vehicle emissions since 1 July 2019 in which all-new lightweight vehicles sold must fulfill the criteria set out in the National Sixth Standard (Sixth Phase National Lightweight Vehicle Pollutant Emission Standard).



Electric bus (left) and public charging poles for electric cars stationed at the parking lot (right)



Roads that are designed for dedicated bus lane, cycling and pedestrian path ways (left); electric scooters are also common (right)

Urban planning

Foshan City Masterplan 2011 – 2020 highlights the need for regional integration, urban planning, leaning administration works, strengthening urban-rural integration, upgrading existing urban areas, and promoting an intensive urban-rural network. There is a tendency for Chinese cities to develop in the periphery of the urban centers as part of the growth-oriented urbanization, which is far from the existing urban centers. While this is a less sticky phenomenon in Foshan, it is also observed that new developments still emphasize car-oriented connectivity while phasing in the development of a transport network. Transit-oriented development is advocated widely in Foshan but generally focused on new developments.

The *Lingnan Tiandi* is a famous historical area that is also car-free, allowing people to enjoy the culture and space there. There is a parking policy in Foshan to maintain carpark demand and improve efficiency. As the central business district is limited, Foshan aims to reduce parking spots but strengthen public transport.



Car-free center in Zhumiao Temple (left) and new public park (right)



Square that is only for walking and minimal cycling (left) and newly developed areas also provides for people on wheelchair (right)



Movement of goods in small vehicles is common

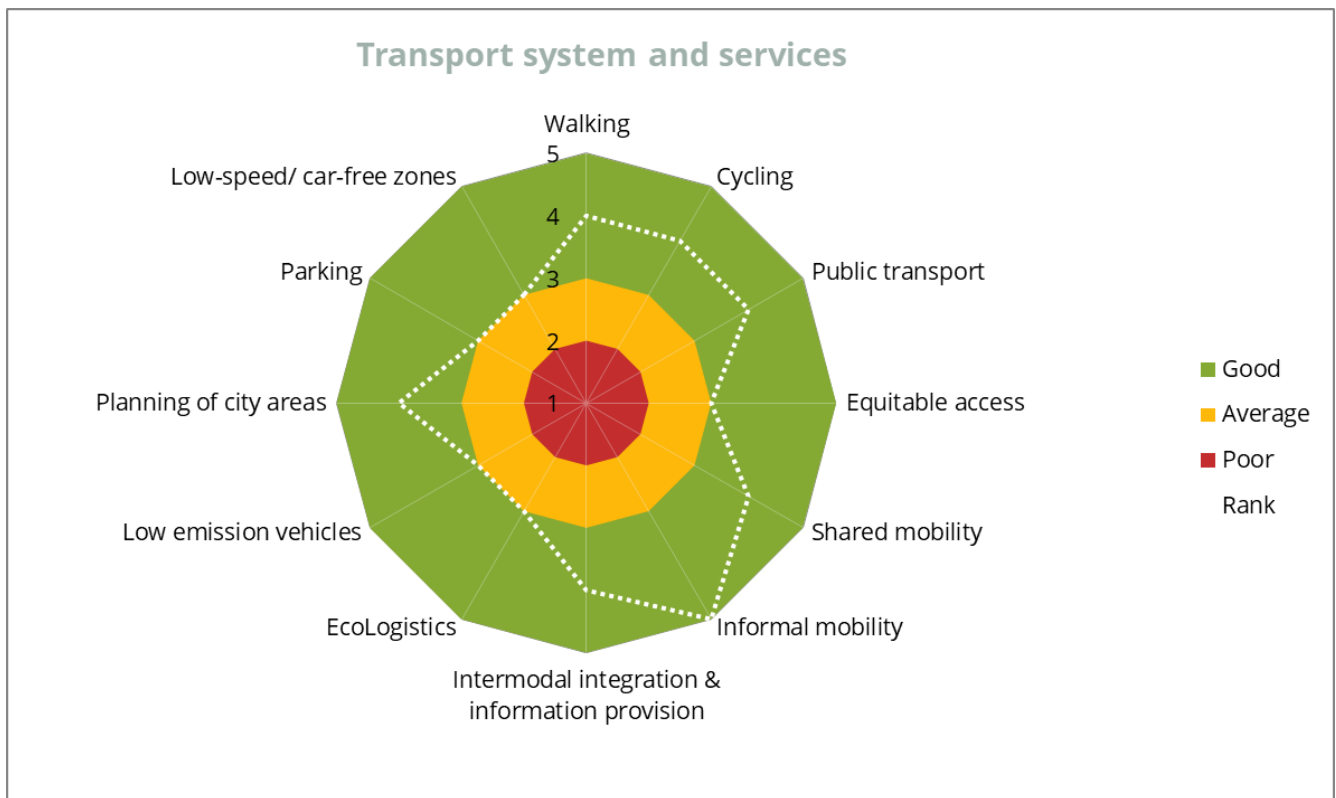


Figure 4: Transport system and services category's indicators' ranking

Performance

More than half of the trips made in Foshan are in an ecomobile manner, walking (24%) and cycling (21.3%) and public transport (9.1%). Private car usage is 33.3%, and taxis are 7.7%. Other transport modes such as motorcycle, electric scooters represent 4.6%. The average transit time is 30 - 35 minutes, but taking private automobiles is sometimes faster than public transport.

In 2017, 1,896 accidents occurred with 542 fatalities and 1,833 injuries, amounting to 4,591,000 CNY (604,239 Euro) of economic loss, although it has reduced from 2016. While most of the incidents are contributed by motorcycles (37.1%) and cars (10.1%), fatalities due to lorries are the highest (34.1%). While most accidents are caused by poor driving, there is also a notable percentage of incidents that are caused by pedestrians or cyclists (14.8%, fourth-highest reasons). Amongst the fatalities, 15.4% are due to pedestrians or cyclists. This highlights the need for better active mobility infrastructure and separation of lanes².

In 2017, 290 days met the Air Quality Index (AQI) standard of good air quality, albeit with a slight reduction. The highest contributor is NO₂, O₃, PM_{2.5}, showing that pollution from transportation is significant.

Performance indicators' ranking is illustrated in Figure 5.

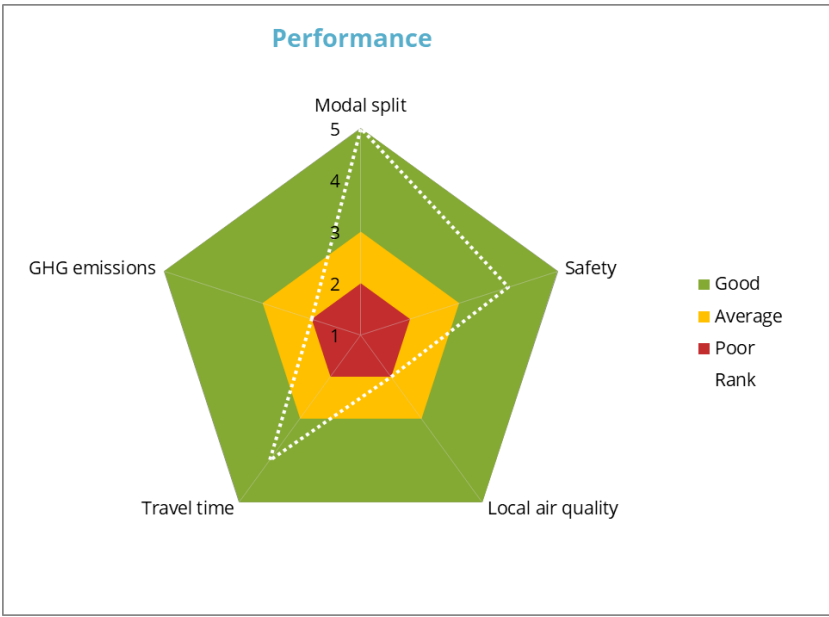


Figure 5: Performance category indicator ranking

Proposed actions

Based on the SHIFT+ Working Group committee members discussion, the following summarizes the strengths of the city.

- Monitoring and evaluation: useful annual reports that are publicly available
- Different strategic documents on various aspects of sustainable mobility in coordination with Masterplan
- Proactive and open towards innovations and regulation
- Walking and cycling network that is quite extensive within the urban core
- Shared mobility options are abundant
- Having public transportation system as the backbone of mobility, supplemented by active mobility
- Open space created at different parts of the city that are also pedestrian zones
- Electrification of public transport and private vehicles
- Use of smart and innovative technologies

Areas identified for improvement are also discussed in the sections below. The two main questions addressed are as follows:

- Foshan residents use cars as their primary transport mode, how could Foshan promote sustainable mobility, especially in older districts?
- How can Foshan effectively connect and integrate transport planning and urban space development and planning between districts?

Improving congestion through transportation demand management

Foshan is one of the four most traffic-hit cities in China, according to a survey by Gaode Map 2018, the equivalent of Google Maps for China. This is mainly due to the increase of private vehicles in Foshan, which also reduces air quality. Although Foshan has the right development policies and plans, the growth of private vehicles could be attributed to a more affluent society and new development areas that are relatively far with less populated commercial centers, making car use a comfortable choice. Furthermore, while there are many options to encourage the use of public transport and shared mobility, there **is a lack of restrictive policies to discourage car ownership or private car usage**. Roads in the villages of Foshan are mainly for cars and are of greater distance, relying more on car ownership.

Push and pull strategies

Push and pull strategies are policies or measures that discourage the use of personal automobiles, while pull strategies provide incentives for people to transit from private cars to sustainable mobility. One of the ways is transport demand management (TDM), which is an accessible overarching policy that is adopted by Singapore's transportation model. TDM is a strategy that aims to maximize the efficiency of the urban transport system by discouraging unnecessary private automobile use and trips and by promoting sustainable transport. The main aim is to reduce the total volume of traffic and encourage shifts towards sustainable modes of transportation to reduce congestion.

Different instruments can be adopted to manage supply and demand. Table 1 describes the different policy instrument and examples of Foshan's corresponding implementation

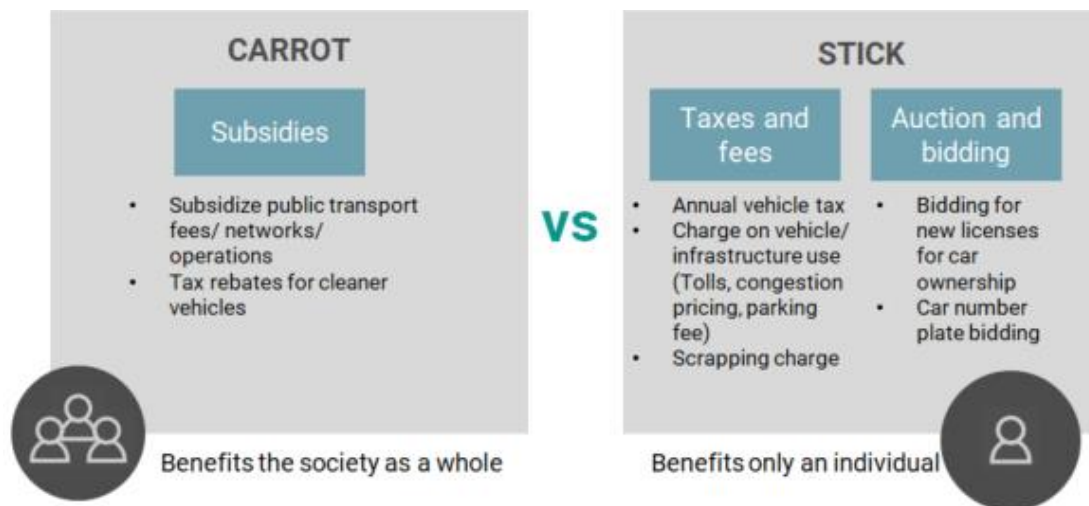
Table 1: Different policy instruments and example of Foshan's implementation

Instruments	Examples	Foshan's implementation
Planning instruments	Landuse planning and urban planning to reduce the need to travel by improving access to goods and services to where people are. The urban planning of transportation options	All of Foshan's district and new development maintain extensive plans with TOD as the core development ideology
Regulatory instruments	Standards and regulatory measures to restrict certain motorized vehicles, road space allocation (e.g., speed limit, parking, emission limits)	Enforcement is relatively vigorous in Foshan especially with speed limit
Economic instruments	Financial means to discourage the use of motorized vehicles by charging taxes, fees or levies (e.g., road pricing, fuel tax) while investing and subsidizing sustainable transport infrastructure Non-financial resource provision such as allocating public land for sustainable transport projects	Lacking except for parking charges
Information instruments	Provide easily accessible information on alternative transport means and the cost of travel between different modes to influence behavior Knowledge creation, education, awareness campaigns can be included	Online applications that are extensively used for transport information Foshan adopts stricter vehicle standards for emission control Excellent data analysis and monitoring
Technological instruments	When travel with motorized vehicles is unavoidable, adopt for cleaner fuels and vehicles	Foshan places many efforts in electrifying of fleets and is currently piloting hydrogen buses

(Adapted from GIZ 2009, *Transport Demand Management*)

Foshan can be applauded by the development of policies and strategies to promote sustainable mobility, but the problem of increasing private vehicles still poses a challenge. This is one of the pitfalls of only providing attractive ecomobile options without restricting personal automobiles. In many cities, even after implementing bicycle lanes and improving public transport, the use of these modes does not see an increase. In Foshan, the use of shared bicycles and cheap public transportation options have acquainted many residents with the idea of using more ecomobile modes, implementing policies that restrain and disincentivize the use of personal automobiles can leapfrog Foshan to achieving sustainable mobility. An efficient and powerful approach to solve traffic problems and to enhance transport efficiency is through economic measures.

The current pricing model does not reflect the full cost of driving or personal automobile ownership, such as the social externalities of traffic congestion; air pollution is not accounted for, making driving "cheap." For example, the total external cost in the EU-27 countries comes up to 258 to 373 billion Euro/ year (TU Dresden, 2012). Underpricing drives transport demand and focuses on the benefit of an individual, often the car owner. Figure 6 below shows the different economic measures that can be adopted. In principle, subsidies should be offered to transport mode that benefits society, such as public transport. On the other hand, taxes, fees, or charges should be placed on personal automobiles that benefit only an individual. The right investment to the transport system means maintaining the necessary road infrastructure and support sustainable mobility. The goal is to create stable revenue streams to enhance sustainable transport systems and services while reducing the desire for private car usage.



Figures 6: The different economic instruments

Changing mobility landscape: How can shared mobility support public transportation?

Foshan offers a myriad of shared mobility options, ranging from bike sharing, car sharing, ride-hailing, mobility as a service, which have proven beneficial to encourage people to commute sustainably. On the whole, new mobility services reduce private car ownership in many developed cities, especially in congested cities with good public transportation network. Although Foshan’s public transportation network is relatively extensive, ride-hailing services are gaining popularity due to its flexibility, privacy, and possibly comfort compared to using public transport. It is also showing signs that ride-hailing companies draw riders from public transport users.

This sign is not exclusive to Foshan as studies of impacts on public transportation by ride-hailing in the USA and Germany show similar trends. Further studies may be required for Foshan to determine the trends, effects, and policy needs conclusively. Studies in the USA showed that most ride-hailing users would have walked, cycled, or taken public transport if ride-hailing services were not available. Bus (6%) and light rail services (3%) experienced the most considerable reductions, while usage of heavy rail systems increased with ride-hailing (3%) The German study concludes that ride-hailing leads to an increase in motorized traffic despite pooling of individual rides as it reduces public transport trips by around 38% and other impacts on walking and cycling modes. Different from the USA and Germany, the result of ride-hailing on walking and cycling trips in Foshan is negligible due to the popularity of shared bicycles. Hence, attention and study should be focused on defining the role of ride-hailing services and public transportation. The question is how new mobility solutions work towards the city’s objectives?

The key to not allow ride-hailing services to replace the existing public transport trips is similar to managing private automobile trips. This could refer to different instruments such as (Ultra) Low Emission Zones (ULEZ) or congestion charging, as in London and Singapore. The backbone of sustainable mobility in Singapore is an excellent public transportation network, and shared mobility options are encouraged to complement public transport. As congestion pricing is in place, ride-hailing vehicles are also subject to the same charge to private vehicles, which impacts the fares. As electronic road pricing is area-sensitive, it still encourages commuters to opt for public transport in core urban areas, while ride-hailing services serve the less densely populated areas. London drafted a policy to regulate ride-hailing services to ensure that it does not compete with walking, cycling and the use of public transport, before banning Uber again in 2019, citing safety as a vital issue as more than 14,000 trips were taken with drivers who had faked their identity on the Uber’s app. Shanghai Metropolitan is working with Trip company to pilot vanpooling at the central office and residential blocks using app matching. Early results proved to reduce car trips effectively.

Currently, the impact on public transportation by ride-hailing in Foshan is modest, although more efforts are needed as the city is actively investing in public transportation such as light-rail service. More studies are needed on who

uses ride-hailing services as the profile of users would impact the policy implications such as if the users are sensitive to the price difference, which directly affects commuters' choice. In principle, new mobility services such as car-sharing and ride-hailing services play a role in reducing car ownership, but it also depends on an efficient public transportation system. As such, data sharing from these companies is necessary to make an informed decision in policymaking.

Create human-scale cities with proper land-use planning and urban design

The goal of transport planning is not a movement but access to services, opportunities and goods. On a macro-level, the best way to avoid mobility is to reduce demand through mixed land-use and urban planning. Transit-oriented development is advocated widely in Foshan but generally focuses on new developments. Local authorities need to be more committed to restructuring and upgrading the existing urban areas and local industry to improve access to services and opportunities, especially in villages.

At a city-level, connectivity between different districts in Foshan City and between old and new developments is essential. While road networks are already extensive, walking, cycling networks can be strengthened to make it safer and more conducive for people. Other urban plans, such as parking policies or low emission zones, can be considered to reduce the number of automobiles in the core urban areas. Parking policy in Foshan needs to be better enforced because of the number of carparks in the city area as well as the parking habits of drivers that often encroaches walking and cycling space.

In a micro-scale, tactical urbanism can be adopted to improve the quality and livability of existing urban areas. This is a deliberate and phased approach that is easy but reaps high rewards. For example, creating public space in the residential district, open streets that are safe for people with reduced mobility, changing road designs to reduce car speeds.

In general, controlled land expansion and new developments that are aligned with a sustainable transport network that is not just road-based but people-oriented and sustainable are crucial. Within each district, villages and neighborhoods, evaluations can be conducted to identify improvements that can be made, such as walking networks, safety audits, and unobstructed cycling lanes, etc. In Shanghai's Chang Ning District, local improvements are identified to create an underground passageway for pedestrians, pedestrian crossings that are disabled-friendly, tree canopy that is suitable for summer and winter conditions. These reforms are necessary to transform growth-oriented urbanization into a people-oriented one and to achieve more sustainable and balanced growth.

Health and safety as an essential narration for equitable access

Health and safety are growing concerns for a more affluent society like Foshan City. Transport contributes significantly to air pollution and GHG emissions. As China is leading the world in the climate battle, traffic is a key contributor. This includes both passenger and freight transport as freight transport contributes to almost 40% of the transport emissions globally. As online shopping and delivery services mature in Foshan, freight and logistics system need to be studied - not just for the emissions but more importantly for safety. It is observed that mini electric freight vans often share space with pedestrians and cyclists, although the vehicle speed is much higher and is often silent. This could explain the high percentage of pedestrians and cyclists involved in accidents due to the lack of separation of lanes. This is associated with health and safety concerns but can be overcome by planning complete streets (Figure 7).

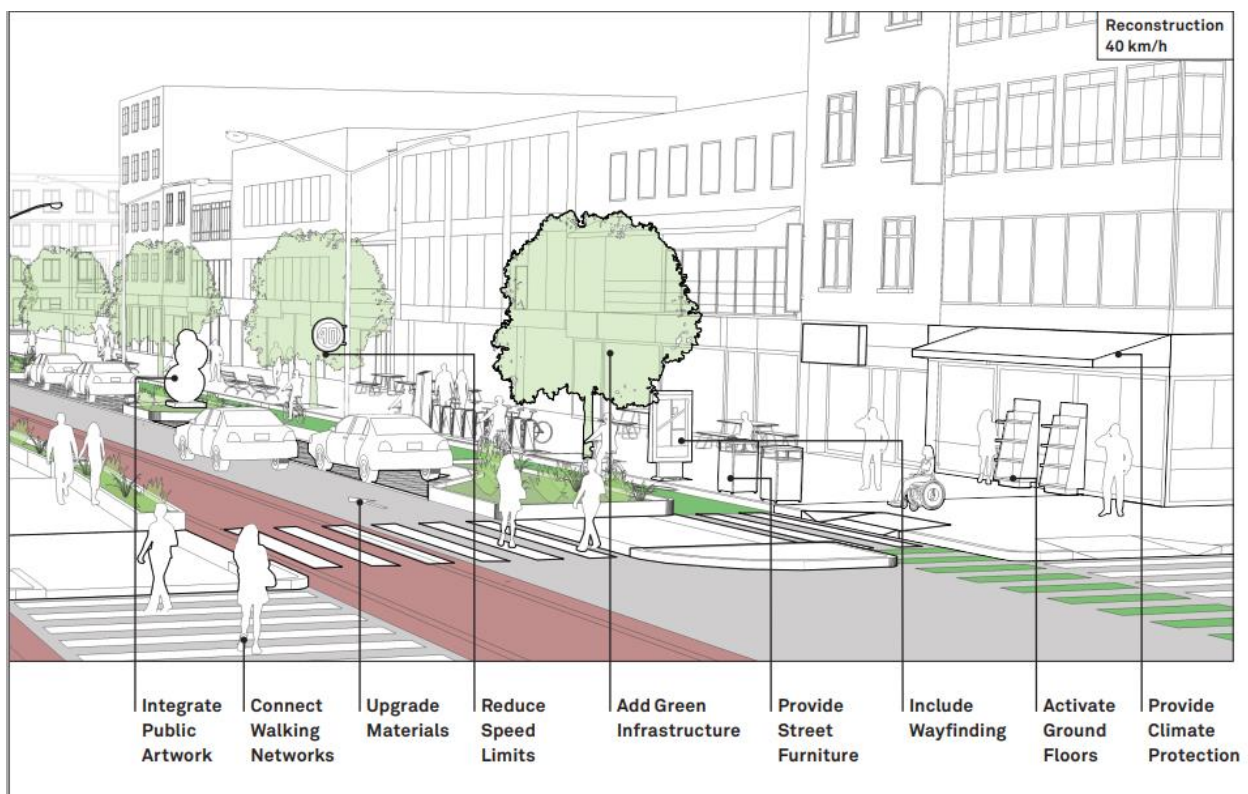
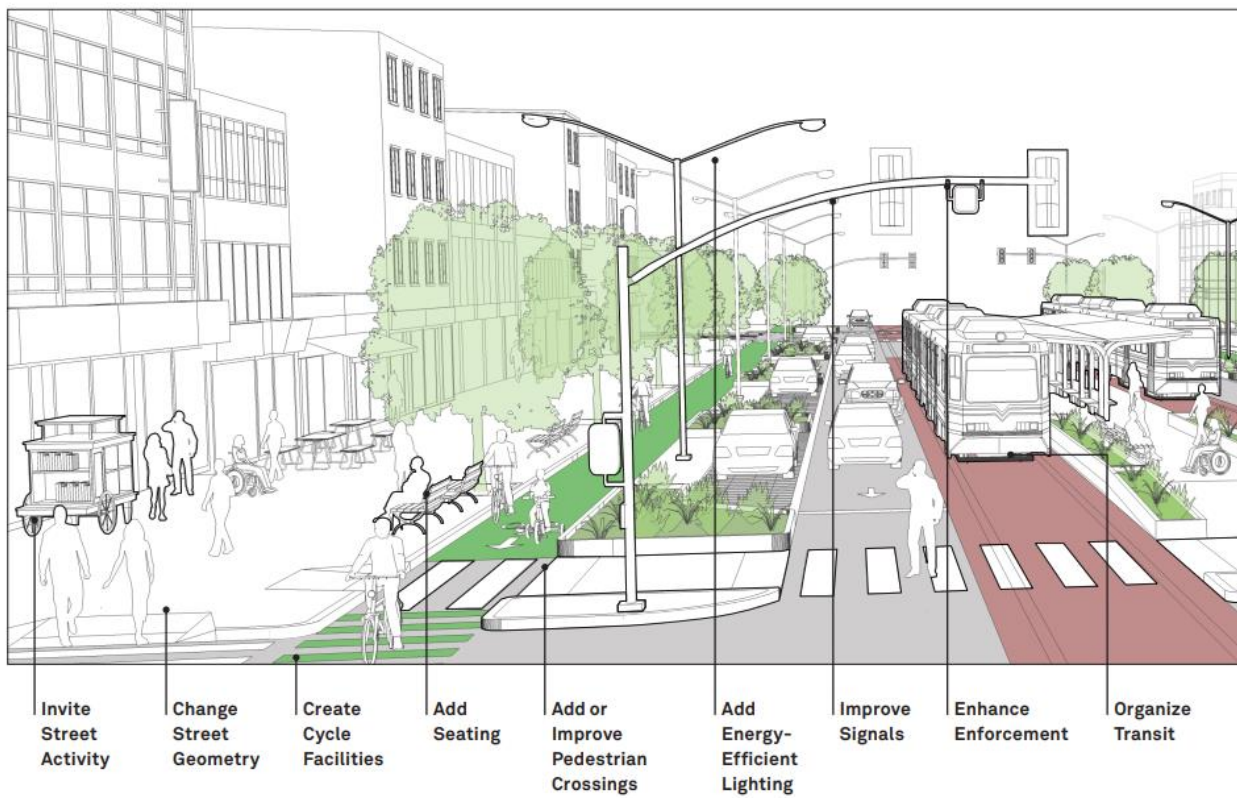


Figure 7: Complete streets (Photo source: NACTO)

Equitable access also considers accessibility for different types of transport user groups, such as women, children, elderly, low-income groups, disabled, etc. While Foshan City does have differentiated fare schemes for particular groups, more can be studied in terms of usability of transport (e.g., if the public bus is also friendly to people in the

wheelchair). It is internationally recognized that women travel differently from men so transport should also be catered to them. This can also be included in Foshan’s continuous quest to achieve sustainable, equitable, and efficient transport.

All measures are summarized in Table 2 below. The five policy goals (more accessible, efficient, greener, equitable, and safer) are retrieved from Foshan’s 13th Five Year Plan for Transport Development.

Table 2: Summary of policy changes or strategies and the corresponding impacts for Foshan City

Instruments	Policy changes/ strategies	More accessible	More efficient	Greener	More equitable	Safer	Impact for Foshan*	Remarks
Planning instruments	Integrated land-use planning	++	++	++	++		5	Integration between existing and new development
	Strengthen and upgrade the quality of existing urban areas		++		++		4	
	Parking management (reducing demand for cars)		++	++	++		5	Better bicycle parking esp. for dockless bikes
	Traffic calming measures (reducing road width, open streets)		++	++	++	++	5	
	Car-free or car-reduced zones		++	++	++	++	4	
	Improve public transport services especially at main corridors	++	++	++	++	++	3	Existing results are already good
	Cycling and public transport network between districts and at major transit corridors		++	++	++	++	3	
	Improve public transport services that are inclusive and accessible for all	++	++	++	++	++	4	More stops including villages and inclusive planning for people with reduced mobility
	Enhance pedestrian and bicycle infrastructure (network, safety audit, signage, comfort)			++	++	++	5	Improving safety and separation of lanes, preventing automobiles; adopting complete streets
	Low emission zones		++	++	++		5	Reduces traffic and control types of cars
Street design for pedestrians and bicycles	++	++	++	++	++	5	Especially for older districts of Foshan	

Instruments	Policy changes/ strategies	More accessible	More efficient	Greener	More equitable	Safer	Impact for Foshan*	Remarks
Regulatory instruments	More expensive carpark		++		++		4	
	Enhance shared mobility services that reduce private car trips	++	++		++		4	
	Regulate ride-hailing drivers					++	4	
	Fine illegal and inappropriate parking that intrudes walking or cycling lanes		++			++	5	Ban motorized vehicles on walking and cycling lanes
Economic instruments	Congestion pricing	++	++	++	++		5	Influences behavior patterns
	Distance-based fees (Electronic road pricing)	++	++	++	++		5	
	Parking pricing		++	++	++		5	
	Fuel tax or vehicle taxes		++	++	++		5	
Information instruments	Data collection especially for ride-hailing data	++	++			++	4	
	Wayfinding for pedestrians and cyclists	++	++				3	
Technological instruments	Cleaner vehicles that are based on renewable energy			++	++		3	
	Intelligent technology system to prioritize public buses over private cars		++	++	++	++	4	Reduces traffic times for public buses

*1 being the lowest impact, while 5 being the highest (Source: Author)

Best Practices: Inspiration from Barcelona, Spain

Marc Iglesias Perez, Project Director of Sustainable Mobility and Transportation of Barcelona Metropolitan Government, Spain, shared 12 strategies of how Barcelona Metropolitan Government (AMB) adopted sustainable mobility as a strategy to improve air quality and combat climate change, under the “Metropolitan Program against Air Pollution.” This program is a package of 33 specific measures in the fields of mobility, which causes 80% of the pollution with a budget of 46 million Euros.

Barcelona Metropolitan³ is about the size of 363 km² with 3,239,337 inhabitants. About 50% of the air pollutants are from road transport but increases in the main urbanized areas to about 70 to 80%. Each day, 8.8 million trips are made in Barcelona Metropolitan, of which 71.5% is made in sustainable modes, i.e., 40% walk, 2.3% cycle, 0.22% use micro-mobility, while 30% take public transport including buses, metro, and railway lines. Private cars consist of 22% and 6% for motorcycles⁴.

Breaking the chain of car-dependency

Most of Foshan’s strategy and interventions are efforts to encourage residents to use public transportation by providing cheap public transport options, multiple shared mobility offers, and walking and cycling infrastructure in different parts of the city. Some interventions to discourage the use of private cars needs to be considered to prevent the rise of private vehicles. In Barcelona’s case, low emission zones are one of the policy approaches to phase out old cars and reduce reliance on cars, especially in the central areas.

Barcelona maintains a car-free zone in the inner city where most areas are pedestrianized. It is now demarcating the outer zone as low emission zones (LEZ) where only approved vehicles are allowed to enter, but Park and Ride options are provided. This will be implemented through a few phases until 2025. The first phase will be implemented at different municipalities as Ultra Low Emission Zones (ULEZ) as well as within the urban ring in Barcelona City as LEZ. By 2025, a Metropolitan Low Emission Zone (MLEZ) will be implemented covering a larger area. What this means is that all vehicles are differentiated by the level of pollution and provided with a label. For example, diesel cars will be banned by 2030, and cars that emit pollutants above the set threshold are not allowed to be on the road.

To complement this effort, the city demarcated park and ride spaces where drivers could also reserve a parking place through a smart application. LEZ is a common policy instrument in Europe which targets to regulate access to urban cores and restrict traffic of the most polluting vehicles while promoting the shift to more sustainable transport modes and decarbonize the transportation system.

Another approach is through financial instruments such as a congestion charge based on the principle of polluters pay. This can be implemented through area pricing, corridor pricing, or network pricing. In Singapore’s case, it reduced considerable scale congestion with the city and the controlled roads. This can be implemented on the basis that the public transportation system is well established, efficient, and reliable. London’s congestion charge increased 38% of bus passengers from 8%, reduced the waiting time by 30%, and reduced service disruption due to congestion by 60%. Meanwhile, the number of cars decreased by 33%. Other forms of financial costs could be high parking fees, vehicle tax, or car number plate auction, as seen in Shanghai.

³ Barcelona Metropolitan Government governs the 36 cities, including the Barcelona City

⁴ Presentation from Barcelona Metropolitan Government

Human-scale cities

Barcelona's superblock model (Figure 8) is a concept that restructures the urban road network to enhance the quality of public space and active mobility. To achieve this, the existing road network is modified, and the road hierarchy is established for different transport modes. The chosen area is structured into grids of 400 by 400 meters. The interior streets within this grid are closed to motorized vehicles and parking, allowing pedestrians and cyclists to move safely. The exterior perimeter of this grid is where normal motorized traffic circulates. Pockets within the inner network are beautiful public spaces for residents to enjoy and socialize. This integrated solution combines urban planning and sustainable mobility without massive modifications to existing spaces, especially in older districts.



SUPERBLOCKS MODEL

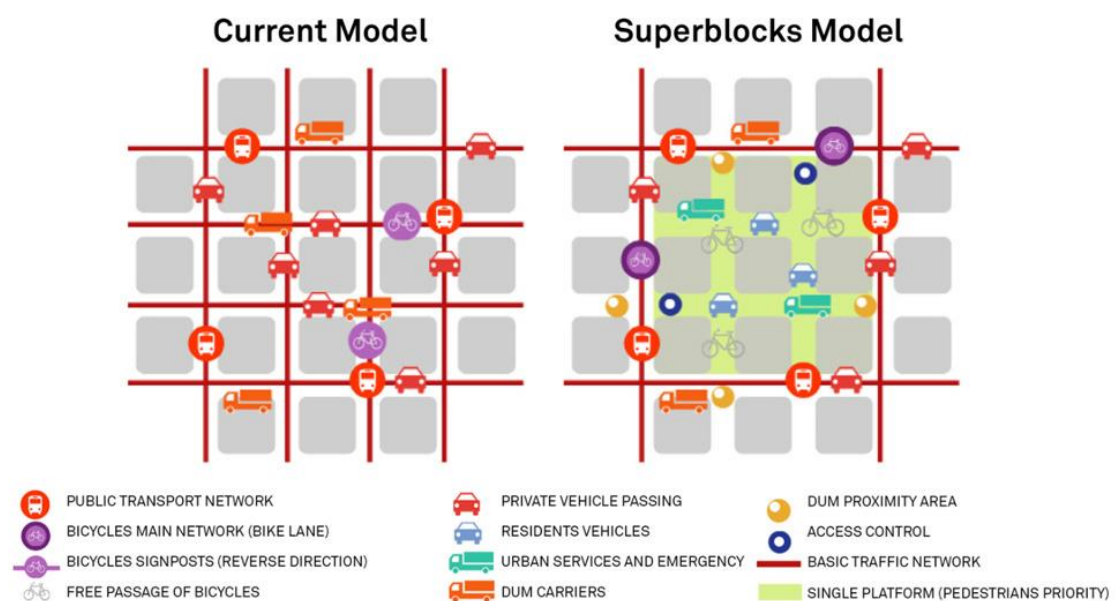


Figure 8: Barcelona's Superblocks Model (Source: Barcelona City)

In many parts of Barcelona, most of the commercial and residential areas are also mixed land use with easy access to supermarkets, bakeries, and shops within walking distance, reducing the need for travel. Within the older parts of the city, there is more potential to strengthen walking and cycling by providing quality infrastructure and creating beautiful public spaces to enjoy and rest. The speed of motorized vehicles can be reduced to less than 20 km/hr in older parts. In Barcelona's superblock area, it is reduced to less than 10 km/hr.

In order to improve the connectivity of cycling lanes between different districts, a Metropolitan Cycling Plan to improve connectivity is proposed, including a 55 km cycling metropolitan network. Each districts need to improve cycling infrastructure within their jurisdiction and work with other communities to ensure connectivity at a local and metropolitan level.

Conclusion

Foshan's forward-looking sustainable transportation policy and strong implementation capacity catapult the city to green and sustainable mobility. Foshan's institution and financial resources create an enabling environment to provide proper transportation services and systems, with public transportation as the backbone. The rise of new mobility services is rapidly changing the mobility landscape of Foshan but the close attention of the city administration allows for adaptive management. Some challenges exist, particularly increasing private automobiles despite the efforts. Economic instruments need to be considered to restrict private automobiles effectively.

The data and information forming the narrative for Foshan is collected through various sources, including desktop review, interviews, stakeholder engagement as part of the exhaustive data collection process. In summary, an excellent transport strategy for Foshan includes the following central tenets:

- Transport demand management, e.g., number plate rationing, priority schemes, high vehicle taxes, parking fee, etc. through different policy instruments
- Multimodality to spread transport demand, e.g., shared mobility, flexible working hours, on-demand buses, etc.
- Good land-use and transport planning that considers connectivity between districts, developments and areas which include walking, cycling, public transport network
- Traffic management including using intelligent technology system and spread transport demand
- An efficient, modest and connected road network

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 more 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
Bonn, Germany
www.ecomobility.org | ecomobility@iclei.org