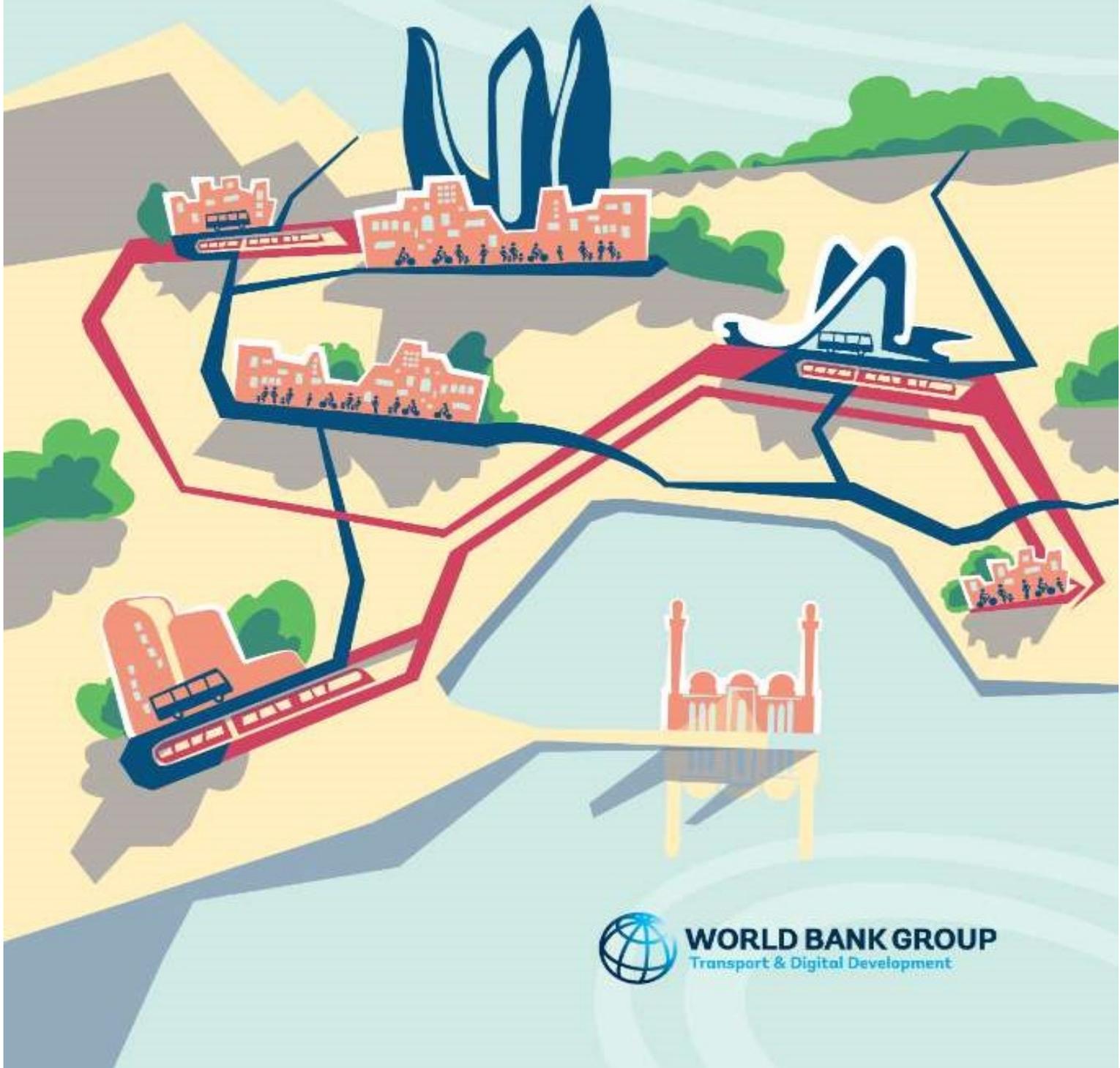


# Baku Urban Mobility Policy Note



**WORLD BANK GROUP**  
Transport & Digital Development

# BAKU URBAN MOBILITY POLICY NOTE

*Towards a More Efficient and Sustainable Urban Mobility*

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The report was prepared by a World Bank team led by Nijat Valiyev (Senior Infrastructure Specialist), and including Antonio Nunez (Senior Transport Specialist), Sadig Aliyev (Infrastructure Specialist) and Jorge Rebelo (Consultant). The report benefited from the comments of Peer Reviewers: Arturo Ardila (Global Lead Urban Mobility), Hadji Huseynov (Senior Operations Officer), Victor Aragonés (Senior Transport Economist) and Wei Winnie Wang (Senior Transport Specialist). The team is grateful for the guidance provided by Juan Gaviria (Practice Manager), Naveed Naqvi (Country Manager) and Sarah Michael (Program Leader).

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## EXECUTIVE SUMMARY

### OBJECTIVES OF THE POLICY NOTE

1. **This Policy Note has been prepared to inform the Government of Azerbaijan about the key challenges and possible ways forward to improve the urban transport system in Baku.** The Policy Note describes the existing institutional setup and emerging issues related to different transport modes of the city. It further presents a road map to develop more efficient and sustainable urban mobility in Baku.
2. **This Policy Note aims at characterizing the main issues and proposing options to tackle them.** The main objective of this Policy Note is, based on available data and discussions held with key stakeholders, to review the present situation of Baku's urban transport sector, to identify the bottlenecks, which prevent cost-efficient and user-oriented mobility system and to propose strategies and options to promote a more cost and energy efficient system providing better accessibility and quality of service to the users.
3. **The recommendations provided in this Policy Note are structured around the achievement of three main objectives – improved intermodal integration, sustainable management of traffic and congestion and financial sustainability of the sector.** These imply (i) the development of well-coordinated and well-integrated multimodal transport system for Greater Baku; (ii) the promotion of public and non-motorized transport vis-à-vis private cars and (iii) adjusting taxes, charges and fares to match government expenditures in the sector.

### SUMMARY OF RECOMMENDATIONS

#### *Strengthen the institutional framework*

4. **The Public Transport Authority for Baku city with comprehensive coordination, planning and implementation functions should be mandated.** While the establishment of Baku Transport Agency (BTA) in 2015 was a very positive development its role at present is still relatively narrow compared to Public Transport Authorities in London, Vancouver or Madrid. Gradual expansion of BTA's mandate to cover the full range of functions of a Public Transport Authority could be one of the possible solutions to strengthen institutional framework of urban mobility for Baku. Typical functions of Public Transport Authority, inter alia, include management, coordinating, and planning mobility, coordination of all public transport operators and intermodality, the management of traffic and on-street and off-street parking, and promotion of non-motorized transport.
5. **The public transport system of Baku does not rely on an approved strategy document or prioritized investment program.** The city needs an Integrated Land Use, Urban Transport and Air quality strategy, which would map out the agreed capital investments, operating strategies and the tariff and subsidy policies, which would increase accessibility, availability, affordability and sustainability of public and private transport for the users.
6. **Contractual mechanisms and key performance indicators (KPIs) need to be introduced for better management and improving quality and operational efficiency of all public transport operators.** This task requires changing the way public transport providers are contracted and how they perform against the standards that they have agreed to comply with.
7. **Availability of data and information, along with expertise and analytical tools constitute the first step for implementation of better transport policies.** Comprehensive and regular Origin-Destination surveys should help filling the information gap and serve as a basis for urban transport decision making and prioritization of investments.

### *Enhance the financial framework of the system*

8. **Public transport in Baku is not financially sustainable in its current form.** Public transport operators should be able to recover long-run operating costs, cover depreciation and contribute to fixed costs. The current level of tariffs is apparently not sufficient to provide sustainability and quality of urban transport services and ensure competition and attractiveness of the sector to the private sector. Well targeted subsidy policies should be designed to support the most socially vulnerable groups of users of urban transport services.
9. **There is significant potential to attract more funding to the sector.** These include adjusted transportation fares, enforcement of parking fees and fines for traffic and parking violations, revenues from advertisement and real estate development around intermodal stations, potential betterment taxes, amongst others. Illegal parking and lack of enforcement of parking fees are considered one of the main forms of implicit subsidies to car users, which contributes to congestion and increasing motorization rates and negatively affects quality and regularity of public transportation services.
10. **Expansion of single ticketing system to all major modes of public transportation,** including suburban rail, would be a major step towards a well-integrated public transportation system and improving quality of services. This will also allow for more flexibility in optimization of transport fare levels. Finally, a comprehensive review of all public transport tariffs from intermodal perspective should be implemented with a view to better linking tariffs to travel distances, peak and off-peak hours, occupancy rates, etc.

### *Further modernization of the urban transport system*

11. **Despite recent improvements, there is still large room to provide better quality bus services.** The creation of BakuBus was an important step towards better public transport, which should be followed by further optimization of the bus network and improvement of quality, comfort and accessibility of the entire system. This can be achieved through better planning and regulation, and improving the contractual framework for the provision of public transport by the private sector.
12. **Bold political decisions are needed for implementation of the long-discussed expansion of dedicated bus lanes and development of BRT and LRT lines on priority city corridors.** Some of the potential projects are already well defined and their implementation would have a strong demonstration effect and shape the future of the Baku urban transport system. Priority lanes are likely to improve level of service and attract more ridership from cars.
13. **There is a large scope to promote intermodality.** This can be achieved through more and better intermodal facilities, such as metro/bus stations, park and ride, bicycle parking as well as reliable information systems and well-structured tariffs.

### *Continue improving the metro and suburban rail systems*

14. **Metro, light rail and suburban rail should become a backbone of the public transportation system for central and Greater Baku respectively.** They are expected to be connected to feeder, trunk and express bus services via core and subsidiary intermodal transfer hubs.
15. **While the state program for development of metro is well-defined, it is expensive and slow to materialize.** Therefore, strategic selectivity of metro investments is very important. Private companies should be allowed to compete for efficiency and thus drive cost and time of metro construction down.
16. **Completion of 28 May/Jabbarli metro interchange (separation of red and green lines) is critical and could be a quickest win and huge relief for the existing metro system.** Currently, the red line of Baku metro has reached its maximum capacity and green line is expected to

reach its maximum capacity soon. While technical solutions have been proposed to correct this impediment, implementation of the project needs to be expedited.

17. **The improvement of the Baku-Sumgayit suburban rail line had immediate positive impacts and should be expanded to other lines.** The ridership of the Baku-Sumgayit line has increased substantially following the improvements in infrastructure, rolling stock and quality of service. Suburban rail network in the Greater Baku area has a lot of potential for expansion subject to implementation of respective feasibility studies. Reconstruction of the rail ring Baku-Khirdalan-Sumgayit-Pirshagi-Zabrat-Sabunchu-Baku, as well as lines connecting Central Baku with Yeni Surakhani, Mashtaga, Heydar Aliyev International Airport, and some other destinations are among key prospective suburban rail projects.
18. **There is a potential for Transit Oriented Development.** Several areas along the suburban rail lines have potential for transit oriented development, which should be assessed in terms of potential and legal framework and subsequently piloted in the most promising location. The aim is to increase potential ridership for the suburban rail system by promoting jobs and education, health and leisure facilities along the rail right-of-way.

#### *Improve traffic management and safety*

19. **Better enforcement of the traffic and parking rules is essential for improving management of traffic congestion and safety.** Strict enforcement of the existing parking rules and fines for their violation would have an immediate positive impact on the traffic congestion, safety, and pollution. This would need to be followed by the careful analysis and improvements to the parking policies and penalties to ensure long-term results. Speed limits are recommended to be reviewed and reduced to 50km/h in most of urban areas with a view of improved road safety and protection of pedestrians.
20. **The Intelligent Transport Management System (ITMS) is at a crossroads of improvement or complete disrepair.** There is an urgent need to revamp the system and remove the huge maintenance backlog to bring it back to full functionality and later expanding its coverage. ITMS has a huge untapped potential for data collection and analysis. A fully working ITMS can provide larger economic and financial benefits to the transport in terms of traffic management, reducing congestion, improving road safety and enabling the capture of additional financial revenues from enforcement and fines.
21. **The ongoing small-scale smart improvements in the design of city roads, cross-sections, and regulation of traffic flows have a positive impact on traffic management situation in the city and should be continued.** More attention, however, should be paid to construction and improvement of the pedestrian oriented infrastructures.

#### *Better regulate the taxi industry*

22. **Better regulation and enforcement are needed to improve level of taxi services and ensure their safety.** The taxi system should be better regulated from both technical and economic point of view to improve technical standards of vehicles, service culture, and to ensure that licenses and taxes are properly captured by the fiscal services.

#### *Promote inclusiveness*

23. **Baku needs to expand its pedestrian and cyclist friendly infrastructure.** Currently, it is still very difficult to bike or walk in most of Baku. Pedestrian and cyclist's infrastructure are today very limited to the central and sea side areas and play a role of leisure rather than mobility. Master plans and designs of future urban development should explicitly incorporate these opportunities.

24. **Infrastructure and system must be designed to be more inclusive towards women, children and people with mobility restrictions.** As different groups of users have different behavior and needs, the system needs to accommodate them in terms of infrastructure, vehicles and services.

## BACKGROUND AND CONTEXT

25. **Baku is a capital of Azerbaijan and a major economic, political and cultural center in the South Caucasus region.** The Baku Metropolitan Region, which includes Baku and its twelve districts, has a population of about 2.25 million. The population has increased by 22 percent since 2000, which is one of the highest urbanization rates in the region. The city continues to expand and will accommodate an estimated 3 million people by 2030.
26. **Baku remains a main engine of growth in the country.** Major oil and gas industries, manufacturing and services are concentrated in Baku. Baku accounts for about 45 percent of the formal employment in the country, with 1.14 million jobs in Baku City and 1.4 million jobs in Greater Baku (2016). Despite the oil-price-led economic slowdown of recent years after the decade of two-digit growth, the city is currently recovering from the economic recession and experiencing new wave of construction and urban development activities.
27. **The number of motorized trips in Baku is estimated at about 4.8 million per day<sup>1</sup>,** which implies about 2 motorized trips per day per inhabitant. The modal split between private and public transport is estimated to be even. Amongst the public transport modes, the metro carries about 1/3 of trips, and buses the remaining 2/3. Tram and trolleybus services existed in Soviet times, but were discontinued in 1990s. The government has plans to recover the sub-urban rail network of the city.
28. **The Baku urban transport system is under heavy pressure due to the increase in average incomes which led to higher motorization rates.** While the urban transport infrastructure has been significantly improved over the past years, fragmentation in the institutional setup impedes development of an integrated transport system for the city. Inadequate traffic management system, illegal parking and inadequate intermodality add pressure to the system.
29. **The city and suburban areas have been extensively affected by pollution from oil production for over one century.** Rapidly increasing motorization and large gasoline consumptions during past decades have significantly increased CO2 emissions, which is estimated to account for more than 40 percent of total emissions. In the absence of effective measures to improve public transportation services, high motorization rates are likely to lead to further air pollution and worsening the quality of life in the city.
30. **Despite significant improvements during recent years, road safety remains a serious problem.** The rate of road fatalities in Baku is about 200 per year and involves many pedestrians. Pedestrian and driver behavior, availability and poor design of pedestrian passes and other issues contribute to the traffic safety situation.

## INSTITUTIONAL FRAMEWORK

31. **The institutional framework for Baku's urban transport is characterized by fragmentation.** The main government stakeholders include Baku Transport Agency, Baku Metro, State Road Agency, Azerbaijan Railways, Baku City Executive Authority, State Committee for Urban Planning and Architecture and State Traffic Police. There are different reporting lines of these agencies to the President, Cabinet of Ministers or line ministries and agencies. The City Executive Authority has very limited authority on management of urban transportation in the city. At present, there is no a single public transport agency (PTA) in charge of coordination,

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<sup>1</sup> ADB report prepared by Systra consultants, 2014

planning and implementation of overall public transportation and and/or mobility policy in Baku Metropolitan Region.

32. **Baku Transport Agency (BTA) was created in 2015 to manage the bus system and taxis, and partially traffic management.** Its charter was recently approved and expanded with a mandate to fully cover traffic management and parking in the city, which before was shared with other agencies. The Intelligent Transport Center and the Driver Training Center (for bus drivers) are under BTA. BTA reports to the President as per its charter. Some improvements have been achieved in improving bus transportation system after establishment of BTA.
33. **ITMS was created in 2011 with an investment of more than USD 100 million to manage the traffic in Baku.** It was designed based on characteristics of its prototype operating in Seoul (Korea). ITMS's software and hardware have not been maintained and replaced properly and are now in need of heavy investments. The system is capable of identifying illegal parking and other violations, but, due to lack of coordination with the police, is not used to issue fines.
34. **BakuBus, the largest bus operator, is formally under the Baku City Administration.** Other bus operators are privately owned and operate on the bus routes contracted with BTA. The organization of the bus network needs substantial improvement, with definition of lines and competition for the market – so far, only one line has been allocated by competitive bidding.
35. **Baku Metro is run by Baku Metro CJSC, which is fully owned by the state. It was reorganized** by a Decree of February 27, 2014 as a successor to the existing company by merging with another state-owned company specialized in metro and tunnel construction. Metro network has 36.63 kilometers of double track and is made up of three lines with 25 stations. In 2017, it carried 222.0 million passengers, which yielded an average daily ridership of approximately 650,000 in a work day. Baku Metro CJSC reports to the Cabinet of Ministers without contractual arrangements based on Key Performance Indicators (KPIs).
36. **Suburban rail system is managed by the state-owned Azerbaijan Railways CJSC.** At present, the only regular service available is recently rehabilitated Baku-Sumgayit line (connecting Baku with its satellite city in the north), a commuter train service, which transported about 1.27 million passengers in 2017 or roughly 5,000 passengers per work day. Similar to Baku Metro, Azerbaijan Railways CJSC is also reporting to the Cabinet of Ministers, which is not based on a specific Contract Plan with KPIs.
37. **The State Committee for Urban Planning and Architecture (SCUPA) is in charge of urban planning.** Despite SCUPA's efforts to prepare a master plan, which would take into account present and future urban transport scenarios, the lack of a full-fledged Public Transport Authority made it difficult to get a comprehensive view of future mobility in Greater Baku. Consultations with each of the main operators tend to stress their individual views, which are not comprehensive. Yet, the master plan is the closest document available to an integrated strategy.
38. **State Road Agency reports to the Cabinet of Ministers and is responsible for improvement and maintenance of major roads in the city, while enforcement of road safety and partially traffic management is implemented by the Traffic Police (under the Ministry of Internal Affairs).** Funds for road works are allocated from the road fund and state budget.
39. **Baku is hardly complying with the Four Main Pillars for Sustainability of the Urban Transport Sector,** because it does not have (a) Public Transport Authority; (b) An updated Integrated Land Use, Urban Transport and Air Quality Strategy; (c) Financing Mechanisms for the sector other than government budget; and (d) strong participation of the private sector in operations and investment other than in the bus sector. The government needs to work hard to improve these four pillars.

40. **The above institutional framework needs to be strengthened**, either by creating and empowering a new entity to be a true public transport authority or by expanding the role of BTA and ensuring that all stakeholders understand that their investment plans and operating policies need to be coordinated with the PTA. A strong PTA would increase intermodality, stress the alignment with the Master Plan and undertake a careful evaluation of priority investments to fit the available budget for the sector. PTA would also measure periodically user's satisfaction.

#### *Way forward to strengthen institutional framework*

41. **As in major European cities, a Public Transport Authority (PTA) for Greater Baku with comprehensive planning, coordination and policy making functions should be created.** BTA is well positioned to perform the functions of a PTA, but this would require further amendment of its mandate.
42. **Typical functions of a PTA** usually include coordination, planning and implementing mobility, including but not limited to the preparation and periodic updating of an Integrated Land Use, Urban Transport and Air Quality strategy for the city, prioritization of proposed major investments in accordance with the multi-year budget allocations, coordination of all public transport operators including modal integration, bidding of new bus routes and rationalization of existing routes, licensing of bus operators and taxis, management of on-street and off-street parking, planning and coordination of intermodal hubs, demand management including congestion pricing, and promotion of non-motorized transport. Its policy making functions include tariff and subsidy policy and planning and management of integrated fare cards. Last, but not least, the PTA should promote public audiences to discuss major new investments as well as service provision to gauge user's satisfaction.
43. **Better mobility management requires data and tools.** Comprehensive and regular Origin-Destination surveys should help filling the information gap and serve as a basis for urban transport decision making and prioritization of investments. Disaggregated data, information and analytical tools such as demand and land use models, along with expertise in transport planning, economics and policy, are necessary resources for a PTA to function properly. They are necessary to test different options and scenarios and formulate adequate transport policies. Origin-destination surveys, transport demand modelling, cost-benefit analysis of major investments, and a sources and application of funds analysis for the sector are some of the tools required to better plan and implement new policies and gauge its financial health.
44. **The PTA should have adequate financial sources** required for managing urban transport networks, designing projects and formulation of policies. A PTA without an adequate budget will not have the authority required to properly coordinate all transportation modes and enforce the approved policies.

## **BUS NETWORK**

45. **The bus network in Baku is large and dense.** Baku Metropolitan Region is served by a bus system, which has 147 bus lines and 41 operators (one is state-owned), comprises 5,119 km of routes with about 2,168 buses. The overall number of passengers transported per day by bus is 1.624 million of which 220,000 by Bakubus and 120,000-150,000 by Khaliq Faiqoglu. The latter transports another 150,000 in the periphery and the rest is transported by other small bus operators. At present, there are 15 bus depots with seven opened in 2017.
46. **Bus system is regulated by BTA.** Its mandate includes wide range of areas for regulating the bus transportation sector, including: (i) tendering, award and enforcing contracts for bus passenger transportation; (ii) determining bus routes and lines, transport schedules and

timetables; (iii) identification and management of bus stops; (iv) monitoring compliance with passenger transportation laws and regulations, and others.

47. **To improve the quality of bus services in Baku, the Government established BakuBus LLC.** BakuBus is a state-owned enterprise created in 2015 with a fleet of 300 buses. It has modern maintenance facilities and a good web based information system. BakuBus serves central areas of the city with modern fleets (Euro 5) fully equipped with GPS and card readers for the smart fare card (Baku Card). The BakuBus is prepared to double its fleet by procuring additional 300 buses to be financed from the state budget.

*Figure 1: BakuBus vehicles and information system*



48. **Private operators include one large and many small companies.** Khaliq Faiqoglu is privately owned, operates about 300 buses split evenly between the city center and the periphery. Similar to BakuBus, Khaliq Faiqoglu has fleet equipped with GPS and card readers (on buses serving central areas) for the smart fare card (Baku Card). About 40 operators manage the remaining fleet of about 1,500 vehicles. These are mostly aging small vehicles (6-9m), like in the picture below, they accept only cash and cannot be tracked, which means no real-time information can be generated for the users. The driver pays a daily fee to the owner and keeps the surplus. BTA is working on consolidation of small bus companies and enforce driving, safety and quality requirements to this segment of the bus operators, although it remains a challenge without changing the existing contracting and incentive arrangements.

*Figure 2: Regular buses in Baku*



49. **The bus tariffs are unsustainably low.** An average single ticket costs 0.2 AZN - about USD 0.13 - flat rate. This amount can barely sustain the operations and minimum maintenance, and definitely cannot ensure capital investments, fleet renewal and provision of good quality services.
50. **E-ticketing has been introduced, but its scope is not comprehensive.** The BakuCard can so far only be used on the two largest operators mentioned above and the Baku Metro. The card system is administered by a private company, which does the clearing at the percentage of the cost of the fares collected. Beyond expanding the system to other bus companies, the system development needs to consider distance-based fares and possibility for intramodality (fares are currently additional).
51. **The number of dedicated bus lanes is very limited.** Currently, there are only 3 km of reserved bus lanes and no bus priority at intersections. In addition, the impact of these dedicated lanes is diminished by lack of enforcement to prevent infringement by vehicles. However, projects for the construction of special bus lanes on 37 streets and avenues were prepared and sent to the State Road Traffic Safety Commission by Baku Transport Agency. The Commission has agreed to introduce the lanes on 9 streets and avenues. The ADB financed project prepared a feasibility study for light rail project in the central Baku. However, implementation and financing of the plans for dedicated bus lanes and LRT are slow to realize and require swift political decision-making.
52. **Limited information is available to the users.** The Intelligent Transport Management website has been the most reliable source of information for several years, but it's no longer operational. Many screens at bus stops to provide real-time information for bus users also came to the state of disrepair. Meanwhile, the functional monitors at bus stops can display information only for buses equipped with GPS. No real-time information is available for the vast majority of buses serving outside the central area.

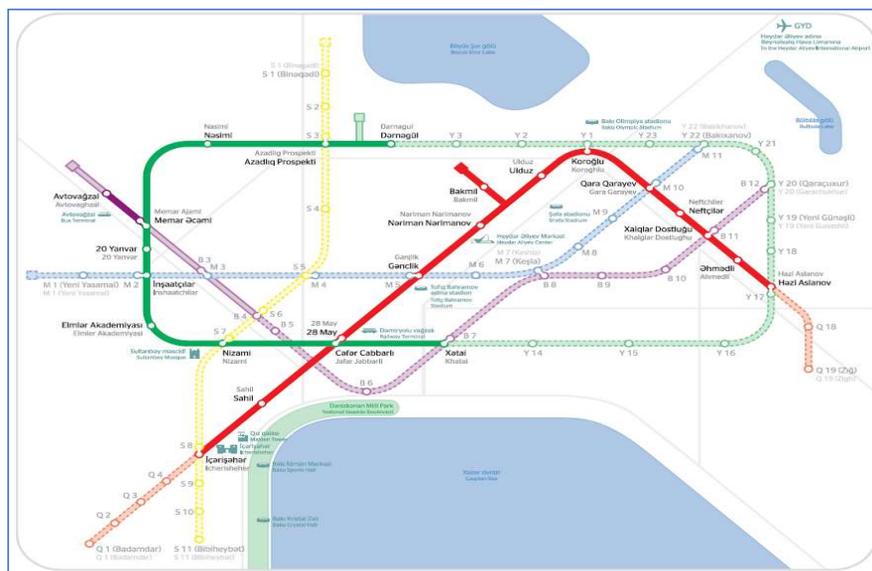
#### *Way forward for the Bus Sector*

53. **Rationalization of network and operationalization of priority lanes should be among the main priorities in the bus sub-sector.** BTA has been studying ways to optimize network and consolidate the high number of bus companies and standardize services. This is a challenging task, which will require strong political support, particularly in Baku's periphery. This is also true for the implementation of bus only lanes, which require full cooperation of several government agencies.
54. **The agency in charge of public transportation should take measures to improve the operational efficiency of public transport provision.** Another important task is to provide adequate and inclusive services to all types of users. Part of these tasks require changing the way public transport providers are contracted and how they perform against the standards that they agreed to comply with. To address the issues raised earlier in the report, the following actions are recommended for implementation: a) Extended practice of competitive bidding for bus routes with Key Performance Indicators (KPIs); b) establishment of Annual Contract Plans with BakuBus and private operators to improve level of service; c) undertaking a study for selection and design of comprehensive express routes and high-speed segregated lanes; d) extension of e-tickets to all buses and e) improving financial sustainability of bus operations and elimination of subsidies.

## BAKU METRO

55. **The Baku Metro system consists of 3 lines, totaling 37km, 25 stations and carries about 650,000 trips per working day.** Baku Metro is a rapid transit system, which opened on November 1967, and has typical features of soviet metro systems, including very deep central stations. It operates on 1.52 meters track gauge and has a third rail electrification of 825 V DC. It has 228 vehicles. The metro is run by Baku Metro CJSC, which is fully owned by the state and was reorganized by the Decree of the President of the Republic of Azerbaijan in 2014.
56. **Although very efficient, the metro faces many operational challenges.** The metro ensures very short headways (120s) for its level of automatization, providing a fast and reliable service. The metro suffers, however, from (i) lack of separation between the main green and red lines at their cross-point, (ii) short platforms, which limit the length of the trains, and (iii) lack of second exit in many stations, which perturbs the passenger flow and generate safety issues.
57. **The Baku Metro is not financially sustainable.** Similar to the bus, the metro ticket costs 0.2 AZN (flat rate, about 0.12 USD) which makes it one of the cheapest globally. For comparison, the Kiev metro, which is one of the least expensive in the world, costs about 0.2USD per trip. It is estimated that the metro fare does not cover the operational costs let alone depreciation and cost of capital. The capital investment in infrastructure, rolling stock and systems are provided by the state.
58. **Baku Metro has an ambitious expansion plan, including construction of 84 additional km lines costing about EUR 6.6 billion.** The plan was approved in 2008 with a 20-year implementation horizon and includes the extension of the green and the red lines, and construction of three new lines: the blue, the purple and the yellow lines. Works at several locations are currently ongoing, but the pace of construction is low due to the reduced financial capabilities of the state budget and inefficiencies involved. The picture below shows the expansion plan.

Figure 3: Existing (solid lines) and planned (dotted lines)<sup>2</sup> lines of metro network



### Way forward for Baku Metro

59. **The expanded and modernized Baku Metro would further strengthen its role as the backbone of the public transport network.** Modernization of metro requires from the government to: (a) Expedite the separation of red and green lines at 28 May station; (b) Accelerate the ongoing Metro Extension Plan; (c) Establish Annual Contract Plans with metro with KPIs to set service standards; (d) Introduce competitive bidding to enhance competition and decrease capital costs of the Metro expansion so that more kilometers could be built during shorter period of time; (e) Review operational costs with a view of improving efficiency; and (f) Review tariff policies to bring them closer to the cost-recovery level and consider distance-based differentiated tariffs in combination with introducing targeted subsidies for socially vulnerable groups of population.

<sup>2</sup> Source [www.metro.gov.az](http://www.metro.gov.az)

Figure 4: Metro station in Baku



## SUBURBAN RAIL

60. **Poor condition of suburban rail infrastructure and rolling stock left from soviet times made the service unreliable and led to dramatic reduction in utilization of services by population.** While in the past electrified railways were connecting Baku City center to a variety of suburban destinations, by 2014 the service levels deteriorated and ridership decreased to a handful of passengers. Some unfortunate decisions were also made around those times to build North Absheron highway within sections of the suburban rail right of way.
61. In 2015 the above harmful policies were reverted by the Azerbaijan Railways CJSC (ADY), the operator of the Baku suburban rail, and first investments were made in rehabilitation of infrastructure and rolling stock of the western Baku-Sumgayit line. The higher traffic frequency for this link was provided with 11 trains per day. The number of passengers has since then been increasing from 214,000 in 2015 to 1.3 million in 2017. This number remains low and there is still large room for improvement.
62. **Rehabilitation and modernization of suburban rail services around Baku is potentially a viable alternative to private cars.** To improve the urban transport system in Greater Baku and attract passengers presently carried by road-based modes, it is necessary to offer options that are accessible, safe, affordable and show clear advantages over a road-based trip by auto or bus. ADY has identified 11 links for rehabilitation and modernization, as indicated below, the most important of which is the rail ring between Baku and Sumgayit, of which the western part of the ring through Khirdalan is already operating.

Table 1: Total Estimated Investments Required for Rehabilitation of Commuter Rail Network (Millions of USD)

	1	2	3	4	5	6	7	8	9	10	11	
Link	Baku-Sumgayit circular	Bakikhanov - Yeni Surakhani	Yeni Surakhani - Airport	Yeni Surakhani - Qala	Qala - Expo Center	Airport - Expo Center (1.6 km)	Yeni Surakhani - Hovsan	Qala - Zira	Bash Keshla - Ahmadli	Zabrat - Baghlar	Zira - Gurgan (Pirallahı)	Grand Total
Infrastructure	84.8	11.9	23.5	9.6	23.5	1.4	9.7	14.9	13.2	9.4	4.6	206.6
Signalling/Electrification	85.4	7.2		6.5		1.1	9.7	12.2	8.7	7.2	4.3	142.2
<b>Total</b>	<b>170.2</b>	<b>19.1</b>	<b>23.5</b>	<b>16.0</b>	<b>23.5</b>	<b>2.5</b>	<b>19.4</b>	<b>27.1</b>	<b>21.9</b>	<b>16.6</b>	<b>8.9</b>	<b>348.9</b>

(Source: ADY, April 2018)

63. **In all proposed projects, power supply, tracks, signaling system, platforms, information systems and rolling stock should be modernized to comply with commuter railway passenger service standards.** Operation could be provided by trains with an overall length of 150m (2x75m), operated at peak period with 2 vehicles for a total capacity of 1 000 passengers per unit. Maximum speed target for infrastructure, rolling stock and system design ranges from 80 to 100km/h or from 100 to 120km/h, according to performance scenarios. ADY is in the process of hiring consultants to evaluate the rehabilitation works needed to transform the selected links into modern commuter rail facilities.

Figure 5: Baku-Sumgayit suburban trains



64. **The potential for suburban rail ridership is significant.** Most of the proposed for rehabilitation links serve peripheral districts of Baku City, which have a high population density and lack good public transport infrastructure. For example, population directly served by the western link of Baku-Sumgayit rail ring within a 760m radius around stations was estimated at 80 000 inhabitants in 2014. The current metro network does not reach Bilajari area which stays out of range of the new Avtovagzal station giving access to the purple line. The current population served by the Eastern link of the Baku-Sumgayit rail ring is estimated at 90 000 inhabitants. Suburban railway is connected to metro red line and large bus station at Koroglu multimodal hub.

65. **There is a potential to explore Transit-Oriented Development.** The extensive properties of ADY in the right-of-way along corridors also offer potential for transit oriented development options which could increase ridership and eventually finance part of the expansion. Housing developments, commercial and industrial buildings, education, health and leisure facilities, if adequately promoted, may generate potential users of the commuter rail lines, similar to what was done in Japan by JR-East railway company. ADY needs to work with SCUPA on eventual TOD plans and Baku Metro and BTA to find good solutions for the so called first and last mile, i.e, the access to its stations.
66. **Overall, although there is potential demand, the question is how much of the potential demand can be shifted to rail.** At this time, no detailed studies are available to prioritize the proposed links. The decision to modernize the Baku-Sumgayit rail ring seems to be sound, but financial viability of the commuter rail system hinges on a well-planned development program to increase ridership to levels of at least 20,000/day.

#### *Way forward for Baku suburban rail*

67. **Rehabilitation of suburban rail system is critical for establishment of the well-functioning and integrated urban transport system for Baku and should be prioritized together with the Baku Metro expansion.** The following are the key recommendations for development of the Baku suburban system for the current stage: (a) Modernization of the Baku-Sumgayit rail ring and other viable suburban rail lines should be properly linked with the Baku Metro expansion and the connections with metro stations and bus system studied and designed; (b) Detailed engineering and implementation of the eastern and western links of the Baku-Sumgayit network should continue, but TOD opportunities should also be examined as part of a detailed demand study; (c) The feasibility of reconstruction of the lines connecting central Baku with Yeni Surakhani, Mashtag, Heydar Aliyev International Airport, and some other destinations proposed by ADY should be examined and projects prioritized according to potential ridership; (d) Annual Contract Plans with ADY's Suburban Rail division with KPIs should be established to improve level of service and decrease subsidies; (e) Procurement for all major bids for the suburban rail expansion should be implemented on a competitive basis to decrease capital costs and ensure efficiency; (f) Transition of suburban rail to Baku Card payment system currently used by bus and metro riders would enable establishment of a single ticketing system for the entire Baku urban transport g) Separation of finances and operational information of suburban rail from other ADY services would help it to be better accounted and supported by the government and improve financial sustainability of both the suburban rail services and ADY as a whole.

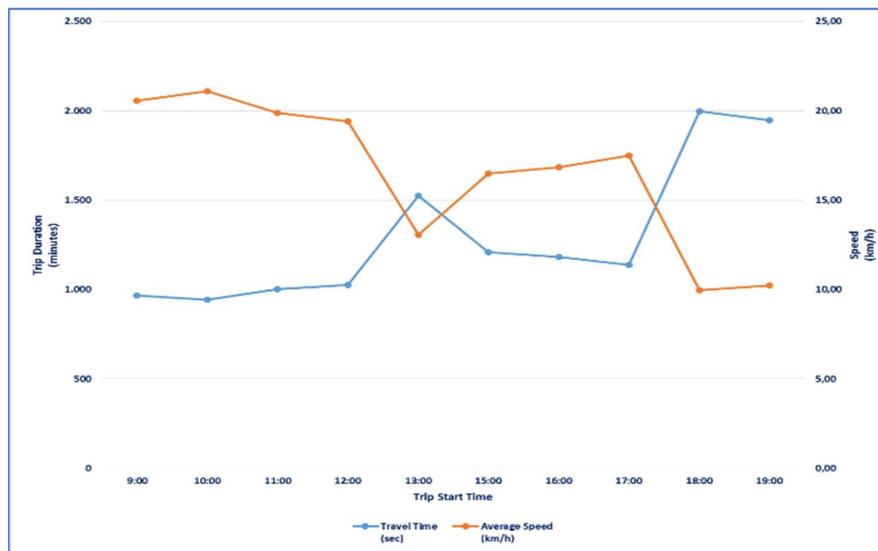
## TAXI SERVICES

68. **There are 20-25 thousand taxis in Baku of which only about 8000 are legal.** Taxis are mainly privately owned, either by taxi companies, which sub-rent vehicles to individual drivers, or by independent private drivers. Only some of the taxi companies have taxi-meters installed on board the vehicles (which are barely used), whilst charging by the individual independent drivers is subject to negotiation with the customer. Better regulation and enforcement are needed to improve level of taxi services and ensure their safety. The taxi system shall be better regulated from both technical and economic point of view to improve technical standards of vehicles and drivers and to ensure that licenses and taxes are properly captured by the fiscal services.

## TRAFFIC MANAGEMENT, SAFETY AND PARKING

69. **Despite a dense road network, Baku is a congested city.** Baku has a large main road network of about 1600 km including express, main, secondary and local roads. Traffic speeds are, however, below 20km/h during daytime as can be seen from the below Figure. These are associated with the increasing motorization, inadequate traffic management, ill-designed intersections and illegal parking practices.

Figure 6: Car speeds in the center of Baku (October-November 2016, source BTA).



70. **City traffic management is a shared responsibility of Baku Transport Agency, Traffic Police and State Roads Agency.** The Intelligent Transport Management Centre (ITMC) for Baku was created in 2011 and is currently under the Baku Transport Agency (previously directly under the Ministry of Transport). ITMC is mandated to collect real-time data and prepare both immediate and long-term solutions for bottlenecks and traffic issues. It covers the main circular and arterial roads inside Baku and the roads connecting the city center with the suburbs. ITMC has more than 250 traffic cameras located all around Baku to register and count the number of vehicles and their speed. While until recently ITMC managed only the centrally located digital traffic lights, which represent 50% of the lights, and the other half was managed by the traffic police, as of April 2018, all traffic lights are managed by NIIM.
71. **Underinvestment in maintenance and spare parts brought ITMC to a state of disrepair.** The Baku ITS was purchased from and installed by Korean providers without proper adaptation to the local context. Lack of software and hardware maintenance and replacement of faulty equipment have been hindering ITMC's operation and if continued will bring ITMC to a state of scrap. To avoid this situation, significant investments need to be made urgently to repair the system in a first stage and later to expand it to better serve the city.
72. **ITMC could be financially sustainable.** ITMC could cover at least part of its operational costs by capturing a share of the traffic and parking violations it detects.
73. **Illegal on-street parking generates congestion, disrupts pedestrians and diverts revenues.** Violation of on-street parking rules reduces road capacity and triggers congestion. It also lowers pedestrian's safety since they sometimes have to walk on the roads because the sidewalks are congested. While on-street parking is prohibited in almost all the main streets and squares of Baku, it is not properly enforced. ITMC is capable of identifying illegally parked vehicles, but has inadequate coordination mechanism with the traffic police. In addition to

direct impacts on traffic and safety, the lack of enforcement also implies that potential revenues from parking and fines are not captured by the authorities, but partially captured by car keepers. Illegal parking and lack of enforcement of parking fees are also considered one of the main forms of implicit subsidies to car users, which contributes to congestion and increasing motorization rates and negatively affects quality and regularity of public transportation services. Resolving illegal on-street parking problem requires strict enforcement to discourage this behavior. As of April 2018, BTA is fully in charge of all parking.

74. **Off-street parking is a double edge sword since it might incentivize motorization if used as the only solution to problems caused by on-street parking.** There are several large off-street parking lots in the city center. The off-street parking arrangements should be carefully designed to accommodate adequately the overall city traffic management policy. A parking policy should ensure amongst others that the city seeks proper off-street parking for its new and existing buildings and government offices.
75. **BTA together with other authorities responsible for traffic management in the city is undertaking mostly small-scale, but smart improvements in the design of city roads, cross-sections, and regulation of traffic flows.** These improvements are effective and demonstrate how relatively minor design solutions can make difference and have a positive impact on traffic management situation in the city. More attention, however, should be paid to construction and improvement of the pedestrian oriented infrastructures.
76. **About 200 people die every year on Baku's roads.** While the number of fatalities on the roads in Baku (and Azerbaijan in general) have been decreasing thanks to better enforcement, the rate is still high compared to the best international standards. Of particular concern is the high level of pedestrian fatalities. Safer pedestrian crossings need to be provided, with adequate signaling and enforcement. In addition, a program of black-spot improvements should be implemented for Baku. The speed limit in urban areas in Azerbaijan is still 60 km/h while most cities in Europe have decreased it to 50 km/h and lower in specific areas.

#### *Way forward for traffic management, safety and parking*

77. **The Intelligent Transport Management System is in an urgent need of significant investment to remove the extensive maintenance backlog and restore its original functionality.** Rehabilitation of the system, however, might also require careful review of the original design and substantial modifications to ensure its better compliance with city's current context and actual needs. Finally, rapidly developing city will require expansion of geographic coverage of the ITMS system. Overall, a fully working ITMS can provide significantly larger economic and financial benefits to the transport in terms of traffic management, reducing congestion, improving road safety.
78. **Underutilization of ITMS's great functionalities is one of the issues, which could be relatively promptly addressed.** The ITMS could and should play a much prominent role in identification of traffic violations and improvement of road safety. This could also generate financial revenues from enforcement and fines, which could help in maintenance of this state of the art, but expensive system. The system is also capable of generating a huge amount of data (not mentioning big data) and undertaking extensive traffic surveys to update knowledge of existing traffic conditions and contribute to resolution of traffic management problems. Developing a much stronger data collection and analysis capability within the ITMC should be an important task for BTA.
79. **Smart improvements in the design of road infrastructure and regulation of traffic flows in critical locations are commendable, but not sufficient.** A higher capacity for comprehensive review and analysis of city infrastructure and traffic situation should be established. The

prioritized program for addressing traffic bottlenecks, including development of geometric designs for improvement of road segments, intersections and interchanges, should be prepared and regularly updated.

80. **Better management and enforcement of the traffic and parking rules is essential for improving traffic situation and road safety.** Strict enforcement of the existing parking rules and fines for their violation would have an immediate positive impact on the traffic congestion, safety, and pollution. In the subsequent stage, a strategic program for parking policy and traffic restraint could be designed and implemented. There is a wide range of policies and wealth of international experience for improving traffic situation, including, but not limited to physical controls on access or parking, higher pricing for parking, charging for access to the most congested areas of the city and other measures. These would also yield additional revenues, which could be used to improve public transport supply.

## NON-MOTORIZED TRANSPORT AND INTERMODALITY

81. **Some of the initiatives to promote non-motorized transport in Baku have been successful and must be continued.** The implementation of pedestrian, cycling and overall green areas such as around Nizami street and the Seaside Boulevard have been instrumental in attracting people and stimulating business. More infrastructure and enforcement is, however, needed.
82. **More sidewalks with wheelchair ramps are needed to encourage walking for short trips.** A project is currently being implemented in a central part of Baku for making sidewalks more wheelchair and stroller friendly, which should be replicated in other parts of the city. Also, while central areas have sidewalks and pedestrian crossings, in many parts of Baku pedestrians have trouble crossing the streets safely, due to a combination of aggressive driving behavior, high speed, lack of safe pedestrian crossings, deteriorated or inexistent sidewalks, often occupied by illegally parked cars making walking an unsafe activity.
83. **Cycling should be further encouraged.** There are few bikeways in mixed traffic and strategy should be adopted to promote cycling starting from park areas or specific facilities such as the ones around the stadiums. Beyond the often-claimed benefits for health, cycling saves public money. Cycling leads to congestion reduction, roadway cost savings, vehicle cost savings, parking cost savings, air pollution reduction, energy conservation, and traffic safety improvements. Further improvement of sidewalks and cycling lanes must be accompanied by better driving behavior through education and enforcement. Non-motorized transport will only materialize in full scale if better traffic education and heavy fines are applied to ensure appropriate safety.
84. **While Baku has several intermodal hubs, their concept should be further developed.** The metro stations have naturally become intermodal hubs, connecting with the bus network. In practice, however, most of these hubs do not have sufficient infrastructure. Also, the concept of park and ride should be introduced to encourage inter-modality between private cars and public transport.

## FINANCIAL SUSTAINABILITY OF THE SECTOR

85. **Most of the financing for mobility investments in Baku city comes from the Government of Azerbaijan through the budgets allocated to the State Road Agency, Metro, ADY, City and BTA.** In the bus sector, private operators finance their buses and depots, but are worried about the low tariffs, which make fleet renewal problematic. Financial sustainability of the sector will require a great deal of public resources from the central government, particularly given the immediate needs of heavy capital investments for the metro and suburban rail

network extensions. To ease the burden on the government, financing mechanisms other than the state budget must be evaluated and implemented.

86. **Examples of typical instruments for generating additional financial resources elsewhere in the world include advertising, rental of station space, use of the right-of-way for fiber optic cables, transit-oriented development through PPPs, betterment taxes, etc.** Development of facilities along the rights-of-way, if well planned, may generate substantial revenues through the construction of residential facilities and commercial centers as it is often done in Hong Kong and Japan. Although these instruments will not cover all the investments they might be able to reduce them substantially. In some countries, the cities collaborate with the governments to ensure support for major investments into development of some of their main corridors through the use of betterment taxes on properties within a certain radius from the new lines. Finally, creating incentives for public private partnerships for operations and investment in the sector could reduce the burden on the government, as in the case of some countries like Brazil.
87. **The present low tariffs in public transport are not sustainable.** The current situation will continue requiring unsustainable solutions, such as government financing for acquisition of buses for the city. A review of the tariff and subsidy policies could be a part of the financial strategy to ensure that operating subsidies do not grow to unmanageable levels. At the same time, the government wants to protect the lowest-income users from spending a higher share of their incomes on urban transport. Targeted subsidies might be a solution, which will allow higher tariffs. Private operators will have difficulties in renewing their fleets unless they get subsidized loans guaranteed by the government. It is unlikely that Baku Metro and ADY suburban rail services are able to cover their operating expenses with the same low tariffs. Although the government has so far financed the major capital investments, it should encourage its operating agencies to improve considerably their financial performance by good management, adequate staffing policies, competitive procurement, rigorous evaluation of capital investments and a strong pursuit of non-operating revenues using its own assets. All this should be reflected in the contract plans between each of the organizations and the government.

#### *Way forward to improve financial sustainability of the sector*

88. **Financial sustainability of the sector is key to provision of good level of service.** The main actions proposed for improving financial sustainability of the sector are the following: a) review of tariff policy to have it more in line with actual operating costs including depreciation and cost of capital; b) undertaking a sources and applications of funds exercise for each of the sub-sectors to evaluate what are the deficits/subsidies required and how they can be reduced; c) undertaking a road user charges exercise for Greater Baku to determine whether private auto are covering their costs and which of the existing or potential taxes/charges could support public transport; d) encouraging transport operators to increase their non-operating revenues with incentives for those which achieve targets; e) considering introduction and use of betterment taxes in corridors served by new mass transit lines; and f) estimating and designing targeted subsidies for users whose affordability of urban transport is limited.

## COMPREHENSIVE APPROACH TO IMPROVE PUBLIC TRANSPORT

89. **Improving the urban transport in Baku requires a comprehensive approach.** The assessment established in this Policy Note provides a number of possible directions for improvement, ranging from investments to reforms, while most alternatives require a mix of both. Three

suggested overarching concepts to be promoted are (i) development of well-coordinated and well-integrated Multimodal Urban Public Transport System for Greater Baku; (ii) Improving traffic congestion situation in Baku by giving priority to public transport over private car use and (iii) financial sustainability of the sector. These concepts should be well articulated upfront.

90. **The main immediate aim is improving public transport supply - Accessibility, Availability, Affordability and Acceptability for all.** Good mobility, which improves user's transport availability, accessibility, affordability and acceptability, requires a well-developed public transport system. With income growth, which normally leads to car ownership growth, an increasing number of citizens use cars, partly because of the unattractiveness of the public transport alternative. In this circumstance, providing high-quality public transport is not an option, but a mandate for sustainable development. Improving the quality of the non-car alternatives is thus essential not only to lure people away from their cars to increase the efficiency of the use of infrastructure, but also to improve the quality and reduce the cost of services available to less wealthy citizens without cars.
91. **Prioritizing public transport and increasing priority lanes are absolute requirements for development of public transport system in Baku.** Baku Transport Agency seems to be committed to develop an extensive program of bus priority lanes, but so far very limited has been done. If public transport is to be attractive as an alternative to the private car it will have to match the private car on a balance of cost, reliability, comfort, speed and access to location considerations. Cities in which public transport have a higher share of the modal split have a significant number of bus priority lanes coupled with very extensive and efficient metro and suburban rail networks interconnected in major transfer nodes (Berlin and London are good examples). In Baku, the metro can compete with the private car for home to work from many locations particularly at peak hours. However, the existing metro services are at full capacity utilization, while further expansions of the system mentioned earlier in the report are only planned for operation around 2020 (estimated at 6.5 billion € for the full program) and are taking too long. As described before, a suburban rail system exists, but is not yet well developed as part of an urban transport system. The road-based surface public transport modes are caught up in the same congestion as the car, while having the extra disadvantage of being less comfortable and less flexible in their ability to provide door to door service. Thus, only by extensively segregating surface public transport from mixed traffic can public transport achieve a travel time advantage over the private car.

## CROSS-CUTTING ISSUES

92. **Baku is facing a serious air pollution problem.** In the overall increase of country's greenhouse gas emissions since 1992, transportation accounts for 11% of emissions. Most of this comes from the road transport, particularly passenger cars, 80% of which are used in Baku. The number of imported cars meeting high environmental standards steadily increases, but there is still a large number of old cars in use, which are heavily emitting and do not meet international standards.
93. **The Government of Azerbaijan is undertaking certain measures to improve air quality in the Greater Baku area.** Since April 2014 EURO-4 standard has been introduced, which helps to regulate the quality of imported cars in terms of allowable emission levels, and restricts import of passenger cars, buses and trucks not meeting EURO 4 standard. In 2015 Azerbaijan became a party to the Paris Agreement and formulated its Intended Nationally Determined Contribution (INDC) as part of the global climate change mitigation and adaptation effort. As such, the INDC sets an ambitious target of decreasing GHG emissions by 35% by the year 2030, compared to 1990 base year level. In the transport sector, INDC calls for the enhanced

use of electric vehicles, electrification of railway lines, improvement and expansion of the scope of Intelligent Transport Management System, development of metro transport and other measures. In this regard, the government should consider better enforcement of low emission levels from private cars, promotion of green modes of public transport, enforce more stringent emission standards, and incentivize non-motorized transport and electric vehicles.

94. **As elsewhere in the world, women and men in Baku have different road user profiles.** Women, as well as children, elderly and disabled are at most risk in traffic as they are more likely to be pedestrians than drivers. Women’s travel generally consists of more frequent family support trips for shorter distances and during off-peak hours, while men make less frequent and more direct trips, mainly to and from work. Women almost always prioritize safety in their travel decisions, which is not a coincidence as women across the world are subjected to sexual and other forms of harassment when walking or using public transport. Thus, according to the disputed findings of the 2014 ADB study, more than half of the surveyed women indicated that they have experienced unwanted gender-based behavior towards them in the Baku metro. The above are examples of issues that need to be further explored and careful attention paid when designing urban transport projects. Physical design of roads should also take into consideration the needs of females by adopting a traffic management approach that is safer and more compatible with walking, such as traffic-calming devices, road humps, well-designed pedestrian crossings, pedestrian overpasses/underpasses, etc.
95. **Transport industry remains male dominated.** In 2016, 16.9% of all employed in transport and storage were females as compared to 83.1% for their male counterparts<sup>3</sup>. There are a number of barriers that impede women’s access to employment in the sector. This includes, but is not limited to gender stereotypes, which have an influence on the education choices that women and men make and which see transport positions as a ‘male’ occupation, and the prevalence of the male-dominated working culture. In some instances, however, women are even legally restricted from working in such jobs in the same way as men<sup>4</sup>.

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<sup>3</sup> State Statistics Committee of Azerbaijan Republic

<sup>4</sup> Decree of Cabinet of Ministers of the Republic of Azerbaijan No. 170 of 20 October 1999

ANNEX: Map of existing and planned metro and urban rail network

