

Stakeholder Communication Strategy

Project Number: 52230-001
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PRC: Xiangtan Low-Carbon Transformation Sector
Development Program

ABBREVIATIONS

ADB	–	Asian Development Bank
CEL	–	Chinese Energy Label
FGD	–	focus group discussion
ITS	–	intelligent transport system
NRPB	–	Natural Resource and Planning Bureau of Xiangtan City
PMO	–	project management office
PRC	–	People's Republic of China
XLCTSDP	–	Xiangtan Low-Carbon Transformation Sector Development Program
SES	–	socioeconomic survey
TAX	–	Transport Authority of Xiangtan
TOR	–	terms of reference
XPSC	–	Xiangtan Public Security Bureau

GLOSSARY

Electric Bike	–	Motorcycles/mopeds powered by an electric motor
Higher income residents	–	Residents in Xiangtan whose monthly income is above 6,000 CNY/month covering the top income brackets in the SES
Lower income residents	–	Residents in Xiangtan whose monthly income is up to 3,000 CNY/month covering the two lowest income brackets in the SES.
Medium income residents	–	Residents in Xiangtan whose monthly income is between 3,001 and 6,000 CNY/month covering the two middle income brackets in the SES.

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I. BACKGROUND

A. Project Description

1. The Xiangtan Low-Carbon Transformation Sector Development Program (XLCTSDP) has a systems-wide portfolio of mutually supporting interventions assisting the Government of the city of Xiangtan in Hunan Province, People's Republic of China to pursue a Low-Carbon Development Path.

2. The program is grounded in systems-thinking, encourages integrated city planning, collaborative and coherent sector development, resilience improvement by taking preventive approach, and active governance through engaging and activating all stakeholders by providing the right incentives. Low-carbon development progress can be measured by quantifiable indicators including GHG emissions reduction.

3. The impact of the Xiangtan Low-Carbon Transformation (XLCTSDP) is "Carbon emissions peak achieved in Xiangtan by 2028" and the outcome is "Use of low-carbon enabling systems in Xiangtan increased." The outputs are: (i) Low-carbon and resilient infrastructure transformation demonstrated; (ii) Information and knowledge platforms established for informed decision making and behavior changes; (iii) Low-carbon transformation policy reforms adopted; and (iv) Capacity building and program management enhanced. Both project- and policy-based lending will support these four outputs.

B. Context

4. The four outputs of the program are described below:

5. **Output 1: Low-Carbon and Resilient Infrastructure Transformation Demonstrated.** This includes: (i) Establishing a **priority bus system** through (a) lane modification to 31.3 km of main trunk roads in the Yuetang and Yuhu urban districts to establish priority median bus lanes; (b) lane modification to 31.5 km of other trunk roads to establish peak hour priority curbside bus lanes; and (c) traffic light reprogramming to improve bus traffic flows; (ii) Establishing 104 pairs of bi-directional **smart accessible bus stops**, including 56 new bi-directional smart bus stops every 500 m along the median bus priority lanes, and upgrading of 48 existing bi-directional road side bus stops; (iii) **Clean-energy vehicle promotion** through (a) procurement of 100 battery electric busses (BEBs); and (b) installing 778 e-chargers in 30 charging stations in Yuetang and Yuhu districts; (iv) **Fuxing Middle Road Improvement Demonstration Project**, including an iRAP road safety assessment; road layout improvements for safety, bus stops, bike lanes and pedestrian walkways; ecosystem-based adaptation (EbA) measures to treat stormwater, alleviate drainage and runoff pollution, improve flood resilience and enhance the amenity value of the street; and drainage improvements, (v) **Upgrading of non-motorized transport systems** by (a) improving 63.4 km of bike paths; (b) upgrading of 69 km of pedestrian walkways; (c) installing 48 safe crossing islands at major intersections for safe use and inclusive access; and (d) providing accessible and safer pedestrian crossing by adding screens with countdown red timers and synchronized sound buzzers at 3,000 pedestrian crossings across Xiangtan, (vi) A **school road safety assessment** utilizing the iRAP Star Ratings for Schools (SR4S) methodology will be undertaken for five elementary schools; (vii) Construction of the first **EDGE-certified hospital building** in the PRC will demonstrate the integration of passive building design, clean energy technologies, and ecosystem-based adaptation (EbA) measures; (viii) **Retrofit of a run-down public building** to be equipped with high energy and water saving features and appliances; (ix)

Improvement of public facilities and other urban infrastructure at 20 urban low-income communities showing practical ways to build a low-carbon, resilient, and livable Xiangtan; and, (x) **Demonstrating user-friendly multimodal station design** at the Xiangtan Railway Station and Bantang Inter-city Railway Station, by modifying layouts to give priority access and use-space for public busses over taxis and private cars.

6. **Output 2: Information and Knowledge Platforms Established for Informed Decision Making and Behavior Changes.** Physical transformations in output (i) will be complemented by ICT and knowledge platforms to support Xiangtan's LCT. A number of sectoral ICT platforms will be installed or upgraded, and then consolidated into a city-wide ICT platform. These will include: (i) reprogramming the existing intelligent transport system (ITS) to prioritize people and public mobility systems; (ii) developing a smart bus information platform which combines various subsystems to enable more control over the operation of busses while sharing real time location data to passengers; (iii) a building energy management system to monitor and improve energy efficiency of 200 public buildings; (iv) a community-scale multi-energy and utility management system to optimize operational efficiency of over 1,300 companies at Jiu Hua Economic and Technological Development Zone; (v) integrated urban catchment management plans for key flood prone areas in Xiangtan; (vi) an early flood warning system to monitor and analyze potential risks caused by fluvial and pluvial floods; and (vii) an environmental monitoring and assessment system. These platforms will enable better decision making and foster behavior changes towards LCT.

7. **Output 3: Capacity Building and Program Management Enhanced.** Program Management Consultant (PMC) services will be provided to support the PMO in program management, technical support, and safeguards policy compliance and monitoring.

8. **Output 4: Low-carbon Transformation Policy Reforms Adopted.** The infrastructure and system transformations in outputs (i) and (ii) will be sustained and scaled up by policy, institutional, and operational reforms, and outreach activities. Reform areas include: (i) introduction of parking policy and institution setup; (ii) market and demand-driven operation of public buses; (iii) people-oriented ITS operation; (iv) school-zone reform for road safety; (v) clean district energy system and waste heat recovery; (vi) industrial energy and utility management and operation; (vii) low-carbon building sector reforms through green building certification, energy performance contract, and green financing, building energy management system, and energy statistics; (viii) capacity building on EbA and climate adaptation planning tool; and (ix) data security and standardization.

9. This document describes a communication plan to directly support Outputs 1 and 2 of the program.

II. COMMUNICATION ANALYSIS

A. Stakeholders

10. The stakeholder communication strategy is designed to involve a broad spectrum of stakeholders involved in low-carbon transformation in their choice of green transport modes and efficient energy use. The strategy also gives attention to the diverse needs of the many different groups affected by the program's components particularly ensuring inclusiveness of women and people with special needs. The communication strategy will also ensure that program components are developed in collaboration with and supported by key stakeholders.

11. This communication strategy is informed by the following: (i) consultations with key government, private sector and public/private partnerships stakeholders; (ii) a socio-economic survey (SES); (iii) semi-structured observation-based studies and open-ended interviews with stakeholders in program sites; and, (iv) focus group discussions (FGDs). These activities were undertaken by ADB and a combined team consisting of communication and social research consultants commissioned during the design and program processing phase.

12. The SES¹ gathered primary data on the Xiangtan population's demographics, mobility and consumption patterns, and other choices affecting their lifestyle-related carbon footprints (i.e., room cooling and heating, prevalence of energy efficient appliances and use of low-carbon transportation modes such as bicycles, buses, and walking). The survey also gathered data on the residents' knowledge of choosing and leading low-carbon lifestyles, and preferred information channels. All of these aspects were further examined in the FGDs.

13. The FGDs² centered on the following themes: different paths to achieve a low-carbon lifestyle; sustaining low-carbon lifestyles choices; and government support for low-carbon lifestyles.

14. Site visits and group interviews³ with key stakeholders from government, private sector and public/private partnerships were conducted to gain insights into how existing structures and systems such as buses and shared bikes work and shape behaviors and lifestyles. These also added insights into the priorities and worldviews of local institutional stakeholders that are key to the low-carbon transformation of Xiangtan.

15. Observations in program sites provided more in-depth insights into the daily mobility and energy use of key stakeholders. The analyses triangulated the results of the SES, FGDs and observations to determine whether stakeholders actually practice behaviors they said they did in focus groups discussions and interviews. Layering several types of analyses added to a fuller picture of the practices and priorities of the diverse range of stakeholders and allowed for a better targeted communication strategy. Using a behavior template and field notes, the communication and social research teams conducted observations as neutral observers and participant-observers.

16. The stakeholder analysis is split in two. Part one corresponds to the mobility practices of stakeholders and preferences for social engagement. Part two of the stakeholder analysis focuses on the household energy use of stakeholders and possibilities for engaging with private sector.

¹ The SES was conducted on 26 August to 24 September 2019 as street interviews based on a multiple-choice questionnaire. Sample size is 406 respondents.

² 21 focus groups discussions were conducted with approximately 130 individuals. The participants comprised of current residents of the Yu Hu and Yue Tang areas in Xiangtan and undergraduate students from Hunan University of Science and Technology. Three groups were with low-income families and two were with disabled participants and one with students. Each group had between four and eight participants and were interviewed for one hour on average. All the resident participants were recruited by local sub district committees supported by Xiangtan DRC.

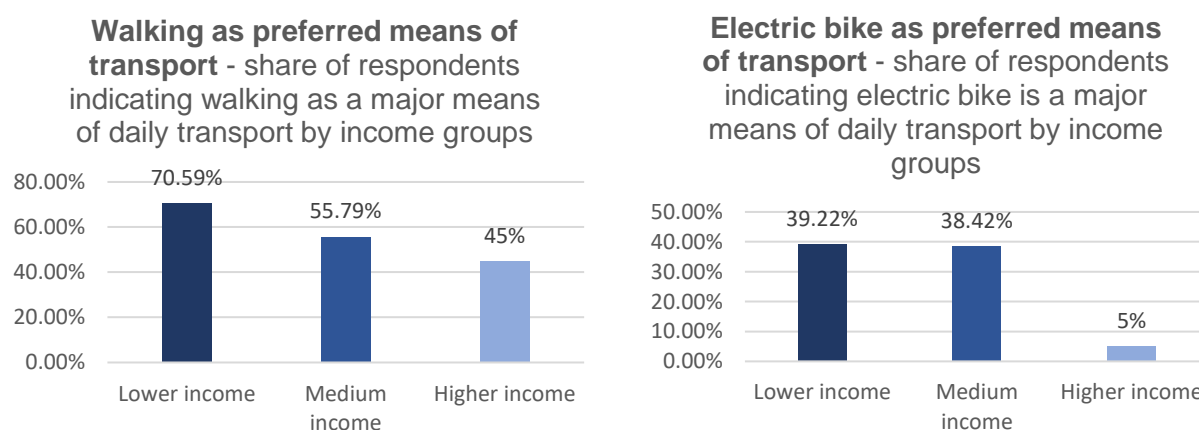
³ Conducted during the program inception mission in July 2019

1. Stakeholder analysis – Part one

a. Public stakeholders

17. The primary stakeholders are Xiangtan residents specifically women, students, the elderly, disabled and shopkeepers in and around the key program sites. To reflect the strong elements of transportation and road designs in program Outputs 1 and 2, stakeholders are described mainly by their primary modes of transportation but acknowledging that residents often employ several modes of transportation in any given day.

18. **Transportation needs and means.** Based on the SES and the FGDs, the typical resident in Xiangtan takes two to four trips per day. Most trips are for commuting to and from work or for shopping/recreational activities. Most transport trips are short (below 5 kilometers) and takes up to 20 minutes. Most often, there is no or little costs (below CNY 5) involved. Around a third of all trips are on foot, but for other trips, buses (20%), cars (18%) and electric motorcycles (18 %) stand out as the main means of transportation. When segmented for income, electric motorcycles are used mainly by lower and medium income groups while higher income groups favor personal cars for transport. Respondents point to convenience – the ability to use the chosen means of transportation when needed – as the main factor (53% of responses) influencing their choice of transportation, with speed (15%) and cost (13%) coming in next.



Source: 2019 Stakeholder Engagement Survey conducted for program.

19. Car ownership has almost doubled in China from 2013 to 2017⁴, and projections⁵ indicate a further tripling of the car fleet in Hunan province by 2030.

20. **Public and shared transport use.** SES results show that buses are most popular with lower income residents – 38% indicate buses as one of the three most used means of transport. Medium income groups also use buses (33%), while only 15% higher income residents commute by bus. Other forms of public or shared transportation within the city of Xiangtan (i.e., public bikes,

⁴ China Statistical Yearbook. 2018. Table 6-5: Main durable goods owned per 100 households nationwide. <http://www.stats.gov.cn/tjsj/ndsj/2018/indexeh.htm>.

⁵ Lim Ma et al. 2019. China's Provincial Vehicle Ownership Forecast and Analysis of the Causes Influencing the Trend. <https://www.mdpi.com/2071-1050/11/14/3928/pdf>

sharing rides with friends/family, Didi or taxis) are used the least (between 0, 1 and 4% of trips). Public bikes and privately-owned bikes account for only 5% of trips.

21. **Factors influencing use of public transport.** The primary reasons given in the SES for not taking buses are that the trips are often too short, and for these, walking is preferred. For longer trips, buses lose out to other transport means in terms of convenience. The distance to bus stops as well as long waiting times are other prevalent reasons for not using buses. On the other hand, the speed of buses is not seen as a downside by many passengers. Only 7% reported that slow speed is their reason for not using buses. FGDs also report that bus stops are not well designed and provide too little shelter from rain or spray from puddles. Street observations reinforce these findings.

22. **Connectivity.** Results of observations point to lack of connectivity in public transport as a factor that works against its greater use. Often, bus stops and shared bike stations are placed too far apart to facilitate connectivity and ease of use. At the Xiangtan Intercity Railway Station, walking from the nearby bus stop closest to the station included crossing two major roads, with a long portion of the walking route spent on the road for lack of pedestrian walkways. At the Xiangtan Train Station, bus stops were closer, but bollards placed to keep motorcycle drivers off the main square in front of the station blocked access for people in wheelchairs or those with heavy and/or wheeled bags.

23. **Accessibility.** Observations show that pedestrian walkways are often uneven, in bad shape and needing repairs or poorly designed restricting access for elderly or disabled people. No section of Fuxing middle road allows people in wheelchairs to travel freely from one trunk road to the next. Most crossings also pose considerable challenges. For this reason, people in wheelchairs and people with wheeled bags often choose to walk on the street at considerable risk. Obstacles are both permanent (poor design or disrepair) and temporary (pedestrians walkways blocked by parked cars or motorcycles). Bus stops are often inaccessible for people in wheelchairs or with impaired walking because of very high curbs on all sides. The narrow platforms of bus stops provide waiting passengers with little space, increasing safety risks during peak hours. The stops also offer little shelter from rain or spray.

24. **Bus drivers.** Observations and FGDs show that bus drivers do not wait for elderly or disabled people to safely embark and disembark from buses. Bus drivers do not park close to the curb at bus stops, forcing passengers to step onto the road and up the high steps to the buses. In several FGDs, elderly and disabled stakeholders also say bus drivers are discourteous to them when they enter buses.

21. **Safety on buses.** Safety on bus rides is an important factor especially for women, but in Xiangtan, only one in 406 respondents of the SES point to safety or the lack of it as a factor for using buses. FGDs with students support this, although female students did report that they often ride buses in groups but did not directly cite safety from harassment or unwanted attention as a main reason for this behavior.

25. **Parking.** Parking in central Xiangtan causes major problems for pedestrians, local residents and shopkeepers as cars are parked in pedestrian walkways severely restricting pedestrian traffic. However, local residents and shop owners are protective of their own ability to park as there are few or no alternative parking spaces. The owners of 53 cars and motorcycle repair shops and affiliated stores that line Baoto Middle road consider it important that customers can use the pedestrian walkway in front of their stores as parking or they will be out of business. Other store owners cite former restrictions in parking that led to dramatic loss of business for them.

26. Fuxing middle road also holds a large number of restaurants that often cater to a more local set of customers than the repair shops. The owners and employees of these establishments are more averse to cars using the pavement for parking. Though they also park in the pavements themselves, they are concerned with their restaurant's visibility from the street, and some also use the pedestrian walkways to serve customers. In the FGDs, residents say that illegally parked cars block ambulances and fire trucks, although they themselves admit to parking illegally for lack of other options. They also point to the need for facilities to charge their electric bikes at the street level. They often pull power lines down from their apartment along the halls and stairways causing inconvenience to all residents of the building.

27. **Risky behaviors.** Traffic in Xiangtan is growing but congestion in program areas is still relatively low. Even in peak hours, vehicles are still able to pass through most intersections without waiting for more than one traffic light cycle. However, risky behaviors in these intersections are high. Electric bikes and motorcycles particularly, encroach on pedestrian zones and drive against the flow. Pedestrians crossing trunk roads often find the time allotted by traffic lights as too short forcing them to run. On the other hand, pedestrians also start crossing on a red light or deviate from zebra crossings to cut corners. Pedestrians, electric bike users, and bicyclists have all been observed cutting corners if the opportunity is available.

28. **Road safety.** The Baseline and Design Road Assessments and School Zone Road Assessment, Xiangtan conducted for the program, evaluates road safety issues in Fuxing middle road and in 5 schools. The report concludes that the most problematic zones are around intersections, and that pedestrians suffer most from poor road design especially around pedestrian crossings and intersections with no signal lights. Most of the road sections with pedestrian crossings have poor signage visibility from the distance because of vehicles parking along the road blocking the signs. Around schools, the report points to a number of problem behaviors mainly from adults such as parking in pedestrian crossings, riding motorcycles on pedestrian sidewalks and congestion during school rush hours.

29. **Enforcement.** Larger road crossings have assigned police to facilitate traffic around peak hours (peak hours are from 7.30 to 8.30 and from 17:30 to 18.30) There are large differences in how these traffic police officer carry out their duties. Some are lenient, others are stricter. Observations show that the stricter police officers cause a significant reduction in risky behavior especially from electric motorcycle drivers. Police officers were not observed handing out any ticket or other sanctions. Local shop owners report that illegal parking is also most prevalent in areas not covered by public security cameras.

b. Institutional stakeholders

30. Road design and traffic management are managed by several institutions in Xiangtan. Stakeholders include the following: Transport Authority of Xiangtan (TAX); Natural Resource and Planning Bureau of Xiangtan City (NRPB); Housing Bureau; Xiangtan Public Security Bureau (XPSC). Authorities concerned with traffic, TAX and XPSC, place great emphasis on getting traffic to move faster although based on the SES, for residents, speed of traffic and congestion are not yet emerging issues.

31. Placing stronger restrictions on parking and enforcing existing regulations are not high on the local government's agenda, as these are considered to be very unpopular among residents. Parking enforcement is considered an "infringement on people's private property" (cars), as one official put it during the stakeholder consultations.

32. The Housing Bureau and NRPB share responsibility for the design of the areas in front of buildings including pedestrian walkways, parking spots, potential electric car charging stations etc. Pedestrian walkways and parking lots are administered and constructed by the Housing Bureau, but the planning is approved by NRPB. According to NRPB regulations, street building owners should make certain there is room for pedestrian traffic. In reality, due to the shortage of parking areas, parked cars always take up much of the space for pedestrians.

33. The areas around the buildings are part of the developers' design work, and designs have to get the approval of NRPB. Large developers have their own professional design teams for the roads, whereas, the small developers may subcontract external professional teams. Locally designed guidance and regulations are always stricter than the national ones.

2. Stakeholder analysis – Part two

34. The second part of the analysis focuses on households' energy consumption for heating, cooling and use of appliances. Secondary research shows that: (i) Heating and cooling constitute the greatest cause of lifestyle-related GHG emissions from homes in the People's Republic of China⁶⁷. Results from the SES and FGDs confirm that: (ii) a sizeable part of households' income go to cooling and heating, but (iii) energy efficiency is not high priority for households when they buy appliances. The communication designed to support Outputs 1 and 2 to address the other prominent sources of carbon emissions – choice of and use of transport means – is covered in section III of this document.

35. **Characteristics of households.** Xiangtan is a tier 3 city, with income levels very close to the national average. Average disposable income in Xiangtan in 2018 was 29,872 CNY per capita compared to the national average of 28,228 CNY per capita in 2018. However, this is far from the income levels of the People's Republic of China's most affluent cities like Shanghai (64,183 CNY per capita in 2018) and Beijing (62,361 CNY)⁸. Housing is a mix of new apartment buildings (cost is up to the area of 8-9,000 CNY/m² for most expensive areas) and older houses. The latter range from apartment buildings which are mostly between 10 to 40 years old to shanty town buildings of varying age which are often self-constructed. Many will have the potential for improved energy efficiency through small scale interventions such as individual sun shading and caulking windows to the large-scale insulation of apartment buildings. Most new developments are not constructed with a central heating or cooling system but instead have shelves outside apartments for placing heat exchanger units.

36. **Cooling and heating.** Cooling and heating are considerable expenses for many Xiangtan households. From June to August, most households use air-conditioners to cool their homes. Even though temperatures can be high also outside this period, it is generally cooler in the mornings and evenings where families are in their homes and cooling is less needed. From November to January, residents use electric or gas heaters to keep homes warm. Global warming and the rising standards for comfort among the younger generation may extend the seasons, and

⁶ Jin Guo et al. 2016. *Electricity Demand in Chinese Households: Findings from China Residential Energy Consumption Survey*. https://aceee.org/files/proceedings/2016/data/papers/9_76.pdf

⁷ Institute for Global Environmental Strategies, Aalto University, and D-mat Ltd. 2019. *1.5-Degree Lifestyles: Targets and Options for Reducing Lifestyle Carbon Footprints. Technical Report*. https://www.aalto.fi/sites/g/files/flghsv161/files/2019-02/15_degree_lifestyles_mainreport.pdf

⁸ Source: National Bureau of Statistics of the People's Republic of China: National Economy and Society Developed Statistical Bulletin 2018)/ Xiangtan City Bureau of Statistics: Xiangtan City National Economy and Society Developed Statistical Bulletin 2018).

thus, the need for cooling and heating. Lower income residents report heating costs of close to 400 CNY per month in the November-January and cooling costs of close to 800 CNY in June-August. Medium-income residents report slightly higher costs (around 500/850 CNY for heating/cooling) and higher-income residents report slightly higher than that (around 550/900 CNY). This indicates that heating and cooling costs hit the lower income household the hardest, as even though they live in smaller homes. Their heating/cooling bill is not much lower than households with a much higher income. This can also indicate that the lower income households live in lower quality housing with less efficient insulation and more leaks creating drafts.

37. FGDs and SES both show that residents are consciously trying to save energy by only using heating and cooling appliances in rooms that are actively in use and turning them off when not in use. Around 98.5% of SES respondents indicate that the energy bill is based on individual metering of energy consumption for each apartment/house.

38. **Energy saving LEDs and appliances.** The People's Republic of China has a mandatory energy efficiency label for appliances (China Energy Label or CEL), which identifies a product's efficiency on a scale of 1 to 5, with one being the most efficient and 5 the least. Labels must be present at the point of sale of any product covered by the mandate. China Energy Label was introduced in 2005, and as for then over than 25 product groups have become CEL-mandatory, while additional product groups are continually added.⁹

39. The SES indicates that most residents look for quality and brand first when buying appliances. Cost and efficiency have lower impact on their decision to purchase. The FGDs, however, show that although most of the residents know about the energy efficiency labels on electric appliances, only a minority choose to buy energy-efficient products. This is mainly because they do not trust that the appliances with 1st tier green label can really save as much energy (or money) as indicated, and energy-efficient appliances are often more expensive. Based on the FGDs, end users don't have enough information or visible evidence to prove how much electricity the energy efficient appliance can save, and if it is efficient, how many years it will take to balance that additional expense against savings.

40. Administrators and owners of appliance stores are stakeholders that could be key in designing and disseminating communication that could increase the uptake of energy-saving appliances. Xiangtan has a number of physical stores located at street-level and at malls, but residents also have a large selection to choose from online.

41. **Knowledge of low-carbon lifestyles.** Only 8% of SES respondents believe they "know quite well," how to live a low-carbon lifestyle. Almost half or 46% have a general idea what a "low-carbon lifestyle" is, whereas the rest of the SES respondents are unsure or know nothing about it. The SES results show that the main barrier for respondents to live low-carbon lifestyles is knowledge about what it constitutes and how to transition in making individual lifestyle choices. This indicates that there is a knowledge gap that behavior change communication can help fill. The SES also indicates that the main sources of information for the respondents on low-carbon lifestyles are "TV or Broadcast" and "Public advertisement Internet."

42. **Insulation and energy efficiency.** The SES indicates that costs for heating are approximately the same per square meter for all income groups, whereas energy use for heating in winter is significantly higher for the higher income residents (4.7 CNY/m²/month for higher

⁹ China Compulsory Certification. <https://www.china-certification.com/en/what-is-ccc/>

income vs. 3.8 CNY/m²/month for lower income). This can indicate two things: either there is little difference in the insulation and energy efficiency status of homes among income groups or the higher income groups have better insulated homes but also have a higher comfort level and thus, use more energy. Either way, there are opportunities to influence behavior in homes through communication efforts that offer a menu of options for residents to reduce their energy consumption.

43. In many apartment buildings, owners elect “Owners Committees” who take care of the issues that are common for apartment owners in the same building, such as hiring property management companies or deciding on renovation of facade or other common areas. Both owners’ committees and property management companies can be key stakeholders to secure low-carbon lifestyles given that they can influence the overall performance of a whole building from initiatives such as outside insulation measures or better management of building systems such as lighting or water use. The People’s Republic of China is also the Global leader in ESCO (Energy Service Company) business models that allows private sector companies to renovate buildings with energy savings in mind without any cost to the owners. The ESCO market is growing fast (15% per year) and increasingly moving into the housing sector.¹⁰

B. Media analysis

44. **Country media environment.** The People’s Republic of China has a very large and evolving media landscape. As of May 2019, there are 3,350 television channels, 1,900 newspapers, 2,900 radio stations, 5.23 million websites and 4.49 million apps¹¹ in the country. Total media spending in 2018 was up by 17.4% reaching a total of USD 100.13 billion (compared to approximately 45% of the total US media spending). The digital media market showed even stronger 30% growth, with digital media spending reaching USD 65.42 billion in 2018. Data from People’s Republic of China National Statistics Bureau shows that radio and television reached 54.63% of the population in 2017. The relatively limited range is mainly due to bad coverage in rural areas (33.49% of rural population reached)¹².

45. **Internet Access:** As of December 2018, more than half or 59.6% of the citizens of the People’s Republic of China had internet access. By location, 74.6% of urban dwellers and 38.4% of rural dwellers had internet access. Of the total percentage of internet users, 98.6% used their mobile phone for access¹³. Males constitute a higher percentage of internet users than females, and constitute 52.7% in comparison to 47.3%, respectively. Daily use of internet approached 4 hours for an average user.

46. **Content trends:** There is a strong trend towards the use of short videos for online media content especially for targeting younger audiences. The penetration of short videos (52%) is catching up with online television penetration (73%), with consumers watching an average of 128 short videos per day.¹⁴ Douyin is the most dominant platform having more than 293 million monthly active users, but new players are still entering the market including WeChat’s recently launched “Time Capsule” function. Online media segments are blurring as e-commerce, social

¹⁰ International Energy Agency. <https://www.iea.org/topics/energyefficiency/escos/china/>

¹¹ PHD Media. 2019. *PHD Infographic: China Media Landscape*.
<https://www.phdmedia.com/china/phds-latest-china-media-landscape/>

¹² National Bureau of Statistics of China. 2016. *China Statistical Yearbook*. Beijing

¹³ China Internet Network Information Center, Statistical Report on Internet Development in China, #43.Feb 2019. Via China Internet Watch

¹⁴ Marketing Interactive. 2019. *China’s 2019 Media Landscape in 5 Points*.
<https://www.marketing-interactive.com/chinas-2019-media-landscape-in-5-points/>

media, video and other overlap. The ten most important digital media platforms in the People's Republic of China (as of January 2019) are¹⁵:

- WeChat: All round social media platform, sometimes called the “Chinese Facebook”
- Sina Weibo: Similar to Twitter
- Tencent QQ: Popular instant messaging app
- Tencent Video: Leading online video provider in People's Republic of China
- Baidu Tieba: A search engine forum
- Douban: Lifestyle discussion platform
- Zhihu: Similar to Quora
- Meituan – Dianping: Similar to Yelp
- Toutiao: News & information & entertainment platform
- DouYin (TikTok): Fast-growing short-video app

47. **Local media environment.** There are 14 radio stations and 15 television stations in Hunan Province. In 2018, the broadcast and television coverage of the population of Xiangtan City reached 100%. There were 924,000 registered broadband internet users showing an increase of 36.5% from 2017¹⁶. Fixed broadband penetration and mobile broadband penetration in Xiangtan city was 83% and 85% in 2018 respectively, finishing its internet penetration well-off goal two years in advance¹⁷.

48. To promote the internet development of rural areas, Xiangtan City implemented an internet and rural revitalization strategy. At the end of 2018, the fiber optic cable Internet connection has been fully accessible in many rural villages.²

49. Rednet is the mainstream and comprehensive government news service of Hunan Province, which is also where citizens can raise their concerns and questions. The Xiangtan government media has expanded beyond operating traditional newspapers and television by including modern and diverse platforms such as DouYin, Weibo, Damei Xiangtan app and the Xiangtan Media Network. The Xiangtan City television station also manages the Xiangtan WeChat official account in addition to 18 accounts on specific topics such as transportation, environmental protection, building conduction, city planning, and others.

50. Residents use WeChat, Sina Weibo, Tencent QQ and Video, Baidu Tieba, Douban, Zhihu, Meituan–Dianping, Toutiao and DouYin to receive news from their communities, region and abroad, and content about a wide variety of topics from current politics to entertainment.

C. Communication environment

51. The Xiangtan bus system already has an app for showing bus schedules, buying tickets, providing feedback etc. The platform can be potentially expanded to include functionalities where users can source program information and provide feedback. The smart transport systems operated by the traffic police and the transport authority also has data that can be potentially valuable to users if these can be accessed. The app for renting shared bikes can also be expanded and linked to the Xiangtan bus app to include not just bike-share information but also bus and bike connectivity and low-carbon lifestyle information for bike riders.

¹⁵ Dragon Social. 2019. *10 Most Popular Social Media in China (2019)*.

<https://www.dragonsocial.net/blog/social-media-in-china/>

¹⁶ Xiangtan City National Economy and Society Developed Statistical Bulletin 2018

¹⁷ <http://news.sina.com.cn/o/2019-01-18/doc-ihrfqziz8737529.shtml>

52. FGDs show that many residents do not use the bus app and instead pay with cards and use generic social media or map services to get data on bus schedules and traffic. With the high social media use in Xiangtan, the bus and bike share apps will be promoted through various digital channels as well as through KOLs (Key Opinion Leaders) in which are regarded in the People's Republic of China as more trustworthy than brands¹⁸.

D. Implementing agency

53. This communication strategy will be implemented by the PMO, supported by communication consultants. These consultants will provide technical support to assess the communication capacity and needs of the XMG, and assist in implementing this communication strategy.

III. STRATEGY ELEMENTS

A. Primary communication objective

54. Communication is an important component to secure the success of the program's Output 1 (Low-Carbon and Resilient Infrastructure Transformation Demonstrated) and Output 2 (Information and Knowledge Platforms for Informed Decision-Making and Behavioral Changes Enabled). The communication strategy has two tracks – one, for the planning and second, for the implementation of the program -- to ensure that communication is incorporated in the program's systems thinking approach.

55. The communication strategy has four objectives:

- (i) Create platforms for meaningful stakeholder involvement in the planning and implementation of low-carbon and resilient infrastructure
- (ii) Promote the Xiangtan residents' continued use of public buses and increase use of low-carbon transport modes
- (iii) Promote more widespread adoption of low-carbon lifestyles in homes to reduce energy consumption for cooling, heating and lighting
- (iv) Promote walking as a low carbon mode of transportation and pedestrian road safety among school children

Objective 1: Create platforms for meaningful stakeholder involvement in the planning and implementation of low-carbon and resilient infrastructure

56. **Planning stage:** Understanding how the transport system and household energy use work from the users' perspective allows Xiangtan planners, designers and enforcement agents to work on integrated solutions that fit users' needs and contexts. Engaging with users and potential users will help planners understand the "pain points" of the current transport system and household energy use. This needs to start early in the planning process for designers to incorporate the priorities of users and potential users in their planning.

57. Based on the SES, FGDs, key informant interviews and observations, the first section of this document summarizes the behaviors of key road users – bus riders and drivers, vehicle

¹⁸ China Briefs. 2019. *How Influencer Marketing Works in China*.
<https://www.chinabriefs.io/blog/2019/6/20/how-influencer-marketing-works-in-china>

drivers, shop owners, e-motorcycle drivers, cyclists and pedestrians – and their motivations for use and non-use of public and low-carbon transport modes.

58. To contribute to program Output 1 (Low-Carbon and Resilient Infrastructure Transformation Demonstrated) communication will be used to ensure that stakeholders in and around the program sites are informed and engaged in the low-carbon transformation process. Understanding the priorities of present and potential bus passengers, bike riders and pedestrians as well as riders of electric motorcycles and car users is key to designing a system that effectively shift passengers from cars to more low-carbon modes of transportation. Understanding the current energy use and barriers to energy saving practices in households provides design directions in sustaining program interventions.

59. The following key agencies – Transport Authority of Xiangtan (TAX); Natural Resource and Planning Bureau of Xiangtan City (NRPB); Xiangtan Public Security Bureau (XPSC) and the PMO – will be capacitated to ensure that participatory processes are used to engage with the identified stakeholders. Part of the capacity building is providing technical assistance for the conduct of behavior trials (see appendix 3) to support the finalization of the detailed design, and develop the more detailed behavior communication strategy.

60. Communication plays a vital role for creating meaningful stakeholder involvement in two ways: (i) providing a platform for stakeholders to engage with the program designer to communicate their priorities; and (ii) keep users and potential users informed of progress and manage their expectations.

61. Meaningful stakeholder involvement includes setting up platforms for stakeholders to give feedback and have a tangible influence on the planning process for Outputs 1 and 2. The observations and interviews done suggest that there are multiple conflicting interests at stake when the road is to be reworked for ecosystem-based adaptation, such as residents wanting to keep – sometimes unsanctioned – parking opportunities in the pedestrian zones while shopkeepers want visibility and easy access for customers. Also, Fuxing middle road has a large number of auto repair garages and connected stores. In interviews, garage owners say the proposed new road design with a focus on separating different modes of traffic risk putting them out of business because customers will not be able to cross bicycle and pedestrian sections and drive their cars to the garages.

62. **Implementation stage:** Engagement with users remain important throughout the implementation phase. Communication has a pivotal role in: (i) generating feedback from users that allows transport authorities and bus operators to make ongoing adjustments to schedules and other services to keep satisfaction high; (ii) maintain a platform for user engagement on ongoing adjustments to infrastructure or systems.

63. The Xiangtan bus and bike-share apps will be enhanced to include feedback options, and provide regular program information to users. Promotion activities will generate more traffic and users to the apps. The Xiangtan Transport Authority can reinforce the apps through its social media accounts particularly WeChat and Sina Weibo. Ensuring that users get fast and meaningful responses on their feedback is one of the best ways to build user satisfaction and loyalty.

64. The PMO will provide regular updates to stakeholders through monthly or bimonthly bulletins. Regular meetings with road users such as town hall-style meetings or meetings with voluntary user representative groups offer city government a source of information to continuously

improve services and understand users better. More detailed activities are on Appendix 1: Communication strategy matrix.

Objective 2: Promote the Xiangtan residents' use of public buses and increase use of low-carbon transport modes

65. **Planning stage:** Information to users and potential users is important throughout the program phases. Knowledge of upcoming investments in better bus and bicycle transport is important information for users who consider buying a car or moving to another part of the city. Communication will strengthen Xiangtan's brand as a city that is pursuing green growth and transforming citizens to adopt low-carbon lifestyles.

66. To ensure that the proposed program designs are centered on user needs and feedback is incorporated, the results of the observations, FGDs and SES were used to develop a behavior trials plan (see appendix 3) to guide the program team and program management office of the implementing agency prior to finalizing the detailed design. Depending on the key design aspects to test and the behaviors needed for trials, the methodologies are all participatory and include a mix of phased observations, actual trials and simulations and on-site interviews. The results of the trials will determine design adjustments, and the kind and extent of communication and enforcement needed to ensure behavior changes.

67. Detailed information on the new low-carbon transport system will also be valuable for private sector stakeholders such as developers, restaurants, shops etc. when they plan for where to place or expand their business. Communicating early with these groups can build support and create new opportunities for synergies created around the program outputs.

68. **Implementation stage:** Working on the supply side – offering better low-carbon transport modes – is most efficient when coupled with initiatives to increase demand. Under this stage, communication is focused on: (i) Managing stakeholder perceptions and expectations about the program prior to, during and after civil works; (ii) Dissuading citizens from investing in new cars in favor of better, low-carbon transport options; (iii) Increase public bus use; (iv) Increase proper use of pedestrian lanes; and, (v) Increase biking and proper use of bike lanes.

69. **Communication will be in tactical phases:** To manage stakeholder perceptions and expectations about the program, dissuade citizens from investing in new cars and encourage more residents to use low carbon transport modes, communication will be timed prior to, during and after civil works.

70. A more detailed behavior change communication (BCC) strategy targeting each stakeholder's transition to using low-carbon transport modes will be developed based on the results of the behavior trials. The exact timing, recurrence of messages, key messages and channel choices will be part of the BCC strategy. The stakeholders are current and potential users of buses and bicycles, pedestrians, private car owners, and motorcycle riders as well as residents with special transportation needs (i.e., elderly, disabled, pregnant women, parents with babies / small children).

71. Prior to civil works, the following approaches will be implemented: information will be provided about where and when construction will take place, and how civil works will affect the road users and residents of affected areas. The feedback app (incorporated in the bus app and in the Xiangtan Transport Authority's social media accounts) will be promoted. During civil works: updates will be continuously provided to minimize inconvenience created, reminding road users

about the end result. When infrastructure is finished: the convenience of new buses will be highlighted that will include regular updating about bus schedules and arrivals, and encouraging the use of bike shares located near bus stops. The new bus stops will be maximized to provide information about low-carbon lifestyles. A blended strategy will be used to synchronize messaging and timing of message release in digital, traditional media and physical (communication paraphernalia) channels.

72. To dissuade citizens in investing in new, private cars, infrastructure changes and enforcement are necessary. The behavior trials plan (appendix 3) will determine the parking areas, tariffs and other elements to shift parking patterns. Creating stronger enforcement of parking regulation and making it riskier to park illegally will reinforce the preference for public bus use. Communication will support this behavior by promoting the location, fees and enforcement conditions so private car owners and drivers will weigh the impact of investing in private vehicles.

73. To increase public bus use, communication approaches will focus on highlighting improved access and inclusivity of buses for residents with special needs and promoting the digital monitors to be installed at bus stops which will provide real-time information on coming bus arrivals, schedules and route information as well as service disruptions and crowding conditions. Customer service orientations will be provided to bus drivers and operators to ensure that they follow courtesy, safety and safe access protocols.

74. Better connectivity of buses with shared bikes, and the benefits of tri-modal green transport will be strategically promoted in bus stops, bike stands and through media and social media. The low-carbon lifestyles of KOLs (Key Opinion Leaders) providing testimonials about the benefits of walking, bus and bike travels (cheap, clean, healthy etc.) will be promoted. Enforcement is key to encourage the proper use of bike lanes where cyclists are made vulnerable and unsafe by the risky behavior of motorcycle / e-bike drivers.

75. Communication activities will promote safe cycling behavior in the 5 schools where the road safety campaign will be conducted (See communication objective 4). The student ambassadors program from these 5 schools will increase the visibility of children, who have undergone a gaming-based road safety curriculum in their schools, in helping direct pedestrian and bike traffic piloted within the 5 school zones. This will not only inspire a sense of responsibility in children but also make adult motorcycle / e-motorcycle drivers more conscious of the impact of their unsafe behavior. More detailed activities are on Appendix 1: communication strategy matrix.

Objective 3: Promote more widespread adoption of low-carbon lifestyles in homes to reduce energy consumption for cooling, heating and lighting

76. The communication strategy will focus on reducing energy use in buildings through insulation and use of energy-efficient lighting and appliances. Key messages will revolve around how current behaviors in heating and cooling can be shifted to using LEDs, energy-efficient appliances, and enumerating simple steps that can be easily made into habits.

77. Approaches will be tailored to these specific audiences: (i) middle- and higher-income households with a focus on women in the 20 old communities. FGDs indicate that women are mostly responsible for managing the household and have the greatest concern about household finances. Middle- and high-income households have the capacity and are more likely to have funds to invest in energy-efficient lighting, appliances and systems in apartment buildings; (ii) schoolchildren of the same demographic as influencers to reinforce behavior changes of the women (above) and other members of the household. Done through schools, communication

activities incorporated as part of the curricula or as additional learning activities have direct impact on children who will not just practice energy efficient habits in their houses but also inspire their parents to take action; (iii) owners committees in apartment buildings as they are the organized group that can initiate larger energy efficiency schemes either in collaboration with their property management company or on their own.

78. The communication strategy for households, children and owner committees of apartment buildings in 20 old communities will use four approaches: (i) Raising awareness of the availability and benefits of insulation and energy savings appliances/lighting. This will likely be executed mainly on social media targeted to Xiangtan residents; (ii) education materials for primary schools on energy efficiency and insulation; (iii) targeted information to home owners in medium- or high-income neighborhoods on how they can improve energy efficiency in their homes and buildings. Options for action could include but are not limited to: caulking of windows, changing to high efficiency LEDs for lighting, changing to high efficiency appliances, installing shades/foils to block heat from sunlight; (iv) targeted information to owners committees or other instances serving the same role on their options to create energy savings via insulation and introducing funding opportunities like ESCO contracts.

79. The following set of audiences will be targeted to ensure that technical support and actual energy-efficient options are available for households and owners committees in apartment buildings who are ready to make behavior changes. Targeting these stakeholders ensure that intent to be energy-efficient or demand for energy efficiency is translated into concrete practice by providing supply-side support: (i) property management companies, as they have the option of including advisory services for insulation, and efficient lighting/appliances to residents in a building/complex they serve. Also, they can potentially realize energy savings as a service-business models in the buildings they serve; (ii) local and online appliance stores; (iii) ESCOs as partners in larger insulations projects.

80. Messaging will be focused on detailing the specific opportunities to save on energy costs. For homeowners, examples of actual household savings will be provided, and how interventions such as caulking, for example, also creates greater comfort and can have additional positive health effects. Messaging for schoolchildren is more focused on how saving energy contributes to a greener and more resilient future, but also with the same elements of home improvement as mentioned for homeowners. Messaging for owners' committees will focus on the benefits of larger interventions like insulation of a building or better energy management, the ESCO-model, lifetime costing and finance models that can create savings for residents from the first year of a renovation project.

81. The communication strategy for property management companies, appliance stores and ESCOs will follow a two-pronged approach: (i) securing commitments to supply capacity building for property management companies on energy saving as a service business models; (ii) coordinating price rebates or other sales strategies to social media strategies focusing on LEDs or energy efficient appliances.

82. Messaging towards supply side audiences will center on the market opportunity in creating energy efficient lifestyles that the Xiangtan LCCD program will open. For property management companies, focus is on how better energy management can be turned into savings for their clients and thus a competitive advantage. Xiangtan can be presented to ESCO companies as a new market, and platform to expand the market to upcoming provincial cities in China. More detailed activities are on Appendix 1: communication strategy matrix.

Objective 4: Promote walking as a low carbon mode of transportation and pedestrian road safety among school children

83. Encouraging more walking supports the transition to low-carbon lifestyles but this can leave pedestrians, and especially vulnerable groups such as children, at risk of accidents. Over 20,000 children are killed or injured each year in road-related accidents in the People's Republic of China, with an estimated 43% of students having been involved in a traffic accident at some point in their lifetimes. Children are particularly vulnerable to accidents because they are more difficult to see due to their small size and therefore can be hidden from view due to obstacles such as parked cars. They are also less able to make decisions about safe behavior, and are more likely to behave in unpredictable ways such as running across the street.¹⁹

84. This communication objective is focused on the five (5) Xiangtan schools identified in the Baseline and Design Road Assessments and School Zone Road Assessment, Xiangtan. These are the Jinting Primary School, Heping Primary School, Huojia Primary School, No. 3 Primary School and Xiangji Primary School. Traffic volume near the schools increase at the same rate as the school's peak hours. The Road Safety Report recommends that the program adopt a raised pedestrian crossing that is the same levels as the sidewalk to provide a safe, continuous route for the school kids, their parents and caregivers, teachers and administrators. Raising the pedestrian crossing will make the road users more visible to motorists at the same time, make motorists yield to walkers. The Road Safety Report also recommends extending the curb for the pedestrian crossings in front of school gates to block illegal roadside parking, shorten crossing distances, provide more waiting space for pedestrians and make them more visible to motorists.

85. To support these recommended changes in the pedestrian infrastructure, communication efforts will be focused primarily on children who are the main users of the improved pedestrian crossings, and parents / caregivers who drive vehicles or motorcycles / e-motorcycles. Using participatory co-designing methodology, teachers will develop with the school children a gaming-based curriculum that will: (i) introduce the improved raised pedestrian walkway and extended curb; (ii) simulate safe behaviors in responding to traffic signals, crossing and boarding vehicles / motorcycles / e-bikes; (iii) increase walking; (iv) increase cycling. Gaming-based, all safe pedestrian crossing and riding behavior will earn the school children points that will allow them to proceed to the next level of safe road user behaviors. The game also rewards students who walk and bike more.

86. To reach the secondary audiences, communication efforts will be focused on orienting the parents and caregivers who pick up the children to: (i) follow traffic signals and yield to pedestrians crossing the elevated crossing; (ii) follow new unloading and loading schemes to ensure smooth and safe getting on / getting off behavior of students; (iii) refrain from illegal roadside parking. Risky behaviors and road safety violations will cause children to have demerit points or extra redemption challenges in the gaming-based curriculum. The PMO's communication consultants will provide technical support to teachers to develop the participatory methodology and gaming-based curriculum. The consultants will also provide support in the parents and caregivers' orientation and behavior enforcement.

87. A student ambassador program will also be created that will increase broader awareness of children and traffic safety concerns in Xiangtan while building a sense of leadership among students. Select groups of student ambassadors will accompany local police to direct pedestrian

¹⁹ Chevron China. 2013. *Chevron Supports "Walk Wise" in China*.
http://www.chevronchina.com/en/news/archived/May31_2013.aspx

and bike traffic, increasing the children's visibility in the neighborhood and inspiring a sense of improved road safety behavior among children. More detailed activities are on Appendix 1: communication strategy matrix.

APPENDIX 1: COMMUNICATION STRATEGY MATRIX

Risks	Audiences/ Stakeholders	Current/Desired Attitude Behaviors	Messages	Activity/Channels	Timeline, Responsibility, Resources	Expected Outcomes
Objective 1: Create platforms for meaningful and stakeholder involvement in the planning and implementation of low-carbon and resilient infrastructure						
Low use of new sustainable transport modes (output 1) due to lack of alignment with stakeholders needs and preferences	Agencies with mandates related to Outputs 1 and 2. (Transport Authority of Xiangtan (TAX); Natural Resource and Planning Bureau of Xiangtan City (NRPB); Xiangtan Public Security Bureau (XPSC) and the PMO), program designers and planners.	Centralized planning with little dialogue with users/residents -> Participatory processes engaging users and potential users as well as other key stakeholders in planning and implementation of program.	Developing the program in dialogue with users and stakeholders will enhance the desired outcomes and create greater acceptance of program.	Capacity building on conduct of behavior trials using a mix of participatory methodologies Expert support in incorporating results of behavior trials in the detailed design process. Bimonthly/Quarterly meetings with agencies to track progress and define needs for research and participation initiatives.	Timeline: Planning stage before finalization of detailed design Responsibility: PMO with communication consultants. Resources: 1 person month, international participatory process consultant. 2 person month, national participatory process consultant.	Stakeholders engaged in design and planning process Results of behavior trials incorporated in detailed design Output indicators: 100% of relevant agencies participate in capacity building # of stakeholders/users taking part in "town hall" meetings where:
	Bus passengers (present and potential) and pedestrians with a focus on residents in areas in proximity of trunk roads reworked	From low satisfaction or acceptance of service gaps -> active engagement in defining needs and priorities with regards to transportation.	The new low-carbon, smart urban mobility system can have a large influence on your transportation, but you have the opportunity to help shape it	Creating attention and knowledge with stakeholders of the planned work by: - Stakeholder/community information and dialogue meetings (town hall style) - Social media forums for dialogue on street design and program development	Timeline: Planning and implementation stage Responsibility: PMO with communication consultants Resources:	<ul style="list-style-type: none"> At least 40 % of participants are women At least 10% of participants are elderly or disabled

	<p>Cyclists (present and potential) with a focus on residents in areas in proximity of trunk roads reworked</p> <p>Electric motorcycle and car drivers in program affected areas</p> <p>Committees representing residents with special needs, such as disabled, elderly or women</p>		by contributing to the planning process.	<p>Providing a platform for stakeholders to engage with the program designer:</p> <ul style="list-style-type: none"> - Behavior trials - Co-design workshops providing a platform for stakeholders to engage with the program designer to communicate their priorities <p>Creating platform for user engagement on ongoing adjustments:</p> <ul style="list-style-type: none"> - Enhancing the Xiangtan bus and bike-share apps to include feedback options, and provide regular program information to users. <p>Keep users and potential users informed:</p> <ul style="list-style-type: none"> - Monthly/Bimonthly bulletins from PMO on progress; - Social media forums for dialogue on street design and program development particularly WeChat and Sina Weibo 	<p>½ person month, international participatory process consultant</p> <p>2 person month, national participatory process consultant</p> <p>1 person month national social media consultant</p>	<p># of stakeholders/users taking part in co-design workshops where:</p> <ul style="list-style-type: none"> • At least 40 % of participants are women • At least 10% of participants are elderly or disabled <p># of bulletins issued</p> <p># of active users on chosen social media forums</p> <p># of active users of the enhanced feedback options of the Xiangtan bus and bike-share apps</p>
Public resistance to redesign for Fuxing middle road (output 2) due to lack of alignment with stakeholders	Residents, shopkeepers, regular users of Fuxing middle road such as shop employees and customers, employees of	Protecting status quo of the street design to preserve their business and parking opportunities -> Acknowledging that the street	Fuxing middle road can be better for all users – if all take part in the planning process.	<p>Creating attention and knowledge with stakeholders of the planned work early in the process by:</p> <ul style="list-style-type: none"> - Stakeholder/community information and dialogue meetings (town hall style) - Social media forums for dialogue on street design 	<p>Timeline: planning and implementation phase</p> <p>Responsibility: PMO with communication consultants.</p>	

needs and preferences.	business in or around Fuxing middle road and other stakeholders	reworked for greater resilience can bring benefits for them if they engage in a participatory design process.		<p>and program development.</p> <p>Providing a platform for stakeholders to engage with the program designer to communicate their priorities, by:</p> <ul style="list-style-type: none"> - Behavior trials, stakeholder surveys/interviews/FGDs - Co-design workshops providing a platform for stakeholders to engage with the program designer to communicate their priorities. <p>Keep users and potential users informed of progress and manage their expectations by:</p> <ul style="list-style-type: none"> - Monthly/Bimonthly bulletins from PMO on progress; - Social media forums for dialogue on street design and program development particularly WeChat and Sina Weibo. 	Resources: ½ person month, international participatory process consultant. 2 person month, national participatory process consultant. 1 person month national social media consultant.	
Objective 2: Promote the Xiangtan residents' use of public buses and increase use of low-carbon transport modes						
Risks	Audiences/ Stakeholders	Current/Desired Attitude Behaviors	Messages	Activity/Channels	Timeline, Responsibility, Resources	Expected Outcomes
Program design not reflecting users' needs resulting in low number of	Program designers and planners. Agencies with mandates	Centralized planning with little dialogue with users/residents -> Participatory	The suggested behavior trials plan will enhance the desired	Organizing and executing behavior trials plan (see appendix 3)	Timeline: Planning stage before finalization of detailed design	Stakeholders engaged in design and planning process

residents will use bus or bicycle	related to Output 1 and 2. (Transport Authority of Xiangtan (TAX); Natural Resource and Planning Bureau of Xiangtan City (NRPB); Xiangtan Public Security Bureau (XPSC) and the PMO)	processes engaging users and potential users as well as other key stakeholders in planning and implementation of program.	outcomes and create greater acceptance of program.		<p>Responsibility: PMO with communication consultants</p> <p>Resources: Covered in related activities under Objective 1 (capacity building and expert assistance in behavior trials)</p>	<p>Results of behavior trials incorporated in detailed design</p> <p>Output indicators:</p> <p>Results of behavior trials plan referenced and integrated into planning documents</p> <p>Final planning documents must clearly indicate how the design has been inspired by behavior trials plan</p>
Low number of residents will use public buses	Bus passengers (current and prospective) with a focus on residents in areas in proximity of trunk roads reworked	Uses the bus occasionally -> uses the bus frequently	The new low-carbon, smart urban mobility system is the convenient, affordable and green way to get around Xiangtan	<p>Prior to civil works:</p> <ul style="list-style-type: none"> - Providing information of when specific areas will be affected by construction and highlighting benefits of coming transport system (synergizes with activities described in Objective 1) - Promoting feedback options in Xiangtan Bus and Bike share apps and social media feedback platforms (see Objective 1) <p>During civil works:</p> <ul style="list-style-type: none"> - Keeping residents updated to minimize 	<p>Timeline: implementation phase Tactical phasing in overall strategy taking place over 1-2 years.</p> <p>Responsibility: PMO with communication consultants</p> <p>Resources: 2 person month, international communication consultant</p>	<p>Increased use of bus and bicycle by Xiangtan residents.</p> <p>Output indicators:</p> <p>Bus lines affected by program must show faster growth passenger numbers than non-affected lines.</p> <p>Survey in relevant city parts to establish baseline and measure outcomes in:</p>
Low number of residents will use public bikes	Cyclists (current and prospective) with a focus on residents in areas in proximity of	Occasionally combines bus rides with bicycle rides in their daily transport -> Frequently combines bus rides with bicycle	Support Xiangtan's transformation to a high growth low-carbon, inclusive city			

Residents with special needs will not achieve greater mobility	trunk roads reworked Committees and other groups representing residents with special needs, such as disabled, elderly or women	rides in their daily transport Dissatisfied with lacking or non-inclusive bus services -> promoting new inclusive bus services	New buses offer improved access and inclusivity for residents with special needs	inconvenience (synergizes with activities described in Objective 1) When infrastructure is finished: Highlighting convenience of new buses and traffic information system with blended social media and physical communications campaign using: - Short video format and testimonials from Key Opinion Leaders - Engagement enhancing formats such as games, competitions etc. - Posters etc. in relevant community centers, business zones, shopping areas, businesses, schools etc. - Info-screens at bus stops	3 person month, national communication consultant. 2 person month national social media consultant	- Bicycle ownership (must grow by % determined by PMO) - Share of residents that have bus and as preferred means of transportation (must grow by % determined by PMO)
Resistance from private sector stakeholders will put a break on planned activities	Private sector stakeholders with an interest in affected city areas such as developers, restaurants, shops	Promoting status quo of traffic system to avoid perceived business risks -> realizing and supporting the business potential of Output 1 and 2	The planned enhancement to Xiangtan's transport system and urban design will support the economic development of the city.			
Bus drivers dissuading residents with special needs from using the bus by not taking their needs into consideration	Bus drivers in Xiangtan	From being focused on speed and not being considerate to residents with special needs -> being courteous, placing the bus close to the curb at stops	Customer service is especially important to passengers with special needs	Training program for Xiangtan bus drivers teaching them to meet the needs of passengers with special needs Follow up on effect with customer surveys Use customers surveys as part of bus drivers' employee evaluations.	Timeline: planning and implementation phase – repeat if needed Responsibility: PMO in collaboration with bus operating companies and Transport Authority of Xiangtan (TAX) Resources:	Bus drivers showing increased customer service towards passengers with special needs Outcome indicators: - Customer satisfaction surveys must show increased

					½ month national communications consultant.	satisfaction from passengers with special needs over the program period
Residents invest in new cars before program implementation, making it harder to convince them to use the bus as they would want to utilize the investment in a car	Residents in Xiangtan with plans to buy a new car	Buying a new car -> waiting to evaluate the effect of smart urban mobility system before choosing transport mode.	Parking can become more expensive, and buses will become more convenient.	Monthly/Bimonthly bulletins from PMO on progress Social media forums for dialogue on street design and program development (using WeChat, Sina Weibo)	Timeline: planning and implementation phase Responsibility: PMO with communication consultants Resources: Covered in suggested initiatives above	Slowing growth in car purchase with Xiangtan residents Output indicators: - Growth in car sales in Xiangtan must be lower than in comparable cities over program period
Objective 3: Promote more widespread adoption of low-carbon lifestyles in homes to reduce energy consumption for cooling, heating and lighting						
Risks	Audiences/ Stakeholders	Current/Desired Attitude Behaviors	Messages	Activity/Channels	Timeline, Responsibility, Resources	Expected Outcomes
The considerable source of carbon emissions from households will increase	Female Xiangtan Residents in middle- or higher income brackets mainly responsible for household management.	Not insulating their homes-> insulating their homes	Insulation saves money and creates greater comfort for you and your family. A lot can be done in your home with little effort	Blended strategies with social media and physical presence (e.g. on posters and info-screens at bus stops) Short video format and testimonials from Key Opinion Leaders Social media/ website for information on detailed	Timeline: can start as soon as program funding is available. Phased behavior change communication activities around the start of heating and cooling seasons Resources:	Residents increasing their use of individually applicable insulation technologies such as caulking and shutters/foils to keep out heat from the sun

		Refrain from buying LED lighting and other energy efficient appliances -> buying LEDs and other energy efficient appliances	Energy efficient lighting and appliances saves money in the long run	<p>information, supplier lists, tips and tricks, etc.</p> <p>Detailed choice of platform and formats will be discussed between PMO and program specialists</p> <p>Posters and other communication materials in relevant community centers, business zones, shopping areas, businesses, schools, etc</p>	<p>2 person month, international communication consultant.</p> <p>3 person month, national communication consultant.</p> <p>2 person month national social media consultant.</p>	<p>Increased use of energy efficient LED lighting</p> <p>Increased use of energy efficient appliances</p> <p>Output indicators:</p> <p>Survey of households establishes baseline and measures outcomes for:</p> <ul style="list-style-type: none"> - Average energy use in surveyed households - % of light bulbs that are LED - % of appliances in that are labelled best in the CEL national energy efficiency label - % of households that have taken steps to insulate their dwelling
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New generations will grow up with lifestyles that increase carbon emissions	School children of middle- and higher income brackets	Being uninformed on and uninterested in saving energy -> inspiring their parents to save energy	Saving energy saves money and creates a safer future.	Information/education materials offered to teachers on how to create energy savings in homes. (suggested age groups 8-12 years)	<p>Timeline: can start as soon as program funding is available</p> <p>Phased behavior change communication activities around the start of heating and cooling seasons</p> <p>Responsibility: PMO with communication consultants.</p> <p>Resources: 1/2 person month, international sustainability training specialist. 1 person month, national sustainability training specialist. 2 person month national primary education specialist.</p> <p>Costs: School campaign: USD 97,000</p>	<p>Schoolchildren acting as inspiration for their families in saving energy and carbon emissions</p> <p>Spillover effects on strategy for insulation/energy efficiency in households (see above)</p> <p>Output indicators: #of school classes that have received training</p>
Potential for savings on energy bills and carbon emissions are not realized	Owners' committees or similar groups representing apartment owners in	Not insulating the apartment complex-> insulating the apartment complex	Create energy savings and greater comfort by insulating the building – this can raise	<p>Targeted information materials to owners' committees.</p> <p>Information meetings for owners' committees.</p>	<p>Timeline: can start as soon as program funding is available</p> <p>Phased behavior change communication</p>	Owners' committees adopting use of full-building insulation techniques in Xiangtan

	apartment complex	Not having energy efficiency as a parameter for evaluating the service of property management companies -> having energy efficiency as a key parameter for evaluating the service of property management companies	<p>the value of apartments</p> <p>ESCO or other financial instruments can finance insulation without owners having to pay more.</p> <p>Good property management companies can help the apartment owners to create energy savings and save money.</p>	<p>Energy consultants/ESCOs meeting owners' committees to provide information.</p> <p>Website for reference materials, suppliers lists, etc.</p>	<p>activities around the start of heating and cooling seasons</p> <p>Responsibility: PMO with communication consultants</p> <p>Resources: 1/2 person month, international energy efficiency consultant. 3 person month, national energy efficiency/ESCO consultant. 1 person month national communication consultant.</p>	<p>Output indicators: # of Owners' committees:</p> <ul style="list-style-type: none"> - Request information package. - Attend information meeting - Request visit from energy consultants <p># of visitors on webpage, downloads and time spent</p> <p>#of buildings insulated</p>
	<p>ESCOs: as partners in larger insulation projects</p> <p>Property Management Companies</p> <p>Appliance stores, local and online</p>	Not targeting Xiangtan as a market for low-carbon services and goods -> seeing that the Xiangtan Low-carbon Transformation program opens a new market for low-carbon services and goods in Xiangtan	The low-carbon transformation program offers new markets for insulation and efficient lighting and appliances in Xiangtan.	<p>Targeted information materials to businesses in the relevant sectors</p> <p>Training material offered for capacity building with property management companies.</p> <p>Building a trusted suppliers list where applicants can promote their services after being vetted by PMO</p>	<p>Timeline: can start as soon as program funding is available.</p> <p>Responsibility: PMO with communication consultants</p> <p>Resources: 1/2 person month, international energy efficiency consultant. 1/2 person month, international</p>	<p>Private sector stakeholders in Xiangtan adding energy saving in buildings to their value propositions, products and services</p> <p>Output indicators: # of business engaging in program</p>

					communication consultant 1 person month, national energy efficiency consultant. 1 person month national communication consultant.	# of property management companies requesting capacity building/training
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Objective 4: Promote walking as a low carbon mode of transportation and pedestrian road safety among school children						
Risks	Audiences/ Stakeholders	Current/Desired Attitude Behaviors	Messages	Activity/Channels	Timeline, Responsibility, Resources	Expected Outcomes
Children are a particularly vulnerable population group when it comes to accidents with vehicles. A low carbon lifestyle includes the ability to safely get around while walking, therefore both children and drivers must adopt road-safe behaviors.	School children	Risk of unsafe road crossing-> always crosses the road with caution and in designated areas.	(i) Properly use the improved, raised pedestrian walkway and extended curb; (ii) simulate safe behaviors in responding to traffic signals, crossing and boarding vehicles / motorcycles / e-bikes; (iii) increase walking Children are encouraged to act responsibly leaders and “teach” their families about road safety as well as act as role models to other children	Gaming-based curriculum co-created with children that is piloted in the 5 key schools Children act as leaders to educate their families and act as role models in their behavior Community event where children present road-safety to local stakeholders Student ambassador program where children are selected to accompany police officers in directing pedestrian traffic and orienting pedestrians Social media outreach that supports children in educating their families and includes educational short videos Signages or banners posted in school zones	Timeline: Creation of gaming-based curriculum 3-5 months. Integrated with regular activities Responsibility: PMO with communication consultants Resources: 2 person month, international communication/education consultant 3 person month, national communication/education consultant. Optional: 2 person month national social media consultant	Schoolchildren showing fewer risk behavior in traffic Drivers showing fewer risk behavior around school generally in Xiangtan Output indicators: # of accident/serious accidents/deaths from traffic close to 5 Xiangtan schools decreased from baseline year # of accident/serious accidents/deaths from traffic in Xiangtan decreased
Risk behavior in traffic – and near schools – increases with	Drivers, including the family and	Unsafe behavior near schools such as fast speeds, distracted driving,	(i) Follow traffic signals and yield to pedestrians	Parents/drivers information meetings on safe behaviors in traffic conducted at schools		

more injuries and casualties as a result.	parents of the school children. Drivers of cars, bikes, and motorcycles.	parking near crosswalks and on sidewalks -> cautious driving with particular care in school zones and in the rush hour of school drop offs.	crossing the elevated crossing; (ii) Follow new unloading and loading schemes to ensure smooth and safe getting on / getting off behavior of students; (iii) Refrain from illegal roadside parking.	Participation in the gaming-based curriculum Social media outreach		
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ESCO = energy service companies, LED = light emitting diode, PMO = program management office.

APPENDIX 2: STAKEHOLDERS ANALYSIS FOR THE XIANGTAN LOW-CARBON DEVELOPMENT PROGRAM

This Stakeholders Analysis is split in two parts. Part one corresponds to the mobility practices of stakeholders and preferences for social engagement. Part two of the stakeholder analysis focuses on the household energy use of stakeholders and possibilities for engaging with private sector.

Stakeholder Analysis Part 1: Traffic and Mobility

STAKEHOLDER GROUP	INTEREST/STAKE	ISSUES OF CONCERN	INFLUENCE
Xiangtan Residents			
Cyclists Small group as only 2.7% of responses in SES reports bikes being a major transport mode for daily trips; 21% of households own at least one bike according to SES Young people/students	Needs safe and fast transport Needs good integration with buses and trains for longer trips Used for shorter trips Very few households own a bike. Shared bicycle system has issues with availability of bikes at key points, and the usability since the bikes are heavy and with no gears	Shared bike system is relatively successful, but connectivity can be improved to encourage tri-modal use ((bike-ride bus or train-walk) Cyclists don't wear helmets. Shared bikes are cheap and easy to access from bike docks, but are relatively heavy limiting the usability on longer trips There are no bicycle racks with buildings or in designated bicycle parking spaces, so private bike owners cannot lock their bike to avoid theft Vulnerable group in traffic – bike lanes used by electric-motorcycles; often pressed into car lanes by confusing road layout; missing bicycle lanes	Influence is low – cyclists are a small group and their needs have not been high on the agenda of the relevant city authorities. Students are the more frequent users of the shared bike system Most own a smartphone and are digitally savvy, but street interviews and FGDs indicate that lower income residents don't use ICT on for traffic information because they want to save data use. If they use shared bikes they do so via card payment
Bus passengers Bus use is relatively high with 39 % of lower income residents and 33% of medium income residents based on SES	Need reliable, affordable, convenient and safe bus service Lower income residents are dependent on bus services to get to work	Distance to bus stops from work or from home is too far Bus stops do not provide adequate shelter from rain, sun, and spray from puddles. Lower income passengers save smartphone data and do not use apps to see when bus arrives. This leads to risky behavior as they walk into the street to look for approaching buses Bus drivers often don't drive close to the bus stop platform, forcing passengers to step into street to enter the bus	Bus passenger app has function to give feedback or report complaints Users that pay with other apps, such as Alipay, do not have that option Most own a smartphone, but lower income residents don't use it to get information on bus departure time and other info because they want to save on data use

		<p>Bus stops are narrow and hard to navigate safely without getting into the street.</p> <p>Bus stops have different height of curbs, but buses do not have adjustable floor height, impairing accessibility</p>	
<p>Car users</p> <p>Higher and medium-income residents</p>	<p>Want fast and hassle-free traffic</p> <p>Want parking spaces</p> <p>Cars are convenient and carry status</p> <p>75% of higher income respondents point to cars as the main means of transportation for trips above walking distance. The same is true for 47% of medium-income respondents</p>	<p>Car ownership has almost doubled in China from 2013 to 17²⁰, and projections²¹ indicate a further tripling of the car fleet in Hunan province by 2030. In Xiangtan this has created a lack of parking spaces, resulting in parking on pedestrians walkways and other irregular spaces</p> <p>Still seen as more convenient and faster than buses</p> <p>Traffic is growing, but congestion in Xiangtan is still relatively low</p> <p>Existing bus or bike priority lanes are not prohibited for cars, but car owners are automatically carry responsible for any accidents in these lanes</p>	<p>Enforcement of parking laws is seen as sensitive and hard to tighten</p> <p>Car users park randomly with little fear of parking rules being enforced</p> <p>Influence is high – local authorities generally focus on the needs of car users</p> <p>Most own a smartphone and are digitally savvy</p>
<p>Commuters with no cars</p>	<p>Needs fast, reliable convenient modes of commuting to work</p> <p>Flexibility is needed for those with changing work hours</p>	<p>Connectivity in transport system needs improvement, especially around train stations.</p> <p>Bus stops don't provide adequate shelter from rain, sun, and spray from puddles</p> <p>Lower income passengers save smartphone data and do not use app to see when bus arrives. This leads to risky behavior as they walk into the street to look for approaching buses.</p>	<p>Most own a smartphone and are digitally savvy, but lower income residents don't use it for bus information because they want to save on data use</p>
<p>Disabled and seniors</p> <p>Hindered in their mobility and choice of transportation</p>	<p>Are often dependent on public transport or family members for transport</p>	<p>Bus drivers are reluctant to wait for disabled or elderly people even when they are called out</p> <p>Street observations show that:</p>	<p>Have less access or capabilities to use smartphones for information gathering or expressing their views.</p>

²⁰ <http://www.stats.gov.cn/tjsj/ndsj/2018/indexeh.htm> , table 6-5.

²¹ <https://www.mdpi.com/2071-1050/11/14/3928/pdf>

	<p>Need transportation to avoid isolation in homes</p> <p>FGDs and street observations indicate that seniors often take care of children and need to travel to take them to leisure activities, school or other activities</p>	<ul style="list-style-type: none"> - Bus stops are often designed with very high curbs making it difficult or even impossible for disabled or seniors to use them safely - Most buses have high steps and no access for wheelchairs - Pedestrians walkways are often poorly designed for disabled and elderly with uneven paving and high curbs. Slopes are often too steep - Most pedestrian walkways have lines to guide visually impaired residents, but they are not consistent and sometimes disconnected - Parked cars and bollards to keep motorcycles out block their way <p>For above reasons many choose to walk in the street even in newly developed areas</p>	<p>Can express views / feedback via family members or friends</p>
<p>Electric motorcycle drivers</p> <p>Electric motorcycles are popular with medium and lower income residents. (SES shows 39% of lower income respondents and 38% of middle income respondents indicate that electric motorcycles are a major means of transportation. Same only true for 5% of higher income respondents)</p>	<p>Needs safe and fast transport.</p> <p>Are exposed to weather during travels.</p> <p>Shop owners indicate that some smaller shops also need electric motorcycles or tricycles for delivery.</p> <p>SES shows electric motorcycles are preferred means of transport except walking for lower income residents. Also popular with medium income residents.</p>	<p>Plastic covers to shield drivers from sun/rain are popular but pose a hazard in windy conditions</p> <p>Confusing road design forces drivers into bike priority lanes at crossings, causing hazardous situations</p> <p>Reckless behaviors are common, such as: counterflow driving in slip lanes, using pedestrian islands and zebra crossings to wait for traffic lights or to cross the street, driving on the pedestrian walkways.</p> <p>Only professional drivers wear helmets.</p> <p>Parked cars block access ways, thereby causing drivers to drive on the pedestrian walkways for extended distances</p>	<p>Influence on actual traffic flow and safety is high through their force of numbers and frequency of reckless driving behavior</p> <p>Many pedestrian walkways have bollards to keep drivers from entering public squares or pedestrian walkways. This unfortunately hinders pedestrians especially disabled and elderly who are dependent on the walkways</p> <p>Police officers in the street often reprimand electric motorcycle riders for breaking traffic regulation but no sanctions are given.</p>
<p>Local residents in project areas</p>	<p>Shop owners indicate that residents are worried</p>	<p>Residents report that there are too many cars parked in the street/on pedestrians walkways,</p>	<p>Most own a smartphone and are digitally savvy with</p>

	<p>about parking spaces for their cars</p> <p>Reduced traffic can lead to less air pollution and health risks</p> <p>"Tidiness" of the street is reported as a quality they would like see more of</p> <p>Want to keep parking fees from increasing</p>	<p>but they don't want to give up their own chance to park</p> <p>Crossing trunk roads is difficult on foot as there is little time and most often no pedestrian islands midway</p> <p>Shop owners agree a nearby parking spaces would help keep streets clear of parked cars</p>	<p>access to social media to express opinions</p> <p>Government puts planning online to seek the public's feedback, but they do it at a relatively late phase of the project</p> <p>Hearings will be held for stakeholders if deemed necessary</p>
Local shop owners in project areas	<p>Want to allow customers easy access to shop</p> <p>Want to have their shop visible from the street</p> <p>Want to keep rent from increasing</p>	<p>Fuxing middle road houses a large number of car/motorcycle repair shops and associated stores with spare parts and related products. These stores depend on their clients being able to drive their vehicle across the pedestrian walkway to access the shop</p> <p>Restaurant owners are depend on local customers. They want to use pedestrian walkways to seat more customers.</p> <p>Parked cars block line of sight so stores are not visible to potential customers in the street</p> <p>One shop owner report a 50% drop in revenue the last time parking was made more difficult in front of their shop</p>	
Lower Income Residents Residents with an income in the lower third of the income distribution used in the SES (below 3000 CNY/month)	<p>SES shows this group:</p> <ul style="list-style-type: none"> - Depends on bus service or electric motorcycles for longer transport trips. Walk for shorter trips - Have diverse transport aims, taking several trips per day 	<p>Connectivity in the Xiangtan public transport system could be improved</p> <p>Reckless driving/walking, not using helmets or riding with plastic covering making visibility difficult and hazardous when blown away by to wind.</p> <p>Traffic Police indicates that the ITS (Intelligent Transport Signaling) system in Xiangtan facilitates car traffic at the expense of other traffic modes</p>	<p>Low influence - can give user feedback and complaints via bus app</p>
Medium Income Residents	SES shows that:	Rapid growth in car ownership (see reference above) has	Target audience most likely to transition from car to bus,

Residents with an in the middle third of the income distribution used in the SES (between 3,000 and 10,000 CNY/month)	<ul style="list-style-type: none"> - Car is preferred mode of transport for longer trips for this group (46% indicate car as a major transport means). Electric motorcycles also popular (38%). Bus in third place (33%). - This group has diverse transport aims, taking several trips per day. 	<p>created a lack of parking spaces, resulting in parking on pedestrian walkways</p> <p>Other modes of transportation are seen as more convenient than buses</p> <p>Connectivity in the Xiangtan public transport system can be improved</p>	as still have access to car use
High Income Residents Residents with an in the top third of the income distribution used in the SES (above 10,000 CNY/month)	<p>Car transport is the most preferred transport mode. (75% indicate car as a major transport means). Very few use electric motorcycles</p> <p>Have diverse transport aims, taking several trips per day</p>	<p>Rapid growth in car ownership (see reference above) has created a lack of parking spaces, resulting in parking on pedestrians walkways and other irregular spaces.</p> <p>Could buy electric cars but FGDs indicate that they do not trust the quality or the accessibility of charging stations.</p>	Lifestyles of the wealthy inspire aspirations of lower income families
Pedestrians People travelling on foot. Low income residents travel by foot more often than medium and higher income	<p>Needs safe transportation especially in crossings</p> <p>Need access to well-designed and maintained pedestrian walkways</p>	<p>Electric bicycles, motorcycles – and sometimes cars – drive on pedestrian walkways and in zebra crossings. Sometimes this is encouraged by police</p> <p>Parked cars take up a lot of the available space on pedestrian walkways – sometimes forcing pedestrians into the street</p> <p>Pedestrian walkways are generally uneven and badly kept, with high curbs. Pedestrians with wheeled bags often walk in the street</p> <p>Roads are broad and often have no safe islands in mid-crossing causing people to walk before light turns green</p> <p>Traffic Police indicates that intelligent traffic control system prioritizes cars</p>	<p>More accessible forum – real or virtual – needed for pedestrians to share experiences, form interest groups to influence traffic planning or rule enforcement</p> <p>Most own a smartphone and are digitally savvy, but lower income residents don't use ICT for information because they want to save on data use.</p>

Students Female and male students in Xiangtan's universities	Students aspire to lead a low-carbon lifestyle, but also seek the status of e.g. car ownership. Most live in dorms	Need accessible and affordable transport from dorm/university areas to city or leisure activities Travels to other cities to visit family – need well connected trains/long distance travel modes Female students report little unwanted attention in public transport, but often go in groups	Medium influence, but can potentially be mobilized as “ambassadors” in communication strategy. Can influence families
Xiangtan authorities with related mandates			
Housing Bureau	Pedestrian areas and parking lots are regulated by the Housing Bureau. Planning is approved by NRPB	According to NRPB regulation, street building owners should make certain there is room for pedestrian traffic. In reality, due to the shortage of parking areas, parked cars always take up much of the space for pedestrians Parking regulation is not enforced There is strong resistance to any initiative making it harder to use cars such as tighter regulation of parking	High – planning authority for much of the civil works in program.
Natural Resource and Planning Bureau of Xiangtan City Approves city planning done by other departments and bureaus, such as plans for new developments, for pedestrian and parking areas etc.	Supervises the land use according to national law Organizes the overall city land use planning and implement	The new city government is devoted to link Xiangtan to Changsha and integrate Xiangtan in Changsha-Zhuzhou-Xiangtan area, so the focus for the city's development strategy changed to outwards from previous years' inwards. During the last 5 to 6 years, the strategy was focusing on development in Xiangtan City. Due to lack of government supervision and financial investment many plans cannot be implemented Complaints are being raised by the citizens about city planning and public facilities People's Republic of China's city planners have the knowledge about advanced international ideas and tendencies. However, due to	High influence - gives approval to the city land use plans Administration only reaches to the city level and county level. For more detailed issues such as how many arteries and highways should be planned, this is the responsibility of the relevant functional departments and this is finally approved by NRPB. NRPB is not in charge of the implementation

		<p>the rapid development in the country, they have much less time and resources in the planning phase</p> <p>Planning works which in western countries may take several years, they have to complete the within half year or less</p>	
<p>Transport Authority of Xiangtan</p> <p>Plans and regulates bus services in and around Xiangtan; Manages contract with bus operating companies</p>	<p>Focus is on making buses go faster to compete with car transportation</p> <p>Ambitions is to get more low-income users to use buses.</p> <p>No expectations that they can draw in people from high or higher middle income to use buses more</p> <p>All new buses are reported to be electric and low-floor for accessibility, though few low-floor buses are seen in the street</p>	<p>High-income residents will not use buses</p> <p>Expect that cheaper tickets will increase passenger numbers</p> <p>Expects newer buses will result in more positive/high-end image of bus traffic</p> <p>Expects car use to increase</p>	<p>High Influence -- crucial agency for planning connectivity and accessibility of public transport modes</p> <p>Can influence the bus companies that have the buses by setting standards and key performance indicators for them</p>
<p>Xiangtan Public Security Bureau</p> <p>Traffic police. Regulates traffic and operates the Smart City ITS. Enforces traffic and parking regulation</p>	<p>Needs to keep traffic flowing</p> <p>Objectives of the ITS system:</p> <ul style="list-style-type: none"> - Increase average speed in peak hours by 5-8 km/t - Decrease number of accidents by 30% - Decrease time lost in traffic jams by 20% 	<p>Plans are to develop ITS system to catch traffic violations and provide data for cars to avoid congestion</p> <p>No plans for adding functionalities that can facilitate pedestrian or bike traffic. Consider developing bus priority signaling</p> <p>Traffic police in street enforce regulation irregularly</p>	<p>High – controls development and implementation of ITS including bus priority signaling</p> <p>Controls traffic police enforcement in streets for street safety</p>
Private Sector Stakeholders (Analysis based on generic profile)			
<p>Real estate developers and investors</p> <p>Develops and invests in buildings and developments in the affected areas</p>	<p>Interested in raising housing prices in the areas where they have invested.</p>	<p>Parking is added to all observed new residential areas, giving residents an incentive to own a car</p> <p>Can potentially become a supporter of program, if they believe their investments will</p>	<p>High – shapes the residential areas and can influence choice of transport</p>

		grow as a result of program outcomes	
Taxi and Didi drivers Provides transport services	Interested in keeping or growing their business	Can potentially become a supporter of program, if they believe the program outputs will decrease congestion or otherwise help them in their business Important supplementary services for some residents such as disabled or elderly – if they can afford it	Low influence

FGD = focus group discussion, ITS = intelligent transport system, NRPB = Natural Resource and Planning Bureau of Xiangtan City, SES = socioeconomic survey

Stakeholder Analysis Part 2: Energy Use in Buildings

STAKEHOLDER GROUP	INTEREST/STAKE	ISSUES OF CONCERN	INFLUENCE
Xiangtan Residents			
Lower Income Residents Residents with an income in the lower third of the income distribution used in the SES (below 3000 CNY/month)	FGDs indicate that this group show low-carbon behavior (e.g. using cooling/heating sparingly), waste little food) because they aim to save on cost of living Cooling and heating is a high cost compared to their income.	Has few extra funds to invest in energy/carbon savings. Low-energy appliances are seen as too expensive and lifetime cost calculations (paying more in short term for expensive equipment but saving more in medium/long term on energy savings) are not well understood	Can improve energy efficiency and comfort in their home at a relatively low cost Can influence via owners' committees Can buy more energy labelled goods
Medium Income Residents Residents with an in the middle third of the income distribution used in the SES (between 3,000 and 10,000 CNY/month)	Show low-carbon behavior (e.g. using cooling/heating sparingly) to reduce energy costs Cooling and heating is a considerable cost compared to their income (see section 29)	Low-energy appliances are seen as too expensive and lifetime cost calculations (paying more in short term for expensive equipment but saving more in medium/long term on energy savings) are not well understood Have more funds to invest in energy savings/insulation. Show interest in insulation.	
High Income Residents Residents with an in the top third of the income distribution	Cooling and heating is a smaller cost compared to their income	Have funds to invest in energy savings e.g.in heating and cooling	

used in the SES (above 10,000 CNY/month)		Low-energy appliances are seen as too expensive and lifetime costing is not well understood	Can improve energy efficiency and comfort in their home at a relatively low cost Can influence via owners' committees Can buy more energy labelled goods
Owners Committees Organize owners of apartments within the same building/block (no access could be established to this stakeholder group. Analysis based in generic profile)	Want well-functioning and affordable housing Interested in saving costs where possible	Can influence choice of property management companies As an elected body, it has to balance the interests of the owners Can initiate renovation projects such as external insulation	High – can influence or take decisions on larger projects such as full building insulation
Property Management Companies Manage maintenance of residential buildings. Has insights into the technical systems or the buildings (no access could be established to this stakeholder group. Analysis based in generic profile)	Must keep balance between their service and their price competitive. Seeks to expand business	Can invest in new services such as energy saving as a service but run the risk of customers not wanting it Xiangtan Low-carbon Transformation program can be the catalyst for new business and service models with a focus on energy savings in buildings Needs to build capacity with employees and possibly also management	Medium – can potentially be an active partner driving energy savings in buildings if they see a market for it
ESCOs ESCOs finance large scale energy savings such as full building insulation at no cost to owners. Company is paid by difference in energy costs and apartment owners' fixed energy payment for set period of time. After this period, savings are harvested by apartment owners. (no access could be established to this stakeholder group. Analysis based in generic profile)	ESCOs are well-established business model in People's Republic of China Other finance models (loans for example) can be competitive	Needs scale for their projects to be financially viable, at least a full apartment building, often more, is needed Complicated financial model can be hard to communicate ESCOs or other large-scale energy savings in private homes need mechanism to handle that residents might raise expectations for comfort after project implementation causing parts of the energy savings to be cancelled	

Appliance stores Sell appliances	Want to sell more goods and services	Physical stores are under pressure from online shopping A communication strategy to shift to more energy-efficient appliances can cause a raise demand	
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ESCO = energy service company, FGD = focus group discussion, SES = socioeconomic survey.

APPENDIX 3: BEHAVIOR TRIALS PLAN – SHOW, DO NOT JUST TELL

Behavior change to test	Key project design aspects to test prior to finalization of detailed design	Respondent selection	Suggested methodologies
A. From irregular parking -> Parking only where allowed	<p>Stronger enforcement of parking regulation:</p> <ol style="list-style-type: none"> 1. Park only where allowed 2. Increase parking fee to amount agreed after consulting with key stakeholders <p>How will car users react to increased enforcement of parking regulation (more frequent fines, larger fines)?</p> <p>Background (SES / FGDs): Car owners do not obey parking regulation along Fuxing middle road, blocking pedestrian walkways and access points to shops, roads and houses. There is demand for parking spaces, and they agree to parking fees.</p>	<p>3 respondents who drive private cars everyday to Fuxing middle road or in a selected low-carbon community</p> <p>For in-depth observation and interviews</p> <ol style="list-style-type: none"> 1. Private car users who have heavy packages and/or family members 2. Those who live far away (determine distance) <p>On-site interviews for those who: Insist on parking illegally obstructing pedestrian walkways, right-of-way – and fined for doing so</p> <p>Requirements: 2 researchers</p>	<ol style="list-style-type: none"> 1. Designate an area of project relevance and work with local traffic police to regulate parking diligently for a period. At least two weeks is recommended to allow for regular users to accommodate their use patterns. 2. Two weeks before testing, work with traffic police to disseminate information on the test parking sites (i.e, WeChat groups, flyers for shops along Fuxing middle road r, etc.) -- *this is the comms aspect which will also be tested 3. <u>Day 1:</u> Ride with 2 respondents to determine where they will park and how they park; conduct interviews <u>Day 2:</u> Ride with 2 respondents and point them to the parking sites; conduct interviews (core questions to be finalized) <u>Day 3:</u> Ride with 2 respondents to determine where they will park, point to parking sites; conduct interviews <u>Day 4:</u> Interview same 2 respondents to determine where they parked (without the researchers), and insights 4. On-site interviews with those who insist on parking illegally and are fined and/or towed
B. From using cars -> choose to use bus	<p>Better, more accurate real-time information on bus ETA and routes.</p> <p>How will bus users react to better information at bus stops?</p> <p>Background (SES / FGDs): Waiting time too long, passengers shift to other modes of transportation. They risk walking on street to observe if bus is coming.</p>	<p>Random</p> <p>Requirements: 3 researchers</p>	<ol style="list-style-type: none"> 1. Work with traffic police to choose a bus stop in project area – preferably near a bike-share stand (also to test connectivity modes) 2. Prototype and test a bus stop information system in coordination with bus authority for real-time data. Use visible temporary screens containing bus ETA and route. 4 days total testing in same spot. 3. Use quick feedback mechanisms (emoticons such as 😊 😞) to determine user reactions to the information 4. Create billboard with multiple answers to determine how else to reach bus users

			5. Interview users onsite to deepen feedback (core questions to be finalized)
C. From using cars -> Choose bi-modal transport (use buses then bikes or vice-versa)	<p>Bike share stands located strategically nearer bus stops</p> <p>Can bikes at strategically positioned areas make more people use public bike system?</p> <p>Background (SES / FGDs): Cyclists do not use shared bikes for too long because they are heavy and single-gear</p>	<p>3 respondents who bike everyday to Fuxing middle road</p> <p>For in-depth interviews</p> <ol style="list-style-type: none"> 1. Bus user who wants to try a bike 2. Bike user who wants to ride bus 3. Dedicated bike user <p>Random interviews</p> <p>Requirements: 3 researchers (will also conduct trials for behavior trials E)</p>	<ol style="list-style-type: none"> 1. Bike-share stands should be strategically near a bus stop 2. Install a sign at nearby bus stop to point to bike-stand and benefits of cycling 3. For in-depth interviews – appointments need to be set: Day 1 “before / what used to be” journey map (can be drawn or videoed) and interview (core questions to be finalized) Day 2 (after trying bike / bus) continuation of journey map and interview – same respondents on changes Day 3 continuation of journey map and interview – same respondents on recommendations 4. Random interviews with users of shared bikes
D. From using cars -> choose to use bus	<p>Commuter-friendly bus drivers can increase number of bus users and commuter satisfaction</p> <p>How does bus users react to more user-friendly bus drivers?</p> <p>Background (SES / FGDs): Behavior of bus drivers make it difficult for passengers (particularly elderly, disabled, people with heavy bags and/or kids) to enter or exit buses</p>	<p>3 bus drivers</p> <p>In-depth interview with drivers at the end of shift – for 4 days</p> <p>Random interviews with passengers while riding buses -- Special focus should be given to disabled, elderly, people travelling with small children, people travelling with heavy bags as these groups are especially impacted by bus driver behavior.</p> <p>Requirements: 3 researchers</p>	<ol style="list-style-type: none"> 1. Work with bus supervisors to test a “friendly driver initiative” where a few bus drivers are instructed to: <ul style="list-style-type: none"> ○ Wait for and show cordiality to the elderly/ the disabled/ passenger travelling with children or heavy bags. ○ Pull all the way up to the curve at bus stops. ○ Show good humor in dealing with passengers ○ Are allowed to be less accurate on their time plan to accommodate for the above 2. Design quick satisfaction feedback for passengers as they get off the bus -- for 4 days. 3. Conduct actual interviews with bus passengers (current and prospective) on the importance of bus driver behavior on their choice of transportation mode. (core questions to be finalized) 4. Conduct in-depth interview with drivers at the end of shift – everyday for 4 days
E. From using cars -> Choose to use private bikes	<p>Can access to private bikes make more people give up car travel?</p> <p>Background (SES / FGDs):</p>	<p>5 respondents who drive private cars everyday to Fuxing middle road and willing to use their personal bikes for 2 weeks</p>	<ol style="list-style-type: none"> 1. Get 5 employees at a public office to use their personal bikes for 2 weeks. Incentive from company would be good. 2. Orient employees on use of journey maps (video) to record their

	Cyclists do not use shared bikes for too long because they are heavy and single-g geared	Requirements: 3 Researchers (same researchers who will conduct methodology among bike users / bus users in Fuxing middle road -- see behavior trials C)	experiences with commentaries (prior to mission) 3. Conduct in-depth interviews to understand the experience
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FGD = focus group discussion, SES = socioeconomic survey