

## SECTOR ASSESSMENT (SUMMARY): URBAN TRANSPORT<sup>1</sup>

1. Until the financial and economic crisis, the Armenian economy had grown by more than 10% per annum. In Armenia, 12 cities generate almost 90% of the nation's gross domestic product (GDP). Economic activity remains, however, concentrated in Yerevan and, to a lesser extent, in Gyumri and Vanadzor. The competitiveness and attractiveness of Yerevan and secondary cities are critical to growth rate recovery. Therefore, cities need to revamp their urban infrastructure to provide more competitive platforms for economic growth.

2. The sector assessment has divided urban areas into four groups: (i) Yerevan, the capital city; (ii) secondary cities such as Gyumri, Vanadzor, and Kapan; (iii) cities with potential for economic development such as Armavir, Artashat, Artarak and Ararat; and (iv) cities with high tourism potential such as Jermuk, Dilijan, Sevan, and Tsakhradzor. Gyumri and Kapan are the north and south gateways to the country along the north–south road corridor.

### A. Sector Performance, Problems, and Opportunities

#### 1. Urban Organization and Infrastructure

3. **Urban Armenia.** In a total population estimated at 3.24 million, 64% is urban. With 1.12 million inhabitants, Yerevan has 53.6% of the country's urban population and one-third of the country's total population. The capital city has equal standing with Armenia's 10 provinces and is divided into 12 community districts. Urbanization lacks a strategic focus, so there is too little integrated land use or transport planning. Infrastructure and municipal services delivery in most cities and towns are deficient. The effects of uneven urban development in Armenia are (i) constrained national economic development; (ii) the continued primacy of Yerevan; (iii) health and environmental risks; (iv) a growing number of people in substandard accommodation; (v) restricted urban growth and competitiveness; (vi) reduced living standards; (vii) unequal infrastructure and delivery of municipal services; (viii) weak local urban institutions such as local government, civil society, and utilities.

4. **Yerevan.** The Hrazdan River cuts north to south through Yerevan. Nearly two-thirds of the population lives in the north and northwestern districts, where vast high-density apartment blocks are located. Kentron, the city center, is where most of the jobs are, in government and civic offices, universities, shops, and hospitals. Since 1991, the most important urban trend has been the gradual collapse of heavy industry, which was located mainly in the south. This dramatically reduced the number of jobs, relocated the city's attraction centers, and caused demand for public transport to the area—metro, the tramway, trolleybuses, and buses—to decline. External funds helped to reconstruct the city and develop new residential areas.

5. **Secondary cities.** Gyumri, Vanadzor, and Kapan are industrial cities that have seen no major urban infrastructure investment since before independence in 1991 and severely need economic regeneration. The dominant industries have deep roots in the cities' histories and influenced urban development and spatial organization. Gyumri produces building materials, yarn, textiles, and packaged food and is now in the very early stages of developing an information technology industry. In Vanadzor, chemical and thermal plants regained their peak production capacity in the early 2000s after a decade of interruption caused by Armenia's economic collapse at the time. Kapan is primarily a copper-mining city, but other activities have developed including mining support services and furniture and textile manufacturing.

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<sup>1</sup> This summary is based on ADB. 2009. *Technical Assistance to Armenia for Preparing the Yerevan Urban Sustainable Transport Project*. Manila (TA 7340-ARM); ADB. 2007. *Technical Assistance for Developing Strategic Urban Assessments for Selected Central and West Asia Developing Member Countries*. Manila (TA 6423-REG).

6. **Cities with potential for economic and tourist development.** These cities have potential to develop clusters, strengthen activities, or add value to tourist sites. Armavir, Artashat, Ashtarak and Ararat are industrial cities surrounded by pockets of agriculture, with two major factories for cement and gold recovery and a number of companies are in the agro-industry or manufacturing building materials. Jermuk, Dilijan, and Tsakhkadzor are international-standard tourist cities under renovation or construction. Dilijan, the country's favorite tourist destination, has a green old town. As Dilijan is located in Dilijan National Park,<sup>2</sup> mountain recreational activities are proposed. The government plans to turn Dilijan into a regional financial center. In these cities, the lack of urban investment constrains economic development and private investment.

## 2. Urban Transport Issues in Yerevan

7. **Mobility patterns.** Hrazdan River divides the northern and western residential suburbs, from the city center and the south industrial areas. Only four bridges carry traffic to the city center, causing huge traffic jams at peak hours. Mobility patterns have radically changed with the closure of the large industrial plants, and this significantly affected ridership on the metro, tramway,<sup>3</sup> and bus networks, necessitating a major reorganization of the transport system.<sup>4</sup>

8. **Road traffic, road safety, and parking.** In 2006, traffic on 15% of the city road network was reported to be exceeding capacity, with a further 35% at 70% of capacity. Traffic growth is forecast at 4% annually in the coming years. Several key junctions are bottlenecks. Road capacity is affected by poor maintenance, with broken pavement contributing to traffic congestion, damaging public transport vehicles, and threatening traffic safety. Traffic lights operate without coordination. The 128,500 cars registered in Yerevan in December 2009 accounted for 40% of the vehicles in Armenia, and their numbers are growing quickly. The number of traffic fatalities reached 407 in 2008, an increase of 60% since 2004. The number of injured doubled on the same period, reaching 3,125 in 2008.

9. **Pollution and health.** General air quality in Yerevan is poor, as the city's surrounding mountains restrict the natural dispersal of pollutants. Transport is responsible for 90% of hazardous substances in Yerevan's air. In 2008, the main air pollutant is carbon dioxide, which is expected to increase by 160% by 2020 because of congested roads. Yerevan also has high ground ozone density, especially in summer, which creates photochemical smog.

10. **Public transport.** The 2006 Yerevan master plan identifies actions to develop public transport, including expanding the metro, upgrading trolleybuses, and more use of larger buses. However, general use still relies on captive clients and there are no long-term perspectives.<sup>5</sup> Public transport is slow, using old and poorly maintained trolleybuses, buses, and minibuses. Besides, the absence of passenger information; vehicles not conforming to modern access standards, particularly for the disabled and aged; and routes imperfectly matching demand impede the attractiveness of public transport.

- (i) **Metro.** One north–south 12.1-km metro serves 10 stations, of which three are underground.<sup>6</sup> The metro system needs overhaul to address water seepage,

<sup>2</sup> Dilijan National Park, established in 2002, offers forest landscapes, rich biodiversity, medicinal mineral water springs, and natural and cultural monuments. Sevan National Park was established in 1978 to protect Lake Sevan and the surrounding areas.

<sup>3</sup> Closed in 2006.

<sup>4</sup> The metro extension from Barekamutyun to the automobile factory now appears to be irrelevant.

<sup>5</sup> Since 2002, mobility is unchanged at about two trips per person per day, reflecting a typical commute to work.

<sup>6</sup> During 1994, the metro experienced a surge to 73 million passengers with the energy crisis and the stoppage of surface public transport modes. After 1995, passenger's ridership fell and stabilized at 17 million in 2009.

train fleet renewal, and station upgrading that includes better signage and passenger information.<sup>7</sup>

- (ii) **Trolleybus.** The Yerevan Electric Transport Company operates five routes with a total length of 114.5 km. Ridership fell by 33% from 5.1 million in 2004 to 3.4 million in 2008. Infrastructure needs major replacement. The network will close unless funding is made available.<sup>8</sup>
- (iii) **Bus.** Large buses were withdrawn in 2006. Only 25 bus routes operate now, suffering competition from minibuses. The bus company leases medium-sized buses that run on diesel or compressed natural gas to private operators, but they are underpowered and unsuitable for traffic conditions in Yerevan.
- (iv) **Minibus.** These 14-seaters provide a shared taxi service on fixed routes and operate on a hail-and-ride basis. The 125 minibus lines use 3,250 minibuses that run on compressed natural gas or diesel, but routes are redundant and cause congestion.
- (v) **Taxi.** Yerevan has 4,800 licensed taxis, which are generally operated by small companies and self-employed drivers. The two existing taxi ranks in the city center are inappropriately located.
- (vi) **Non-motorized transport.** Walking infrastructure is of poor quality. Pedestrian footpaths, subways, and road crossings need repair and improvement.
- (vii) **Interchanges, ticketing and information.** Interchange facilities are rudimentary. On-street bus stations for regional services are located too close to the city. The network operates by cash payment with low fares and no integrated tickets.

11. **Financial sustainability.** The main issue is that current public transport fares are too low to allow operators to cover a significant part of operating costs or replace assets in the long term. A higher fuel price in 2010 has made this worse. The calculation and monitoring of the subsidy system should be revised, and the monthly payment paid to Yerevantrans by bus operators should be reformed to allow operators to invest in larger buses. Other needs are to brand and market the network.

### 3. Urban Transport Issues in Secondary Cities and Cities with Potential for Economic and Tourist Development

12. Other Armenian cities need assistance to improve their municipal infrastructure and urban transport networks. Urban transport issues are less prominent in these cities than in Yerevan, but four common features can be found in all: (i) a deteriorated urban road network, (ii) inefficient traffic management, (iii) inappropriate public transport that usually relies on an old bus fleet or unregulated minibuses, and (iv) an unfriendly urban environment, particularly for pedestrians and two-wheelers. A trolleybus network used to operate in Gyumri but was discontinued in 2006 because of decrepit assets, undermined and aging rolling stock, and unfavorable comparison with minibuses. Municipal capacity to plan, monitor, and operate urban transport is usually limited, and there is no strategic master plan to prioritize urban transport projects, identify solutions to emerging congestion, or improve road safety. Investment is needed to (i) upgrade road network, including some missing links; (ii) improve bus facilities and integrate interchanges between city bus and intercity buses, and develop regional ticketing and passenger information; and (iii) develop urban-renewal projects on major corridors and avenues that favor non-motorized transport. In cities with tourism potential, urban transport infrastructure needs to be upgraded to cope with growing demand and flows of tourists during peak seasons.

<sup>7</sup> The European Bank for Reconstruction and Development already supports part of the critical improvement, having lent €15 million to the metro company.

<sup>8</sup> Only 46% of the 98 buses are fully operational. Poor maintenance restricts operation speed to 15 km/hour.

The focus should be mainly on accessibility, road improvements, street lighting, sidewalks, and parking. Seasonal bus shuttles should be provided, linking the main tourist locations. Parking for coaches and cars should be developed near the city centers to avoid road congestion.

## **B. Government's Sector Strategy**

13. The government recently adopted a new Transport Strategy to 2020 to “promote integrated, efficient public transport, and to encourage a sustainable balance between public and private transport.”<sup>9</sup> This strategy covers the road network, public transport infrastructure, public transport operations, the metro, fare integration, traffic management, and parking. The government invested \$110 million during 2005–2010 but a further \$960 million is needed by 2025 to (i) meet demand, (ii) improve the quality of life and environment preservation, and (iii) provide world-class infrastructure to create a business-friendly environment. Strategic plans have been elaborated for Gyumri and cities with high potential for economic and tourism development. In Gyumri, the government decided to create clusters dedicated mainly to information technology and jewelry by setting up a technology park, for which a road map has been prepared.<sup>10</sup> Cluster creation is seen as possibly replicable in Vanadzor and Kapan and would benefit from the investment program.

## **C. ADB Sector Experience and Assistance Program**

14. ADB recently provided two technical assistance grants<sup>11</sup> from which derived the strategic road map for this proposed MFF in line with ADB new urban transport focus.<sup>12</sup> ADB has lent to the urban sector in Armenia but mainly for water supply and sanitation. The government is familiar with the MFF modality, as it was approved in 2010 for the North–South Corridor Investment Program.<sup>13</sup> In respect of the severe funding gaps and the huge investments needed, cooperation among development partners has been initiated. A loan of €15 million has been provided jointly by the European Bank for Reconstruction and Development, European Investment Bank, and European Commission (European Neighborhood Investment Facility) to finance investment backlogs of the metro infrastructure, and additional financing is being considered to improve parking in Yerevan. The proposed MFF will help urban areas implement the coherent development of urban infrastructure and the urban transport network. It has been developed with a holistic vision of multimodal integration and inter-related projects equally combining road and public transport projects. Up to five tranches are being envisaged: a first \$50 million tranche for urgent projects ready to be built, a \$80 million tranche 2 to complement the first projects and support Gyumri cluster, and then up to three subsequent tranches between \$60 to \$110 million upon project readiness targeting the other 10 secondary cities to accompany cluster development, stimulate tourism, improve transport sustainability and implement modern, cost-efficient, and clean mass transit.

<sup>9</sup> ADB.2008. Technical Assistance Consultant's Report: Armenia Transport Sector Development Strategy. Manila.

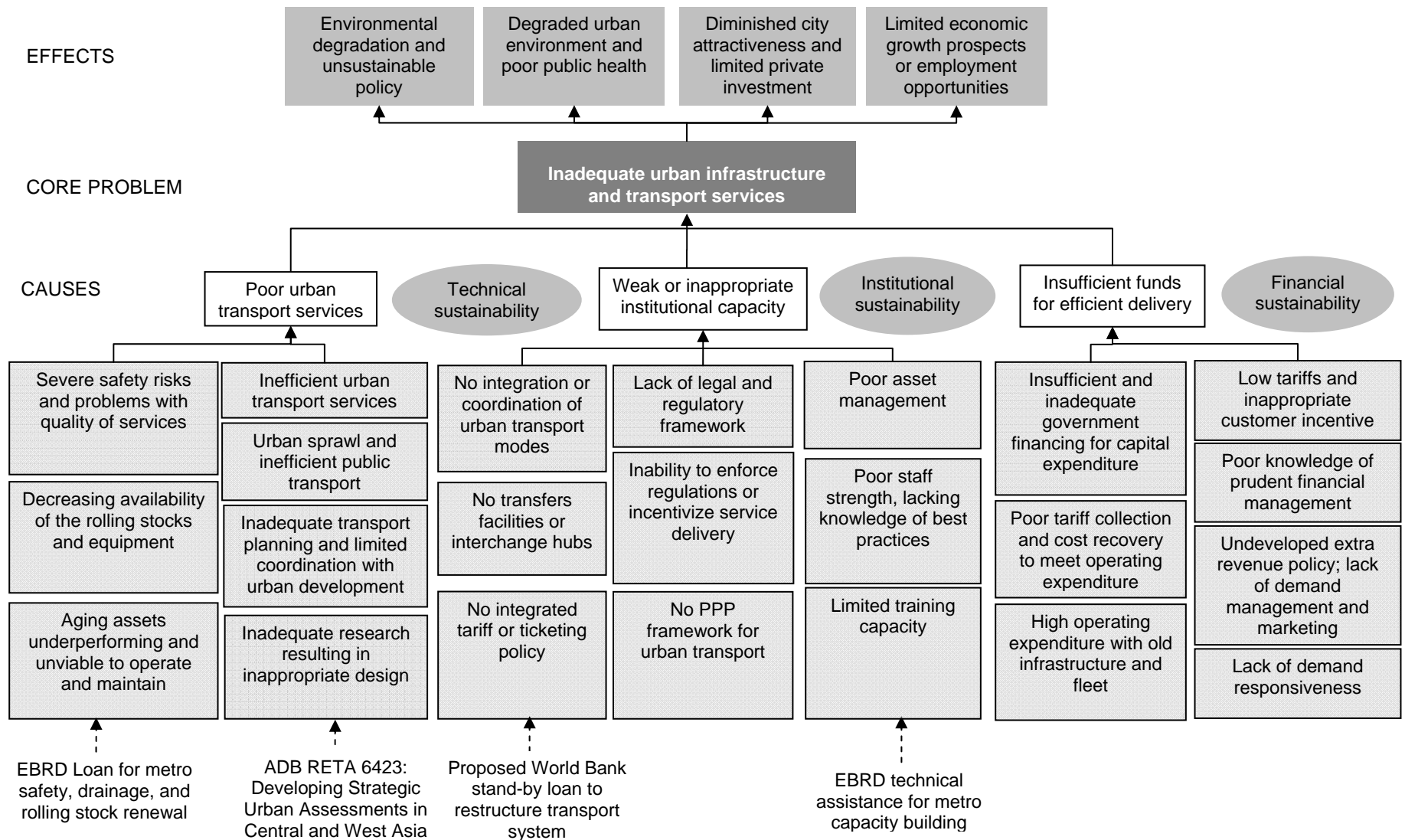
<sup>10</sup> USAID.2008. *Gyumri Technopark Strategic Roadmap and Business Plan*.

<sup>11</sup> ADB. 2007. *Technical Assistance for Developing Strategic Urban Assessments for Selected Central and West Asia Developing Member Countries*. Manila (TA 6423-REG, for \$1.0 million, approved on 27 November 2007); ADB 2009. *Technical Assistance to Armenia for Preparing the Yerevan Sustainable Urban Transport Project*. Manila (TA 7340-ARM, for \$1.10 million, approved on 7 September 2009).

<sup>12</sup> ADB. 2009. *Changing Course: A New Paradigm for Sustainable Urban Transport*. Manila; ADB. 2010. *Sustainable Transport Operation Plan*. Manila.

<sup>13</sup> ADB. 2009. Report and Recommendation of the President to the Board of Directors: Proposed Multitranchise Financing Facility and Administration of Cofinancing for the North–South Road Corridor Investment Program for the Republic of Armenia (MFF 0035-ARM, for \$440 million, approved on 29 September 2009).

## Problem Tree for Urban Transport



ADB = Asian Development Bank, EBRD = European Bank for Reconstruction and Development, PPP = public-private partnership, RETA = regional technical assistance.

### Sector Results Framework (Urban Transport, 2011–2020)

Country Sector Outcomes		Country Sector Outputs		ADB Sector Operations	
Sector Outcomes with ADB Contribution	Indicators with Targets and Baselines	Sector Outputs with ADB Contribution	Indicators with Incremental Targets	Planned and Ongoing ADB Interventions	Main Outputs Expected from ADB Interventions
<p>Reducing road transportation constraints on economic activity</p> <p>Improving service delivery in municipal infrastructure within the evolving decentralization process</p>	<p>Transport cost reduced by 15% from 2008 baseline</p> <p>Government operation subsidy for municipal service companies reduced by 10% by 2020 over 2009</p>	<p>Increasing demand for passenger and goods mobility satisfied with adequate transport infrastructures</p> <p>World-class infrastructure connecting neighboring country provided to favor private sector involvement and create a business-friendly environment</p> <p>Improved quality of life and environmental preservation with clean and cost-efficient transport solutions for all citizens</p>	<p>Flows of passenger and good increased by 20% by 2015 over 2008</p> <p>Foreign investment increased by 10% by 2015 over 2009</p> <p>Carbon dioxide decreased by 15% in urban areas by 2020 compared with 2008</p>	<p>Planned key activity areas:</p> <p>Urban infrastructure including roads and public transport (85% of funds)</p> <p>Urban transport institutional strengthening and capacity building (15% of funds)</p> <p>Pipeline projects with estimated amounts:</p> <p>Road improvement, upgrading or extension in Yerevan and other secondary cities (\$125 million)</p> <p>Public transport upgrading or extension in Yerevan (\$125 million)</p> <p>Road and other urban infrastructure improvement, upgrading, or extension in Yerevan and secondary cities (\$150 million)</p>	<p>A 11.5-km Yerevan bypass completed to divert through traffic</p> <p>10 km of urban roads renewed</p> <p>10 km of upgraded urban road with sidewalks and urban regeneration implemented</p> <p>One underground metro entrance constructed</p> <p>5 km of trolleybus and bus routes restructured with segregated and upgraded infrastructure</p> <p>2 urban transport networks restructured</p> <p>At least 5 multimodal interchange with intercity buses upgraded or developed</p> <p>10 km of metro infrastructure upgraded or created</p>

ADB = Asian Development Bank, km = kilometer,

Sources: Ministry of Economy, Ministry of Transport and Communications, Yerevan municipality, Mott MacDonald, ADB.