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Achieving the Aichi 2030 Declaration Goal 6 National Access and Connectivity- Road: Policy Action Recommendations

(Background Paper for Plenary Session 6: Review Goal 6 – National Access and Connectivity Realize Sustainable, Inclusive Economic Growth through Enhanced National Access and Connectivity)

Final Draft

This background paper has been drafted by: Michael Anyala, Asian Development Bank;
Julia Funk, International Road Federation; Sara Seghayer, DT Global, the High Volume Transport Applied Research Programme; and Gurpreet Singh Sehmi – Sustainable Mobility for All for the 15th Regional EST Forum in Asia.

Achieving the Aichi 2030 Declaration Goal 6 for National Access and Connectivity - Roads: Policy Action Recommendations

Policy Recommendations prepared for the High-Level 15th Regional EST Forum, Kuala Lumpur, Malaysia,
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Authors

Michael Anyala – Asian Development Bank (ADB)

Julia Funk – International Road Federation (IRF)

Sara Seghayer – DT Global, the High Volume Transport Applied Research Programme (HVT), funded by UK Aid

Gurpreet Singh Sehmi – Sustainable Mobility for All (Sum4All)

Reviewer

Kevin McPherson – Transport Research Laboratory of UK (TRL)

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Key Policy Recommendations - Summary

Policy Recommendation 1: Strengthen Road Asset Management

Develop, communicate, and implement a road asset management policy and strategy which support national and global goals for sustainable transport, climate action, disaster risk reduction, and quality infrastructure. Prepare road network investment plans based on lifecycle planning principles resulting in a rolling long term road network investment plan. Countries should promote the use of performance-based contracts (PBCs) as a better way of managing their road networks. Countries should envision and plan how digital technologies can be systematically mainstreamed to improve road systems, from the planning, design and construction of roads, to the operation and management of the road network, to the interaction and communication with road users and communities.

Policy Recommendation 2: Improve rural accessibility and connectivity through better rural road networks and transport services

Identify rural areas that can benefit from a denser road network and base infrastructure investment decisions on local needs. Make use of appropriate appraisal tools to assess potential investments. After undertaking stakeholder consultations, resources should be prioritised where improvements create higher economic and social benefits; policy objectives should determine how transport services provision is prioritised. Use credit schemes to fund and finance private transport services in rural areas. Support the provision of cost-effective transport services in rural areas, in particular provide support to establish rural public transport and shared services.

Policy Recommendation 3: Combining wider rural planning with rural transport planning

Make use of Integrated Rural Access Planning combining rural planning and rural transport planning to achieve greater accessibility. Strengthen the role and capacity of local governments in Integrated Rural Access Planning. Central governments should consider supporting different local authorities (such as road, housing, and health authorities) to strengthen their ability to plan for better accessibility with a multisectoral approach. Support research and exchange of experience on Integrated Rural Access Planning.

Policy Recommendation 4: Promote Sustainable and Green Initiatives

Countries should consider prioritising sustainable and green practices in road infrastructure development and operations. This entails promoting the integration of environmentally friendly approaches throughout the project lifecycle. Promoting the use of renewable energy sources for powering transportation systems is paramount in reducing greenhouse gas emissions and achieving a greener transport network. Governments should encourage eco-friendly transportation options and implement green logistics and freight transport.

Policy Recommendation 5: Monitor and Evaluate

To guarantee the success of road connectivity projects, countries should contemplate the establishment of a robust monitoring and evaluation system for overseeing and assessing their implementation. This framework should encompass a set of well-defined performance metrics,

including indicators related to accessibility, safety, environmental impact, and socio-economic development. Monitoring the societal and economic effects of road connectivity projects is vital for gauging their contribution to regional and national development goals. To achieve effective monitoring and evaluation, active involvement and collaboration with all relevant parties is necessary.

Policy Recommendation 6: Strengthen Resilience and Disaster Preparedness

Governments should incorporate climate-resilient design principles and update national design standards, appropriate to the national context, to cover risks and improve resilience of critical infrastructure. This can include elevated roads in flood-prone areas and reinforced structures to withstand earthquakes. Integrating climate data and projections into planning will enhance the infrastructure's longevity and reduce the need for costly post-disaster reconstruction. Retrofitting existing infrastructure and adapting its design to climate change is also important to prevent its premature deterioration and ensure that it functions correctly. Countries should explore prioritising disaster preparedness in road planning and design. This involves the development of robust disaster preparedness plans, including early warning systems and evacuation routes, to minimise the impact of natural disasters on transportation networks.

1. The Need to Act

1. Globally, the road infrastructure is the backbone of transport infrastructure, with most passenger transport and freight transport moved by road, and the role of road transport continues to grow. When designed effectively, the road network can be an engine of economic and social development by linking cities, rural areas, regions, and countries across borders.

2. However, road infrastructure is disproportionately distributed globally, with the lowest provision in low and lower-middle-income countries and regions. For example, Asia and the Pacific region constitute about 58% and 47% of the global population and GDP, but they have only about 31% of global road infrastructure.

3. Between 2010 and 2015, 60% of the global increase in road kilometres occurred in Asia; with the substantial road construction from 2000 to 2020, Asia at the regional level has reached parity with Europe and Northern America regarding road density (km/sqkm). Yet, Asia and the Pacific still fall short compared to per capita terms, and the pace of expansion is still slower than the growth in transport demand. Given that between 2020 and 2030, Asia's population could increase by 300 million, and transport demand could grow at an annual rate of 2.7% for passenger and 5% for freight transport, the mobility and infrastructure gap could widen further (Gota et al. 2023).

4. The United Nations (UN) 2030 Agenda for Sustainable Development adopted in 2015, formulates the objective to 'develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all' in SDG 9.1.

5. The Aichi 2030 Declaration reflects this targets : Goal 6 on National Access and Connectivity aims to '*facilitate, by 2030, inclusive multi-modal national (including rural-urban) and regional (cross-border) connectivity through the provision of sustainable multi-modal freight and passenger transport infrastructure and services (Based on SDG 9.1).'*

6. Countries can work towards the achievement of Aichi Goal 6 by taking the following actions.

2. Policy Recommendations

Recommendation 1: Strengthen Road Asset Management

7. **Develop, Communicate, and Implement a Road Asset Management Policy and Strategy** The policy should support national and global goals for sustainable transport, climate action, disaster risk reduction, and quality infrastructure. It should provide a visible commitment to achieving the benefits that can be delivered through asset management and should be established at the highest possible level within the government. The strategy should explain how the policy will be implemented and how asset management principles will help achieve long term goals and objectives.

8. **Prepare Road Network Investment Plans as one Component of Integrated Multimodal Transport Systems:** Lifecycle planning principles should be used to prepare rolling long term road network investment plans that support the asset management strategy. The investment plan should

identify road maintenance backlog and prioritise works and actions that must be implemented to achieve a good level of service for the road network in the medium to long-term (at least 5 years). Source(s) of funds to deliver the investment plan should be identified and clearly tagged to the maintenance and renewal of the existing road network.

9. **Promote Performance Based Contracts**: Countries should promote the use of performance-based contracts (PBCs) as a better way of managing their road networks. PBCs are contracts that pay the contractor based on the achievement of specific outcomes and performance indicators for the road network. Potential benefits of PBCs include reducing overall transport costs and improving the quality of the road network by encouraging contractors to use lifecycle approach to maintenance, providing more flexibility to contractors to use their expertise and innovation to achieve specified outcomes and indicators, increasing accountability and transparency by linking payments to measurable and verifiable performance indicators, and enhancing the sustainability and reliability of the road network by ensuring that the roads are maintained in a good condition at all times.

10. **Adopt a Digital Strategy for Roads**: Countries should envision and plan how digital technologies can be systematically mainstreamed to improve road systems, from the planning, design and construction of roads, to the operation and management of the road network, to the interaction and communication with road users and communities. This can support achieving road safety, cost efficiency, and low carbon and resilient mobility outcomes.

Recommendation 2: Improve rural accessibility and connectivity through better rural road networks and transport services

11. **Identify rural areas that can benefit from a denser road network:** The construction of rural roads strengthens urban-rural linkages, accessibility to markets, and with it, economic development in rural areas. Rural access typically increases with the density and length of an area's road network. Using the Rural Access Index (RAI)[1], countries can identify the areas that would benefit from investments in the construction and upgrade of the network.

12. **Base infrastructure investment decisions on local needs:** Particularly in scattered and poor rural areas where farmers have lower freight loads and mainly rely on small-scale farming, all-weather rural roads and the improvement of drainage systems are the most beneficial type of infrastructure investment. For rural areas that are closer to higher volume roads and more likely to need access to bigger markets, investments should also be directed towards the improvement of road surface; good road surfacing reduces the overall transport cost due to lower fuel consumption, making farmers' produce more competitive in local, national and international markets. For countries in subtropical and tropical regions, where roads may become impassable during the wet season, the recently developed Road Note 31[2] provides valuable guidance for structural design of roads, and a new approach to simplify and reduce the cost of road construction (Hine et al. 2015).

13. **Make use of appropriate appraisal tools to assess potential investments**: for example, the Road Network Evaluation Tool RONET was developed particularly for developing countries and is suitable for economic analysis of rural roads; the RED is suitable for appraisal of low-volume rural

[1] The Rural Access Index (RAI) expresses rural access as 'the proportion of the rural population that lives within 2 km of an all-season road'. It is one of the most important and widely accepted indicators of rural accessibility and development, and the official indicator for SDG 9 Industry, innovation and infrastructure.
[2] Road Note 31 was produced under the High Volume Applied Research Programme funded by UKAid

roads, and allows users to estimate non-motorised traffic impacts, benefits for social services and environmental impacts while requiring only a moderate amount of data.

14. **Develop multimodal rural transport networks for greater economic and social benefit:** Policymakers and transport planners should focus on multimodal integration by analysing routes, nodes and interchanges used by different commuters from their origin to their destination. After undertaking stakeholder consultations, resources should be prioritised where improvements create higher economic and social benefits; policy objectives should determine how transport services provision is prioritised. In general, high-density areas tend to be favoured when considering short-term benefits while low-density areas are the main target when looking at long-term objectives of poverty reduction and social equality. However, in most cases high- and low-density areas coexist in the same regions and policymakers will need to look at their planning objectives more holistically on a wider scale to identify the right combination of interventions (Starkey et al. 2002).

15. **Use credit schemes to fund and finance private transport services in rural areas:** transport services in rural areas tend to be characterised by lower traffic volumes, which makes funding and financing a key issue. Here, credit schemes can be used to accelerate the adoption of intermediate means of transport. A cost-effective way of increasing credit for transport means would be to improve cooperation between agricultural and transport programmes so that agricultural credit programmes can provide resources for the purchase of transport means. A good example of this model is the one used by the Thailand's Bank of Agriculture and Cooperatives which gives loans for various agricultural and transport machinery. This model could be expanded for the purchase of other means of transport such as bicycles, carts, motorcycles and mini trucks (Starkey et al. 2002). It is key that women have access to these schemes considering their role in agriculture in the region.

16. **Support the provision of cost-effective transport services in rural areas:** governments, international donors and financing institutions have tried to provide accessibility in rural areas almost exclusively by funding transport infrastructure under the assumption that investments in roads will spontaneously lead to the provision of transport services run by the private sector. While it is true that transport services cannot operate without adequate infrastructure, the provision of infrastructure is an enabler yet not sufficient in itself. Sound regulation for transport services provision and the promotion of affordable and reliable solutions are required to strengthen inclusive access in rural areas (Ren et al. 2019).

17. **Provide support to establish rural public transport services:** Public transport is also essential in rural areas to provide an adequate level of service. Reliable and frequent public transport allows the rural population to access markets when they do not have the means to use private transport modes but it also acts as a social inclusion measure to allow students to travel to schools and higher education, women to access hospitals and to allow the rural population to access job opportunities in other sectors. Governments could consider providing subsidies to establish public transport services; licensing a number of routes and requiring operators to bid for the market could be an effective way to implement operating subsidies. As rural areas develop and trips become more frequent, demand-responsive transport can also be considered as an option to integrate subsidised services, reducing costs. This type of solution requires users to use phones to book trips and therefore requires investments in telecommunication infrastructure too (Starkey et al. 2002). This can particularly assist women who may need urgent transfers to hospital for themselves (e.g. when pregnant), for young children and for the elderly in their care.

Recommendation 3: Combining wider rural planning with rural transport planning

18. **Make use of Integrated Rural Access Planning:** The development of the rural transport network and village-level network including footbridges, paths and tracks are key to increasing rural accessibility. Projects in several EST Forum participating countries - such as Cambodia, India, Indonesia, Laos PDR, the Philippines, Thailand, Viet Nam - that used the Integrated Rural Access Planning (IRAP) methodology, successfully demonstrated that the integration of rural planning and rural transport planning leads to greater accessibility. IRAP, similar to Transit Oriented Development (TOD) in urban settings, is a land-use and sustainable planning strategy that aims to create built environments suitable for walking and cycling, to reduce the need for motorised trips, and to provide amenities and services near transport networks. As most rural dwellers rely on walking and non-motorised transport, reducing the need for long trips leads to greater social inclusion. With the objective to reduce travel time at the lowest infrastructure cost, it assesses investments in a market, a school, a clinic, or trail based on the expected reduction in travel time and the total investment costs involved (Donnges 2003).

19. **Strengthen the role and capacity of local governments in Integrated Rural Access Planning:** IRAP projects have shown to be more effective when implemented by local governments that have the physical proximity to local communities and better understand their needs. Central governments should consider supporting different local authorities (such as road, housing, and health authorities) to strengthen their ability to plan for better accessibility with a multisectoral approach. This can be achieved through increased funding but also cross-sectoral capacity building (Donnges 2003).

20. **Support research and exchange of experience on Integrated Rural Access Planning:** TOD research studies and implementation measures in urban areas receive a lot of funding from national governments and the international community. Countries can collaborate with international organisations and academia to study and advance the Integrated Rural Access Planning methodology and engage in exchange of experiences to support and scale the adoption of the IRAP methodology on a regional level.

Recommendation 4: Promote Sustainable and Green Initiatives

21. **Emphasise Sustainable Infrastructure Development:** To achieve Aichi Goal 6, countries should consider prioritising sustainable and green practices in road infrastructure development and operations. This entails promoting the integration of environmentally friendly approaches throughout the project lifecycle. Governments should also encourage the use of sustainable construction materials, such as recycled and locally sourced materials, to reduce the environmental footprint of road construction. The integration of nature-based solutions is in many cases not only more cost-effective when trying to improve climate resilience but it also provides several additional social and economic benefits to local communities that standard grey infrastructure does not have. Different countries will, based on national circumstances, set priorities either on economic, social or another basis.

22. **Adopt Renewable Energy Sources:** Promoting the use of renewable energy sources for powering transportation systems is paramount in reducing greenhouse gas emissions and achieving a greener transport network. Governments should consider incentivizing the adoption of renewable energy technologies, such as solar and wind-powered charging stations, to support the growing

adoption of electric and hybrid vehicles. Additionally, exploring opportunities for biofuels and other low-carbon alternatives can contribute to more sustainable transportation.

23. **Encourage Eco-Friendly Transportation Options:** To enhance national and regional connectivity sustainably, countries should encourage the adoption of greener mobility. This can include offering incentives for public transportation usage, supporting the development of efficient and accessible public transit networks, as well as distribution hubs for first mile / last mile pickup / delivery, and promoting non-motorized transportation, like cycling and walking, for short-distance trips within urban areas.

24. **Implement Green Logistics and Freight Transport:** Governments should consider – in collaboration with the private sector – expanding sustainable logistics and freight transport solutions which involve environmentally responsible and resource-efficient management of goods transportation, integrating eco-friendly technologies and multi-modal approaches to minimise the environmental impact while maintaining economic viability. Encouraging the use of cleaner and more energy-efficient freight vehicles, optimising logistics operations to minimise empty trips, and promoting intermodal transportation can significantly reduce the carbon footprint of goods movement and improve overall transport efficiency. Governments can do so through regulatory instruments at their disposal. They can also conduct awareness raising, implement multi-stakeholder consultations, and in some cases provide financial incentives.

25. **Adopt a 'dig once' policy:** For example, if a road is being constructed or widened, a dig once policy would encourage or require the installation of conduits or micro-ducts that can house electric cables and fibre cables for future use (e.g. for EV charging).

Recommendation 5: Monitor and Evaluate

26. **Establish Comprehensive Performance Metrics:** To guarantee the success of road connectivity projects, countries should contemplate the establishment of a robust system for overseeing and assessing their implementation. This framework should encompass a set of well-defined performance metrics, including indicators related to accessibility, safety, environmental impact, and socio-economic development. The use of technology and data-driven tools will be instrumental in collecting real-time information and enhancing the accuracy of evaluations.

27. **Monitor Socio-Economic Impact:** Monitoring the societal and economic effects of road connectivity projects is vital for gauging their contribution to regional and national development goals. Governments should assess factors like job creation, income generation, and improved access to markets and social services. By understanding these impacts, decision-makers can make informed adjustments to optimise project outcomes.

28. **Foster Stakeholder Engagement:** To achieve effective monitoring and evaluation, active involvement and collaboration with all relevant parties is necessary. Governments should involve local communities, civil society organisations, and private sector stakeholders in the evaluation process. By soliciting feedback from these groups, potential challenges and opportunities can be identified early, leading to more responsive and inclusive project development.

Recommendation 6: Strengthen Resilience and Disaster Preparedness

29. **Incorporate Climate-Resilient Design:** Considering the increasing frequency and intensity of natural disasters and climate change impacts, road infrastructure must be designed to withstand

these challenges. Governments should incorporate climate-resilient design principles and update national design standards, appropriate to the national context, to cover risks and improve resilience of infrastructure . This can include elevated roads in flood-prone areas and reinforced structures to withstand earthquakes. Integrating climate data and projections into planning will enhance the infrastructure's longevity and reduce the need for costly post-disaster reconstruction. Retrofitting existing infrastructure and adapting its design to climate change is also important to prevent its premature deterioration and ensure that it functions correctly.

30. **Develop Disaster Preparedness Plans:** Countries should explore prioritising disaster preparedness in road planning and design. This involves the development of robust disaster preparedness plans, including early warning systems and evacuation routes, to minimise the impact of natural disasters on transportation networks. Cooperation between relevant agencies and emergency response teams is crucial to ensuring a swift and effective response during crises.

31. **Encourage Green Infrastructure Solutions:** Incorporating green infrastructure elements, such as natural drainage systems and vegetation buffers, can enhance the resilience of road networks. These features not only help manage stormwater runoff but also contribute to ecosystem preservation and biodiversity conservation. Governments should consider incentivizing the inclusion of such green infrastructure in road projects to promote environmental sustainability and climate adaptation. The integration of nature-based solutions is in many cases not only more cost-effective when trying to improve climate resilience but it also provides several additional social and economic benefits to local communities that standard grey infrastructure doesn't have.

3. Suggestions for Support from the International Community

32. **Technical Expertise and Knowledge Sharing:** International organisations and more advanced EST countries can offer technical expertise and knowledge sharing on sustainable infrastructure development, renewable energy integration, and resilient road planning. Capacity-building initiatives, workshops, and webinars can facilitate the transfer of best practices and lessons learned.

33. **Funding and Financing Mechanisms:** Access to funding and financing remains a challenge for many developing countries. The international community can support EST countries by providing innovative funding mechanisms, such as green bonds and public-private partnerships, to attract investment in sustainable transport projects. Additionally, international financial institutions and climate funds can explore better ways to work closely with governments to mobilise climate finance dedicated to sustainable transport projects on the ground. This can help facilitate access to funding opportunities for countries to implement climate-resilient and low-emission transport solutions.

34. **Policy Frameworks and Guidelines:** Developing standardised policy frameworks and guidelines can streamline the implementation of sustainable transport initiatives. International organisations can collaborate with EST countries to create adaptable templates that align with regional contexts and consider local needs.

35. **Establish Regional Transport Initiatives:** The international community can facilitate greater collaboration with regional organisations and development partners to establish joint initiatives focused on sustainable transport in the region. By pooling resources and expertise, these initiatives can address cross-border transport connectivity challenges and foster regional integration.

36. **Support Data and Technology Sharing:** The International Community can facilitate the sharing of data and technology solutions relevant to sustainable transport planning and operations. Establish data-sharing agreements and platforms to enhance the availability of transport-related information for evidence-based decision-making.

37. **Foster Public Awareness and Behavioural Change:** Awareness campaigns can promote sustainable and eco-friendly transportation choices among citizens. Collaborations between the international community, local communities, and civil society organisations can be leveraged to advocate for the benefits of green transport options.

38. **Enhance Rural Transport and Mobility Investments:** Improve data collection and analysis of transport solutions in rural areas. Develop structured theories of change and monitor socio-economic indicators to justify and attract investments in rural transport projects. Address the lack of quantitative evidence by providing comprehensive data on the benefits and technical effectiveness of rural transport investments.

39. **Stakeholder Engagement and Capacity Building:** Provide support for stakeholder engagement and capacity building before the construction of rural infrastructure and transport services. Encourage local community involvement during planning and design phases for more effective and successful project outcomes, taking care to ensure that women and girls are included in the stakeholder discussions and capacity building efforts.

4. Wider Benefits and Linkages of National Connectivity and Access with other Aichi Goals, the SDGs, and the Paris Agreement

40. The physical network of roads and transportation facilities - on the national, regional, urban and rural level - holds the key to fostering social and economic progress. It provides essential linkages to markets, education, healthcare, services, and employment opportunities, and is therefore closely linked to a wide variety of the SDGs well beyond SDG 9 Industry, Innovation and Infrastructure. In particular improved access to basic services will help women, increase intergenerational equity and help raise families out of poverty, whilst retaining the attractiveness of rural and peri urban areas.

41. Aichi Goal 6 National Connectivity also has linkages with other Aichi Goals, most obviously with Aichi Goals 4 Rural Access and 5 Urban Access. The build-out of roads also needs to consider the economic sustainability of the investment (Aichi Goal 3), i.e., the overall social and economic benefit that can be achieved. In this respect, adding ‘unnecessary’ road capacity can have adverse effects on other Aichi Goals and Sustainable Development Goals as it may induce unnecessary individual motorised traffic which, in turns, leads to additional GHG emissions (Aichi Goal 1a Climate Change Mitigation, SDG 13 Climate Action, and the Paris Agreement) and air pollution (Aichi Goal 1c Air Pollution and SDG 3 Health and Well-being). Also, sound design and management of roads and the road network are crucial when it comes to road safety (Aichi Goal 2, SDG 3) and to resilience (Aichi Goal 1b).

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